Requirement Plan

Plan Name: LTE_3GPP_Band13_NetworkAccess
Plan Id: LTEB13NAC
Version Number: 54
Release Date: October 2024
Latest Release Date: October 2024 : Open Access

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Revision History

Author	Description of Changes
Verizon Wireless	Version 0.9: Initial version
Verizon Wireless	Version 0.95 Updates/Clarifications/Additions to the following sections: 1.1, 1.2, 1.3, 1.7, 2.2.1.3, 2.2.2, 3.1.1, 3.1.2.5, 3.1.3, 3.2.1, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.11, 3.2.12, 3.2.13, 4.1.4, 5.2, 6.1.1, 6.1.2, 6.2.1, 6.2.2, 6.2.3, 6.3.1, 7, 8
Verizon Wireless	Version 0.96 Updates/Clarifications/Additions to the following sections: 1.3, 2.2.1.3, 2.2.2.1, 3.1.2.3, 3.1.2.5, 3.1.3.3, 3.2.2, 3.2.3, 3.2.4, 3.2.6, 3.2.7, 3.2.8, 3.2.10, 3.2.12, 4.1.2, 4.1.3, 4.1.4, 5.4, 6.2.1.2, 6.2.3.2, 7, 8
Verizon Wireless	Version 0.97 Updates/Clarifications/Additions to the following sections: 1.3, 2.2.2.1, 3.1.2.5, 3.2.4.4, 3.2.6, 3.2.8, 3.2.9, 3.2.10, 3.2.13, 4.1.2, 4.1.3, 4.1.4, 5.4, 6.1.1, 6.1.2, 6.2, 6.2.1, 6.2.2, 6.2.3, 7, 8
Verizon Wireless	Version 1.00 Updates/Clarifications/Additions to the following

	sections: 1.2, 1.7, 2.2.1.1, 2.2.2.2, 3.1.2.5, 3.1.3, 3.1.3.3, 3.2.1, 3.2.2, 3.2.4.1, 3.2.4.2.2, 3.2.6, 3.2.10, 3.2.11, 4.1.1, 4.1.3.1, 4.1.3.4.1, 4.1.5.1, 5.4, 6.1.1, 6.2.2.2, 7, 8
Verizon Wireless	Version 2.00 Updates/Clarifications/Additions to the following sections: 1.3, 2.2.1.2, 3.1.2.6, 3.2.4.2.1, 3.2.4.4.2, 3.2.6, 3.2.8.1, 3.2.8.2, 3.2.8.4.1, 3.2.10, 3.2.10.2, 3.2.13, 4.1.2.1, 4.1.2.2, 4.1.2.3, 4.1.3.1, 4.1.4, 4.1.8, 4.1.9, 5.4.1, 6.2, 6.2.5, 6.3, 8
Verizon Wireless	Version 3.00 Updates/Clarifications/Additions to the following sections: 1.2, 1.3, 3.1.2.2, 3.2.4.1, 3.2.4.4.2, 3.2.4.4.3, 3.2.4.7, 3.2.5, 3.2.8.5, 3.2.9, 3.2.14, 4.1.2.3, 4.1.2.4.2, 4.1.3, 4.1.3.1, 4.1.3.3.1, 4.1.4.2, 4.1.4.3, 4.1.10, 5.4.1, 6.2.1.2, 6.2.3.2.1, 6.2.3.2.2, 6.2.3.2.3, 7, 8
Verizon Wireless	Version 4.00 Updates/Clarifications/Additions to the following sections: 3.2.4.1, 3.2.4.4.2, 3.2.5, 3.2.5.1, 4.1.3.1, 4.1.4, 4.1.8, 4.1.10, 8
Verizon Wireless	Version 5.00 Updates/Clarifications/Additions to the following sections: 1.2, 3.1.2.6, 3.2.8.5, 4.1.2.1.1, 4.1.3, 4.1.4.1, 4.1.4.2, 4.1.4.2.1, 4.1.4.2.2, 4.1.4.3, 4.1.6.1, 4.1.8, 5.4.1,

	6.2.1.2, 6.2.3.2.1, 6.2.3.2.2, 6.3.4.1, 6.3.4.2, 7, 8
Verizon Wireless	Version 6.00 Updates/Clarifications/Additions to the following sections: 3.1.2.7, 3.2.4.3, 3.2.8.6, 3.2.10.3.1, 4.1.3, 4.1.4.1, 4.1.4.2.1, 4.1.4.2.2, 4.1.4.2.3, 4.1.4.3, 4.1.6.1, 4.1.8.1, 4.1.8.2.2, 5.5.1
Verizon Wireless	Version 7.00 Updates/Clarifications/Additions to the following sections: 1.2, 2.2.1.1, 2.2.1.3, 3.1.2.7, 3.2.4.4.2, 3.2.4.7, 3.2.4.8, 3.2.6, 3.2.8.6, 3.2.9, 4.1.4.2.1, 4.1.10, 5.4.1, 6.2.2.5, 6.2.3.2, 8 Updates to Release 9 throughout the document
Verizon Wireless	Version 8.00 Updates/Clarifications/Additions to the following sections: 1, 3.1.2.5, 3.1.2.7, 3.1.2.7.1, 3.1.2.7.4, 3.1.2.7.5, 3.2.2, 3.2.15, 4.1.4.2.1, 4.1.7, 6.1.3, 6.2.1.2, 6.2.3.2, 6.2.3.2.1, 6.2.3.2.2, 6.2.4.1, 6.2.4.2, 6.3.5, 8
Verizon Wireless	Version 9.00 Updates/Clarifications/Additions to the following sections: 2.1.1, 2.2.2.1, 3.2.1.1, 3.2.4.3, 3.2.4.6, 3.2.4.7, 3.2.6, 3.2.10, 3.2.10.1, 3.2.10.2.1, 3.2.10.3, 3.2.15, 3.2.16, 4.1.2.1.2, 4.1.4.1, 5.4.2, 5.5.1, 6.2.4.2, 8
Verizon Wireless	Version 10.00 Updates/Clarifications/Additions to the following sections:

	3.1.2.7.1, 3.1.2.7.2, 3.1.2.7.5, 3.2.4.4.3, 3.2.4.7, 3.2.8.5, 4.1.4.2.1, 5.4.1, 8
Verizon Wireless	Version 11.00 Updates/Clarifications/Additions to the following sections: 3.1.2.7
Verizon Wireless	Version 12.00 Updates/Clarifications/Additions to the following sections: 4.1.4.1, 4.1.4.2.2, 4.1.4.3, 4.1.6.1, 4.1.8.2.1, 4.1.8.2.2
Verizon Wireless	Version 13.00 Updates/Clarifications/Additions to the following sections: 3.1.2.7.5, 3.1.2.7.6, 3.2.1.1, 3.2.1.2, 3.2.1.3, 3.2.8.7, 3.2.9, 3.2.17, 4.1.2.4.1, 4.1.2.4.4, 4.1.11, 6.2.1.2, 6.2.3.2.1, 6.2.3.2.2, 6.2.3.2.3
Verizon Wireless	Version 14.00 Added section 6.4
Verizon Wireless	Version 15.00 Updates/Clarifications/Additions to the following sections: 3.1.2.7, 3.1.3.3, 3.1.3.7, 3.2.4.4.3, 3.2.4.8, 4.1.2.4.2, 4.1.2.4.5, 4.1.3, 4.1.3.3.1, 4.1.3.3.2, 4.1.6, 4.1.12
Verizon Wireless	Version 16.00 Updates/Clarifications/Additions to the following sections: 2.2.3, 3.1.2.7, 3.1.3.3, 3.1.3.4, 3.2.4.7.1, 3.2.4.7.2, 4.1.2.4.2, 4.1.2.4.6, 4.1.3.3.1, 4.1.4.1, 4.1.8.1.1, 4.1.13, 5.4.1, 8

Verizon Wireless	Version 17.00 Updates/Clarifications/Additions to the following sections: 1.2, 2.1.1, 2.2.1.3, 3.1.3, 3.1.3.3, 3.1.3.8, 3.2.4.7.2, 3.2.4.8, 3.2.9, 3.2.10 Added IMS registration requirements from LTE SMS Requirements, 3.2.10.4.1, 3.2.10.4.4, 3.2.10.4.6, 3.2.10.4.7, 3.2.11, 3.2.18, 4.1.2.4, 4.1.2.4.2, 4.1.2.4.5, 4.1.3.3, 4.1.3.3.1, 4.1.3.3.2, 4.1.5.1, 4.1.10, 4.1.12.1.3, 4.1.14, 4.1.15, 4.1.16, 4.1.17, 4.1.18, 5.4.1, 6.4.1.1, 6.4.1.2, 6.4.2.1, 6.4.2.2, 8
Verizon Wireless	Version 18.00 Updates/Clarifications/Additions to the following sections: 1.2, 2.2.1.1, 3.1.3.9, 3.2.10.5.8, 3.2.10.8, 4.1.18.1, 4.1.18.5, 6.2.1.2, 6.2.1.2.1, 6.2.2.2, 6.2.3.2, 6.2.3.2.1, 6.2.3.2.2, 6.2.3.2.3
Verizon Wireless	Version 19.00 Updates/Clarifications/Additions to the following sections: 3.1.3.10, 3.2.10.4.3, 3.2.10.4.4, 3.2.10.4.6, 3.2.10.5.1, 3.2.10.5.9, 3.2.10.6, 5.4.1, 6.2.1.2.1
Verizon Wireless	Version 20.00 Updates/Clarifications/Additions to the following sections: 3.2.10.4.3, 3.2.10.4.6, 3.2.10.4.7, 3.2.10.5.9, 3.2.10.9
Verizon Wireless	Version 21.00 Updates to sections: 3.1.3.10.1 (VZ_REQ_LTEB13NAC_6461)

	3.1.3.11.1 (VZ_REQ_LTEB13NAC_6482) 3.2.10.5.8.1 (VZ_REQ_LTEB13NAC_6439) 4.1.4.3.1 (VZ_REQ_LTEB13NAC_6370) 4.1.6.2.1 (VZ_REQ_LTEB13NAC_6375)
Verizon Wireless	Version 22.00 Updates to sections: 2.2.1.3.1 (VZ_REQ_LTEB13NAC_6270), 2.2.1.3.2 (VZ_REQ_LTEB13NAC_6271), 3.1.3.5.1 (VZ_REQ_LTEB13NAC_6299), 3.1.3.13.1 (VZ_REQ_LTEB13NAC_36250), 3.2.4.2.1 (VZ_REQ_LTEB13NAC_22716), 3.2.4.3.2.1 (VZ_REQ_LTEB13NAC_6311), 3.2.9.1 (VZ_REQ_LTEB13NAC_6334), 3.2.10.5.3.1 (VZ_REQ_LTEB13NAC_6434), 3.2.10.5.6.1 (VZ_REQ_LTEB13NAC_6437), 3.2.10.5.11.1 (VZ_REQ_LTEB13NAC_6442), 3.2.10.5.13.1 (VZ_REQ_LTEB13NAC_35804), 3.2.10.6.1.1 (VZ_REQ_LTEB13NAC_6444), 3.2.10.6.2.1 (VZ_REQ_LTEB13NAC_6452), 3.2.10.6.7.1 (VZ_REQ_LTEB13NAC_6457), 3.2.10.6.10.1 (VZ_REQ_LTEB13NAC_36128), 3.2.10.10.1 (VZ_REQ_LTEB13NAC_33802), 3.2.10.11 (VZ_REQ_LTEB13NAC_36124, VZ_REQ_LTEB13NAC_36125, VZ_REQ_LTEB13NAC_36126), 4.1.7.2 (VZ_REQ_LTEB13NAC_35805), 4.1.19.1 (VZ_REQ_LTEB13NAC_35802), 4.1.20.1 (VZ_REQ_LTEB13NAC_36238), 5.5.1 (VZ_REQ_LTEB13NAC_23654)
Verizon Wireless	Version 23.00 Updates to sections: VZ_REQ_LTEB13NAC_6264, VZ_REQ_LTEB13NAC_6268, VZ_REQ_LTEB13NAC_6269, VZ_REQ_LTEB13NAC_6270, VZ_REQ_LTEB13NAC_6274, VZ_REQ_LTEB13NAC_6275, VZ_REQ_LTEB13NAC_6277, VZ_REQ_LTEB13NAC_6461, VZ_REQ_LTEB13NAC_6482, VZ_REQ_LTEB13NAC_36250, VZ_REQ_LTEB13NAC_6317, VZ_REQ_LTEB13NAC_6433, VZ_REQ_LTEB13NAC_6435, VZ_REQ_LTEB13NAC_6439, VZ_REQ_LTEB13NAC_6442, VZ_REQ_LTEB13NAC_6444, VZ_REQ_LTEB13NAC_33802, VZ_REQ_LTEB13NAC_36124, VZ_REQ_LTEB13NAC_36125, VZ_REQ_LTEB13NAC_36126, VZ_REQ_LTEB13NAC_23543, VZ_REQ_LTEB13NAC_36843, VZ_REQ_LTEB13NAC_36950, VZ_REQ_LTEB13NAC_36951, VZ_REQ_LTEB13NAC_36952, VZ_REQ_LTEB13NAC_36953, VZ_REQ_LTEB13NAC_36954, VZ_REQ_LTEB13NAC_36957, VZ_REQ_LTEB13NAC_36959, VZ_REQ_LTEB13NAC_36960, VZ_REQ_LTEB13NAC_36963, VZ_REQ_LTEB13NAC_36964, VZ_REQ_LTEB13NAC_36965, VZ_REQ_LTEB13NAC_36966, VZ_REQ_LTEB13NAC_36967, VZ_REQ_LTEB13NAC_36968,

	VZ_REQ_LTEB13NAC_36969, VZ_REQ_LTEB13NAC_6370, VZ_REQ_LTEB13NAC_6375, VZ_REQ_LTEB13NAC_23623, VZ_REQ_LTEB13NAC_36995, VZ_REQ_LTEB13NAC_6392, VZ_REQ_LTEB13NAC_6401, VZ_REQ_LTEB13NAC_6402, VZ_REQ_LTEB13NAC_6403, VZ_REQ_LTEB13NAC_6404, VZ_REQ_LTEB13NAC_6405, VZ_REQ_LTEB13NAC_6412, VZ_REQ_LTEB13NAC_6413
Verizon Wireless	Version 24.00 Updates to sections: VZ_REQ_LTEB13NAC_6264, VZ_REQ_LTEB13NAC_6268, VZ_REQ_LTEB13NAC_6269, VZ_REQ_LTEB13NAC_6270, VZ_REQ_LTEB13NAC_37889, VZ_REQ_LTEB13NAC_6434, VZ_REQ_LTEB13NAC_6435, VZ_REQ_LTEB13NAC_6437, VZ_REQ_LTEB13NAC_6439, VZ_REQ_LTEB13NAC_6485, VZ_REQ_LTEB13NAC_36948, VZ_REQ_LTEB13NAC_36950, VZ_REQ_LTEB13NAC_36952, VZ_REQ_LTEB13NAC_36957, VZ_REQ_LTEB13NAC_37714, VZ_REQ_LTEB13NAC_37808, VZ_REQ_LTEB13NAC_37809, VZ_REQ_LTEB13NAC_37810, VZ_REQ_LTEB13NAC_37812, VZ_REQ_LTEB13NAC_37813, VZ_REQ_LTEB13NAC_37814, VZ_REQ_LTEB13NAC_36238, VZ_REQ_LTEB13NAC_36995, VZ_REQ_LTEB13NAC_37647, VZ_REQ_LTEB13NAC_37648, VZ_REQ_LTEB13NAC_37649, VZ_REQ_LTEB13NAC_37650, VZ_REQ_LTEB13NAC_36963, VZ_REQ_LTEB13NAC_36964, VZ_REQ_LTEB13NAC_36965, VZ_REQ_LTEB13NAC_36966, VZ_REQ_LTEB13NAC_36969, VZ_REQ_LTEB13NAC_37651, VZ_REQ_LTEB13NAC_37816, VZ_REQ_LTEB13NAC_37817 Updated "CTIA Test Plan for Wireless Device Over the Air Performance" references throughout the document.
Verizon Wireless	Version 25.00 Updates to sections: VZ_REQ_LTEB13NAC_6274, VZ_REQ_LTEB13NAC_6332, VZ_REQ_LTEB13NAC_6433, VZ_REQ_LTEB13NAC_6435, VZ_REQ_LTEB13NAC_35804, VZ_REQ_LTEB13NAC_6453, VZ_REQ_LTEB13NAC_6459, VZ_REQ_LTEB13NAC_33802, VZ_REQ_LTEB13NAC_37806, VZ_REQ_LTEB13NAC_38376, VZ_REQ_LTEB13NAC_6465, VZ_REQ_LTEB13NAC_6466, VZ_REQ_LTEB13NAC_38228, VZ_REQ_LTEB13NAC_38230,

	VZ_REQ_LTEB13NAC_38231, VZ_REQ_LTEB13NAC_38232, VZ_REQ_LTEB13NAC_38233, VZ_REQ_LTEB13NAC_38234, VZ_REQ_LTEB13NAC_38235, VZ_REQ_LTEB13NAC_38236, VZ_REQ_LTEB13NAC_38756, VZ_REQ_LTEB13NAC_38757, VZ_REQ_LTEB13NAC_38238, VZ_REQ_LTEB13NAC_38239, VZ_REQ_LTEB13NAC_38240, VZ_REQ_LTEB13NAC_38241, VZ_REQ_LTEB13NAC_38242, VZ_REQ_LTEB13NAC_38243, VZ_REQ_LTEB13NAC_38244, VZ_REQ_LTEB13NAC_35802, VZ_REQ_LTEB13NAC_36238, VZ_REQ_LTEB13NAC_38507, VZ_REQ_LTEB13NAC_38508, VZ_REQ_LTEB13NAC_6385, VZ_REQ_LTEB13NAC_38378
Verizon Wireless	Version 26.00 Updates to sections: VZ_REQ_LTEB13NAC_6467, VZ_REQ_LTEB13NAC_6412 VZ_REQ_LTEB13NAC_39982
Verizon Wireless	Version 27.00 Updates to sections: VZ_REQ_LTEB13NAC_6269, VZ_REQ_LTEB13NAC_6277, VZ_REQ_LTEB13NAC_6336, VZ_REQ_LTEB13NAC_6455, VZ_REQ_LTEB13NAC_6458, VZ_REQ_LTEB13NAC_6459, VZ_REQ_LTEB13NAC_33802, VZ_REQ_LTEB13NAC_39731, VZ_REQ_LTEB13NAC_39749, VZ_REQ_LTEB13NAC_39732, VZ_REQ_LTEB13NAC_39733, VZ_REQ_LTEB13NAC_6467, VZ_REQ_LTEB13NAC_36995, VZ_REQ_LTEB13NAC_6395, VZ_REQ_LTEB13NAC_6412, VZ_REQ_LTEB13NAC_39752, VZ_REQ_LTEB13NAC_39982
Verizon Wireless	Version 28.00 Updates to sections: VZ_REQ_LTEB13NAC_6299, VZ_REQ_LTEB13NAC_6308, VZ_REQ_LTEB13NAC_6311, VZ_REQ_LTEB13NAC_6313, VZ_REQ_LTEB13NAC_6314, VZ_REQ_LTEB13NAC_6317, VZ_REQ_LTEB13NAC_6326, VZ_REQ_LTEB13NAC_6327, VZ_REQ_LTEB13NAC_6332, VZ_REQ_LTEB13NAC_6334, VZ_REQ_LTEB13NAC_6336, VZ_REQ_LTEB13NAC_6338, VZ_REQ_LTEB13NAC_6434, VZ_REQ_LTEB13NAC_6439,

	VZ_REQ_LTEB13NAC_6440, VZ_REQ_LTEB13NAC_6442, VZ_REQ_LTEB13NAC_6445, VZ_REQ_LTEB13NAC_39731, VZ_REQ_LTEB13NAC_6350, VZ_REQ_LTEB13NAC_6351, VZ_REQ_LTEB13NAC_6352, VZ_REQ_LTEB13NAC_6353, VZ_REQ_LTEB13NAC_6356, VZ_REQ_LTEB13NAC_6359, VZ_REQ_LTEB13NAC_6360, VZ_REQ_LTEB13NAC_6361, VZ_REQ_LTEB13NAC_6365, VZ_REQ_LTEB13NAC_6367, VZ_REQ_LTEB13NAC_6368, VZ_REQ_LTEB13NAC_40649, VZ_REQ_LTEB13NAC_6373, VZ_REQ_LTEB13NAC_35802, VZ_REQ_LTEB13NAC_36995, VZ_REQ_LTEB13NAC_40930, VZ_REQ_LTEB13NAC_40797, VZ_REQ_LTEB13NAC_6385, VZ_REQ_LTEB13NAC_6386, VZ_REQ_LTEB13NAC_6388, VZ_REQ_LTEB13NAC_6395, VZ_REQ_LTEB13NAC_6412
Verizon Wireless	Version 29.00 Updates to sections: VZ_REQ_LTEB13NAC_6274, VZ_REQ_LTEB13NAC_6299, VZ_REQ_LTEB13NAC_6424, VZ_REQ_LTEB13NAC_41271, VZ_REQ_LTEB13NAC_41272, VZ_REQ_LTEB13NAC_41328, VZ_REQ_LTEB13NAC_6332, VZ_REQ_LTEB13NAC_6433, VZ_REQ_LTEB13NAC_6455, VZ_REQ_LTEB13NAC_6349, VZ_REQ_LTEB13NAC_35802, VZ_REQ_LTEB13NAC_6384, VZ_REQ_LTEB13NAC_6392, VZ_REQ_LTEB13NAC_6401, VZ_REQ_LTEB13NAC_6402, VZ_REQ_LTEB13NAC_6403, VZ_REQ_LTEB13NAC_41335, VZ_REQ_LTEB13NAC_36995, VZ_REQ_LTEB13NAC_6480
Verizon Wireless	Version 30.00: Updates/Additions/Clarifications to requirements related to: Device category UICC and eUICC 4 Rx and 4x4 MIMO Uplink 64-QAM IMS registration Data over control plane Blind data interference cancellation UE-assisted adaptive DRX IMS-less operation

	Low priority access
Verizon Wireless	Version 31.00: Updated MIMO OTA requirements and added notes on retirement of ECC. Updated 4 receive antenna requirement. Updated MTU size requirement. Updated requirement on SIP 403/404 handling.
Verizon Wireless	Version 32.00: Added LTE Category M1 requirements. Added eDRX requirements. Added clarifications on attach APN behavior for IMS-less data devices. Updated MTU size requirement. Removed antenna imbalance requirement. Removed ECC and antenna test application requirements.
Verizon Wireless	Version 33.00: Added clarifications for category M1, IMS-less operation, PSM, and single receive antenna operation. Updates to eUICC, MTU size, IMS registration, and feICIC requirements.
Verizon Wireless	Version 34.00: Updates to eUICC, IMS registration SIP 403/404 error handling, and attach accept NAS messaging requirements.
Verizon Wireless	Version 35.00:

	Added 5 MHz channel BW, UL 256QAM. Added features for IMS-less Category M1 and below devices. Updated UICC requirements. Updated TIS requirements. Updated single Rx requirements. Removed SIP 503 with "Outage Text".
Verizon Wireless	Version 36.00: Updates for NAS features for low priority/low complexity devices. Clarifications to cat M1 RF OTA requirements.
Verizon Wireless	Version 37.00: Minor clarifications to the PSM, eDRX requirements.
Verizon Wireless	Version 38.00: Updated eUICC Section: - Added Testability requirements. - Added M2M eUICC requirements. - Added OEM-Selected eUICC requirements. Updated References. Added new Acronyms Updated some of Cat M1 specific requirements - Added TBS and HARQ-ACK requirements. - Added Release Assistance Indicator requirement. - Added Data Inactivity monitoring requirement. - Updated TX Power class requirement. - Updated delay-tolerant access and EAB requirements. - Updated spurious emissions coexistence requirement. Moved APN rate control and NIDD requirements into SCEF requirement. Updated attach request requirement for IMS-less device Added SCEF/NIDD related requirement

	Clarified PDN support requirement for NB-IoT device.
Verizon Wireless	Version 39.00: Updated Network initiated PDN disconnection requirement for IMS-less device.
Verizon Wireless	Version 40.00: Added clarification for Cat-M1 only device in in VZ_REQ_LTEB13NAC_4352175, Updated NIDD/SCEF requirement in VZ_REQ_LTEB13NAC_12083025: - Added CIoT requirement - Added GCF certification requirement Update to requirement 6349. Updates to RF radiated performance requirements.
Verizon Wireless	Version 41.00: Added LTE Category 1bis requirements. Retired single receiver TIS requirements. Added note on LTE Category 1bis TIS requirements to C-TIS requirement tables. Updated Attach without PDN requirement. Updated On demand PDN & GCF certification requirement for NIDD/SCEF.
Verizon Wireless	Version 42.00: Corrected Cat-1BIS requirement. Updated single RX antenna data limit requirement. Updated Band 13 TRP requirements. Updates to eUICC requirements.
Verizon Wireless	Version 43.00: Added Service Gap Control requirement Updated APN rate and PLMN rate requirement
Verizon Wireless	Version 44.00: Updated IMEISV requirement.
Verizon Wireless	Version 45.00: Updates to the APN storage and APN update requirements. Clarifications to SMS support requirement.

Verizon Wireless	Version 46.00: Add requirement to address MIB/SIB1/SIB2 acquisition failure.
Verizon Wireless	Version 47.00: Added Cat-M1 requirement for Release 14 relaxed monitoring. Added IMSI ranges. Update to MIB/SIB1/SIB2 acquisition failure requirement.
Verizon Wireless	Version 48.00: Updates to sections 1.3.2.4.2.2.1, 1.3.2.8.5.2, and 1.5.4.1.1.
Verizon Wireless	Version 49.00: Retired select eICIC requirements. Retired all MDT requirements.
Verizon Wireless	Version 50.00: Added TRP and TIS requirements for Category M1 chest worn wearable devices.
Verizon Wireless	Version 51.00: Updated UICC PLMN support requirement in section 1.3.1.3.7.1.
Verizon Wireless	Version 52.00: Retired sections 1.3.2.22.2 (TM10), 1.3.2.23 (ePDCCH), 1.3.2.24 (SON Support), 1.3.2.27 (Blind Data IC), 1.6.5.1, 1.6.5.2, 1.6.5.3, 1.6.5.4, 1.6.5.5, 1.6.5.7, 1.6.7, and 1.6.10.

Verizon Wireless	Version 53.00 (June 2024): Updates to sections 1.3.2.11.1 - System Time & Local Time 1.3.2.30.1. - SOFTWARE REQUIREMENTS APPLICABLE TO CAT M1 ONLY
Verizon Wireless	Version 54.00 (October 2024): Updates to section 1.2.2.2.1.1 - MIMO Antenna Requirements

1.1 INTRODUCTION VZ_REQ_LTEB13NAC_1869

Verizon Wireless has launched LTE network service in the 3GPP Band 13 frequency band (700 MHz C Block). This publication is part of Verizon Wireless compliance with the FCCs rules for 700 MHz C Block (47 C.F.R. § 27.16), as explained in the FCCs Second Report and Order in WT Docket No. 06-150, "Service Rules for the 698-746, 747-762 and 777-792 MHz Bands" released on August 10, 2007.

In this document, the terms LTE (Long Term Evolution) and E-UTRA (Evolved Universal Terrestrial Radio Access) are considered equivalent.

1.1.1 APPLICABILITY VZ_REQ_LTEB13NAC_1870

These requirements apply to all devices designed to operate on the Verizon Wireless LTE 3GPP Band 13 network. 3GPP Band 13 is per 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*.

For any questions related to this document, please contact Verizon Wireless through the Verizon Wireless Open Development website.

1.1.2 ~~3GPP RELEASE 9 SPECIFICATIONS~~ VZ_REQ_LTEB13NAC_1871

1.1.2.1 ~~3GPP RELEASE 9 SPECIFICATIONS~~ VZ_REQ_LTEB13NAC_6264

1.1.3 ACRONYMS/GLOSSARY/DEFINITIONS VZ_REQ_LTEB13NAC_1872

This section defines acronyms and terms used throughout the document.

Acronym/Term	Definition
3GPP	3rd Generation Partnership Project, manages GSM, EDGE, UMTS, HSPA,

	and LTE standards
A-MPR	Additional Maximum Power Reduction
APN	Access Point Name
ATSC	Advanced Television Systems Committee
BW	Bandwidth
CAT	Card Application Toolkit
CMAS	Commercial Mobile Alert Service
CR	Change Request
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
EMM	EPS Mobility Management
EPS	Evolved Packet System
ETSI	European Telecommunications Standards Institute
E-UTRA	Evolved Universal Terrestrial Radio Access
E-UTRAN	Evolved Universal Terrestrial Radio Access Network
FCC	Federal Communications Commission
FDD	Frequency-Division Duplex
FQDN	Fully Qualified Domain Name
GCF	Global Certification Forum
IEC	International Electrotechnical Commission
IMEI	International Mobile station Equipment Identity
IMEISV	International Mobile station Equipment Identity and Software Version Number
IMS	IP Multimedia Subsystem

IMS-Less	Without IMS client
IMSI	International Mobile Subscriber Identity
ISIM	IP Multimedia Services Identity Module
ISO	International Organization for Standardization
LTE	Long Term Evolution
MCC	Mobile Country Code
MIMO	Multiple Input-Multiple Output
MNC	Mobile Network Code
MPR	Maximum Power Reduction
MTC	Machine Type Communications (Cat 1, Cat-M1, NB-IoT)
NAI	Network Access Identifier
NAS	Non-Access Stratum
NI	Network Identifier (part of APN)
NIDD	Non-IP Data Delivery
OI	Operator Identifier (part of APN)
OTADM	Over-the-Air Device Management
PCO	Protocol Configuration Options
P-CSCF	Proxy-Call Session Control Function
PDN	Packet Data Network
PDP	Packet Data Protocol
PLMN	Public Land Mobile Network
PUCCH	Physical Uplink Control Channel
PUSCH	Physical Uplink Shared Channel

QoS	Quality of Service
RAT	Radio Access Technology
RB	Resource Block
REFSENS	Reference Sensitivity
ROHC	Robust Header Compression
RRC	Radio Resource Control
RSS	Received Signal Strength
SCEF	Service Capability Exposure Function
SMS	Short Message Service
SNR	Serial Number (part of IMEI and IMEISV)
SVN	Software Version Number (part of IMEISV)
TAC	Type Allocation Code (part of IMEI and IMEISV)
TBS	Transport Block Size
TDD	Time-Division Duplex
TIS	Total Isotropic Sensitivity
TRP	Total Radiated Power
TTL	Time-to-Live
UE	User Equipment
UICC	Universal Integrated Circuit Card
USIM	Universal Subscriber Identity Module
VZW	Verizon Wireless

1.1.4 FCC COMPLIANCE VZ_REQ_LTEB13NAC_1873

1.1.4.1 FCC COMPLIANCE VZ_REQ_LTEB13NAC_6265

Please note that devices submitted to the Verizon Wireless Open Development Initiative for conformance testing must have previously completed U.S. Federal Communications Commission equipment authorization procedures and comply with relevant FCC rules and regulations. It is the responsibility of the developer to comply with relevant FCC requirements.

1.1.5 ~~LTE SERVICES~~VZ_REQ_LTEB13NAC_1874

1.1.6 REQUIREMENTS LANGUAGE VZ_REQ_LTEB13NAC_1875

This document uses the following verbal forms in conjunction with requirements:

- "*Shall*" or "*Shall not*" indicates the requirement is mandatory
- "*Should*" indicates the requirement is recommended but not mandatory
- "*May*" indicates the requirement is optional

1.1.7 DEVICE TESTING ON THE VERIZON WIRELESS LTE 3GPP BAND 13 NETWORK VZ_REQ_LTEB13NAC_1876

1.1.7.1 DEVICE TESTING ON THE VERIZON WIRELESS LTE 3GPP BAND

13 NETWORK VZ_REQ_LTEB13NAC_6266

Prior to any testing on the "live" Verizon Wireless LTE network, the device shall pass the Verizon Wireless LTE Band 13 Safe for Network Test Plan.

1.2 HARDWARE SPECIFICATIONS VZ_REQ_LTEB13NAC_1877

1.2.1 MECHANICAL VZ_REQ_LTEB13NAC_1878

1.2.1.1 UICC SUPPORT - FORM FACTOR VZ_REQ_LTEB13NAC_22654

1.2.1.1.1 UICC SUPPORT - FORM FACTOR VZ_REQ_LTEB13NAC_6267

The device shall support one of the following UICC form factors:

- 2FF, or Plug-in, UICC, as specified in clause 4.2 of ETSI TS 102 221: *Smart Cards UICC-Terminal Interface; Physical and Logical Characteristics, Release 8*
- 3FF, or Mini, UICC, as specified in clause 4.3 of ETSI TS 102 221: *Smart Cards UICC-Terminal Interface; Physical and Logical Characteristics, Release 8*
- 4FF UICC, as specified in clause 4.0.4 of ETSI TS 102 221: *Smart Cards UICC-Terminal Interface; Physical and Logical Characteristics, Release 11*

Verizon Wireless strongly recommends support of the 4FF UICC, with mechanical provisions in the device for easy insertion and removal of the card.

1.2.2 ELECTRICAL VZ_REQ_LTEB13NAC_1879

1.2.2.1 LTE SUPPORT VZ_REQ_LTEB13NAC_22655

1.2.2.1.1 LTE SPECIFICATION VZ_REQ_LTEB13NAC_22657

1.2.2.1.1.1 LTE SPECIFICATION - LTE CATEGORY 1 AND HIGHER VZ_REQ_LTEB13NAC_6268

LTE Category 1 and Higher Devices:
LTE category 1 and higher devices shall support Frequency-Division Duplex (FDD) LTE operation as defined in the 3GPP Release 9 Specifications, September 2010 baseline. Time-Division Duplex (TDD) operation is not required for LTE in 3GPP Band 13. The device may support Frequency-Division Duplex (FDD) LTE operation as defined in the 3GPP Release 10 Specifications, June 2011 baseline. The device may support LTE operation as defined in later 3GPP releases and baselines (i.e. later than 3GPP Release 10, June 2011 baseline).

LTE category 1 devices may also support LTE category 1bis as per the 3GPP Release 13 Specification (and later). LTE category 1bis devices are only required to support 1 receive antenna (full duplex Frequency-division duplex (FDD)) even though the UE indicates UE category 1 for legacy compatibility, as defined in the 3GPP Release 13 Specification. The device may support later 3GPP releases.

If the device supports 3GPP Release 9 (September 2010 baseline), support for the following CRs to Release 9 and the following features from Release 10 and Release 11 shall be included:

- 3GPP RP-101431, CR#532: Splitting FGI bit 3 (CR to 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*)
- SIB16 per the Release 11 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC).*

- RRC Connection Reject with Deprioritization per the Release 11 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC).*
- SON support (i.e. radio link failure reporting, handover failure reporting, and RACH information reporting) per the Release 10 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification.*
- Support for EMM Cause Value #42 "Service Network Failure" per the Release 11 version of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3.*
- Cell selection with hybrid cells per section 5.2.4.9 of the Release 10 version of 3GPP TS 36.304: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode.*
- Timers T3245, T3346, and T3396 per the Release 10 version of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3.*
- T3402 value in the ATTACH REJECT message per the Release 10 version of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3.*
- Low priority access/delay tolerant UE support and extended access barring per the Release 11 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification.*
- eICIC (and associated features) per 3GPP Release 10.
- Transmission mode 9 (TM9) downlink CoMP per 3GPP Release 10.
- Transmission mode 10 (TM10) downlink CoMP per 3GPP Release 11.

If the device supports 3GPP Release 10 (June 2011 baseline), support for the following features from Release 11 shall be included:

- SIB16 per the Release 11 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC).*
- RRC Connection Reject with Deprioritization per the Release 11 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC).*
- Support for EMM Cause Value #42 "Service Network Failure" per the Release 11 version of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3.*
- Low priority access/delay tolerant UE support and extended access barring per the Release 11 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification.*
- eICIC (and associated features) per 3GPP Release 10.
- Transmission mode 10 (TM10) downlink CoMP per 3GPP Release 11 (including TM9 downlink CoMP per 3GPP Release 10).

1.2.2.1.1.2 LTE SPECIFICATION - LTE CATEGORY M1 VZ_REQ_LTEB13NAC_4297753

LTE Category M1 Devices:
LTE category M1 devices shall support either a) frequency-division duplex (FDD) category M1 LTE operation, or b) Type B half-duplex frequency-division duplex (HD-FDD) category M1 LTE operation, as defined in the 3GPP Release 13 Specifications. The device may support later 3GPP releases.

1.2.2.1.2 LTE DEVICE CATEGORY VZ_REQ_LTEB13NAC_22658

1.2.2.1.2.1 LTE DEVICE CATEGORY VZ_REQ_LTEB13NAC_6269

The device shall be either 1) an LTE category M1 device, or 2) an LTE category 1 or higher device per 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities*.

All smartphones and tablets shall be LTE category 2 or higher.

NOTE: Depending on the modem features supported by the device, the device may need to report separate device categories for downlink and uplink using the *ue-CategoryDL* and *ue-CategoryUL* fields in the *UE-EUTRA-Capability* information element. Value m1 corresponds to UE category M1, and value oneBis corresponds to UE category 1bis. Refer to the Release 12/13 version of 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities*, and the Release 12/13 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification* for additional details.

1.2.2.1.3 RRC UE FEATURE GROUP SUPPORT VZ_REQ_LTEB13NAC_22659

1.2.2.1.3.1 RRC UE FEATURE GROUP SUPPORT - MANDATORY FGI'S

VZ_REQ_LTEB13NAC_6270

The device shall support the following feature groups defined in section B.1 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*: 2, 3, 4, 5, 6, 7, 14, 16, 17, 20, 21, and 103.

1.2.2.1.3.2 RRC UE FEATURE GROUP SUPPORT - OPTIONAL FGI'S

VZ_REQ_LTEB13NAC_6271

The device may support the following additional feature groups defined in section B.1 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*: 28 and 29.

1.2.2.1.3.3 RRC UE FEATURE GROUP SUPPORT - RRC MESSAGING

VZ_REQ_LTEB13NAC_6272

When responding to the *UECapabilityEnquiry* RRC message (refer to 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*, clause 5.6.3 for additional details), the indicators for all feature groups that are not supported by the device and the indicators for all feature groups with capabilities that have not been tested as a part of 3GPP standard conformance testing or VZW-specific testing shall be set to "0" (i.e. indicating that the UE does not support them). Refer to the *Performance* and *Required Verizon Wireless Device Compliance Test Plans* sections of this document for additional details on 3GPP standard conformance testing and VZW-specific testing.

1.2.2.1.4 LTE FREQUENCY BAND VZ_REQ_LTEB13NAC_22660

1.2.2.1.4.1 LTE FREQUENCY BAND VZ_REQ_LTEB13NAC_6273

The device shall support LTE in 3GPP Band 13 using 5 MHz and 10 MHz channel bandwidths as defined in 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*.

1.2.2.1.5 UPLINK 64-QAM SUPPORT VZ_REQ_LTEB13NAC_1275530

Downlink LTE category 16 and higher devices shall support uplink 64-QAM. Devices that are less than downlink LTE category 16 may support uplink 64-QAM. If the device supports uplink 64-QAM, the device shall implement uplink 64-QAM per 3GPP TS 36.211: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation*, 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*, and 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*.

NOTE: When operating in uplink 64-QAM mode, the MPR, configured output power, A-MPR, and GPS emissions requirements in VZ_REQ_LTEB13NAC_6391, VZ_REQ_LTEB13NAC_6393, VZ_REQ_LTEB13NAC_6395, and VZ_REQ_LTEB13NAC_6398 shall apply.

1.2.2.1.6 UPLINK 256-QAM SUPPORT VZ_REQ_LTEB13NAC_8364374

Downlink LTE category 20 and higher devices shall support uplink 256-QAM. Devices that are less than downlink LTE category 20 may support uplink 256-QAM. If the device supports uplink 256-QAM, the device shall implement uplink 256-QAM per 3GPP TS 36.211: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation*, 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*, and 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*.

NOTE: When operating in uplink 256-QAM mode, the MPR, configured output power, A-MPR, and GPS emissions requirements in VZ_REQ_LTEB13NAC_6391, VZ_REQ_LTEB13NAC_6393, VZ_REQ_LTEB13NAC_6395, and VZ_REQ_LTEB13NAC_6398 shall apply.

1.2.2.2 MIMO SUPPORT VZ_REQ_LTEB13NAC_22661

1.2.2.2.1 MIMO ANTENNA REQUIREMENTS VZ_REQ_LTEB13NAC_22664

1.2.2.2.1.1 MIMO ANTENNA REQUIREMENTS VZ_REQ_LTEB13NAC_6274

LTE category 2 and higher devices shall support one transmitter and two receivers for LTE 3GPP Band 13 operation. The LTE category 2 and higher device shall have a primary antenna for transmit and receive functions, and a secondary antenna for MIMO/receive diversity functions. When receiving LTE 3GPP Band 13 signals, the LTE category 2 and higher device shall always support dual receiver operation. At no time when receiving LTE 3GPP Band 13 signals shall the LTE category 2 and higher device autonomously cease dual receiver operation for any purpose.

For LTE category 1 devices, two receivers is recommended but not mandatory. Per 3GPP standards, LTE category M1 devices and LTE category 1bis devices are single receiver.

NOTE 1: For LTE category 2 and higher devices, this requirement applies with the following exception:

- A single receive antenna (i.e., no secondary antenna for MIMO/received diversity functions) is permissible for the follow category 2 and higher devices:
    - Low data rate machine-to-machine (M2M) and internet of things (IoT) devices that are category 2 or higher
    - Wearable devices that are category 2 or higher
    - Devices that are category 2 or higher and are primarily uplink data. By saying that, downlink data usage shall not exceed 30MB per month. If this downlink limit cannot be satisfied then total data usage (DL+UL) shall not exceed 100MB per month
- If operating with a single receive antenna:

1. The device shall at all times report a rank indictor of 1 to the network.
2. The device shall meet all 3GPP and Verizon Wireless LTE RF and RRM performance requirements. The receive antenna shall meet the same radiated performance requirements as for LTE Category 1bis as defined in requirement VZ_REQ_LTEB13NAC_6400 of this document.

3. The device SHALL support LTE operation when the eNB is transmitting on 4 antenna ports.
4. When implementing single receiver using a chipset/modem that supports 2 or more receivers, the device shall disable the un-used receiver(s) at the chipset/modem. If possible. all active components within the un-used receivers (i.e. LNA, downconverter, demodulator, ADC) shall be powered off.

NOTE 2: For devices with a single receive antenna, the device receiver performance will be negatively affected by up to 4 dB. Verizon Wireless cannot guarantee that device field performance with single receive antenna operation will be comparable to device field performance with dual receive antenna operation. Verizon Wireless strongly recommends against single receive antenna operation for mission critical devices. Verizon Wireless will monitor any increased interference to other users devices arising from devices operating with a single receive antenna, and reserves the right to terminate network access for a device that causes increased interference to other users while operating with a single receive antenna until the device manufacturer, owner, or user implements corrective action to come back into compliance with these requirements or otherwise to the satisfaction of Verizon Wireless. Additionally, devices designed for other use cases must adhere to the standard for two receive antennas.

1.2.2.2.1.2 TX ANTENNA SWITCHING VZ_REQ_LTEB13NAC_6275

The device shall not allow the transmitter output to be switched between the primary and secondary antennas.

1.2.2.2.2 MIMO SUPPORT REQUIREMENTS VZ_REQ_LTEB13NAC_22665

1.2.2.2.2.1 ~~TRANSMIT DIVERSITY (APPLIES TO ALL DEVICE CATEGORIES)~~ VZ_REQ_LTEB13NAC_22666

1.2.2.2.2.2 Transmit Diversity (Applies to All Device Categories) VZ_REQ_LTEB13NAC_6276

All LTE category 1 and higher devices shall support downlink 2x2 and 4x2 transmit diversity as defined in the 3GPP Release 9 Specifications.

1.2.2.2.2.3 ~~SPATIAL MULTIPLEXING~~ ~~VZ_REQ_LTEB13NAC_22667~~

1.2.2.2.2.4 Spatial Multiplexing VZ_REQ_LTEB13NAC_6277

As defined in the 3GPP Release 9 Specifications, Category 2 and higher devices shall support:

- downlink 2x2 and 4x2 open loop spatial multiplexing
- downlink 2x2 and 4x2 closed loop spatial multiplexing (single layer and 2 layers).

Category 1 devices shall support downlink 2x2 and 4x2 single layer spatial multiplexing using transmission modes 3 and 4.

1.2.2.2.3 4 RECEIVE ANTENNAS VZ_REQ_LTEB13NAC_1231230

1.2.2.2.3.14 RECEIVE ANTENNA SUPPORT VZ_REQ_LTEB13NAC_1231233

All LTE category 1 and higher devices may support 4 receive antennas on Band 13. Devices that support 4 receive antennas on Band 13 shall support one transmitter and four receivers for LTE 3GPP Band 13 operation. Devices that support 4 receive antennas shall support downlink 2x2 and downlink 4x2 operation per requirements VZ_REQ_LTEB13NAC_6276 and VZ_REQ_LTEB13NAC_6277 with all 4 receivers enabled. Devices that are category 2 or higher and support 4 receive antennas shall operate with all 4 antennas enabled while in RRC_CONNECTED mode.

1.2.2.2.3.24x4 MIMO SUPPORT VZ_REQ_LTEB13NAC_1232098

Devices that support 4 receive antennas and are a device category that allows 4 layer spatial multiplexing per 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities*, shall support downlink 4x4 spatial multiplexing (both open and closed loop) as defined in the 3GPP standard.

1.2.2.3 ~~TESTABILITY~~VZ_REQ_LTEB13NAC_22662

1.2.2.3.1 ~~TESTABILITY~~VZ_REQ_LTEB13NAC_6278

1.2.2.4 UICC SUPPORT VZ_REQ_LTEB13NAC_22663

1.2.2.4.1 ~~ACTIVATION/DE-ACTIVATION OF CONTACTS TO THE UICC~~ ~~VZ_REQ_LTEB13NAC_22671~~

1.2.2.4.1.1 ACTIVATION/DE-ACTIVATION OF CONTACTS TO THE UICC VZ_REQ_LTEB13NAC_6279

Electrical and mechanical interface contacts for activation and de-activation of the UICC shall be compliant with ETSI TS 102 221: *Smart Cards UICC-Terminal Interface; Physical and Logical Characteristics* (Release 8). All mandatory procedures, commands and files shall be supported. Support for contacts c4, c6, and c8 as specified in ETSI TS 102 221: *Smart Cards UICC-Terminal Interface; Physical and Logical Characteristics* (Release 8) is optional.

1.2.2.4.2 ~~POWER SUPPLY~~ ~~VZ_REQ_LTEB13NAC_22672~~

1.2.2.4.2.1 POWER SUPPLY VZ_REQ_LTEB13NAC_6280

The device shall support Class C as specified in ETSI TS 102 221: *Smart Cards UICC-Terminal Interface; Physical and Logical* Characteristics (Release 8). The device may support Class B as specified in ETSI TS 102 221: *Smart Cards UICC-Terminal Interface; Physical and Logical* Characteristics (Release 8).

1.2.2.4.3 ~~DEVICE INTERFACE~~ VZ_REQ_LTEB13NAC_22673

1.2.2.4.3.1 DEVICE INTERFACE VZ_REQ_LTEB13NAC_6281

The device shall be compliant to the interface defined in ETSI TS 102 221: *Smart Cards UICC-Terminal Interface; Physical and Logical* Characteristics (Release 8). As ETSI 102 221 is generic for an IC card implementation, the device shall also be compliant to the 3GPP application as specified in 3GPP 31.101: *UICC-terminal interface; Physical and logical characteristics*.

1.2.2.4.4 ~~ISO/IEC-7816 SPEED~~ VZ_REQ_LTEB13NAC_22675

1.2.2.4.4.1 ISO/IEC-7816 SPEED VZ_REQ_LTEB13NAC_6282

The device shall support all ISO/IEC-7816-2: *1999/AM1: 2004, Identification cards - Integrated circuit(s) cards with contacts - Part 2: Dimension and location of the contacts, Amendment 1: Assignment of contacts for C4 and C8* and ISO/IEC-7816-3: *Information technology - Identification cards - Integrated circuit(s) cards with contacts - Part 3: Electronic signals and transmission protocols* communication speeds (as defined by the value of TA1 in the Protocols and Parameters Selection) up to and including TA = 97h.

If the UICC requests a speed not supported by the device, the device shall use the highest speed supported by the device.

1.2.2.4.5 ~~FALLBACK SUPPORT~~ VZ_REQ_LTEB13NAC_22676

1.2.2.4.5.1 FALLBACK SUPPORT VZ_REQ_LTEB13NAC_6283

The device shall support fallback policy as specified in ISO/IEC-7816-2: *1999/AM1: 2004, Identification cards - Integrated circuit(s) cards with contacts - Part 2: Dimension and location of the contacts, Amendment 1: Assignment of contacts for C4 and C8* and ISO/IEC-7816-3: *Information technology - Identification cards - Integrated circuit(s) cards with contacts - Part 3: Electronic signals and transmission protocols* for cases where the highest speed is not supported.

1.3 SOFTWARE SPECIFICATIONS VZ_REQ_LTEB13NAC_1880

1.3.1 DEVICE BASED VZ_REQ_LTEB13NAC_1881

1.3.1.1 ~~RRC_CONNECTED TO RRC_IDLE TIMERS (INFORMATIVE)~~ VZ_REQ_LTEB13NAC_22677

1.3.1.2 TESTABILITY VZ_REQ_LTEB13NAC_22678

1.3.1.2.1 ~~LTE TEST APPLICATION PROTOCOL SUITE~~ ~~VZ_REQ_LTEB13NAC_22681~~

1.3.1.2.1.1 LTE TEST APPLICATION PROTOCOL SUITE VZ_REQ_LTEB13NAC_6284

The device shall support 3GPP TS 36.509: *Evolved Universal Terrestrial Radio Access (E-UTRA); Special conformance testing function for User Equipment (UE).*

1.3.1.2.2 ~~LTE TEST MODE SUPPORT~~ ~~VZ_REQ_LTEB13NAC_22682~~

1.3.1.2.2.1 LTE TEST MODE SUPPORT VZ_REQ_LTEB13NAC_6285

The device shall support a test mode in which the device is configured for LTE only operation. In this test mode, the device shall disable any non-LTE radio access technologies supported in the device, and the device shall not perform any interRAT functions while attached to the LTE network. By default, this test mode shall be disabled, i.e. by default the device is configured for normal operation.

This test mode shall be enabled and disabled using a non-volatile memory setting. Upon changing this memory setting, the device shall perform a soft reset. The vendor shall provide a lab application to modify this memory setting during device acceptance testing. The device vendor shall not allow the user to modify this memory setting through the device user interface or the remote access user interface for tethered devices.

1.3.1.2.3 ~~LTE DIAGNOSTIC MONITOR CAPABILITY~~ VZ_REQ_LTEB13NAC_22683

1.3.1.2.3.1 ~~LTE DIAGNOSTIC MONITOR CAPABILITY~~ VZ_REQ_LTEB13NAC_6286

1.3.1.2.4 ~~FIELD TEST MENU~~ VZ_REQ_LTEB13NAC_22684

1.3.1.2.4.1 ~~FIELD TEST MENU~~ VZ_REQ_LTEB13NAC_6287

1.3.1.2.5 ~~AT COMMAND SUPPORT~~ VZ_REQ_LTEB13NAC_22685

1.3.1.2.6 ~~USB DEVICE DRIVER~~VZ_REQ_LTEB13NAC_22686

1.3.1.2.6.1 ~~USB DEVICE DRIVER~~VZ_REQ_LTEB13NAC_6288

1.3.1.2.7 ~~LTE TEST APPLICATION FOR ANTENNA TESTING~~VZ_REQ_LTEB13NAC_22687

1.3.1.2.7.1 ~~LTE Test Application for Antenna Testing Requirements~~VZ_REQ_LTEB13NAC_6289

1.3.1.2.7.2 ~~ANTENNA INFORMATION REQUEST~~VZ_REQ_LTEB13NAC_22689

1.3.1.2.7.3 ~~Antenna Information Request Message~~ VZ_REQ_LTEB13NAC_6290

1.3.1.2.7.4 ~~ANTENNA INFORMATION RESPONSE~~ VZ_REQ_LTEB13NAC_22690

1.3.1.2.7.5 ~~Antenna Information Response Message~~ VZ_REQ_LTEB13NAC_6291

1.3.1.2.7.6 ~~ANTENNA CONFIGURATION REQUEST~~ VZ_REQ_LTEB13NAC_22691

1.3.1.2.7.7 ~~Antenna Configuration Request Message~~ VZ_REQ_LTEB13NAC_6292

1.3.1.2.7.8 ~~ANTENNA ERROR RESPONSE~~ VZ_REQ_LTEB13NAC_22692

1.3.1.2.7.9 ~~Antenna Error Response Message~~ VZ_REQ_LTEB13NAC_6293

1.3.1.2.7.10 ~~ANTENNA CONFIGURATION STATUS REQUEST~~ VZ_REQ_LTEB13NAC_22693

1.3.1.2.7.11 ~~Antenna Configuration Status Request Message~~ VZ_REQ_LTEB13NAC_6294

1.3.1.2.7.12 ~~ANTENNA CONFIGURATION STATUS RESPONSE~~ VZ_REQ_LTEB13NAC_22695

1.3.1.2.7.13 ~~Antenna Configuration Status Response Message~~ VZ_REQ_LTEB13NAC_6295

1.3.1.2.7.14 ~~RSSI AND RELATIVE PHASE MEASUREMENTS, ACCURACY, AND AVERAGING~~ ~~VZ_REQ_LTEB13NAC_22696~~

1.3.1.2.7.15 ~~RSSI and Relative Phase Measurements, Accuracy, and Averaging~~ ~~VZ_REQ_LTEB13NAC_6296~~

1.3.1.3 UICC SUPPORT VZ_REQ_LTEB13NAC_22679

Device compliance to Verizon Wireless UICC device requirements is validated through the Verizon Wireless LTE Device-UICC (USIM, ISIM) Interaction Test Plan.

1.3.1.3.1 USIM and ISIM VZ_REQ_LTEB13NAC_6470

Ø The UICC supports USIM and ISIM profiles. In order to support the USIM and ISIM, the device shall be compliant to the specifications in the subsections below. The device shall use the service table to determine the list of files and functionalities supported on the USIM and ISIM.

1.3.1.3.2 NAA applications on the UICC VZ_REQ_LTEB13NAC_6471

Ø The device shall select the NAA applications on the UICC by use of the EF_{DIR} file. If an NAA application is listed more than once in EF_{DIR}, only the first application on the list shall be selected.

1.3.1.3.3 SUPPORT FOR USIM VZ_REQ_LTEB13NAC_22697

Device compliance to Verizon Wireless UICC device requirements is validated through the Verizon Wireless LTE Device-UICC (USIM, ISIM) Interaction Test Plan.

1.3.1.3.3.1 SUPPORT FOR USIM VZ_REQ_LTEB13NAC_6297

The device shall support the software to interact with the USIM module on the UICC as described in 3GPP TS 31.102: *Characteristics of the USIM application* and 3GPP TS 31.101: UICC-*terminal interface; Physical and logical characteristics*. The device shall support the security procedures as specified in 3GPP TS 33.401: *3GPP System Architecture Evolution (SAE); Security architecture*. All mandatory procedures, commands, and files shall be supported.

1.3.1.3.4 SUPPORT FOR ISIM VZ_REQ_LTEB13NAC_22698

1.3.1.3.4.1 SUPPORT FOR ISIM VZ_REQ_LTEB13NAC_6298

The device shall support the software to interact with the ISIM module on the UICC as described in 3GPP TS 31.103: *Characteristics of the IP Multimedia Services Identity Module (ISIM) application* and 3GPP TS 31.101: UICC-*terminal interface; Physical and logical characteristics*. All mandatory procedures, commands and files shall be supported.

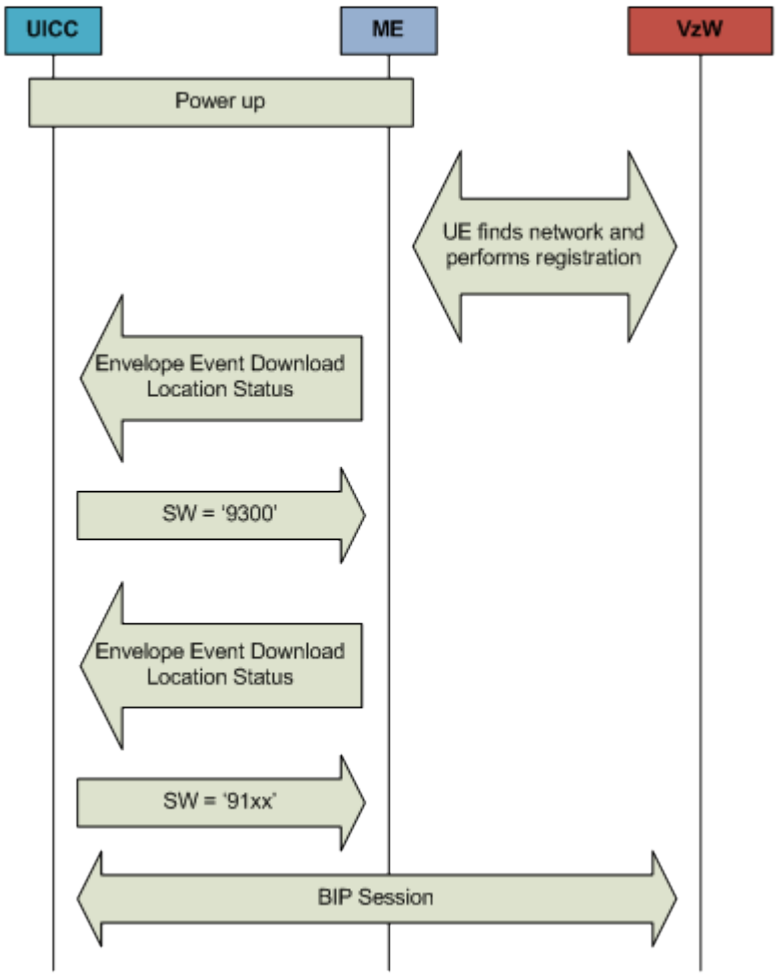
1.3.1.3.5 SUPPORT FOR APPLICATION TOOLKIT VZ_REQ_LTEB13NAC_22699

1.3.1.3.5.1 SUPPORT FOR APPLICATION TOOLKIT VZ_REQ_LTEB13NAC_6299

The device shall support Card Application Toolkit (CAT) as specified in ETSI TS 102 223: *Smart cards; Card Application Toolkit (CAT), Release 8* and the USIM Application Toolkit (USAT) as described in 3GPP TS 31.111: *Universal Subscriber Identity Module (USIM) Application Toolkit (USAT).*

The following events, envelope commands, and corresponding procedures shall be supported:

- Envelope SMS-PP Data Download as per 3GPP TS 31.111: *Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)*
    - In the case where the UICC is busy (9300) or provides exceptions, the device shall resend the Envelope SMS-PP to the UICC until a successful response (9000/91xx) from the UICC is received.
- Envelope Timer Expiration
- Envelope Event Download
    - Data available
    - Channel Status
    - Location Status
        - The device shall send the Download Location Status (DLS) Event as per 3GPP TS 31.111: *Universal Subscriber Identity Module (USIM) Application Toolkit (USAT).*
        - In the case where the UICC is busy (9300) or provides exceptions, the device shall resend the DLS Event to the UICC until a successful response (9000/91xx) from the UICC is received.



- Access Technology Change
  - If more than one access technology is available, only the access technology for the data connection shall be reported.

Data Access Technology	Value
LTE	'08'
Non-LTE	'00', '03', '06', '07'

  - In the case where the UICC is busy (9300) or provides exceptions, the device shall resend the Download Access Technology Change Event (DATC) to the UICC until a successful response (9000/91xx) from the UICC is received.

- EVENT PROFILE DOWNLOAD
- STATUS (The device shall send the STATUS command only on logical channel 0.)
- The device shall support the IMS Registration Event as specified in the ETSI TS 131 111: *Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS);*

Universal Subscriber Identity Module (USIM) Application Toolkit (USAT), v.10.7.0 section 7.5.21, using Event Download IMS Registration to communicate the IMS registration status and changes in the IMS registration status to the UICC.

- The device shall provide the contents of the 000EH PCO container (i.e. MSISDN) provided in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the attach PDN to the UICC via a proprietary envelope as specified in ETSI TS 102 223: *Smart cards; Card Application Toolkit (CAT), Release 8* and 3GPP TS 31.111: *Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)* as described below:
    - The PCO container 000EH shall be sent to the UICC via: EVENT_UNRECOGNIZED_ENVELOPE, using the following syntax:

80 C2 00 00 0F EF 0D 02 02 82 81 4C 07 91 51 16 33 13 90 F5

    - where the dialing number/MSISDN is 15613331095 (i.e. the dialing number/MSISDN is in swapped format in the envelope)

The following proactive commands and corresponding procedures shall be supported:

- REFRESH (support for 7 modes) as specified in 3GPP TS 31.111: *Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)* and ETSI TS 102 223: *Smart cards; Card Application Toolkit (CAT), Release 8*
- Send Short Message as specified in 3GPP TS 31.111: *Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)* and ETSI TS 102 223: *Smart cards; Card Application Toolkit (CAT), Release 8*
- OPEN CHANNEL
- CLOSE CHANNEL
- RECEIVE DATA
- SEND DATA
- GET CHANNEL STATUS
- POLL INTERVAL
- TIMER MANAGEMENT
- MORE TIME
- PROVIDE LOCAL INFORMATION (following tags shall be supported)
    - location information
    - terminal identity (IMEI, IMEISV)
    - network measurement results
    - current date, time, and time zone
    - current access technology
        - If more than one access technology is available, only the access technology for the data connection shall be reported.

- current network search mode

All other events, commands, and procedures defined in ETSI TS 102 223: *Smart cards; Card Application Toolkit (CAT), Release 8* and 3GPP TS 31.111: *Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)* are highly recommended and should be supported.

NOTE: All SMS requirements specified for UICC in 3GPP TS 31.111: *Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)* and ETSI TS 102 223: *Smart cards; Card Application Toolkit (CAT), Release 8* shall supersede the specifications in section 5.1.2 of the Verizon Wireless LTE SMS Requirements (i.e. requirement VZ_REQ_LTESMS_30278).

1.3.1.3.6 LOGICAL CHANNELS VZ_REQ_LTEB13NAC_22700

1.3.1.3.6.1 LOGICAL CHANNELS VZ_REQ_LTEB13NAC_6300

The device shall support standard and extended logical channels as specified in ETSI TS 102 221: *Smart Cards UICC-Terminal Interface; Physical and Logical Characteristics, Release 8*.

1.3.1.3.7 PLMN SUPPORT VZ_REQ_LTEB13NAC_22701

1.3.1.3.7.1 PLMN SUPPORT VZ_REQ_LTEB13NAC_6301

The device shall support at least 70 entries if it is a 4G-only device and at least 100 entries it if is a 5G capable device, and the OPLMNwAcT, HPLMNwAcT, PNN, OPL and OPL5G files related to roaming and PLMN list(s) as specified in 3GPP 31.102: *Characteristics of the USIM application*. Only Verizon Wireless will update the PLMN list(s) on the USIM (as needed).

1.3.1.3.8 LTE AUTHENTICATION VZ_REQ_LTEB13NAC_22702

1.3.1.3.8.1 LTE AUTHENTICATION VZ_REQ_LTEB13NAC_6302

The device shall support the authenticate commands and mechanisms to interact with the USIM as specified in 3GPP TS 31.102: *Characteristics of the USIM application*. The EPS security context, procedures, and files shall be supported.

1.3.1.3.9 BIP OVER THE CLASS 2 APN VZ_REQ_LTEB13NAC_22703

1.3.1.3.9.1 BIP OVER THE CLASS 2 APN VZ_REQ_LTEB13NAC_6424

If the device receives an OPEN CHANNEL command from the UICC with an APN NI equal to "VZWADMIN", then the device shall behave as follows:

- If no PDN connection using the class 2 APN* currently exists, the device shall establish a PDN connection for the class 2 APN* using standard 3GPP messaging. The device shall not release the PDN connection prior to receiving a CLOSE CHANNEL command from the UICC.
- If a PDN connection using the class 2 APN* already exists, the device shall report terminal status as "success" to the UICC and use the existing PDN connection. The device shall not release the PDN connection prior to receiving a CLOSE CHANNEL command from the UICC.

* **NOTE 1:** The device shall use the class 2 APN NI provisioned on the device regardless of whether the APN NI for the class 2 APN provisioned on the device equals "VZWADMIN".

When the device receives a CLOSE CHANNEL command from the UICC (for the class 2 APN), the device shall behave as follows:

- If the PDN connection for the class 2 APN is being used by other applications, then the device shall not release the PDN connection. The device shall report terminal status "success" to the UICC and leave the PDN connection intact.
- If the PDN connection for the class 2 APN is not being used by any other applications, then the device shall release the PDN connection using standard 3GPP messaging.

NOTE 2: The device shall implement the BIP connection establishment and processing exclusively on the baseband processor of the modem (as opposed to on an application processor in the device).

1.3.1.3.10 DEVICE BEHAVIOR IN RESPONSE TO REFRESH COMMAND

VZ_REQ_LTEB13NAC_22704

1.3.1.3.10.1 DEVICE BEHAVIOR IN RESPONSE TO REFRESH COMMAND

VZ_REQ_LTEB13NAC_6461

Upon receipt of a UICC REFRESH type 0 command, the device shall detach from the LTE network and then re-attach to the LTE network using all updated USIM/ISIM parameters.

If the device has a valid IMS registration when the UICC REFRESH type 0 command is received, the device shall terminate the subscription to the registration events package by sending a Subscribe message with expires= 0, followed by an IMS de-registration request message. This shall be done before sending a NAS DETACH REQUEST message. Upon the IMS client generating the initial SIP REGISTER message with expires=0, the device shall start an implementation specific timer with a value of 4 seconds. While this implementation specific timer is running, the device shall respond to all SIP messaging from the network, e.g. if the network challenges the de-registration request with a 401 Unauthorized. Upon expiration of this implementation specific timer, the device shall take no further action with respect to SIP messages from the network and execute the NAS detach procedure. The device shall stop the implementation specific timer and immediately execute the NAS detach

procedure if a SIP 200 OK or a SIP 481 or a SIP 501 is received in response to the SIP REGISTER (with expires=0) before the implementation specific timer expires.

NOTE: The implementation specific timer is started when the IMS client generates the initial SIP REGISTER message with expires=0. The implementation specific timer shall run even if the IMS client cannot send the SIP REGISTER message to the modem for transmission because an IMS signaling connection could not be established.

*1.3.1.3.11 DEVICE BEHAVIOR IF UICC IS NOT PRESENT OR REMOVED

VZ_REQ_LTEB13NAC_22705

1.3.1.3.11.1 DEVICE BEHAVIOR IF UICC IS NOT PRESENT OR REMOVED

VZ_REQ_LTEB13NAC_6482

If no UICC is present or if the device cannot detect a UICC that is present, the device shall not attempt to access any LTE network.

If the device detects that the UICC has been removed while the device is connected to a LTE network, the device shall detach from the LTE network. If the device has a valid IMS registration when the UICC is removed, the device shall terminate the subscription to the registration events package by sending a Subscribe message with expires= 0, followed by an IMS de-registration request message. This shall be done before sending a NAS DETACH REQUEST message. Upon the IMS client generating the initial SIP REGISTER message with expires=0, the device shall start an implementation specific timer with a value of 4 seconds. While this implementation specific timer is running, the device shall respond to all SIP messaging from the network, e.g. if the network challenges the de-registration request with a 401 Unauthorized. Upon expiration of this implementation specific timer, the device shall take no further action with respect to SIP messages from the network and execute the NAS detach procedure. The device shall stop the implementation specific timer and immediately execute the NAS detach procedure if a SIP 200 OK or a SIP 481 or a SIP 501 is received in response to the SIP REGISTER (with expires=0) before the implementation specific timer expires.

Upon detaching from the LTE network, the device shall not attempt to access any LTE network until the UICC is re-inserted in the device or a new UICC is inserted in the device.

NOTE 1: This requirement only applies to non-emergency access to an LTE network. Emergency access to an LTE network shall be allowed regardless of whether a UICC is present or not per 3GPP Release 9 Specifications. The device shall implement emergency access to an LTE network per 3GPP Release 9 Specifications.

NOTE 2: The implementation specific timer is started when the IMS client generates the initial SIP REGISTER message with expires=0. The implementation specific timer shall run even if the IMS client cannot send the SIP REGISTER message to the modem for transmission because an IMS signaling connection could not be established.

1.3.1.3.12 APPLET DOWNLOAD TO UICC VZ_REQ_LTEB13NAC_22706

1.3.1.3.12.1 APPLET DOWNLOAD TO UICC VZ_REQ_LTEB13NAC_6486

For non-interrupted BIP sessions, the device shall support over the air download to the UICC's Secure Element of applets at least 100 kilobytes in size in less than two minutes (which is the timing between the OPEN CHANNEL and CLOSE CHANNEL commands).

1.3.1.3.13 UICC DNS ADDRESS RETRIEVAL FROM THE NETWORK VZ_REQ_LTEB13NAC_36248

1.3.1.3.13.1 UICC DNS IP Address Retrieval from the Network VZ_REQ_LTEB13NAC_36250

The device shall support DNS server IP address retrieval from the network as defined in ETSI TS 102 223: *Smart cards; Card Application Toolkit (CAT)* and below:

- The device shall indicate the support of the DNS feature by using bit 1 in Byte 33 of the Terminal Profile.
- When the device receives a DNS resolution request from the UICC (UPD OPEN CHANNEL) with no IP address defined, the device shall establish a session with the PDN for the APN defined in the OPEN CHANNEL command.
- Upon receiving the DNS IP address(es) in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST for the PDN connection, the device shall pass the IP address(es) of the DNS server(s) to the UICC in the Terminal Response.
- The device shall support the notification bit as defined in ETSI TS 102 223: *Smart cards; Card Application Toolkit (CAT)* sections 6.4.28 and 8.6:
    - 6.4.28 : If class "yy" is supported, the UICC may indicate to the terminal that the next CAT command will be an OPEN CHANNEL command using the same setting for the APN, i.e. requesting a channel to the same gateway entity. The device may use this information to keep the channel to the gateway established until the next CAT command.
    - 8.6: CLOSE CHANNEL for packet data service:
      bit 1: 0 = no indication;
      1 = indication to device that the next CAT command will be OPEN CHANNEL using same APN as channel to be closed.
- If the device receives a CLOSE CHANNEL with bit 1 set to 1, the device shall not close the connection to the PDN unless one of the following occurs:
    - The next UICC command received by the device is not a OPEN CHANNEL using the same APN as the previous command that originally established the PDN connection.
    - The network forced the PDN to be closed due to any reason (i.e. network Idle time out, etc.)
    - The UICC has been idle for more than 30 seconds.

1.3.1.3.14 UICC RE-ACTIVATION VZ_REQ_LTEB13NAC_37887

1.3.1.3.14.1 Power Cycle for UICC Re-activation VZ_REQ_LTEB13NAC_37889

To support UICC re-activation, the device shall support a mechanism via the device user interface or the remote access user interface (for tethered devices) for the user to initiate a power cycle of the device.

1.3.1.3.15 GROUP IDENTIFIERS VZ_REQ_LTEB13NAC_41327

1.3.1.3.15.1 GID1 and GID2 VZ_REQ_LTEB13NAC_41328

When USIM fields EF_{GID1} and EF_{GID2} are present and enabled, the device shall read ALL bytes of these files (not just the first bytes).

The device shall re-read these files in their entirety upon modem power cycle, modem reset, and after a REFRESH command is issued by the UICC.

1.3.1.3.16 eUICC VZ_REQ_LTEB13NAC_41270

This section describes the requirements for eUICC using a Consumer RSP device Local Profile Assistant in support of eUICC. A Consumer RSP implementation entails Verizon's second launch for eUICC remote provisioning feature using GSMA's Consumer RSP Specifications [64], [65].

This section also describes requirements for an M2M eUICC implementation using GSMA's M2M specifications [63], [75].

Device vendors should contact Verizon Wireless prior to implementing eUICCs with RSP support on any device for guidance regarding eUICC hardware requirements.

Term [Abbreviation (if Applicable)]	Definition
eUICC	Embedded UICC (eUICC)

eSIM	Another term for eUICCs, implementing the RSP specifications
LPA	Local Profile Assistant
LPD	Local Profile Download
LUI	Local User Interface
OEM-Selected eUICC	eUICCs conforming to minimum RSP requirements
RSP	Remote SIM Provisioning
SM-DP+	Subscription Manager Data Preparation+

1.3.1.3.16.1 LPA and Consumer eUICC VZ_REQ_LTEB13NAC_41271

Devices may support eUICC in the context of Consumer RSP functionality. If the device supports a Consumer eUICC implementation, then the device shall support the following requirements:

The device shall support the eUICC remote provisioning feature using GSMA Consumer RSP Specifications [64], [65]. The device shall implement a Local profile Assistant (LPA) for profile management including a Local User Interface (LUI) enabling user interaction.

All the RSP related device requirements and LPA requirements defined in the SGP21 Architecture document [64] sections 4.4, 4.5, 4.6, 4.7, 4.8, 4,9, 4.11, Annex G and related device and LPA Certification requirements (in section 4.14.2) shall be supported unless superseded by a requirement specified in this document. All the RSP related device and LPA requirements in the SGP22 Technical specification [65] including Annex C shall be supported unless superseded by a requirement specified in this document.

The LPA shall detect removal and insertion of a UICC while the device is powered on, and if the LPA detects that the UICC in the device is not an eUICC, then it shall not attempt to execute any local profile management processes on the UICC and shall not make any LUI options available to the user.

1.3.1.3.16.2 Consumer eUICC and Companion Devices VZ_REQ_LTEB13NAC_41272

For devices that support eUICC and can operate as a companion device (e.g. a wearable that operates as a companion device to a smartphone), v2.2.2 of the Consumer eUICC Remote SIM Provisioning Technical Specification [65] includes profile download into a companion device (e.g. a wearable) using the initial network connectivity provided by a primary device (e.g. a smartphone). The companion device LPA shall access SM-DP+ through the data connectivity provided by the primary device. For a Consumer RSP v2.2.2 implementation, more than one profile download, and corresponding local profile management operations, shall be supported by the device and LPA implementation.

1.3.1.3.16.3 MF-only Consumer eUICC VZ_REQ_LTEB13NAC_535613

For devices that support eUICCs using GSMA Consumer RSP [65], the device shall properly handle eUICCs that have MF as the only file contents for the following cases:

- Before initial profile download
- For cases where a profile is downloaded but not enabled
- For cases where a single remaining profile in an eUICC has been deleted
- For cases where an eUICC memory reset has been executed

Devices supporting MF-only eUICCs shall not power off the eUICC and shall allow communication to the eUICC as needed. Refer to Section 3.4.3 of GSMA SGP.22: *RSP Technical Specification [65]* for more information on eUICC File Structure.

1.3.1.3.16.4 M2M eUICC VZ_REQ_LTEB13NAC_11997717

For devices that support an M2M eUICC, the eUICC shall conform to the GSMA M2M remote Provisioning Architecture for Embedded UICC Technical Specifications [63], [75].

For devices that support an M2M eUICC, the device shall conform to Annex G of the GSMA M2M emote Provisioning Architecture for Embedded UICC Technical Specifications [63], [75].

1.3.1.3.16.5 Testability VZ_REQ_LTEB13NAC_11997740

The following requirements apply to devices that will be going through Verizon's Reverse Logistics flow.

Note: The Reverse Logistics flow maynot apply to M2M eUICC devices at this time. Therefore, testability requirements for M2M eUICC are currently undefined and may be updated in a future revision of this specification.

1.3.1.3.16.6 Consumer eUICC VZ_REQ_LTEB13NAC_11997748

The following requirements apply to Consumer eUICCs.

1.3.1.3.16.7 Test Profile Definition VZ_REQ_LTEB13NAC_11997762

The device and LPA shall support Operational and Test Profiles as indicated by profileClass as defined in SGP.22 [65].

1.3.1.3.16.8 Minimum Requirements for an OEM-Selected eUICC VZ_REQ_LTEB13NAC_11997775

An OEM Selected eUICC is defined as an eUICC conforming to the minimum requirements below. Verizon only validates that the Verizon eSIM profile is compatible with an OEM Selected eUICC but will not perform hardware testing on this eUICC.

These eUICCs differ from Verizon Technically Approved eUICCs in that Verizon TA eUICCs comply to additional requirements and have been fully tested per Verizon test requirements.

1.3.1.3.16.9 M2M eUICC VZ_REQ_LTEB13NAC_11997780

An M2M eUICC shall support GSMA SGP.01 Remote Provisioning Architecture for eUICC [75] and SGP.02 Remote Provisioning Architecture for eUICC Technical Specification [63].

1.3.1.3.16.10 Consumer eUICC VZ_REQ_LTEB13NAC_11997788

A Consumer eUICC shall support GSMA SGP.21 RSP Architecture [64] and SGP.22 RSP Technical Specification [65].

1.3.1.3.16.11 Profile Interoperability VZ_REQ_LTEB13NAC_11997795

For 4G LTE or 5G NSA implementations using eUICCs, the eUICC shall support the Trusted Connectivity Alliance ~~SIMAlliance~~ eUICC Profile Package technical specification v2.1 [66].

For 5G SA capable implementations using eUICCs, the eUICC shall support the Trusted Connectivity Alliance ~~SIMAlliance~~ eUICC Profile Package technical specification v2.3.1 [78]

NOTE: 5G SA implementations require eUICCs that support v2.3.1 to take advantage of new 5G SA capabilities like SUCI. This includes indicating support for Get Identity Command and SUCI protections schemes.

1.3.1.3.16.12 Volatile Memory VZ_REQ_LTEB13NAC_11997813

The eUICC shall have a free volatile memory of 6 KB per Verizon eSIM Profile.

1.3.1.3.16.13 Java Card API VZ_REQ_LTEB13NAC_11997823

The eUICC shall support Java Card 3.0.4 or higher.

1.3.1.3.16.14 GlobalPlatform Java Card API VZ_REQ_LTEB13NAC_11997839

The eUICC shall support Java Card API and Export for Card Spec (org.globalplatform) v1.6 or higher.

1.3.1.3.16.15 GlobalPlatform Card VZ_REQ_LTEB13NAC_11997853

The eUICC shall support GlobalPlatform Card Specification [67] and the following amendment card specifications:

- GlobalPlatform Card Confidential Card Content Management, Amendment A [68]
- GlobalPlatform Card Remote Application Management over HTTP, Amendment B [69]
- GlobalPlatform Card Secure Channel Protocol 03, Amendment D [70]
- GlobalPlatform Card Security Upgrade for Card Content Management, Amendment E [71]
- GlobalPlatform Card Secure Channel Protocol '11', Amendment F [72]

1.3.1.3.16.16 Cumulative Granted Memory VZ_REQ_LTEB13NAC_11997867

The eUICC shall support Cumulative Granted Memory as defined in GlobalPlatform Card Technology Contactless Services, Amendment C [73].

1.3.1.3.16.17 Secure Element Access Control VZ_REQ_LTEB13NAC_11997881

The eUICC shall support Access Rule Application-Master (ARA-M) and Access Rule Application-Client (ARA-C), as defined in GlobalPlatform Device Technology Secure Element Access Control specification [74].

1.3.1.3.16.18 ARA Applets VZ_REQ_LTEB13NAC_11997897

The eUICC shall support the installation of ARA-M and ARA-C applets.

1.3.1.3.16.19 Cryptographic Algorithms VZ_REQ_LTEB13NAC_11997913

The eUICC shall support the following cryptographic algorithms:

- SHA-256
- HMAC-SHA-256
- AES-CMAC-256
- AES 128/192/256
- TLS 1.2
- RSA 1024/2048/4096
- BrainpoolP256r1, BrainpoolP256t1, BrainpoolP320r1
- SecP256r1, SecP256k1
- Frp256v1

1.3.1.3.16.20 ETSI DAP VZ_REQ_LTEB13NAC_11998109

The eUICC shall support Data Authentication Pattern (DAP) as defined in ETSI TS 102 226 [75].

1.3.1.3.16.21 Resource Contention VZ_REQ_LTEB13NAC_41059993 11865629

For eUICC implementations sharing resources with non-eUICC components in the same package (e.g. Embedded Secure Element, Contactless components, others), any cellular network critical eUICC operations shall have priority over operations involving the other components.

NOTE: For example, Network Access Operations using the eUICC shall be executed in real-time without delay or interruption.

1.3.1.3.16.22 Non-Volatile Memory for Operational Profiles VZ_REQ_LTEB13NAC_41059993 1876877

The eUICC shall have free non-volatile memory of 125 KB per Verizon eSIM Operational Profile.

NOTE: Operational profile non-volatile memory requirements may evolve over time.

1.3.1.3.16.23 Non-Volatile Memory for Test Profiles VZ_REQ_LTEB13NAC_41059993 1876906

If required, the eUICC shall have free non-volatile memory of 40KB for a Verizon Test Profile.

NOTE: This requirement applies to devices that will be going through Verizon's Reverse Logistics flow and do not provide a physical SIM slot. Test profile non-volatile memory requirements may evolve over time.

1.3.1.3.16.24 Minimum Overall Non-Volatile Memory for Verizon Profiles VZ_REQ_LTEB13NAC_41059993 1948668

The eUICC shall have free non-volatile memory to accommodate at least two Verizon eSIM Operational Profiles and one CTRC test profile for reverse logistics. Note: Additional test profiles may be needed for device certification.

1.3.1.3.16.25 Expected eUICC Behavior during Memory Depletion VZ_REQ_LTEB13NAC_41059993 1948669

The eUICC shall perform profile management operations (e.g. RSP operations such as profile enable, disable, switching, eUICC Memory Reset, etc.) as expected even if all volatile or non-volatile memory is consumed.

1.3.1.3.16.26 Expected Profile Lifecycle Behavior during Memory Depletion VZ_REQ_LTEB13NAC_41059993 1948670

Once installed and enabled, a Verizon Operational or Test Profile shall function as expected (e.g. provide cellular connectivity, execute SIM OTA transactions, run Proactive Commands, allow applet

installation and updates) during its lifecycle, even if all volatile and non-volatile memory is consumed.

1.3.2 LTE NETWORK TO/FROM VZ_REQ_LTEB13NAC_1882

1.3.2.1 SYSTEM SELECTION/RESELECTION VZ_REQ_LTEB13NAC_22707

1.3.2.1.1 SYSTEM SELECTION/RESELECTION VZ_REQ_LTEB13NAC_6303

If a UICC is inserted in the device, then the device shall support system selection/reselection based on the Verizon Wireless PLMN information stored in the UICC and per 3GPP Release 9 Specifications. For additional details refer to:

a. 3GPP TS 23.122: *Non-Access Stratum (NAS) functions related to Mobile Station (MS) in idle mode*
b. 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*
c. 3GPP TS 36.304: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode*

1.3.2.1.2 MULTIPLE PLMN SUPPORT VZ_REQ_LTEB13NAC_22708

1.3.2.1.2.1 MULTIPLE PLMN SUPPORT VZ_REQ_LTEB13NAC_6304

The device shall be capable of supporting multiple PLMNs for LTE on 3GPP Band 13. The device shall be capable of decoding up to 6 PLMN ids broadcasted in the System Information Block Type 1.

This includes the use case(s) below. (NOTE: These use case(s) are included for informational purposes only and do not include all possible scenarios associated with this requirement.)

For the use case(s) below, the term UE refers to the combination of the device and the UICC inserted in the device containing the subscriber information.

Use Case #1: One network (A) broadcasting two PLMNs, adjacent to network (B) broadcasting single PLMN where network A broadcasts the PLMN for network A and the PLMN for network B. Networks A and B and are in different geographic regions.

- UE is homed to network B and begins there, i.e. the subscriber/UICC in the UE is homed to network B.
- When the UE enters network A (two PLMNs), it is required to perform a tracking area update.
- When the UE returns from network A to network B, it is required to perform a tracking area update.

- UE is homed to network A and begins there, i.e. the subscriber/UICC in the UE is homed to network A.
- When the UE enters network B (single PLMN), it is required to perform a tracking area update.
- When UE returns to network A, it is required to perform a tracking area update.

1.3.2.1.3 ~~SERVICE AREA RESOLUTION IN M-PLMN~~ ~~VZ_REQ_LTEB13NAC_22709~~

1.3.2.1.3.1 SERVICE AREA RESOLUTION IN M-PLMN VZ_REQ_LTEB13NAC_6415

The device shall be capable of determining its serving area based on the UICC configuration as opposed to direction from the network.

1.3.2.1.4 ~~UICC EFS FOR M-PLMN SUPPORT~~ VZ_REQ_LTEB13NAC_22710

1.3.2.1.4.1 UICC EFs FOR M-PLMN SUPPORT VZ_REQ_LTEB13NAC_6416

The device shall support use of the following USIM Elementary Files pursuant to 3GPP TS 31.102: *Characteristics of the USIM application*: PLMN Network Name (PNN), Operator PLMN List (OPL), Equivalent Home PLMN (EHPLMN), Operator Controlled PLMN Selector with Access Technology (OPLMNwACT), HPLMN Selector with Access Technology (HPLMNwACT), User Controlled PLMN Selector with Access Technology (PLMNwACT), and Forbidden PLMNs (FPLMN).

1.3.2.2 LTE-TO-LTE HANDOVERS VZ_REQ_LTEB13NAC_22711

1.3.2.2.1 LTE-TO-LTE HANDOVERS VZ_REQ_LTEB13NAC_6305

The device shall support LTE-to-LTE handovers per the 3GPP Release 9 Specifications. Refer to 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access*, 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, 3GPP TS 36.133: *Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management*, and 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification* for additional details.

1.3.2.3 LTE SIGNALING VZ_REQ_LTEB13NAC_22712

1.3.2.3.1 LTE SIGNALING VZ_REQ_LTEB13NAC_6306

The device shall be in conformance with all LTE signaling requirements in the 3GPP Release 9 Specifications. Refer to 3GPP TS 23.122: *Non-Access Stratum (NAS) functions related to Mobile Station (MS) in idle mode*, 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*, and 3GPP TS 36.321: *Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification* for additional details.

1.3.2.3.2 ~~MAC Padding~~VZ_REQ_LTEB13NAC_36970

1.3.2.4 LTE IPV6/IPV4 AND BEARER SUPPORT VZ_REQ_LTEB13NAC_22713

1.3.2.4.1 IPV6/IPV4 SUPPORT VZ_REQ_LTEB13NAC_22714

1.3.2.4.1.1 IPV6/IPV4 SUPPORT VZ_REQ_LTEB13NAC_6307

The device shall support both IPv6 and IPv4. IPv6 and IPv4 support shall be per the 3GPP Release 9 Specifications unless indicated otherwise in this document. The device shall be capable of simultaneously supporting at least one unique IPv6 address and a unique IPv4 address for each PDN

connection. Refer to 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access* and 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

1.3.2.4.2 PDN SUPPORT VZ_REQ_LTEB13NAC_22715

Verizon Wireless PDN implementation details are in development. Additional PDNs and other PDN-related requirements may be included in a future release.

1.3.2.4.2.1 ~~NETWORK PDN SUPPORT (INFORMATIVE)~~ ~~VZ_REQ_LTEB13NAC_22716~~

1.3.2.4.2.2 ~~UE PDN SUPPORT~~ ~~VZ_REQ_LTEB13NAC_22717~~

1.3.2.4.2.3 UE PDN Support VZ_REQ_LTEB13NAC_6308

The device shall connect to the appropriate PDN as follows:

- The device shall connect to the IMS PDN for IMS applications only (applies to IMS capable devices ONLY).
- The device shall connect to the Administrative PDN for UICC/USIM updates and OTADM functions only.
- The device shall connect to the VZW Application PDN for VZW-branded applications only.

- The device shall connect to the Internet PDN for all other applications. When tethered to a laptop, the device shall connect to the Internet PDN for all applications running on the laptop.

1.3.2.4.2.4~~UE BEARER AND PDN SUPPORT~~ VZ_REQ_LTEB13NAC_22718

1.3.2.4.2.5UE BEARER AND PDN SUPPORT VZ_REQ_LTEB13NAC_6309

The device shall support a minimum of six simultaneous bearers (default bearers plus dedicated bearers). The device may support up to eight simultaneous bearers (default bearers plus dedicated bearers). The device shall support a minimum of four simultaneous PDN connections. NB-IoT (cat-NB1) device shall support a minimum of two simultaneous PDN connections.

1.3.2.4.3 PDN CONNECTIONS VZ_REQ_LTEB13NAC_22719

1.3.2.4.3.1PDN TYPE VZ_REQ_LTEB13NAC_22720

1.3.2.4.3.2PDN Type VZ_REQ_LTEB13NAC_6310

In all PDN CONNECTIVITY REQUEST messages, the device shall populate the "PDN Type" information element as IPv4v6 (including the IMS PDN). Refer to the *Scenarios* section of this document for additional details.

1.3.2.4.3.3IMS PDN CONNECTION VZ_REQ_LTEB13NAC_22721

1.3.2.4.3.4IMS PDN Bearer VZ_REQ_LTEB13NAC_6311

As part of the attach procedure to the Verizon Wireless LTE network for IMS capable devices, the device shall establish a default bearer to the IMS PDN. While attached to the Verizon Wireless LTE network, the device shall maintain a default bearer to the IMS PDN and the associated IP address(es). For the bearers to the IMS PDN, the device shall associate one IPv6 address, one IPv4 address, or both an IPv6 and IPv4 address as directed by the network. The device shall be capable of supporting a dual IP bearer to the IMS PDN connection, i.e. the device shall be capable of simultaneously associating both an IPv6 and an IPv4 address with the bearers to the IMS PDN.

1.3.2.4.3.5PDN Connection Request During Attach VZ_REQ_LTEB13NAC_6312

During the initial attach procedure for IMS capable devices, the PDN CONNECTIVITY REQUEST message in the ESM Container of the ATTACH REQUEST message shall not contain the APN (per section 6.5.1.2 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*), but shall include the PCO (for requesting DNS IP addresses and P-CSCF IP addresses). The APN shall be included in the ESM INFORMATION RESPONSE message later in the attach procedure.

Refer to the *Scenarios*, *APN Support for LTE*, *DNS*, and *SMS over IMS* sections of this document and 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

1.3.2.4.3.6ON-DEMAND PDN CONNECTIONS VZ_REQ_LTEB13NAC_22722

1.3.2.4.3.7On-Demand PDN Bearer VZ_REQ_LTEB13NAC_6313

IMS capable devices shall establish a default bearer to the Internet PDN, the Administrative PDN, or the VZW Application PDN if an application requires a bearer to any of these PDNs. If a connection to an on-demand PDN is no longer required (i.e. the application(s) using the on-demand PDN have been closed), the device shall release the default bearer to the PDN by sending a PDN DISCONNECT REQUEST message. For the default bearer to an on-demand PDN, the device shall associate an IPv6 address, an IPv4 address, or both an IPv6 and IPv4 address as directed by the network. The device shall be capable of supporting a dual IP bearer to any on-demand PDN connection, i.e. the device shall be capable of simultaneously associating both an IPv6 and an IPv4 address with the default bearer to any on-demand PDN connection.

NOTE 1: In a data retry scenario where an IMS capable device attaches to the LTE network using the internet PDN (or PDN identified by the class 3 APN), the device shall consider the internet PDN (or PDN identified by the class 3 APN) as an "always on" connection as opposed to an "on-demand" PDN connection. If the device successfully attaches to the LTE network using the internet PDN (or PDN identified by the class 3 APN), the device shall consider the IMS PDN to be an "on-demand" PDN for the duration of the attach.

Devices that do NOT support IMS shall NOT specify an APN when attaching to the LTE network (i.e. the device shall allow the network to choose the attach APN). The network will typically use the Internet PDN (or PDN identified by the class 3 APN) as the attach PDN for devices that do not support IMS. The device may consider the attach Internet PDN (or PDN identified by the class 3 APN) as an "always on" connection as opposed to an "on-demand" PDN connection. For the bearers to the attach Internet PDN, the device shall associate one IPv6 address, one IPv4 address, or both an IPv6 and IPv4 address as directed by the network. The device shall be capable of supporting a dual IP bearer to the Internet PDN connection, i.e. the device shall be capable of simultaneously associating both an IPv6 and an IPv4 address with the bearers to the Internet PDN. If the APN for the attach PDN chosen by the network does not match any APN entries in the device's APN table, devices that do not support IMS shall treat this attach APN the same as the class 3 APN and route all internet traffic to this PDN. Devices that do not support IMS shall NOT make a PDN connection request

using the class 3 APN in the APN table when the APN for the attach PDN chosen by the network does not match any APN entries in the device's APN table.

Devices that do NOT support IMS shall establish a default bearer to the Administrative PDN or the VZW Application PDN if an application requires a bearer to any of these PDNs. If a connection to an on-demand PDN is no longer required (i.e. the application(s) using the on-demand PDN have been closed), the device shall release the default bearer to the PDN by sending a PDN DISCONNECT REQUEST message. For the default bearer to an on-demand PDN, the device shall associate an IPv6 address, an IPv4 address, or both an IPv6 and IPv4 address as directed by the network. The device shall be capable of supporting a dual IP bearer to any on-demand PDN connection, i.e. the device shall be capable of simultaneously associating both an IPv6 and an IPv4 address with the default bearer to any on-demand PDN connection.

NOTE 2: Devices that do NOT support IMS shall NOT request a connection to the IMS PDN at any time.

1.3.2.4.3.8On-Demand PDN Connection Request VZ_REQ_LTEB13NAC_6314

The APN shall be included in the PDN CONNECTIVITY REQUEST message for all on-demand PDN connections established after the initial attach.

Refer to the *Scenarios* and the *APN Support for LTE* sections of this document and 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

NOTE 1: In a data retry scenario where an IMS capable device attaches to the LTE network using the internet PDN (or PDN identified by the class 3 APN), the device shall support requirement VZ_REQ_LTEB13NAC_6312 when attaching to the LTE network using the Internet PDN (or PDN identified by the class 3 APN).

NOTE 2: Devices that do NOT support IMS shall NOT specify an APN when attaching to the LTE network per VZ_REQ_LTEB13NAC_6313. Any PDN connection after attach shall be considered an on-demand PDN connection (this could be the original attach APN is that PDN is disconnected but the device is still attached).

1.3.2.4.4 IP MOBILITY VZ_REQ_LTEB13NAC_22723

1.3.2.4.4.1 IP MOBILITY VZ_REQ_LTEB13NAC_6315

When establishing default bearers and their associated IP addresses, the device shall use the Attach Procedure to create the first default bearer and the PDN Connectivity Request procedure to request subsequent default bearers. Refer to 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

IP mobility shall be handled by GTP and/or Proxy Mobile IPv6, which are network capabilities (i.e. no device impact). Refer to 3GPP TS 29.274: *3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3* and 3GPP TS 29.275: *Proxy Mobile IPv6 (PMIPv6) based Mobility and Tunnelling protocols; Stage 3* for additional details.

1.3.2.4.5 IP HEADER COMPRESSION VZ_REQ_LTEB13NAC_22724

1.3.2.4.5.1 IP HEADER COMPRESSION VZ_REQ_LTEB13NAC_6316

The device may support ROHC IP header compression. If the device supports ROHC IP header compression, the device shall support the following ROHC IP header compression profiles defined in section 5.5.1 of 3GPP TS 36.323: *Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) specification*:

- 0x0000
- 0x0001
- 0x0002

If the device supports ROHC IP header compression, the device may also support the following ROHC IP header compression profiles defined in section 5.5.1 of 3GPP TS 36.323: *Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) specification*:

- 0x0101
- 0x0102

1.3.2.4.6 BEARER QOS VZ_REQ_LTEB13NAC_22725

1.3.2.4.6.1 BEARER QOS VZ_REQ_LTEB13NAC_6317

The device shall support network initiated quality of service (QoS) for both default and dedicated bearers including the creation of new dedicated bearer(s) using 3GPP standard network initiated bearer context activation procedures defined in 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*. The device shall support changes to the QoS of a default or dedicated bearer using 3GPP standard network initiated bearer context modification procedures defined in 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*. The device shall support the removal of a dedicated bearer using 3GPP standard network initiated bearer context deactivation procedures defined in 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*.

The device shall support the use of all 3GPP defined QCI values in the range of 1-127. The device shall support the use of any operator-specific QCI value in the range of 128-254.

If the network establishes dedicated bearers, the device shall route packets to these dedicated bearers based on the traffic flow template information provided by the network in the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST messages or the MODIFY EPS BEARER CONTEXT REQUEST messages (these messages are per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*).

The device shall support the use of a traffic flow template on any default bearer if the network provides a traffic flow template for a default bearer using 3GPP standard network initiated bearer context modification procedures defined in 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*. If the network assigns a traffic flow template for a default bearer, the device shall route packets on the default bearer per the traffic flow template.

The device shall not initiate QoS establishment or initiate changes to the QoS level for a given bearer. The device shall NOT request a dedicated bearer for any PDN (i.e. all dedicated bearer activation will be initiated by the network).

Refer to 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3,* 3GPP TS 36.300: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2*, 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*, and 3GPP TS 36.321: *Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification* for additional details.

1.3.2.4.6.2BEARER QOS and TESTING VZ_REQ_LTEB13NAC_6318

During any conformance or performance testing (e.g. 3GPP standard signaling conformance per 3GPP TS 36.523-1: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification*), the device shall not attempt to initiate QoS even if the device receives an AT command to initiate QoS.

1.3.2.4.6.3~~TRAFFIC FLOW TEMPLATE SUPPORT~~ ~~VZ_REQ_LTEB13NAC_22726~~

1.3.2.4.6.4Traffic Flow Template Support VZ_REQ_LTEB13NAC_6428

The device shall support all traffic flow template requirements as defined in section 15.3 of 3GPP TS 23.060: *General Packet Radio Service (GPRS); Service description; Stage 2* and section 10.5.6.12 of 3GPP TS 24.008: *Mobile radio interface Layer 3 specification; Core network protocols; Stage 3*.

The device shall support a total of 16 packet filters/traffic flows per bearer. These 16 packet filters/traffic flows may be all uplink, all downlink, or any combination of uplink and downlink that adds up to a total of 16.

At a minimum, the device shall support the following protocols in the "Next Header" if the "Next Header" is a packet filter attribute: UDP, TCP, ICMP, ESP, and AH.

The device is only required to support non-zero values for the "TOS/Traffic Class" packet filter attribute.

1.3.2.4.6.5~~UPLINK TRAFFIC SHAPING~~ VZ_REQ_LTEB13NAC_22727

1.3.2.4.6.6Uplink Traffic Shaping VZ_REQ_LTEB13NAC_22729

The device's modem shall not enforce maximum bit rates (MBR's) on any uplink bearer or any uplink APN aggregate maximum bit rates (APN-AMBR's). Enforcement of uplink MBR's and uplink APN-AMBR's will be handled by the network.

The device's modem shall prioritize the routing of uplink packets to their destination bearers based on the priority and prioritized bit rate assigned for each bearer by the network through the RRC *LogicalChannelConfig* information element. For packets destined for the same bearer, the device's modem shall prioritize packets based on their DSCP marking. If the packet has no DSCP marking then a DSCP marking of 0 (i.e. best effort) shall be assumed. Refer to 3GPP TS 23.203: *Policy and charging control architecture*, 3GPP TS 36.300: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description;*

Stage 2, and 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification* for additional details.

1.3.2.4.7 MTU SIZE VZ_REQ_LTEB13NAC_22728

1.3.2.4.7.1 MTU SIZE VZ_REQ_LTEB13NAC_6319

For each PDN connection, the MTU size shall be configurable via the Protocol Configuration Options during PDN connection setup, i.e. the device shall request the MTU size as part of the PCO in the PDN CONNECTIVITY REQUEST message. If the network fails to send an MTU size as part of the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the given PDN, the device shall set the MTU size for that PDN to 1428 bytes. The device shall apply the configured MTU size for the given PDN to both IPv4 and IPv6 packets. The device shall be capable of supporting a different MTU size setting for each PDN. The device shall be capable of supporting an MTU size of up to 3000 bytes for each PDN.

The device vendor shall not allow the user to modify the MTU size settings through the device user interface or the remote access user interface for tethered devices.

1.3.2.5 DNS VZ_REQ_LTEB13NAC_22730

1.3.2.5.1 DNS Server Support VZ_REQ_LTEB13NAC_6320

The device shall be capable of supporting 2 IPv6 DNS server addresses and 2 IPv4 DNS server addresses for each PDN connection. The device shall be capable of supporting unique DNS server addresses for each PDN connection. DNS server addresses are provided to the device by the network

(refer to the *Scenarios* section of this document for additional details) and shall not be hard coded on the device. The device shall not store DNS server addresses across power cycles.

1.3.2.5.2 CACHING VZ_REQ_LTEB13NAC_22731

1.3.2.5.2.1 Applications and DNS Results Caching VZ_REQ_LTEB13NAC_6321

Embedded applications on the device and any other applications that use the DNS resolver software in the device shall not cache DNS results. All caching for such applications shall take place in the DNS resolver software in the device. The applications shall never store IP addresses past the end of a session.

1.3.2.5.2.2 Device DNS Resolver Software Caching VZ_REQ_LTEB13NAC_6322

The following rules shall apply to the DNS resolver software in the device in the event that the resolver caches the results of a DNS query:

- DNS caches shall be cleared when the device experiences a hard power cycle (i.e. the device is powered off by the user and eventually powered back on, the battery is pulled, etc.) or soft reset (software instigates a power cycle). In other words, any cache of DNS results shall be stored in volatile memory only and shall not be stored in non-volatile memory.
- No DNS result shall be cached by the resolver longer than the Time-To-Live (TTL) field that is returned with the result. For example, if the DNS result indicates a Time-To-Live of 30 minutes, then that result shall not be cached by the device for longer than 30 minutes. If no TTL value is available in a particular response, the embedded application may use the result for the duration of that PDN connection but shall not cache the value after the PDN connection ends.
- In the event that the source software offers an option for setting the maximum cache time (e.g. via a compile-time static variable), the time shall be set to a value of 24 hours. However, if the TTL value is less than the maximum cache time, then the TTL value shall always take precedence over the maximum cache time. For instance, if the maximum cache time is 24

hours and the TTL for a result is 2 hours, then the resolver shall cache the result for 2 hours only. If the maximum cache time is 24 hours and the TTL for a result is 48 hours, then the resolver shall cache the result for 24 hours.

1.3.2.5.3 DOMAIN NAME MAXIMUM LENGTH VZ_REQ_LTEB13NAC_22732

1.3.2.5.3.1 DOMAIN NAME MAXIMUM LENGTH VZ_REQ_LTEB13NAC_6323

As per RFC 1034, the maximum domain name length shall be 255 octets. If an application requests resolution of a domain name longer than 255 octets, the DNS resolver software in the device shall return an error to the application.

1.3.2.6 ~~DATA RETRY REQUIREMENTS~~ VZ_REQ_LTEB13NAC_22733

1.3.2.6.1 ~~DATA RETRY REQUIREMENTS~~ VZ_REQ_LTEB13NAC_6324

1.3.2.7 IMSI SUPPORT FOR LTE VZ_REQ_LTEB13NAC_22734

1.3.2.7.1 IMSI SUPPORT FOR LTE VZ_REQ_LTEB13NAC_6325

The device shall retrieve the IMSI stored in the USIM as per 3GPP 31.102: *Characteristics of the Universal Subscriber Identity Module (USIM) application* for operation on the Verizon Wireless 3GPP Band 13 LTE network. The IMSI will be coded as per 3GPP TS 23.003: *Numbering, addressing and identification*. The IMSI will be used as the subscriber identity when interacting with the Verizon Wireless LTE network.

1.3.2.8 APN SUPPORT FOR LTE VZ_REQ_LTEB13NAC_22741

1.3.2.8.1 PDN CONNECTION REQUESTS VZ_REQ_LTEB13NAC_22742

1.3.2.8.1.1 PDN CONNECTION REQUESTS VZ_REQ_LTEB13NAC_6326

When requesting a connection to a PDN, the device shall use the APN associated with that PDN based on the APN class as described below.

- The device shall use the Class 1 APN for the IMS PDN (applies to IMS capable devices ONLY).
- The device shall use the Class 2 APN for the Administrative PDN.
- The device shall use the Class 3 APN for the Internet PDN.
- The device shall use the Class 4 APN for the VZW Application PDN.

Refer to the *LTE IPv6/IPv4 and Bearer Support*, *Scenarios*, and the *Factory LTE Programming* sections of this document and 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

1.3.2.8.2 APN ENABLE/DISABLE VZ_REQ_LTEB13NAC_22743

1.3.2.8.2.1 APN ENABLE/DISABLE VZ_REQ_LTEB13NAC_6327

The device shall support an enable/disable control parameter for each APN.

The device shall only use an APN if the APN is enabled. The device shall not request a PDN connection if the associated APN is disabled or not present (e.g. deleted). If the Class 1 APN (i.e. APN for the IMS PDN) is disabled or not present (e.g. deleted) on an IMS capable device, or the Class 2 APN (i.e. APN for the Administrative PDN) is disabled or not present (e.g. deleted) on any device, then the device shall not attempt to attach to the Verizon Wireless LTE network.

1.3.2.8.3 APN CONTENT VZ_REQ_LTEB13NAC_22744

1.3.2.8.3.1 APN CONTENT VZ_REQ_LTEB13NAC_6328

When sending the APN as an information element in a NAS message, the device shall only include the APN Network Identifier (NI). The network will append the APN Operator Identifier (OI) to complete the FQDN of the APN, and the network will perform the DNS resolution.

1.3.2.8.4 UICC APN VERIFICATION VZ_REQ_LTEB13NAC_22745

1.3.2.8.4.1 ~~UICC APN VERIFICATION ENABLED~~ VZ_REQ_LTEB13NAC_22746

1.3.2.8.4.2UICC APN Verification Enabled VZ_REQ_LTEB13NAC_6329

If the APN Control List feature is enabled in the UICC (i.e. USIM service table), then the device shall check that the entire APN of any PDP context is listed in EF_{ACL} under USIM before requesting this PDP context activation from the network. If the APN is not present in EF_{ACL}, the device shall not request the corresponding PDP context activation from the network. If the Class 1 APN (i.e. APN for the IMS PDN) is not present in EF_{ACL}, the device shall not attempt to attach to the Verizon Wireless LTE network until the UICC is removed and replaced. If the device is attached to the Verizon Wireless LTE network and needs to establish a connection to the Administrative PDN and the Class 2 APN (i.e. APN for the Administrative PDN) is not present in EF_{ACL}, the device shall detach from the LTE network using standard 3GPP messaging and shall not attempt to re-attach to the Verizon Wireless LTE network until the UICC is removed and replaced. Refer to 3GPP TS 31.102: *Characteristics of the Universal Subscriber Identity Module (USIM) application*, 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, and the *LTE Network Detachment* section of this document for additional details.

The interpretation of the APN TLV shall be as per 3GPP TS 23.003: *Numbering, addressing and identification*.

1.3.2.8.4.3~~UICC APN VERIFICATION DISABLED~~ VZ_REQ_LTEB13NAC_22747

1.3.2.8.4.4UICC APN Verification Disabled VZ_REQ_LTEB13NAC_6330

If the APN Control List feature is disabled in the UICC (i.e. the USIM service table), then the device shall use the APN without any verification from the UICC.

1.3.2.8.5 APN STORAGE ON THE DEVICE VZ_REQ_LTEB13NAC_22748

1.3.2.8.5.1 APN STORAGE VZ_REQ_LTEB13NAC_6331

APN network identifiers and their associated parameters shall be stored on the device in non-volatile memory. Refer to the *Factory LTE Programming* section of this document for additional details.

1.3.2.8.5.2 APN STORAGE AND UPDATES VZ_REQ_LTEB13NAC_6332

If the Verizon Wireless UICC is removed from the device, the device shall remember all APN parameter settings used with the Verizon Wireless UICC prior to removal, and the device shall restore all APN parameters to these settings when a Verizon Wireless UICC is re-inserted into the device.

NOTE: The device shall consider the UICC to be a Verizon Wireless UICC if the ICCID begins with "891480" or the IMSI is from one of the following IMSI ranges:

- 311-480
- 311-270
- 310-590
- 310-599
- 311-280

When the device is operated with a Verizon Wireless UICC, the device shall comply with the following requirements:

1. The device may provide the capability for the user to update the class 3 APN network identifier through the device user interface or the remote access user interface for tethered devices.
2. The device may provide the capability to update all APN network identifiers through a diagnostic menu (for use during device acceptance/field testing). This diagnostic mode shall not be accessible to the end user, i.e. this diagnostic menu shall only be accessible by the device vendor and/or Verizon Wireless.
3. The device shall not allow the user to update any other existing APN NI's (except the class 3 APN NI) through the device user interface or the remote access user interface for tethered devices. When modifying the class 3 APN NI (through the device user interface or the remote access user interface for tethered devices), the device shall NOT allow the user to leave the class 3 APN NI blank. **For any APN classes in the APN table**, the device shall not allow the user to create a new APN entry in the APN table or delete an existing APN entry in the APN table through the device user interface or the remote access user interface for tethered devices (e.g. the device **shall not** allow the end user to create additional entries in the APN table for a given APN class, to create an entry in the APN table with a completely new APN class, or to delete the APN entry in the APN table for any APN class).
4. The device shall provide the capability of updating all APN network identifiers and their associated parameters through OTADM except MAX_CONN, MAX_CONN_T, and WAIT_TIME (i.e. MAX_CONN, MAX_CONN_T, and WAIT_TIME are NOT OTADM configurable). Refer to the *OTADM* section of this document for additional details. The device shall not allow the user to update the following APN related parameters through the device user interface or the remote access user interface for tethered devices:
    - APN Class
    - APN IP Type
    - APN Bearer
    - APN Enable/Disable
    - APN MAXCONN, MAXCONN_T, WAIT_TIME
5. If an APN network identifier or APN-related parameter is updated after a PDN connection using the APN has been established, the device shall release the PDN connection and then immediately re-establish the PDN connection using the updated APN parameter(s). If any APN network identifier or APN-related parameter is updated for an APN for which the device has no current PDN connection, the device shall use the updated APN parameter(s) in all future PDN connections using the APN. Refer to the *Scenarios* section of this document for additional details.

1.3.2.8.6 MULTIPLE PDN CONNECTIONS USING THE SAME APN VZ_REQ_LTEB13NAC_22749

1.3.2.8.6.1 MULTIPLE PDN CONNECTIONS USING THE SAME APN VZ_REQ_LTEB13NAC_6333

The device shall only support one PDN connection for a given APN. After successful establishment of a PDN connection using a given APN, the device shall not attempt to establish additional PDN connections using the same APN, i.e. the device shall not send another PDN CONNECTIVITY REQUEST message with the same APN.

1.3.2.8.7 APPLICATION ACCESS TO APN PARAMETERS VZ_REQ_LTEB13NAC_22750

1.3.2.8.7.1 APPLICATION ACCESS TO APN PARAMETERS VZ_REQ_LTEB13NAC_6417

The device shall not allow any applications to access or modify APN parameters stored on the device with the exception of the device's OTADM application and any lab applications provided the vendor for device certification/acceptance testing.

1.3.2.9 DEVICE EQUIPMENT IDENTIFIER VZ_REQ_LTEB13NAC_22751

1.3.2.9.1 IMEI and IMEISV VZ_REQ_LTEB13NAC_6334

The device shall use the IMEI and the IMEISV as the device equipment identifiers when operating in LTE. The IMEI (including the IMEI check digit) shall be stored on the device in secure, non-volatile, read-only memory populated at the time of device maufacture. The device shall not be capable of modifying the IMEI. The device shall not be capable of modifying the Type Allocation Code (TAC) and Serial Number (SNR) components of the IMEI or IMEISV. The device shall not allow the user to modify the SVN component of the IMEISV. The device shall only be capable of updating the Software Version Number (SVN) component of the IMEISV as part of a software update to the device. Refer to 3GPP TS 23.003: *Numbering, addressing and identification* and 3GPP TS 22.016: *International Mobile Equipment Identities (IMEI)* for additional details.

The IMEI and IMEISV shall always be read from the device (as opposed to the UICC). When the IMEI is requested by the network, the UICC, or an application on the device, the device shall retrieve the IMEI from the secure, non-volatile, read-only memory whose value was populated at the time of the device manufacture (as opposed to retrieving from any volatile, unsecure memory which may be changed or modified after initial device manufacture). When the IMEISV is requested by the network, the UICC, or an application on the device, the device shall retrieve the 14 digit IMEI (i.e. TAC+SNR) from the secure, non-volatile, read-only memory whose value was populated at the time of the device manufacture (as opposed to retrieving from any volatile, unsecure memory which may be changed or modified after initial device manufacture) and concatenate the 14 digit IMEI (i.e. TAC+SNR) with the SVN to form the IMEISV, i.e. only the SVN portion of the IMEISV may be retrieved from any volatile, unsecure memory which may be changed or modified after initial device manufacture.

The value for the SVN component of the IMEISV shall be 01 for the software version on the device at device launch. The SVN component of the IMEISV shall be incremented by at least one for every released post-launch software update for the device. **NOTE:** Any deviation from this requirement (i.e. to increment the SVN component for a post-launch software update) requires the device vendor to receive approval from Verizon Wireless.

1.3.2.9.2 IMEI Display VZ_REQ_LTEB13NAC_6335

When displaying the IMEI to the end user through the device user interface or the remote access user interface for tethered devices, the device shall include the IMEI check digit. Per the 3GPP Release 9 Specifications, the IMEI check digit shall not be included in messaging between the device and the

network. Refer to 3GPP TS 23.003: *Numbering, addressing and identification* and 3GPP TS 22.016: *International Mobile Equipment Identities (IMEI)* for additional details.

1.3.2.10 IMS SUPPORT VZ_REQ_LTEB13NAC_23507

1.3.2.10.1 SMS over IMS Support VZ_REQ_LTEB13NAC_6336

All devices that support voice shall support SMS over IMS when operating on the Verizon Wireless LTE network as per the Verizon Wireless LTE SMS Requirements. Compliance to LTE SMS requirements shall be per the Verizon Wireless LTE SMS Test Plan. Compliance to IMS registration and IMS registration retry requirements shall be per the Verizon Wireless LTE IMS Registration and IMS Registration Retry Test Plan.

Data-centric devices shall support SMS when operating on the Verizon Wireless LTE network based on their device category as described below:

- LTE Category 1 and higher data-centric devices shall support SMS over IMS.
- LTE Category M1 devices shall support either SMS over IMS or SMS over NAS. Refer to VZ_REQ_LTEB13NAC_39731 for additional details on SMS over NAS.
- NB-IoT devices shall support SMS over NAS. Refer to VZ_REQ_LTEB13NAC_39731 for additional details on SMS over NAS.

NOTE 1: Data-centric or IMS-less devices that support SMS over NAS (and do NOT support SMS over IMS) are NOT required to support any IMS-related requirements in this document.

NOTE 2: ***Data-centric or IMS-less device vendors should contact Verizon Wireless prior to implementing SMS over NAS on any devices.***

1.3.2.10.2 ~~SMS TRANSPORT LAYER MESSAGE FORMAT~~ VZ_REQ_LTEB13NAC_23508

1.3.2.10.3 IMS CLIENT VZ_REQ_LTEB13NAC_23509

1.3.2.10.3.1 IMS CLIENT VZ_REQ_LTEB13NAC_6337

The IMS client shall be embedded in the device (as opposed to residing on a laptop for tethered devices). In logical terms, the device shall only have one IMS client which communicates with the network.

1.3.2.10.3.2 IMS TEST MODE VZ_REQ_LTEB13NAC_23510

1.3.2.10.3.3 IMS Test Mode VZ_REQ_LTEB13NAC_6338

IMS capable devices shall support an IMS test mode in which the IMS client is disabled. By default, this test mode shall be disabled, i.e. the IMS client is enabled.

This test mode shall be enabled and disabled using a non-volatile memory setting. Upon changing this memory setting, the device shall perform a soft reset. The vendor shall provide a lab application to modify this memory setting during device acceptance testing. The device vendor shall not allow the user to modify this memory setting through the device user interface or the remote access user interface for tethered devices.

The IMS test mode shall operate independently of the setting of the SMS_Over_IP_Networks_Indication parameter defined in the *SMS over IMS Control* section of the LTE SMS Requirements. Refer to the *LTE Network Attachment* section of this document for additional details.

1.3.2.10.4 ~~SMS STORAGE~~ ~~VZ_REQ_LTEB13NAC_23511~~

1.3.2.10.4.1 ~~3GPP FORMATTED SMS TEXT MESSAGES~~ ~~VZ_REQ_LTEB13NAC_23512~~

1.3.2.10.4.2 ~~3GPP2 FORMATTED SMS TEXT MESSAGES~~ ~~VZ_REQ_LTEB13NAC_23513~~

1.3.2.10.5 IMS REGISTRATION REQUIREMENTS VZ_REQ_LTEB13NAC_23514

1.3.2.10.5.1 ~~PDN AND BEARER SELECTION~~ ~~VZ_REQ_LTEB13NAC_23515~~

1.3.2.10.5.2 PDN and Bearer Selection VZ_REQ_LTEB13NAC_6432

The device shall use the IMS PDN for all messaging and traffic associated with the device's embedded IMS client. No other PDN's shall be used for messaging and traffic associated with the device's embedded IMS client.

The device shall proceed with IMS registration when all of the criteria below are met:

- The device has established a default bearer with the IMS PDN.
- The device has established a globally routable IPv6 address for the IMS PDN.
- The device has received the P-CSCF IP addresses in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.

The device shall use the IMS PDN default bearer for all SIP signaling unless the network indicates otherwise.

1.3.2.10.5.3 ~~PROXY-CSCF DISCOVERY~~ VZ_REQ_LTEB13NAC_23516

1.3.2.10.5.4 Proxy-CSCF Discovery VZ_REQ_LTEB13NAC_6433

The device shall obtain the IP address(es) of the IMS Proxy-CSCF as one of the Protocol Configuration Option (PCO) parameters that is provided by the network in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN during the LTE attach procedure. The device shall be capable of supporting a minimum of three P-CSCF IP addresses. For requirements on IMS registration and the use of the three P-CSCF IP address values, see section 3.2.10.5 "IMS Registration Errors." The device shall NOT use cached P-CSCF IP addresses from a previous IMS PDN context - i.e. when a new IMS PDN connection/context is established the device shall use the P-CSCF IP addresses provided in that IMS PDN bearer activation.

The device shall use port 5060 as the default P-CSCF IMS SIP port number, i.e. the destination port number that the devices IMS SIP User Agent Client uses to send SIP messages to the P-CSCF (and

the listening port number of the P-CSCF). The device shall also use port 5060 as the default port for the device's IMS SIP User Agent Servers listening port. When opening a new TCP socket for SIP, the device shall randomly select a source port that is equal to or above 32768. When opening up a new TCP socket, the device shall not re-use a source port that has been used in any of the previous 32 TCP sockets. The device vendor shall provide a lab application to modify the P-CSCF IMS SIP port setting during device acceptance testing. The device vendor shall not allow the user to modify the P-CSCF IMS SIP port setting through the device user interface or the remote access user interface for tethered devices.

1.3.2.10.5.5 ~~REGISTRATION WITH THE PROXY-CSCF AND S-CSCF~~ ~~VZ_REQ_LTEB13NAC_23517~~

1.3.2.10.5.6 Registration with the Proxy-CSCF and S-CSCF VZ_REQ_LTEB13NAC_6434

The device shall support the IMS registration functions with the IMS network as described in 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*. Specifically, the device shall support the initial registration functions described in the section *" Initial Registration"* in 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*.

- The device shall use SIP URIs in the FROM and TO Headers
- The device shall use the pre-provisioned Home Domain Name in the Request URI of the Registration Message.
- The P-Associated-URI will be returned to the device with both a SIP and a tel URI. The device shall use the SIP URI in the P-Preferred Identity and the FROM Headers.
- The device shall attempt IMS registration using the first P-CSCF IP address provided by the network in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN during the LTE attach procedure. The device shall attempt IMS registration using additional P-CSCF IP addresses provided by the network as indicated per section 3.2.10.5 of this document.
- As a part of the IMS registration process, the device shall set the registration expiration timer value to 600,000 seconds as defined in section 5.1.1.2, *Initial Registration*, of 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*.

This applies to both the normal scenario where a 200 OK is received in response to the Register, and abnormal scenarios where a SIP error code (such as a SIP 423 Interval Too Brief) is received. The device shall request the registration expiration timer value in either the "Contact" header or the "Expires" header but not both.

- The device shall include the 3GPP SMS feature tag (+g.3gpp.smsip).
- The device shall include the P-Access-Network-Info header in all SIP REGISTER requests per 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*. **NOTE:** The MCC, MNC, TAC, and ECI shall be for the current serving LTE network and serving cell.
- The device shall include the following feature tag in the Contact header of the SIP REGISTER request: "+sip.instance" with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>", e.g. Contact: +sip.instance= "urn:gsma:imei:<device_IMEI>".

If the device receives a SIP 200 OK response from the network for its SIP REGISTER request, and the SIP 200 OK response contains more than one Contact header, then the device shall process each Contact header as follows:

- If the one of the URI's in the Contact headers matches the URI used in the Contact header of the SIP REGISTER request for establishing the current IMS registration, then the device shall process the Contact header in the SIP 200 OK response and take appropriate action.
- If none of the URI's in the Contact headers match the URI used in the Contact header of the SIP REGISTER message for establishing the current IMS registration, then the device shall disregard the SIP 200 OK response (as if there was no response from the network) and follow a) all normal IMS registration re-transmissions and b) follow all normal IMS registration retry procedures as defined in requirement VZ_REQ_LTEB13NAC_6444. **NOTE:** If the device does NOT receive a 200 OK matching the SIP REGISTER request and TimerF expires, then the device shall consider the SIP REGISTER request to have timed out and follow IMS registration retry procedures as defined in requirement VZ_REQ_LTEB13NAC_6444.

If the device receives a SIP NOTIFY message from the network associated with IMS registration and the SIP NOTIFY message also contains an Instance-ID, then the device shall act as follows:

- If the Instance-ID matches the Instance-ID used in the original IMS REGISTER message for establishing the current IMS registration, then the device shall process the SIP NOTIFY message and take appropriate action.
- If the Instance-ID is different from the Instance-ID used in the original IMS REGISTER message for establishing the current IMS registration, then the device shall respond to the SIP NOTIFY message with a 200 OK message but take no further action (i.e. the device shall disregard the SIP NOTIFY message).

NOTE: In some cases, the SIP NOTIFY may contain multiple registration instances (each with a unique Instance-ID). The device shall process all registration instances (and their associated Instance-IDs) in the SIP NOTIFY before making a decision how to proceed based on the logic above.

1.3.2.10.5.7 ~~AUTHENTICATION DURING REGISTRATION~~ ~~VZ_REQ_LTEB13NAC_23518~~

1.3.2.10.5.8 Authentication during registration VZ_REQ_LTEB13NAC_6435

Until further notice from Verizon Wireless, all devices shall use the Digest AKAv2 method as the IMS authentication mechanism. The Digest AKAv2 authentication method is per IETF RFC 4169.

Note the following items for Authentication:

- The REGISTER message will be challenged.
- Devices shall always send the "Authorization" header with username parameter even in the initial REGISTER messages.
- De-registrations will be challenged.
- SIP MESSAGE transactions may be challenged by the IMS network.

After a successful IMS registration, the device shall provide an indication of success to the connection manager if the device is tethered to a PC.

1.3.2.10.5.9 ~~URI FORMATTING~~ ~~VZ_REQ_LTEB13NAC_23519~~

1.3.2.10.5.10 URI formatting VZ_REQ_LTEB13NAC_6436

The ISIM will contain multiple records for the IMS Public User Identity under EF_{IMPU}. The first record will always be an IMSI-based SIP URI in the format:
sip:<IMSI>@ims.mnc480.mcc311.3gppnetwork.org (NOTE: Verizon Wireless will add additional MNC-MCC combinations as needed.)

The ISIM will also contain an MSISDN-based SIP URI for the IMS Public User Identity in the format:
sip:+19085554321@vzims.com
where the 10 digit MDN (in E.164 format) is in the user part.

In normal operation, the device shall use the MSISDN-based SIP URI for its IMS Public User Identity. If a tel URI is also desired for the device, it shall not be permanently stored in the device. The tel URI will be downloaded to the device during registration from the IMS network using the P Associated URI Header.

Refer to the *Scenarios* section of the Verizon Wireless LTE SMS Requirements and 3GPP TS 31.103: *Characteristics of the IP Multimedia Services Identity Module (ISIM) application* for additional details.

1.3.2.10.5.11 ~~SUBSCRIPTION TO THE REG EVENT PACKAGE~~ VZ_REQ_LTEB13NAC_23520

1.3.2.10.5.12 Subscription to the reg event package VZ_REQ_LTEB13NAC_6437

After successfully completing any new IMS registration (as opposed to a re-registration), the device shall always request a new subscription to the reg events package. The procedures for this subscription are described in the section "*Subscription to the Registration-State Event Package*" in 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*. The device shall include the following feature tag in the Contact header of the SIP SUBSCRIBE request: "+sip.instance" with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>", e.g. Contact: +sip.instance= "urn:gsma:imei:<device_IMEI>". **NOTE:** This same "+sip.instance" feature tag shall be included in both the REGISTER message and the SUBSCRIBE (for the reg events package).

Per RFC 3261, the device shall use a "Call-ID" in the SUBSCRIBE message that is different from the "Call-ID" that was established during the registration procedure.

The device shall re-subscribe at the expiration of the subscription timer as described in the section "*Subscription to the Registration-State Event Package*" in 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*. When sending a SUBSCRIBE message to initiate a re-subscribe to the reg events package, the device shall use the same dialog that was established at the initial SUBSCRIBE procedure.

The device shall include the P-Access-Network-Info header in all SIP SUBSCRIBE requests per 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*.

1.3.2.10.5.13 ~~REREGISTRATION~~ VZ_REQ_LTEB13NAC_23521

1.3.2.10.5.14 Reregistration VZ_REQ_LTEB13NAC_6438

Either the device or the network may initiate a reregistration. The device shall reregister at the expiration of the registration timer as described in the section "User-initiated Reregistration" in 3GPP

TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*.

When sending a REGISTER message to initiate a re-registration, the device shall use the same "Call-ID" that was established at the initial registration.

1.3.2.10.5.15 ~~DEREGISTRATION~~ VZ_REQ_LTEB13NAC_23522

1.3.2.10.5.16 Deregistration VZ_REQ_LTEB13NAC_6439

Either the device or the network may request deregistration with the IMS network. The procedures are described in the sections "User-initiated Deregistration" and "Network-initiated Deregistration" in 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*.

The device shall initiate deregistration if it has a current registration and the device is going to either initiate a detach from the LTE network (including device power down detach) or initiate a disconnection of the IMS PDN connection. To deregister, the device shall 1) terminate the subscription to the registration events package by sending a Subscribe message with expires= 0, followed by 2) sending an IMS de-registration request which shall consist of a REGISTER message with the value Expires= 0 in the header. This shall be done before sending a NAS DETACH REQUEST message or a NAS PDN DISCONNECT REQUEST message for the IMS PDN. Upon the IMS client generating the initial SIP REGISTER message with expires=0, the device shall start an implementation specific timer with a value of 4 seconds. While this implementation specific timer is running, the device shall respond to all SIP messaging from the network, e.g. if the network challenges the de-registration request with a 401 Unauthorized. Upon expiration of this implementation specific timer, the device shall take no further action with respect to SIP messages from the network and execute the NAS detach procedure or NAS PDN disconnect procedure. The device shall stop the implementation specific timer and immediately execute the NAS detach procedure or NAS PDN

disconnect procedure if a SIP 200 OK or a SIP 481 or a SIP 501 is received in response to the SIP REGISTER (with expires=0) before the implementation specific timer expires.

NOTE: The implementation specific timer is started when the IMS client generates the initial SIP REGISTER message with expires=0. The implementation specific timer shall run even if the IMS client cannot send the SIP REGISTER message to the modem for transmission because an IMS signaling connection could not be established.

The device shall enter the de-registered state if the network sends a SIP NOTIFY message with one or more registration elements that have the state attribute set to "terminated" and the event attribute set to either "rejected" or "deactivated". In this case, the device shall wait 60 seconds and then attempt an initial IMS registration.

If the device receives a SIP NOTIFY message from the network indicating a network-initiated IMS de-registration and the SIP NOTIFY message also contains an Instance-ID, then the device shall act as follows:

- If the Instance-ID matches the Instance-ID used in the original IMS REGISTER message for establishing the current IMS registration, then the device shall process the request as a normal de-registration following the steps described in the preceding paragraph above.
- If the Instance-ID is different from the Instance-ID used in the original IMS REGISTER message for establishing the current IMS registration, then the device shall respond to the SIP NOTIFY message with a 200 OK message but take no further action (i.e. the device shall disregard the SIP NOTIFY message).

NOTE: In some cases, the SIP NOTIFY may contain multiple registration instances (each with a unique Instance-ID). The device shall process all registration instances (and their associated Instance-IDs) in the SIP NOTIFY before making a decision how to proceed based on the logic above.

1.3.2.10.5.17 ~~DEVICE IDENTITY AND RELATED PARAMETERS~~ ~~VZ_REQ_LTEB13NAC_23523~~

1.3.2.10.5.18 Device Identity and Related Parameters VZ_REQ_LTEB13NAC_6440

The device shall retrieve the following parameters from the ISIM/USIM:

- IMS Private User Identity: The IMS Private User Identity is a network identity with the format <IMSI>@vzims.com. This parameter is stored in the ISIM on the UICC.
- IMS Public User Identity: In normal SMS operation, the IMS Public User Identity shall be a MSISDN-based SIP URI with the format sip:+19085554321@vzims.com. The ten digit MDN (i.e. 9085554321) is in the user part. This parameter is stored in the ISIM on the UICC. The ISIM also contains an IMSI-based SIP URI of the format sip:<IMSI>@ims.mnc480.mcc311.3gppnetwork.org (NOTE: Verizon Wireless will add additional MNC-MCC combinations as needed.). The first record under EF_{IMPU} will always be the IMSI-based SIP URI.
- Home Network Domain name: the home network domain name of the P-CSCF. This parameter has a default value of vzims.com.
- IMSI: The IMSI consists of 3 digits MCC, 2 or 3 digits MNC, and from 1 to 9 digits MSID that is formatted according to ITU-T E.212. The IMSI has a maximum length of 15 digits. This parameter is stored in the USIM on the UICC.
- IMS AKA: The IMS AKA password is stored in the ISIM on the UICC.

1.3.2.10.5.19 ~~SMS OVER IMS CONTROL~~ VZ_REQ_LTEB13NAC_23524

1.3.2.10.5.20 SMS over IMS Control VZ_REQ_LTEB13NAC_6441

The device shall support a configurable parameter that controls the operation of the SMS over IMS functions. The configurable parameter is defined as SMS_Over_IP_Networks_Indication and it is a

Boolean parameter having a value of 1 or 0 (refer to 3GPP TS 24.167: *3GPP IMS Management Object (MO); Stage 3* for additional details). This configurable parameter shall not be accessible to the end user.

- When the SMS_Over_IP_Networks_Indication parameter is set to a value of 1, the device shall support SMS over IMS and shall attempt IMS registration as defined by the requirements in this section. The value of 1 shall be the default value and this value is used for normal operation in the LTE network.
- When the SMS_Over_IP_Networks_Indication parameter is set to a value of 0, the device shall not use the SMS over IMS feature to originate SMS messages, but the device shall attach to the LTE network and attempt IMS registration as defined by the requirements in this section. If IMS registration is successful, the device shall be able to receive and process MT SMS messages delivered over IMS, but shall not originate MO SMS messages over IMS.

Note that the SMS_Over_IP_Networks_Indication parameter is a parameter that operates independently of the IMS test mode parameter that is defined in this document.

1.3.2.10.5.21 ~~SIP TIMERS FOR IMS~~ VZ_REQ_LTEB13NAC_23525

1.3.2.10.5.22 SIP Timers for IMS VZ_REQ_LTEB13NAC_6442

The device shall support the following SIP timers for IMS:

- The value of the SIP T1 timer shall be controlled by the configuration parameter *T1Timer_ims*. This timer shall have a default value of 3 seconds.
- The value of the SIP Timer F (SIP timeout timer) shall be controlled by the configuration parameter *TFtimer_ims.* This timer shall have a default value of 30 seconds. Note that the Timer F value shall not be calculated from the formula in the SIP standard.
- The value of the SIP T2 timer shall be controlled by the configuration parameter *T2timer_ims*. This timer shall have a default value of 16 seconds.
- The device vendor shall provide a lab application to modify the values of *T1timer_ims*, *TFtimer_ims*, and *T2timer_ims* during device acceptance testing.

- The values of the other SIP timers shall be as documented in section 7.7 of 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*.

The device vendor shall not allow the user to modify any SIP timer settings through the device user interface or the remote access user interface for tethered devices.

1.3.2.10.5.23 ~~MSISDN AND MSISDN-BASED SIP URI VALIDITY~~ ~~VZ_REQ_LTEB13NAC_23526~~

1.3.2.10.5.24 MSISDN and MSISDN-based SIP URI Validity VZ_REQ_LTEB13NAC_6443

Before any IMS registration attempt, the device shall determine if the MSISDN under EF_{MSISDN} in the USIM and the MSISDN-based SIP URI for the IMS Public User Identity under EF_{IMPU} in the ISIM are valid using the procedure below:

- If all bytes of the dialing number/SSC string under EF_{MSISDN} in the USIM are set to hexadecimal "FF" values, then the MSISDN shall be declared invalid. Otherwise, the MSISDN shall be declared valid. (NOTE: The dialing number/SSC string under EF_{MSISDN} in the USIM is preceded by the TON/NPI byte which may or may not be set to a hexadecimal value of "FF" for an un-provisioned USIM. Only the 10 bytes allocated to the dialing number/SSC string shall be used to determine the validity of the MSISDN.)

If the MSISDN is valid and the MSISDN-based SIP URI for the IMS Public User Identity under EF_{IMPU} in the ISIM contains the dialing number/SSC string read from the USIM EF_{MSISDN}, then the MSISDN-based SIP URI for the IMS Public User Identity under EF_{IMPU} shall be declared valid. Otherwise the MSISDN-based SIP URI for the IMS Public User Identity shall be declared invalid.

If the MSISDN-based SIP URI for the IMS Public User Identity is provisioned in the ISIM and is valid, then the device shall IMS register using the MSISDN-based SIP URI as its IMS Public User Identity. Upon successful IMS registration using the MSISDN-based SIP URI as the devices IMS Public User Identity, the device shall be capable of all SMS services detailed in the Verizon Wireless LTE SMS Requirements.

If the MSISDN-based SIP URI for the IMS Public User Identity is invalid, then the device shall IMS register using the IMSI-based SIP URI as its IMS Public User Identity. The device shall use the first record in the ISIM under EF_{IMPU} as the IMSI-based SIP URI for the IMS Public User Identity. Upon successful IMS registration using the IMSI-based SIP URI as the devices IMS Public User Identity, the device shall operate in a limited access SMS mode where the device only originates/terminates administrative SMS messages. An example of SMS messages supported in this limited access SMS mode are the administrative SMS messages for the OTADM application or the SIM OTA application. An example of SMS messages that are not supported in this mode would be application directed SMS messages for an end user application. When operating in this limited access SMS mode, the device shall be capable of receiving SMS messages addressed to the device's MDN or addressed to the device's IMSI.

1.3.2.10.5.25 ~~UDP VS. TCP FOR SIP SIGNALING~~ VZ_REQ_LTEB13NAC_35803

1.3.2.10.5.26 UDP vs. TCP for SIP Signaling VZ_REQ_LTEB13NAC_35804

The device shall use UDP for all SIP requests where the request is less than the MTU size for the IMS PDN minus 200 bytes. If the SIP request is within 200 bytes of the MTU size for the IMS PDN, then the device shall use TCP for the SIP request. Refer to RFC 3261 and 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3* for additional details.

NOTE: When creating a TCP socket, the device shall use port 5060 as the default P-CSCF IMS SIP port number, i.e. the destination port number that the devices IMS SIP User Agent Client uses to send SIP messages to the P-CSCF (and the listening port number of the P-CSCF). When opening a new TCP socket for SIP, the device shall randomly select a source port that is equal to or above 32768. When opening up a new TCP socket, the device shall not re-use a source port that has been used in any of the previous 32 TCP sockets.

1.3.2.10.6 IMS REGISTRATION ERRORS VZ_REQ_LTEB13NAC_23527

1.3.2.10.6.1 ~~IMS REGISTRATION/RE-REGISTRATION RETRY ALGORITHM~~ VZ_REQ_LTEB13NAC_23528

1.3.2.10.6.2 IMS Registration/Re-Registration Retry Algorithm VZ_REQ_LTEB13NAC_6444

The device shall implement an IMS registration/re-registration retry algorithm based on the Failure Type as described in the table below.

Failure Type	Retry Behavior
No response from network and the SIP timeout timer (i.e. SIP Timer F) expires	Follow algorithm below.
Network rejects the IMS registration/re-registration with the following SIP error codes: 400, 402, 421, 484	Refer to the special requirement for these error codes.
Network rejects the IMS registration/re-registration with the following SIP error codes:	Refer to the special requirement for this error

403, 404	code.
Network rejects the IMS registration/re-registration with the following SIP error codes: 401 423	Part of normal registration call flow, refer to 3GPP TS 24.229. The device shall use the same P-CSCF for all retries.
Network rejects the IMS registration/re-registration with the following SIP error codes: 480 (if Retry-After header is absent) 482 486 (if Retry-After header is absent) 491 494 500 (if Retry-After header is absent) 503 (if Retry-After header is absent) 504 600 (if Retry-After header is absent)	Follow algorithm below.
Network rejects the IMS registration/re-registration with the following SIP error codes: 480 (if Retry-After header is present) 486 (if Retry-After header is present) 500 (if Retry-After header is present) 503 (if Retry-After header is present) 600 (if Retry-After header is present)	Follow the algorithm below with the following exception: The throttling timer value shall be set to the duration specified in the Retry-After header.
Network rejects the IMS re-registration or de-registration with the following SIP error codes: 481 501 (de-registration only)	Refer to the special requirements.

Definition of general IMS registration and re-registration algorithm is provided below (note that as defined in the above table, some scenarios with specific SIP error codes have special requirements and these are defined in the subsequent sections):

1. The first time an IMS registration or re-registration attempt fails, the IMS application shall increment a "throttling counter" to 1 and start a "throttling timer". The length of the timer shall be 30 seconds. The IMS application shall not make another registration or re-registration attempt while the throttling timer is running.

2. Upon the expiration of the throttling timer, the IMS application shall make another IMS registration or re-registration attempt. A re-registration attempt shall use the same P-CSCF while a registration attempt shall use the next P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (if the IMS application used the last P-CSCF IP address provided by the network in the previous attempt, then the IMS application shall use the first P-CSCF IP address provided by the network for this attempt). If the IMS registration or re-registration is successful, the throttling counter shall be cleared. If the IMS registration or re-registration attempt fails, the IMS application shall increment the throttling counter to 2 and start the throttling timer. The length of the timer shall be 30 seconds. The IMS application shall not make another registration or re-registration attempt while the throttling timer is running.

3. Upon the expiration of the throttling timer, the IMS application shall make another IMS registration attempt using the next P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (if the IMS application used the last P-CSCF IP address provided by the network in the previous attempt, then the IMS application shall use the first P-CSCF IP address provided by the network for this attempt). If the previous attempt was a re-registration attempt, the IMS application shall make a new IMS registration request in this step and all subsequent steps of the algorithm. If the IMS registration is successful, the throttling counter shall be cleared. If the IMS registration attempt fails, the IMS application shall increment the throttling counter to 3 and start the throttling timer. This time, the length of the timer shall be one minute plus a random value; the random value shall have an upper bound of 15 seconds. The IMS application shall not make another registration attempt while the throttling timer is running.

4. Upon the expiration of the throttling timer, the IMS application shall make another IMS registration attempt using the next P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (if the IMS application used the last P-CSCF IP address provided by the network in the previous

attempt, then the IMS application shall use the first P-CSCF IP address provided by the network for this attempt). If the IMS registration is successful, the throttling counter shall be cleared. If the IMS registration attempt fails, the IMS application shall increment the throttling counter to 4 and start the throttling timer. This time, the length of the timer shall be two minutes. The IMS application shall not make another registration attempt while the throttling timer is running.

5. Upon the expiration of the throttling timer, the IMS application shall make another IMS registration attempt using the next P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (if the IMS application used the last P-CSCF IP address provided by the network in the previous attempt, then the IMS application shall use the first P-CSCF IP address provided by the network for this attempt). If the IMS registration is successful, the throttling counter shall be cleared. If the IMS registration attempt fails, the IMS application shall increment the throttling counter to 5 and start the throttling timer. This time, the length of the timer shall be eight minutes. The IMS application shall not make another registration attempt while the throttling timer is running.

6. Upon the expiration of the throttling timer, the IMS application shall make another IMS registration attempt using the next P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (if the IMS application used the last P-CSCF IP address provided by the network in the previous attempt, then the IMS application shall use the first P-CSCF IP address provided by the network for this attempt). If the IMS registration is successful, the throttling counter shall be cleared. If the IMS registration attempt fails, the IMS application shall increment the throttling counter to 6 and start the throttling timer. This time, the length of the timer shall be fifteen minutes. The IMS application shall not make another registration attempt while the throttling timer is running. All subsequent IMS registration failures on this system that occur while the throttling counter is set to a value of 6 or greater shall result in a fifteen minute throttling timer. i.e. from this point on, there shall not be more than one attempt at an IMS registration on this system per fifteen minutes. For each subsequent attempt, the IMS application shall use the next P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (if the IMS application used the last P-CSCF IP address provided by the network in the previous attempt, then the IMS application shall use the first P-CSCF IP address provided by the network for this attempt).

1.3.2.10.6.3 ~~NETWORK REJECTS THE IMS REGISTRATION/RE-REGISTRATION WITH A 'SIP 400', 'SIP 402', 'SIP 421', OR 'SIP 484' MESSAGE~~ ~~VZ_REQ_LTEB13NAC_23529~~

1.3.2.10.6.4 Network Rejects the IMS Registration/Re-registration with a 'SIP 400', 'SIP 402', 'SIP 421', or 'SIP 484' Message VZ_REQ_LTEB13NAC_6452

If the network rejects the IMS registration/re-registration attempt with either of the following cause codes:

- SIP 400
- SIP 402
- SIP 421
- SIP 484

the device shall follow the algorithm defined in section ***IMS Registration/Re-Registration Retry Algorithm*** of this document. If the device encounters another rejection of an IMS registration/re-registration attempt before the throttling counter is reset where the IMS registration/re-registration is rejected by the network with either of the following cause codes:

- SIP 400
- SIP 402
- SIP 421
- SIP 484

then the device shall not attempt to IMS register/re-register with the Verizon Wireless LTE network until the device is power cycled or the UICC containing the ISIM is removed/replaced.

1.3.2.10.6.5 ~~NETWORK REJECTS THE IMS REGISTRATION/RE-REGISTRATION WITH A 'SIP 403' OR 'SIP 404' MESSAGE~~ ~~VZ_REQ_LTEB13NAC_23530~~

1.3.2.10.6.6 Network Rejects the IMS Registration/Re-registration with a 'SIP 403' or 'SIP 404' Message VZ_REQ_LTEB13NAC_6453

If the network rejects an IMS registration/re-registration attempt using the MSISDN-based SIP URI for the IMS Public User Identity with either of the following cause codes:

- SIP 403
- SIP 404

the device shall wait 30 seconds and then reattempt the registration using the next P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (if the previous attempt was a re-registration attempt, the device shall send a new IMS registration request in this and all subsequent retry attempts). Typically the network will provide the IP address values of three P-CSCF servers in the PCO field. If the device has attempted to IMS register/re-register using all of the P-CSCF IP addresses provided by the network and in all attempts the network has rejected the IMS registration/re-registration attempt (using the MSISDN-based SIP URI for the IMS Public User Identity) with either of the following cause codes:

- SIP 403
- SIP 404

then the device shall wait 30 seconds and then reattempt the registration using the IMSI-based SIP URI for the IMS Public User Identity. If an IMS registration using the IMSI-based SIP URI for the IMS Public User Identity is successful, the device shall operate in limited access SMS mode as described in this document.

If the network rejects an IMS registration/re-registration attempt using the IMSI-based SIP URI for the IMS Public User Identity with either of the following cause codes:

- SIP 403
- SIP 404

the device shall wait 30 seconds and then reattempt the registration using the next P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (if the previous attempt was a re-registration attempt, the device shall send a new IMS registration request in this and all subsequent retry attempts). Typically the network will provide the IP address values of three P-CSCF servers in the PCO field. If the device has attempted to IMS register/re-register using all of the P-CSCF IP addresses provided by the network and in all attempts the network has rejected the IMS registration/re-registration attempt (using the IMSI-based SIP URI for the IMS Public User Identity) with either of the following cause codes:

- SIP 403
- SIP 404

then the device shall not attempt to IMS register with an LTE network until the device is power cycled or airplane mode is toggled on then off on the device or the UICC containing the ISIM is removed/replaced.

1.3.2.10.6.7 ~~IMS REGISTRATION TIMER EXPIRES WHILE THROTTLING~~ ~~VZ_REQ_LTEB13NAC_23531~~

1.3.2.10.6.8 IMS Registration Timer Expires while Throttling VZ_REQ_LTEB13NAC_6454

If the device is attempting to re-register and the registration timer expires while the throttling timer is running, the device shall perform a new registration attempt at the next retry. The throttling counter shall not be reset.

1.3.2.10.6.9 ~~IMS REGISTRATION/RE-REGISTRATION THROTTLING ACROSS SYSTEM TRANSITIONS~~ ~~VZ_REQ_LTEB13NAC_23532~~

1.3.2.10.6.10 IMS Registration/Re-Registration Throttling Across System Transitions VZ_REQ_LTEB13NAC_6455

The device shall maintain only one set of IMS registration/re-registration throttling parameters (e.g. timers and counters). This set of throttling parameters shall apply to all systems. The device shall not reset these throttling parameters as the result of a system transition unless one of the following events occurs:

1. The device receives a new IMS PDN bearer activation and the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message contains a new list of P-CSCF IP addresses which does NOT include the current serving P-CSCF.
2. The device receives a new IMS PDN bearer activation, and the IP address for the IMS PDN connection changes (i.e. IP address continuity is NOT maintained).

If one the events above occurs, the device shall stop the IMS registration throttling timer, reset the IMS registration throttling counter, and initiate a new IMS registration using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER REQUEST message for the IMS PDN.

Example A:

- The current system is system "A" and the IMS registration/re-registration throttling counter is set to a value of 6 and a fifteen minute throttling timer is running.
- The device transitions to system "B". There is no re-activation of IMS PDN bearer during the system transition (i.e. the current IMS PDN bearer is maintained across the system transition).
- The IMS registration/re-registration throttling counter will still be 6 and the 15 minute throttling timer will still be running. The device does not retry IMS registration/re-registration until the throttling timer expires.

Example B:

- The current system is system "A" and the IMS registration/re-registration throttling counter is set to a value of 6 and a fifteen minute throttling timer is running.
- The device transitions to system "B". There is a new IMS PDN bearer activation during the system transition but the IP address for the IMS PDN is the same as the previous IMS PDN context and there is no change in the entires or order of the P-CSCF IP addresses provided in the PCO field of the ACTIVATE DEFAULT EPS BEARER REQUEST message for the IMS PDN.
- The IMS registration/re-registration throttling counter will still be 6 and the 15 minute throttling timer will still be running. The device does not retry IMS registration/re-registration until the throttling timer expires.

Example C:

- The current system is system "A" and the IMS registration/re-registration throttling counter is set to a value of 6 and a fifteen minute throttling timer is running.
- The device transitions to system "B". There is a new IMS PDN bearer activation during the system transition and the current serving P-CSCF is NOT included in the list of P-CSCF IP addresses provided in the PCO field of the ACTIVATE DEFAULT EPS BEARER REQUEST message for the IMS PDN.
- The IMS registration/re-registration throttling timer will still be stopped and the throttling counter will be reset. The device initiates a new IMS registration using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER REQUEST message for the IMS PDN.

Example D:

- The current system is system "A" and the IMS registration/re-registration throttling counter is set to a value of 6 and a fifteen minute throttling timer is running.
- The device transitions to system "B". There is a new IMS PDN bearer activation during the system transition and the IP address for the IMS PDN is the same as the previous IMS PDN context and the order of the entires in the list of P-CSCF IP addresses provided in the PCO field of the ACTIVATE DEFAULT EPS BEARER REQUEST message for the IMS PDN is different from the previous IMS PDN context (the entries in the list are the same).
- The IMS registration/re-registration throttling counter will still be 6 and the 15 minute throttling timer will still be running. The device does not retry IMS registration/re-registration until the throttling timer expires.

Example E:

- The current system is system "A" and the IMS registration/re-registration throttling counter is set to a value of 6 and a fifteen minute throttling timer is running.
- The device transitions to system "B". There is a new IMS PDN bearer activation during the system transition and the IP address for the IMS PDN is the same as the previous IMS PDN context and both the order and one or more of the entires in the list of P-CSCF IP addresses provided in the PCO field of the ACTIVATE DEFAULT EPS BEARER REQUEST message for the IMS PDN is different from the previous IMS PDN context, but the current serving P-CSCF is included in the list.
- The IMS registration/re-registration throttling counter will still be 6 and the 15 minute throttling timer will still be running. The device does not retry IMS registration/re-registration until the throttling timer expires.

Example F:

- The current system is system "A" and the IMS registration/re-registration throttling counter is set to a value of 6 and a fifteen minute throttling timer is running.
- The device transitions to system "B". There is a new IMS PDN bearer activation during the system transition and the IP address for the IMS PDN is different from the previous IMS PDN context.
- The IMS registration/re-registration throttling timer will still be stopped and the throttling counter will be reset. The device initiates a new IMS registration using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER REQUEST message for the IMS PDN.

1.3.2.10.6.11 ~~RESET OF THROTTLING COUNTERS AND TIMERS ON POWER CYCLE AND ON USIM/ISIM REPLACEMENT/REFRESH~~ ~~VZ_REQ_LTEB13NAC_23533~~

1.3.2.10.6.12 Reset of Throttling Counters and Timers on Power Cycle and on USIM/ISIM Replacement/Refresh VZ_REQ_LTEB13NAC_6456

The device shall reset all IMS registration throttling counters and throttling timers on power cycle or USIM/ISIM replacement/refresh.

1.3.2.10.6.13 ~~SIP 501 OR SIP 481 IN RESPONSE TO A DEREGISTRATION REQUEST~~ VZ_REQ_LTEB13NAC_23534

1.3.2.10.6.14 SIP 501 or SIP 481 in Response to a Deregistration Request VZ_REQ_LTEB13NAC_6457

If the device receives a SIP 501 or SIP 481 error code in response to a deregistration request, the device shall ignore the error and consider the deregistration request to have been accepted by the network.

1.3.2.10.6.15 ~~IMS SIGNALING AND LOWER LAYER FAILURES~~ VZ_REQ_LTEB13NAC_23535

1.3.2.10.6.16 IMS Signaling and Lower Layer Failures VZ_REQ_LTEB13NAC_6480

An IMS registration procedure shall not be started if an IMS signaling connection cannot be established due to lower layer failure(s). An IMS registration procedure shall not be considered a failure if an IMS signaling connection/lower layer failure occurs before the procedure completes. The IMS registration retry throttling counter shall not be incremented and the IMS registration throttling shall not be started. An IMS signaling connection/lower layer failure includes any of the following:

- Any data retry event that prevents connection to the IMS PDN or the P-CSCF.
- Any RRC/radio connection failure

Refer to the Verizon Wireless LTE Data Retry Requirements for additional details.

If the device has successfully IMS registered, any IMS non-registration procedure shall be executed regardless of the IMS signaling connection/lower layer status of the device. For example, if a data retry event prevents connection to the LTE network a SIP SUBSCRIBE shall be allowed to time out.

NOTE 1: It is recommended to start TimerF when the REGISTER message is sent to the modem for transmission (and not prior).

NOTE 2: This requirement applies to all IMS registration procedures (i.e. IMS registration procedures for initial registration, re-registration, and de-registration.

1.3.2.10.6.17~~SIP 503 WITH 'OUTAGE TEXT'~~ ~~VZ_REQ_LTEB13NAC_23536~~

1.3.2.10.6.18~~SIP 503 with 'Outage Text'~~ ~~VZ_REQ_LTEB13NAC_6485~~

1.3.2.10.6.19 ~~SIP 481 IN RESPONSE TO A RE-REGISTRATION REQUEST~~ ~~VZ_REQ_LTEB13NAC_36127~~

1.3.2.10.6.20 SIP 481 in Response to a Re-Registration Request VZ_REQ_LTEB13NAC_36128

If the network rejects an IMS re-registration request with a SIP 481 cause code, the device shall locally terminate the current IMS registration (including all active SIP dialogs and SIP requests), enter IMS non-registered state, and initiate a new IMS registration request.

1.3.2.10.7 IMS REGISTRATION ON SYSTEM TRANSITIONS VZ_REQ_LTEB13NAC_23537

1.3.2.10.7.1 IMS REGISTRATION ON SYSTEM TRANSITIONS VZ_REQ_LTEB13NAC_6458

If the device has successfully IMS registered and either a) transitions to another system and successfully performs a tracking area update or "handover" attach (i.e. the "Request Type" information element in the PDN CONNECTIVITY REQUEST message sent as part of the attach procedure is set to "***Handover***"), or b) transitions to "no service" and back to any system and successfully performs a tracking area update or "handover" attach (i.e. the "Request Type" information element in the PDN CONNECTIVITY REQUEST message sent as part of the attach procedure is set to "***Handover***"), the device shall maintain the IMS registration as follows.

The device shall retain the previous IMS registration context including the P-CSCF IP address until either 1) the registration timer for this context expires, or 2) the device sends a de-registration request

for this context, or 3) the device successfully re-registers, or 4) the device successfully performs a new registration.

If the following criteria are all met, then the device shall not send a new registration as the result of a system transition (including a transition to another RAT within the same PLMN), i.e. the device shall use the previous established IMS registration context and route all IMS communications using the original P-CSCF:

- IP address continuity is maintained.
- The IMS registration timer has not expired.
- The original P-CSCF IP address is one of the P-CSCF IP addresses provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

If one or more of the criteria above is not met, then the device shall send a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

If the device is using IMS for SMS over IMS only and all the criteria above are all met and the re-registration is not due, then the device shall not send a re-registration request as the result of a system transition, i.e. the device shall use the previous established IMS registration context and route all IMS communications using the original P-CSCF. If the device is using IMS for SMS over IMS only and all the criteria above are all met and the re-registration is due, then the device shall send a re-registration request to the using the original P-CSCF.

For all system transitions where the device successfully performs an "initial" attach (i.e. the "Request Type" information element in the PDN CONNECTIVITY REQUEST message (sent as part of the attach procedure) is set to "***Initial Request***"), the device shall send a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

NOTE: If the device is throttling IMS registration retry attempts when the system transition occurs, then requirement VZ_REQ_LTEB13NAC_6455 applies and takes precedence.

1.3.2.10.7.2 IMS REGISTRATION ON SYSTEM TRANSITIONS - EXAMPLES

1-7 VZ_REQ_LTEB13NAC_6459

Example 1:

- The UE is turned on.
- The UE successfully performs an "initial" attach to system A.
- The UE sends a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 2:

- UE transitions from system A to system B, and successfully performs either a tracking area update with system B or a "handover" attach to system B.
- All the criteria below are met and the re-registration is not due. The UE does not perform a re-registration and uses the previous established IMS registration context and routes all IMS communications using the original P-CSCF.
    - IP address continuity is maintained.
    - The IMS registration timer has not expired.
    - The device is using IMS for SMS over IMS only.
    - The original P-CSCF IP address is one of the P-CSCF IP addresses provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 2a:

- UE transitions from system A to system B, and successfully performs a "handover" attach to system B.
- The original P-CSCF IP address is one of the P-CSCF IP addresses provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation), but IP address continuity is NOT maintained.
- The UE performs a new registration using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 2b:

- UE transitions from system A to system B, and successfully performs a "handover" attach to system B.
- The original P-CSCF IP address is NOT one of the P-CSCF IP addresses provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).
- The UE performs a new registration using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 3:

- UE transitions from system A to system B, and successfully performs either a tracking area update with system B or a "handover" attach to system B.
- All the criteria below are met and the re-registration is due. The UE sends a re-registration request using the original P-CSCF.
    - IP address continuity is maintained.
    - The IMS registration timer has not expired.
    - The device is using IMS for SMS over IMS only.
    - The original P-CSCF IP address is one of the P-CSCF IP addresses provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 4:

- UE transitions from system A to no service and back to system A.
- The UE successfully performs a tracking area update with system A.
- All the criteria below are met and the re-registration is not due. The UE does not perform a re-registration and uses the previous established IMS registration context and routes all IMS communications using the original P-CSCF.
    - IP address continuity is maintained.
    - The IMS registration timer has not expired.
    - The device is using IMS for SMS over IMS only.

Example 5:

- UE transitions from system A to system B, and a "handover" attach to system B is rejected with EMM #19 piggybacked with ESM #54 (in the PDN connection reject).
- The UE then successfully performs an "initial" attach to system B.
- The UE sends a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 5a:

- UE transitions from system A to system B, and initiates a tracking area update that is rejected by system B with EMM 9.
- The UE then successfully performs an "initial" attach to system B.
- The UE sends a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 6:

- Network detaches the UE from system A.
- The UE then successfully performs an "initial" attach to system A.
- The UE sends a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 7:

- The UE initiates a detach from system A (per Verizon Wireless requirements, prior to sending the NAS DEATCH REQUEST message, the UE terminates the subscription to the registration events package by sending a Subscribe message with expires= 0, followed by an IMS de-registration request message).
- The UE then successfully performs an "initial" attach to system A.
- The UE sends a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

1.3.2.10.8 IMS REGISTRATION DUE TO NEW IMS PDN BEARER ACTIVATION VZ_REQ_LTEB13NAC_23538

1.3.2.10.8.1 IMS REGISTRATION DUE TO NEW IMS PDN BEARER ACTIVATION VZ_REQ_LTEB13NAC_6460

If while attached to the network the device is required to send a new PDN connection request to re-establish the IMS PDN connection (e.g. network initiates disconnect of the IMS PDN), upon successful re-establishment of the IMS PDN connection, the device shall send a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 8:

- Network disconnects the IMS PDN.
- The UE then successfully performs a PDN connection request to re-establish the IMS PDN connection.
- The UE sends a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 9:

- The UE initiates a disconnection of the IMS PDN (per Verizon Wireless requirements, prior to sending the NAS PDN DISCONNECT REQUEST message, the UE terminates the subscription to the registration events package by sending a Subscribe message with expires= 0, followed by an IMS de-registration request message).
- The UE then successfully performs a PDN connection request to re-establish the IMS PDN connection.
- The UE sends a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

1.3.2.10.9 IMS REGISTRATION AFTER UICC REFRESH OR UICC INSERTION VZ_REQ_LTEB13NAC_23539

1.3.2.10.9.1 IMS REGISTRATION AFTER UICC REFRESH OR UICC INSERTION VZ_REQ_LTEB13NAC_6483

If the device detached from an LTE network and then successfully re-attached to an LTE network as the result of receiving a UICC REFRESH type 0 command, the device shall send a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

If no UICC was present in the device or the device detached from an LTE network as the result of removal of the UICC, upon successful attach to an LTE network after insertion of a UICC the device shall send a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 10:

- The UICC issues a REFRESH type 0 command to the device triggering a detach from system A (per Verizon Wireless requirements, prior to sending the NAS DEATCH REQUEST message, the UE terminates the subscription to the registration events package by sending a Subscribe message with expires= 0, followed by an IMS de-registration request message).
- The UE then successfully performs an "initial" attach to system A using all updated USIM parameters.
- The UE sends a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation) using all updated USIM/ISIM parameters.

Example 11:

- No UICC is present in the device on power up.
- UICC is inserted into the device.
- UE is power cycled.
- The UE then successfully performs an "initial" attach to system A.

- The UE sends a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

Example 12:

- UICC is removed from the device triggering a detach from system A (per Verizon Wireless requirements, prior to sending the NAS DEATCH REQUEST message, the UE terminates the subscription to the registration events package by sending a Subscribe message with expires= 0, followed by an IMS de-registration request message).
- UICC is inserted into the device.
- The UE then successfully performs an "initial" attach to system A.

The UE sends a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN (in the new IMS PDN bearer activation).

1.3.2.10.10 P-CSCF RESTORATION PROCEDURES VZ_REQ_LTEB13NAC_33801

1.3.2.10.10.1 P-CSCF Restoration Procedures VZ_REQ_LTEB13NAC_33802

If the device receives a MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN default bearer and the PCO of the MODIFY EPS BEARER CONTEXT REQUEST message contains a new list of P-CSCF IP addresses where either or both of the following is true:

- The new list contains one or more P-CSCF IP address entries that are different from the current list of P-CSCF IP addresses.
- The new list contains one or more of the P-CSCF IP address entries in the current list of P-CSCF IP addresses, but the order of the P-CSCF IP addresses has changed.

The device shall replace the current list of P-CSCF IP addresses with the new list of P-CSCF IP addresses. IMS registration retry procedures shall use the new list of P-CSCF IP addresses in the order provided by the network.

If the device is IMS registered and the current P-CSCF IP address is NOT an entry in the new P-CSCF IP address list, the device shall locally terminate the current IMS registration, enter IMS non-

registered state, and immediately send a new IMS registration request using the first P-CSCF IP address provided by the network in the PCO field of the MODIFY EPS BEARER REQUEST message. If the IMS registration request fails, the device shall follow the IMS registration retry requirements in this document using the new P-CSCF IP address list.

If the device is IMS registered and the current P-CSCF IP address is an entry in the new P-CSCF IP address list, the device shall immediately send an IMS re-registration request to the current P-CSCF. If the re-registration request fails, the device shall follow the IMS registration retry requirements in this document using the new P-CSCF IP address list.

NOTE 1: If the device receives a MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN default bearer and the PCO of the MODIFY EPS BEARER CONTEXT REQUEST message indicates the P-CSCF IPv6 address container is present but the container is either empty or contains an invalid IP address (e.g. all 0's), the device shall disregard the P-CSCF IPv6 address container entirely and maintain the current IMS registration and the current set of P-CSCF IPv6 addresses. The device shall make no change in IMS registration status.

NOTE 2: If the device transitions from one system to another system and receives a new ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN, then the requirements VZ_REQ_LTEB13NAC_6455 and VZ_REQ_LTEB13NAC_6458 shall take precedence.

Example 13:

- The device receives P-CSCF IP addresses A, B, and C (in this order) in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- The device successfully IMS registers with P-CSCF A.
- The device receives a MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN default bearer and the PCO contains P-CSCF IP addresses A, B, and C (in that order).
- The device immediately attempts an IMS re-registration with P-CSCF A.

Example 14:

- The device receives P-CSCF IP addresses A, C, and B (in this order) in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.

- The device successfully IMS registers with P-CSCF A.
- The device receives a MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN default bearer and the PCO contains P-CSCF IP addresses A, B, and C (in that order).
- The device immediately attempts an IMS re-registration with P-CSCF A.
- Both re-registration attempts to P-CSCF A fail.
- The device attempts a new initial IMS registration with P-CSCF B at the next registration retry attempt (i.e. the devices uses the new order for IMS registration retry).

Example 15:

- The device receives P-CSCF IP addresses A, C, and B (in this order) in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- The device successfully IMS registers with P-CSCF A.
- The device receives a MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN default bearer and the PCO contains P-CSCF IP addresses E, F, and A (in that order).
- The device immediately attempts an IMS re-registration with P-CSCF A.
- Both re-registration attempts to P-CSCF A fail.
- The device attempts a new initial IMS registration with P-CSCF E at the next registration retry attempt (i.e. the devices uses the new list and order for IMS registration retry).

Example 16:

- The device receives P-CSCF IP addresses A, C, and B (in this order) in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- The device successfully IMS registers with P-CSCF A.
- The device receives a MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN default bearer and the PCO contains P-CSCF IP addresses D, E, and F (in that order).
- The device immediately attempts a new initial IMS registration with P-CSCF D (i.e. the devices uses the new list and order for IMS registration retry).

Example 17:

- The device receives P-CSCF IP addresses A, C, and B (in this order) in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- The device successfully IMS registers with P-CSCF A.
- The device receives a MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN default bearer and the PCO contains P-CSCF IP addresses D, E, and F (in that order).
- The device immediately attempts a new initial IMS registration with P-CSCF D and this registration attempt fails.
- The device attempts a new initial IMS registration with P-CSCF E at the next registration retry attempt (i.e. the devices uses the new list and order for IMS registration retry).

1.3.2.10.11 SUBSCRIPTION TO THE REG EVENTS PACKAGE FAILURES
VZ_REQ_LTEB13NAC_36123

1.3.2.10.11.1 ~~RETRY ALGORITHM FOR THE SUBSCRIPTION TO THE REG EVENTS PACKAGE~~ VZ_REQ_LTEB13NAC_36971

1.3.2.10.11.2 Retry Algorithm for the Subscription to the Reg Events Package
VZ_REQ_LTEB13NAC_36124

The device shall implement a retry algorithm for the subscription to the reg events package based on the Failure Type as described in the table below.

NOTE: This retry behavior ONLY applies to SUBSCRIBE requests for the reg events package.

Failure Type	Retry Behavior
No response from network to the SUBSCRIBE and the SIP timeout timer (i.e. SIP Timer F) expires **NOTE:** This does NOT apply to the re-SUBSCRIBE case.	Follow algorithm below.
Network rejects the SUBSCRIBE request (for the reg events package) with the following SIP error codes: 400, 403, 404, 420 **NOTE:** This does NOT apply to the re-SUBSCRIBE case.	Refer to the special requirement for these error codes.
Network rejects the SUBSCRIBE request (for the reg events package) with the following SIP error codes: 482 487 500 (if Retry-After header is absent) **NOTE:** This does NOT apply to the re-SUBSCRIBE case.	Follow algorithm below.
Network rejects the SUBSCRIBE request (for the reg events package) with the following SIP error codes: 500 (if Retry-After header is present) **NOTE:** This does NOT apply to the re-SUBSCRIBE case.	Follow the algorithm below with the following exception: The throttling timer value shall be set to the duration specified in the Retry-After header.

re-SUBSCRIBE failure	Refer to the special requirement.

Definition of the general retry algorithm for the subscription to the reg events package is provided below (note that as defined in the above table, some scenarios with specific SIP error codes have special requirements and these are defined in the subsequent sections):

1. The first time a SUBSCRIBE attempt for the reg events package fails, the IMS application shall increment a "throttling counter" to 1 and start a "throttling timer". The length of the timer shall be 30 seconds. The IMS application shall not make another SUBSCRIBE attempt for the reg events package while the throttling timer is running. There is no impact to the IMS registration status.

2. Upon the expiration of the throttling timer, the IMS application shall make another SUBSCRIBE attempt for the reg events package. If the SUBSCRIBE attempt for the reg events package is successful, the throttling counter shall be cleared. If the SUBSCRIBE attempt for the reg events package fails, the IMS application shall increment the throttling counter to 2 and start the throttling timer. The length of the timer shall be 30 seconds. The IMS application shall not make another SUBSCRIBE attempt for the reg events package while the throttling timer is running. There is no impact to the IMS registration status.

3. Upon the expiration of the throttling timer, the IMS application shall make another SUBSCRIBE attempt for the reg events package. If the SUBSCRIBE attempt for the reg events package is successful, the throttling counter shall be cleared. If the SUBSCRIBE attempt for the reg events package fails, the IMS application shall increment the throttling counter to 3 and start the throttling timer. This time, the length of the timer shall be one minute plus a random value; the random value shall have an upper bound of 15 seconds. The IMS application shall not make another SUBSCRIBE attempt for the reg events package while the throttling timer is running. There is no impact to the IMS registration status.

4. Upon the expiration of the throttling timer, the IMS application shall make another SUBSCRIBE attempt for the reg events package. If the SUBSCRIBE attempt for the reg events package is successful, the throttling counter shall be cleared. If the SUBSCRIBE attempt for the reg events package fails, the IMS application shall increment the throttling counter to 4 and start the throttling timer. This time, the length of the timer shall be two minutes. The IMS application shall not make another SUBSCRIBE attempt for the reg events package while the throttling timer is running. There is no impact to the IMS registration status.

5. Upon the expiration of the throttling timer, the IMS application shall make another SUBSCRIBE attempt for the reg events package. If the SUBSCRIBE attempt for the reg events package is

successful, the throttling counter shall be cleared. If the SUBSCRIBE attempt for the reg events package fails, the IMS application shall increment the throttling counter to 5 and start the throttling timer. This time, the length of the timer shall be eight minutes. The IMS application shall not make another SUBSCRIBE attempt for the reg events package while the throttling timer is running. There is no impact to the IMS registration status.

6. Upon the expiration of the throttling timer, the IMS application shall make another SUBSCRIBE attempt for the reg events package. If the SUBSCRIBE attempt for the reg events package is successful, the throttling counter shall be cleared. If the SUBSCRIBE attempt for the reg events package fails, the IMS application shall increment the throttling counter to 6 and start the throttling timer. This time, the length of the timer shall be fifteen minutes. The IMS application shall not make another SUBSCRIBE attempt for the reg events package while the throttling timer is running. All subsequent SUBSCRIBE failures for the reg events package on this system that occur while the throttling counter is set to a value of 6 or greater shall result in a fifteen minute throttling timer. i.e. from this point on, there shall not be more than one attempt of a SUBSCRIBE for the reg events package on this system per fifteen minutes. There is no impact to the IMS registration status.

The device shall only reset the throttling counter and throttling timer for the algorithm above after one of the following events has occurred:

- The device has successfully subscribed to the reg events package.
- The device has established a new IMS registration (as opposed to an IMS re-registration).
- Power cycle.
- USIM/ISIM replacement/refresh.

The device shall maintain only one set of IMS subscription to the reg events package throttling parameters (e.g. timers and counters). This set of throttling parameters shall apply to all systems. The device shall not reset these throttling parameters as the result of a system transition.

For example: consider the case in which the current system is system "A" and the IMS subscription to the reg events package throttling counter is set to a value of 6 and a fifteen minute throttling timer is running. The device transitions to system "B". The IMS subscription to the reg events package throttling counter will still be 6 and the 15 minute throttling timer will still be running. The device does not retry the subscription to the reg events package until the throttling timer expires.

1.3.2.10.11.3 ~~NETWORK REJECTS THE SUBSCRIBE REQUEST WITH A SIP 400, 403, 404, OR 420 CAUSE CODE~~ ~~VZ_REQ_LTEB13NAC_36972~~

1.3.2.10.11.4 Network Rejects the SUBSCRIBE Request with a SIP 400, 403, 404, or 420 Cause Code VZ_REQ_LTEB13NAC_36125

If the network rejects the SUBSCRIBE attempt for the reg events package with either of the following cause codes:

- SIP 400
- SIP 403
- SIP 404
- SIP 420

the device shall follow the algorithm defined in section ***Retry Algorithm for the Subscription to the Reg Events Package*** of this document. If the device encounters another rejection of a SUBSCRIBE attempt for the reg events package before the throttling counter is reset where the SUBSCRIBE attempt for the reg events package is rejected by the network with either of the following cause codes:

- SIP 400
- SIP 403
- SIP 404
- SIP 420

then the device shall not make any further SUBSCRIBE attempts for the reg events package until one of the following events has occurred:

- The device has established a new IMS registration (as opposed to an IMS re-registration).
- Power cycle.
- USIM/ISIM replacement/refresh.

1.3.2.10.11.5 ~~NETWORK REJECTS A re-SUBSCRIBE REQUEST~~ ~~VZ_REQ_LTEB13NAC_36973~~

1.3.2.10.11.6 Network Rejects a re-SUBSCRIBE Request VZ_REQ_LTEB13NAC_36126

If the network rejects a re-SUBSCRIBE attempt for the reg events package with a SIP 481 cause code, the device shall locally terminate the current subscription to the reg events package and initiate a new subscription request for the reg events package.

If the network rejects a re-SUBSCRIBE attempt for the reg events package with any cause code other than SIP 481, the device shall maintain the current subscription to the reg events package until it expires (i.e. the device shall not send any further re-SUBSCRIBE attempts). Upon expiration of the current subscription to the reg events package, the device shall initiate a new subscription request for the reg events package.

If the network ignores a re-SUBSCRIBE attempt for the reg events package (and TimerF expires), the device shall wait 30 seconds and then send a second re-SUBSCRIBE attempt for the reg events package. If the second re-SUBSCRIBE attempt for the reg events package is ignored by the network (and TimerF expires), the device shall maintain the current subscription to the reg events package until it expires (i.e. the device shall not send any further re-SUBSCRIBE attempts). Upon expiration of the current subscription to the reg events package, the device shall initiate a new subscription request for the reg events package.

1.3.2.11 SYSTEM TIME AND LOCAL TIME VZ_REQ_LTEB13NAC_23540

1.3.2.11.1 SYSTEM TIME AND LOCAL TIME VZ_REQ_LTEB13NAC_6339

For system time and local time, the device shall support:

-
- The EMM information procedure and all optional informational elements within the EMM INFORMATION message.

The device shall update local time based on the contents of the EMM INFORMATION message. Refer to 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

1.3.2.12 CIPHERING AND INTEGRITY PROTECTION VZ_REQ_LTEB13NAC_23541

1.3.2.12.1 CIPHERING AND INTEGRITY PROTECTION VZ_REQ_LTEB13NAC_6340

The device shall support ciphering of RRC signaling, NAS signaling, and user plane data. The device shall also support integrity protection of the RRC signaling and the NAS signaling messages. The device shall support both the SNOW 3G based algorithm and the AES based algorithm for ciphering and integrity protection. Refer to 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, 3GPP TS 33.401: *3GPP System Architecture Evolution (SAE); Security architecture*, 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*, and 3GPP TS 36.323: *Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) specification* for additional details.

1.3.2.13 ~~OTADM~~VZ_REQ_LTEB13NAC_23542

1.3.2.14 ~~UE MODE OF OPERATION~~VZ_REQ_LTEB13NAC_23543

1.3.2.14.1 ~~UE MODE OF OPERATION~~ VZ_REQ_LTEB13NAC_6341

1.3.2.15 PRIMARY AND SECONDARY SYNCHRONIZATION SIGNAL RECEPTION VZ_REQ_LTEB13NAC_23544

1.3.2.15.1 PRIMARY AND SECONDARY SYNCHRONIZATION SIGNAL RECEPTION VZ_REQ_LTEB13NAC_6342

The device shall be capable of receiving and decoding the primary and secondary synchronization signals when transmitted by the eNB on antenna port 0, antenna port 1, or both antenna ports 0 and 1. Specifically, the device shall be capable of receiving and decoding the primary and secondary synchronization signals for all three of the eNB transmission scenarios described below:

- The eNB transmits the primary and secondary synchronization signals on antenna port 0 only.
- The eNB transmits the primary and secondary synchronization signals on antenna port 1 only.
- The eNB transmits the primary and secondary synchronization signals on both antenna port 0 and antenna port 1 with precoding.

Primary and secondary synchronization signals are per 3GPP TS 36.211: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation*.

1.3.2.16 CMAS SUPPORT VZ_REQ_LTEB13NAC_23545

1.3.2.16.1 ~~INDICATION OF CMAS NOTIFICATION~~ ~~VZ_REQ_LTEB13NAC_23548~~

1.3.2.16.1.1 INDICATION OF CMAS NOTIFICATION VZ_REQ_LTEB13NAC_6343

The device shall be able to receive CMAS messages over LTE per the procedures defined in 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC)*. Devices in RRC_IDLE and RRC_CONNECTED state shall find out about the presence of one or more CMAS notifications from the *Paging* message (refer to the specification "Reception of the Paging message by the UE" in section 5.3.2.3 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC)*). If the device receives a *Paging* message including the *cmas-Indication*, the device shall start receiving the CMAS notifications according to the *schedulingInfoList* contained in the *SystemInformationBlockType1* (SIB1).

Device shall perform System Information Acquisition procedures as defined in section 5.2.2.4 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC)* to acquire the *SystemInformationBlockType12* (SIB12), that contains CMAS notifications, when present.

1.3.2.16.2 ~~WARNING MESSAGE PROCESSING~~ ~~VZ_REQ_LTEB13NAC_23549~~

1.3.2.16.2.1 WARNING MESSAGE PROCESSING VZ_REQ_LTEB13NAC_6344

Following reception of the *SystemInformationBlockType12* (SIB12), the device shall perform the procedures per the specification "Actions upon reception of SystemInformationBlockType12" defined in section 5.2.2.19 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC)* to process the Warning message information received and forward it to the upper layers. Segmentation can be applied for the delivery of a CMAS notification. The device shall assemble all the segments of the message before forwarding it to the upper layers. Segments of the same message shall contain the same *messageIdentifier*, *serialNumber* and *warningMessageSegmentNumber*).

The device shall discard warning message segments and the associated values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType12* (SIB12) if the complete warning message has not been assembled within a period of [3] hours.

1.3.2.16.3 ~~SYSTEMINFORMATIONBLOCKTYPE12 INFORMATION ELEMENT~~ ~~VZ_REQ_LTEB13NAC_23550~~

1.3.2.16.3.1 SYSTEMINFORMATIONBLOCKTYPE12 INFORMATION ELEMENT VZ_REQ_LTEB13NAC_6345

The information element *SystemInformationBlockType12* (SIB12) contains a CMAS notification with following fields:

- *messageIdentifier* identifying source and type of CMAS notification (refer to the section 9.4.1.2.2 of 3GPP TS 23.041: *Technical realization of Cell Broadcast Service (CBS)*)
- *serialNumber* identifying variations of a CMAS notification (refer to the section 9.4.1.2.1 of 3GPP TS 23.041: *Technical realization of Cell Broadcast Service (CBS)*)
- *warningMessageSegmentType* indicating whether the current segment is the last segment or not
- *warningMessageSegmentNumber* indicating segment number of the CMAS message contained in the SIB12 (0-63, first segment will have segment number of zero, etc)

- *warningMessageSegment* that carries a segment of the *Warning Message Contents* information element defined in 3GPP TS 36.413: *Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)*
- *dataCodingScheme* identifying alphabet/encoding/language of a CMAS notification. Refer to the 3GPP TS 23.041: *Technical realization of Cell Broadcast Service (CBS)* for information element definition and 3GPP TS 23.038: *Alphabets and language-specific information* for encoding details.

In addition, the *Segment1* field shall be present in the first segment of SIB12 only.
Refer to the section 6.3.1 ("System Information Blocks") of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC)* for additional details.

1.3.2.16.4 ~~DEVICE BEHAVIOR~~ VZ_REQ_LTEB13NAC_23551

1.3.2.16.4.1 DEVICE BEHAVIOR VZ_REQ_LTEB13NAC_6346

Refer to the ATIS-TIA-J-STD-100 Joint ATIS/TIA CMAS Mobile Device Behavior Specification for a common set of requirements for mobile device behavior when a CMAS Alert message is received and processed.

1.3.2.17 SCHEDULING REQUESTS OVER PRACH VZ_REQ_LTEB13NAC_23546

1.3.2.17.1 SCHEDULING REQUESTS OVER PRACH VZ_REQ_LTEB13NAC_6418

The device shall be capable of supporting scheduling requests over the PRACH as per 3GPP TS 36.321: *Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification*.

1.3.2.18 LTE FEMTOCELL SUPPORT VZ_REQ_LTEB13NAC_23547

1.3.2.18.1 LTE FEMTOCELL SUPPORT VZ_REQ_LTEB13NAC_6472

The device shall be capable of supporting open, closed, and hybrid mode femtocells. Refer to 3GPP TS 22.220: *Service requirements for Home Node B (HNB) and Home eNode B (HeNB)*, 3GPP TS 36.300: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2*, 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC)*, and 3GPP TS 36.133: *Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management* for additional details.

1.3.2.19 MAC PADDING VZ_REQ_LTEB13NAC_36842

1.3.2.19.1 MAC Padding VZ_REQ_LTEB13NAC_36843

When applying MAC padding (as defined in 3GPP TS 36.321: *Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification*), the device shall use pseudo-random data in the form of a PN31 sequence for the contents of the MAC padding bits.

1.3.2.20 LTE R10 eICIC and CRS IC w/o ABS (Enhanced Inter-Cell

Interference Cancellation) VZ_REQ_LTEB13NAC_36948

Applicable scenarios:

- Heterogeneous network that has both small/pico cells and macro cells deployed
  - R10 eICIC is used to enable network to perform necessary interference management by configuring ABS subframe dynamically.
- Macro homogeneous network & Heterogeneous network
  - CRS IC is used in macro network in non-ABS scenario
    - Improve PDCCH and PDSCH performance in non-colliding CRS case (user throughput)
    - Improve RSRP accuracy and channel estimation in colliding CRS case (improved CRS SINR and as a result better performance on PBCH and PSS/SSS)

Note: UE shall not advertise any of the CRS IC and/or eICIC capability until "service enablement" direction is received from Verizon Device Marketing. (e.g., FGI115, crs-InterfHandl-r11).

1.3.2.20.1 LTE eICIC Support VZ_REQ_LTEB13NAC_36949

1.3.2.20.1.1 Time-Domain Resource Partitioning VZ_REQ_LTEB13NAC_36955

1.3.2.20.1.2 ~~Req-1~~ VZ_REQ_LTEB13NAC_36950

1.3.2.20.1.3 ~~Req-2~~ ~~VZ_REQ_LTEB13NAC_36951~~

1.3.2.20.1.4 ~~Req-3~~ ~~VZ_REQ_LTEB13NAC_36952~~

1.3.2.20.1.5 Req-4 VZ_REQ_LTEB13NAC_36953

The device shall support the RLM (Radio Link Monitoring) procedure with restricted measurement per sections 4.2.1 of the release 10 version of 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*.

1.3.2.20.1.6 Req-5 VZ_REQ_LTEB13NAC_36954

The device shall support RSRQ measurement with restricted resource measurement per sections 5.1.3 of the release 10 version of 3GPP TS 36.214: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer; Measurements*.

1.3.2.20.2 LTE eICIC and CRS IC W/O ABS Support VZ_REQ_LTEB13NAC_36956

1.3.2.20.2.1 CRS Interference Management VZ_REQ_LTEB13NAC_36957

The device shall support (including reporting its capability in *crs-InterfHandl-r11 defined in section 4.3.4.15 of* the release 11 version of 3GPP TS *36.306: Evolved Universal Terrestrial Radio Access (E-UTRA);UE Radio Access Capabilities*) and apply neighbor CRS assistance information for CRS interference cancellation per sections, 6.3.2, 6.3.6 of the release 11 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification*.

1.3.2.20.2.2 ~~Synchronization and Common Channel Interference Management~~VZ_REQ_LTEB13NAC_36958

1.3.2.20.2.3 ~~Req 1~~VZ_REQ_LTEB13NAC_36959

1.3.2.20.2.4 ~~Req 2~~VZ_REQ_LTEB13NAC_36960

1.3.2.20.3 ~~ICIC for Femto Cell (FFS)~~ VZ_REQ_LTEB13NAC_36961

1.3.2.21 FREQUENCY HOPPING VZ_REQ_LTEB13NAC_37713

1.3.2.21.1 PUSCH Frequency Hopping VZ_REQ_LTEB13NAC_37714

Per the 3GPP standard, the device shall support predefined, inter-TTI frequency hopping for PUSCH with N_sb=1. Refer to 3GPP TS 36.211: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation* for additional details.

1.3.2.22 LTE CoMP (Coordinated Multi-Point) VZ_REQ_LTEB13NAC_37806

NOTE: Although specifications of DL CoMP are introduced in 3GPP Release 11, Release 10 specifications of Transmission Mode 9 provide some fundamental building blocks for DL CoMP. Verizon requires devices shall support both Release 10 Transmission Mode 9 and Release 11 Transmission mode 10 per the functional requirements in this section, and meet the respective performance requirements in VZ_REQ_LTEB13NAC_37816 and VZ_REQ_LTEB13NAC_37817.

1.3.2.22.1 Transmission Mode 9 (TM9) VZ_REQ_LTEB13NAC_37807

1.3.2.22.1.1 PDSCH Decoding in Transmission Mode 9 (TM9) VZ_REQ_LTEB13NAC_37808

The device shall support transmission mode 9 per the 3GPP Release 10 Specifications.

When configured in transmission mode 9, the device shall support UE-specific reference signals and associated PDSCH with up to 4 transmission layers, per sections 6.10.3, 6.3, 6.4 of the Release 10 version of 3GPP TS 36.211: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation*.

When configured in transmission mode 9, the device shall support DCI format 2C, per section 5.3.3.1.5C of the Release 10 version of 3GPP TS 36.212: *Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding*.

When configured in transmission mode 9, the device shall support PDSCH transmission in MBSFN subframes, per section 7.1 of the Release 10 version of 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*.

1.3.2.22.1.2 CSI (Channel State Information) Reporting in TM9 VZ_REQ_LTEB13NAC_37809

When configured in transmission mode 9, the device shall support CSI (Channel State Information) reference signals with up to 4 CSI-RS antenna ports, per section 6.10.5 of the Release 10 version of 3GPP TS 36.211: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation*. The device shall support one non-zero-power CSI-RS configuration per serving cell.

When configured in transmission mode 9, the device shall support CSI-RS based CSI measurements and reporting, per section 7.2 of the Release 10 version of 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*.

1.3.2.22.1.3 RRC Signaling for TM9 VZ_REQ_LTEB13NAC_37810

The device shall support PDSCH transmission mode 9 with up to 4 CSI-RS antenna ports. The device shall set Feature Group Indicator (FGI) index 103 to 1 in field *featureGroupIndRel10* of *UECapabilityInformation* message, per Annex C, Table C.1-1, of the Release 10 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification*.

The device shall support

- setting of *tm9-v1020* for field *transmissionMode-r10* of *AntennaInfoDedicated-r10* information element,
- *CSI-RS-Config-r10* information element with *antennaPortsCount-r10* set in the range of {*an1*, *an2*, *an4*},

as included in *PhysicalConfigDedicated* and/or *PhysicalConfigDedicatedSCell-r10* information element, and support the physical channel configuration and reconfiguration procedures, per sections 6.3.2, 5.3.3.4, 5.3.5.3, 5.3.5.4, 5.3.5.6, 5.3.7.5, 5.3.10.3b, 5.3.10.6, 5.4.3.5 of the Release 10 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification*.

1.3.2.22.2 ~~Transmission Mode 10 (TM10)~~VZ_REQ_LTEB13NAC_37811

1.3.2.22.2.1 ~~PDSCH Decoding in Transmission Mode 10 (TM10)~~VZ_REQ_LTEB13NAC_37812

1.3.2.22.2.2 ~~CSI Reporting in TM10~~VZ_REQ_LTEB13NAC_37813

1.3.2.22.2.3 ~~RRC Signaling for TM10~~VZ_REQ_LTEB13NAC_37814

1.3.2.23 ~~ePDCCH~~VZ_REQ_LTEB13NAC_38375

1.3.2.23.1 ~~Enhanced Physical Downlink Control Channel (ePDCCH)~~VZ_REQ_LTEB13NAC_38376

1.3.2.24 ~~SON SUPPORT~~VZ_REQ_LTEB13NAC_23614

1.3.2.24.1 ~~RADIO LINK AND HANDOVER FAILURE REPORTING~~VZ_REQ_LTEB13NAC_23615

1.3.2.24.1.1 ~~RADIO LINK AND HANDOVER FAILURE REPORTING~~VZ_REQ_LTEB13NAC_6465

1.3.2.24.2 ~~RACH INFORMATION REPORTING~~VZ_REQ_LTEB13NAC_23616

1.3.2.24.2.1 ~~RACH INFORMATION REPORTING~~VZ_REQ_LTEB13NAC_6466

1.3.2.24.3 ~~MINIMIZATION OF DRIVE TEST~~VZ_REQ_LTEB13NAC_38228

1.3.2.24.3.1 ~~Release 10 MDT Support~~VZ_REQ_LTEB13NAC_38229

1.3.2.24.3.2 ~~Overall Requirements~~VZ_REQ_LTEB13NAC_38230

1.3.2.24.3.3 ~~MDT Capability~~VZ_REQ_LTEB13NAC_38231

1.3.2.24.3.4 ~~LocationInfo for measurement report~~VZ_REQ_LTEB13NAC_38232

1.3.2.24.3.5 ~~LocationInfo for failure reports~~VZ_REQ_LTEB13NAC_38233

1.3.2.24.3.6 ~~Logged Measurements Availability and Report~~VZ_REQ_LTEB13NAC_38234

1.3.2.24.3.7 ~~Logged Measurements Configuration~~VZ_REQ_LTEB13NAC_38235

1.3.2.24.3.8 ~~Limitation on Immediate MDT with LocationInfo~~VZ_REQ_LTEB13NAC_38236

1.3.2.24.3.9 ~~Location Area Configuration~~VZ_REQ_LTEB13NAC_38756

1.3.2.24.3.10 ~~Lower Layer Requirements for Logged MDT~~VZ_REQ_LTEB13NAC_38757

1.3.2.24.3.11 ~~Release 11 MDT Support~~VZ_REQ_LTEB13NAC_38237

1.3.2.24.3.12 ~~Overall requirement~~ VZ_REQ_LTEB13NAC_38238

1.3.2.24.3.13 ~~Connection Establishment Failure Handling~~ VZ_REQ_LTEB13NAC_38239

1.3.2.24.3.14 ~~PLMN Configuration for MDT~~ VZ_REQ_LTEB13NAC_38240

1.3.2.24.3.15 ~~Enhanced Location Configuration~~ VZ_REQ_LTEB13NAC_38241

1.3.2.24.3.16 ~~RLF Report Enhancement~~ VZ_REQ_LTEB13NAC_38242

1.3.2.24.3.17 ~~Remove Location info. Restriction~~ VZ_REQ_LTEB13NAC_38243

1.3.2.24.3.18 ~~E-CID positioning support for MDT (FFS)~~ VZ_REQ_LTEB13NAC_38244

1.3.2.25 SMS OVER NAS FOR DATA-CENTRIC OR IMS-LESS DEVICES

VZ_REQ_LTEB13NAC_39730

1.3.2.25.1 SMS over NAS (Data-Centric or IMS-Less Devices ONLY)

VZ_REQ_LTEB13NAC_39731

Data-centric or IMS-less devices that do NOT support IMS voice operation, and do NOT support SMS over IMS, shall support SMS using SMS over NAS per the "transport of NAS messages procedure" as defined in section 5.6.3 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*.

Refer to the LTE SMS Requirements for additional details.

NOTE 1: Data-centric or IMS-less devices that support SMS over NAS (and do NOT support SMS over IMS) are NOT required to support any IMS-related requirements in this document.

NOTE 2: *Data-centric or IMS-less device vendors should contact Verizon Wireless prior to implementing SMS over NAS on any devices.*

1.3.2.26 DL 256QAM VZ_REQ_LTEB13NAC_39750

1.3.2.26.1 DL 256QAM Support VZ_REQ_LTEB13NAC_39749

All devices that are category 11 or higher, or DL category 11 or higher, per sections 4.1 and 4.1A of the Release 12 version of 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities*, shall support 256QAM on the downlink.

NOTE: The device shall be at least a category 11 or DL category 11 device, per sections 4.1 and 4.1A of the Release 12 version of 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities*, if it supports 256QAM.

The device shall indicate whether 256QAM is supported via *dl-256QAM-r12* field in *UE-EUTRA-Capability* information element, per section 4.3.5.7 of the Release 12 version of 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA);User Equipment (UE) radio access capabilities*, and section 6.3.6 of the Release 12 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification*. If the device supports 256QAM, it shall support 256QAM in all supported frequency bands.

If the device supports 256QAM, it shall support the *altCQI-Table-r12* field with the setting of {*allSubframes*, *csi-SubframeSet1*, *csi-SubframeSet2*}, in *CQI-ReportConfig-v1250* information element, as included in *PhysicalConfigDedicated* and/or *PhysicalConfigDedicatedSCell-r10* information element, and support the physical channel configuration and reconfiguration procedures, per sections 6.3.2, 5.3.3.4, 5.3.5.3, 5.3.5.4, 5.3.5.6, 5.3.7.5, 5.3.10.3b of the Release 12 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification*.

If the device supports 256QAM, it shall support both *normal-r12* and *higherOrder-r12* value for *dataMCS-r12* field in *PMCH-InfoList* information element, per section 6.3.7 of the Release 12 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification*.

If the higher layer parameter *altCQI-Table-r12* is configured, the device shall report CQI per section 7.2, with CQI indices and their interpretations defined in section 7.2.3, of the Release 12 version of 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*.

If the higher layer parameter *altCQI-Table-r12* is configured, the device shall determine the modulation order and transport block size for PDSCH per section 7.1.7 of the Release 12 version of 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*.

If a *higherOrder-r12* value is configured for *dataMCS-r12* field, the device shall determine the modulation order and transport block size for PMCH per section 11.1 of the Release 12 version of 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*.

For 256QAM modulation of PDSCH and PMCH, the modulation mapping shall be per section 7.1.5 of the Release 12 version of 3GPP TS 36.211: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation*.

Rate matching for turbo coded transport channels shall be per section 5.1.4.1 of the Release 12 version of 3GPP TS 36.212: *Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding*, if the device supports 256QAM. Downlink power allocation for PDSCH and PMCH with 256QAM modulation shall be assumed per section 5.2 of the Release 12 version of 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*.

All devices that are downlink LTE category 16, 18, or higher, shall further support *alternativeTBS-Index-r14*, per Sections 4.1A and 4.3.4.74 of the Release 14 version of 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities*. Also refer to TBS index 33B for specifications in Sections 7.1.7.1 and 7.1.7.2 of the Release 14 version of 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*.

1.3.2.27 DATA OVER CONTROL PLANE VZ_REQ_LTEB13NAC_41334

VOID

1.3.2.27.1 ~~Data Over Control Plan for Low Data Rate M2M/IoT~~ ~~VZ_REQ_LTEB13NAC_41335~~

1.3.2.28 ~~Blind Data Interference Cancellation/Supression~~ ~~VZ_REQ_LTEB13NAC_1238184~~

1.3.2.29 UE-Assisted Adaptive DRX VZ_REQ_LTEB13NAC_1583448

1.3.2.29.1 UE-Assisted Adaptive DRX Support VZ_REQ_LTEB13NAC_1583450

The device may support UE-assisted adaptive DRX which is an infrastructure vendor proprietary solution designed to reduce UE power consumption and network resource usage while in RRC_CONNECTED state. If the device supports UE-assisted adaptive DRX, then the device shall ONLY initiate and advertise support for this feature if the network advertises support for this feature.

NOTE: *Device vendors shall contact Verizon Wireless prior to implementing UE-assisted adaptive DRX on any devices. Device vendors are required to contact Verizon Wireless for detailed description of the feature, protocol/signaling exchange between the UE and eNB, and required testing.*

1.3.2.30 CAT M1-SPECIFIC REQUIREMENTS VZ_REQ_LTEB13NAC_4352172

1.3.2.30.1 SOFTWARE REQUIREMENTS APPLICABLE TO CAT M1 ONLY VZ_REQ_LTEB13NAC_4352175

Cat-M1 Machine-to-Machine (M2M) and Internet of Things (IoT) devices that are data-centric or IMS-less and do NOT support IMS-based voice operation shall support requirements in this section. **NOTE:** The requirements in this section apply to Cat-M1 devices only, and are in addition to the other requirements in this document. The requirements in this section do apply to Cat-M1 devices that support over-the-top voice solutions.

Req-1: Any Chipset or Module certifying as Cat-M1 only device shall set its operation mode to Cat-M1 only and shall not allow host device/application to change it.

Req-2: Cat-M1 data devices shall be IMS-less, and shall comply with all requirements in this document for data devices that do not support IMS. Cat-M1 data devices shall support SMS over NAS.

Req-3: Cat-M1 devices shall conform to the specifications in latest Release 14 or later version of 3GPP specifications, including but not limited to 3GPP TS 36.211: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation*, 36.212: *Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding*, 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*, 36.304: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode*, 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities*, 36.321: *Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification*, 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*, 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*, and 36.133: *Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management*, for Bandwidth-reduced Low-complexity

(BL) UE and UE of DL/UL Category M1. NOTE: Category M1 devices SHALL support operation when the eNB is transmitting on 1, 2, and 4 transmit ports.

Req-4: Cat-M1 devices shall be capable of supporting the peak UL/DL data throughput rate at the physical layer with larger transport block size (2984 bits for UL and 1000 bits for DL), per Release 14 version of 3GPP TS 36.213 and TS 36.306.

Req-5: Cat-M1 devices shall support the enhanced physical channels for BL UE (PBCH/PRACH/PDSCH/MPDCCH/PUSCH/PUCCH) and repetitions for coverage enhancement, as per 3GPP specifications (refer to Release 13 version of 3GPP TS 36.211, 36.212, 36.213). The Cat-M1 devices shall support both CE mode A and CE mode B.

Req-6: Cat-M1 devices shall support frequency hopping for SIB1-BR and other SI messages, PUCCH, PRACH, MPDCCH (Type 0/1/2 CSS and USS), PDSCH, and PUSCH, per Release 13 version of 3GPP TS 36.211, 36.212, and 36.213.

Req-7: Cat-M1 devices shall support either full duplex FDD (FD-FDD) operation or Type B half duplex FDD (HD-FDD) operation, per Section 6.2.5 of Release 13 version of 3GPP TS 36.211, and Sections 4.2.6 and 4.3.5.1 of Release 13 version of 3GPP TS 36.306.

Req-8: Cat-M1 devices shall support maximum output power of 23 dBm (UE power Class 3) , per 3GPP TS 36.101 and 3GPP 36.331.

Note- Devices with a maximum output power of 20dBm (UE Power Class 5) is permissible, given the following:

- The device shall indicate UE power class 5 to network in UE-EUTRA-Capability.
- The device shall meet all 3GPP and Verizon Wireless LTE RF and RRM performance requirements. The receive antenna shall meet the radiated performance requirements for the "primary receiver" as defined in requirement VZ_REQ_LTEB13NAC_6401 of this document.

NOTE: For devices with maximum output (TX) power of 20dBm, UL data throughput performance may be degraded more than 50% at cell edge when compared to devices with maximum output (TX) power of 23dBm. In addition, for devices with maximum output (TX) power of 20dBm, UL link Budget will negatively be affected by up to 5dB. Verizon Wireless strongly recommends against using a device with maximum output (TX) power of 20dBm for mission critical devices.

Req-9: Cat-M1 devices shall support PDSCH TM1 and TM2 in both CE mode A and CE mode B; further, the Cat-M1 devices should support PDSCH TM6 and TM9 in CE mode A, and should support PDSCH TM9 in CE mode B, per Section 7.1 of Release 13 version of 3GPP TS 36.213.

Req-10: Cat-M1 devices shall support CSI reporting when in CE mode A, per Section 7.2 of Release 13 version of 3GPP TS 36.213.

Req-11: Cat-M1 devices shall support UL power control when in CE mode A, per Section 5.1 of Release 13 version of 3GPP TS 36.213.

Req-12: Cat-M1 devices shall support up to 10 simultaneous HARQ processes in both DL and UL when in CE mode A, and shall support 2 HARQ processes in both DL and UL when in CE mode B, per Sections 7 and 8 of Release 14 version of 3GPP TS 36.213.

Req-13: Cat-M1 devices shall support HARQ-ACK bundling and HARQ-ACK delay through DCI format when in CE-Mode A, per release 14 version of 3GPP TS 36.212 and 3GPP TS 36.213.

Req-14: Cat-M1 devices shall support connected mode DRX, per Section 5.7 of Release 13 version of 3GPP TS 36.321.

Req-15: Cat-M1 devices shall support LTE cell selection and cell reselection in both normal and enhanced coverage, per Sections 5.2.3.2 and 5.2.4.6a of Release 13 version of 3GPP TS 36.304.

Req-16: Cat-M1 devices shall support the bandwidth-reduced (BR) version of System Information Blocks (SIBs), including SIB1, SIB2, SIB3, SIB4, SIB5, and SIB14, and shall support system information acquisition and modification, per Release 13 version of 3GPP TS 36.331.

Req-17: Cat-M1 devices shall support LTE connected-mode mobility. Both intra-frequency and inter-frequency measurement and reporting shall be supported.

Req-18: Cat-M1 devices shall support extended timers for radio link failure (RLF)/handover failure (T300/T301/T304), per Release 13 version of 3GPP TS 36.331.

Req-19: Cat-M1 devices shall support the Radio Resource Management (RRM) requirements for idle mode mobility, connected mode mobility, and mobility control, per Sections 4.2, 5.5, 5.6, 6.2, 6.7 and 6.8 of Release 13 version of 3GPP TS 36.133.

Req-20: For Cat-M1 devices supporting location services, LTE positioning (ECID and OTDOA) shall be supported.

Req-21: Cat-M1 devices shall support Power Saving Mode (PSM) and extended DRX (eDRX) device requirements in this document.

Req-22: Cat-M1 devices shall support low priority/delay-tolerant access and Devices shall support the *RRCConnectionRelease* with *extendedWaitTime* and *RRCConnectionReject* with *extendedWaitTime* for devices which support Delay Tolerant Access as per 3GPP TS 36.306 and TS 36.331.

Req-23: Cat-M1 devices shall support Extended Access Barring (EAB), per device requirements in this document.

Req-24: Cat-M1 devices shall support NAS based Release Assistance Indication IE, per 3GPP TS 24.301.

Req-25: Cat-M1 devices shall support Buffer Status Reporting (BSR), per Release 14 version of 3GPP TS 36.321 in able to support MAC based Release assistance Indication.

Req-26: Cat-M1 devices shall support Data Inactivity Monitoring functionality and DataInactivityTimer, per Release 14 version of TS 36.321.

Req-27: Cat-M1 devices shall support Relaxed Monitoring for intra-frequency or inter-frequency idle mode measurements so that device may choose not to perform intra-frequency or inter-frequency idle mode measurements based on Relaxed monitoring criterion & rules. Refer to section 5.2.4.12 of 3GPP TS 36.304 (release 14 version) for more information including rules and criterion.

1.3.2.31 UNKNOWN RRC/NAS MESSAGES AND IE's VZ_REQ_LTEB13NAC_11581500

The device shall ignore any unknown RRC messages and any unknown RRC message IE's (e.g. RRC message IE's, SIB messages from a later release than the release supported by the device). The device shall NOT experience any operational or performance impact from the presence of an unknown RRC message or an unknown RRC message IE.

The device shall ignore any unknown NAS messages and any unknown NAS message IE's (e.g. NAS message IE's, NAS messages from a later release than the release supported by the device). The device shall NOT experience any operational or performance impact from the presence of an unknown NAS message or an unknown NAS message IE.

1.4 SCENARIOS VZ_REQ_LTEB13NAC_1883

1.4.1 NETWORK & DEVICE MESSAGE TRANSMISSION & RETRIEVAL VZ_REQ_LTEB13NAC_1884

1.4.1.1 LTE SYSTEM SELECTION VZ_REQ_LTEB13NAC_23554

1.4.1.1.1 LTE SYSTEM SELECTION VZ_REQ_LTEB13NAC_6347

The device shall support system selection per 3GPP Release 9 Specifications. Refer to section ***SYSTEM SELECTION/RESELECTION*** for additional details.

1.4.1.2 LTE NETWORK ATTACHMENT VZ_REQ_LTEB13NAC_23555

1.4.1.2.1 LTE NETWORK ATTACHMENT VZ_REQ_LTEB13NAC_6348

The device shall attach to the LTE network using the Attach Procedure described in 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access* and 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3.*

1.4.1.2.2 PDN CONNECTION FOR NETWORK ATTACHMENT
VZ_REQ_LTEB13NAC_23556

1.4.1.2.2.1 ~~NORMAL OPERATION~~ VZ_REQ_LTEB13NAC_23557

1.4.1.2.2.2 PDN CONNECTION FOR NETWORK ATTACHMENT - NORMAL OPERATION VZ_REQ_LTEB13NAC_6349

In normal operation for IMS capable devices, the device shall attach to the LTE network by connecting to the IMS PDN. In normal operation for IMS capable devices, the device shall not attach to the LTE network by connecting to any PDN other than the IMS PDN.

NOTE 1: In normal operation for IMS capable devices, the device shall attach to the LTE network by connecting to the IMS PDN regardless of the setting of the SMS_Over_IP_Networks_Indication parameter setting. Refer to the LTE SMS Device Requirements for additional details.

NOTE 2: IMS capable devices shall NOT attach to the LTE network by connecting to a PDN other than the IMS PDN without the permission of Verizon Wireless.

In normal operation for devices that do NOT support IMS, the device shall NOT specify an APN when attaching to the LTE network (i.e. the device shall allow the network to choose the attach APN). The network will typically use the Internet PDN (or PDN identified by the class 3 APN) as the attach PDN for devices that do not support IMS. The device may consider the attach Internet PDN (or PDN identified by the class 3 APN) as an "always on" connection as opposed to an "on-demand" PDN connection. If the APN for the attach PDN chosen by the network does not match any APN entries in the device's APN table, devices that do not support IMS shall treat this attach APN the same as the class 3 APN and route all internet traffic to this PDN. Devices that do not support IMS shall NOT make a PDN connection request using the class 3 APN in the APN table

when the APN for the attach PDN chosen by the network does not match any APN entries in the device's APN table.

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IMS-Less devices that are Category M1 and below and support "rate control" shall also support the following:

- PLMN rate control from MME as defined in section 4.7.7.2 of 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access* by limiting the Uplink NAS data PDU rate with user data. The rate is defined in "serving PLMN rate control" IE during PDN connection setup. Refer to sections 6.3.8, 6.4.1, and 9.9.4.28 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.
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1.4.1.2.2.3 ~~IMS TEST MODE OPERATION~~ VZ_REQ_LTEB13NAC_23558

1.4.1.2.2.4 PDN CONNECTION FOR NETWORK ATTACHMENT - IMS TEST MODE OPERATION VZ_REQ_LTEB13NAC_6350

IMS capable devices shall support an IMS test mode in which the IMS client is disabled. The device shall initiate a soft reset when it is toggled between the IMS test mode and normal operating mode. When operating in this test mode, an IMS capable device shall attach to the LTE network by connecting to the Internet PDN immediately upon detection of the LTE network. This test mode will be used to support RF and signaling conformance testing.

Per the table below, the IMS test mode shall operate independently of the setting of the SMS_Over_IP_Networks_Indication parameter defined in the *SMS over IMS Control* section of the LTE SMS Device Requirements.

IMS Test Mode Control Parameter	SMS_Over_IP_Networks_Indication Parameter Setting	Device Operation Mode
Disable	Enable	Normal operation, Device attaches via the IMS PDN, Normal SMS over IMS operation
Disable	Disable	Normal operation, Device attaches via the IMS PDN and performs IMS registration, SMS origination over IMS shall be disabled, but device shall be capable of receiving MT SMS messages over IMS
Enable	Enable	IMS test mode operation, Device attaches via the Internet PDN, SMS over IMS is disabled (device shall not perform IMS registration),
Enable	Disable	IMS test mode operation, Device attaches via the Internet PDN, SMS over IMS is disabled (device shall not perform IMS registration)

1.4.1.2.3 IMS PDN DEDICATED BEARER SETUP VZ_REQ_LTEB13NAC_23559

1.4.1.2.3.1 IMS PDN DEDICATED BEARER SETUP VZ_REQ_LTEB13NAC_6351

On network attach (in normal operation) for IMS capable devices, the network may initiate the setup of a dedicated bearer to the IMS PDN.

Should the dedicated bearer setup fail or should the dedicated bearer be released for any reason, the network will attempt to reestablish the dedicated bearer. The device shall not request a dedicated bearer to the IMS PDN at any time.

1.4.1.2.4 IP ADDRESS ASSIGNMENT VZ_REQ_LTEB13NAC_23560

1.4.1.2.4.1 ~~NORMAL OPERATION~~ VZ_REQ_LTEB13NAC_23561

1.4.1.2.4.2 IP ADDRESS ASSIGNMENT - NORMAL OPERATION VZ_REQ_LTEB13NAC_6352

On network attach to the IMS PDN (i.e. normal operation) for IMS capable devices, the device shall associate an IPv6 address, an IPv4 address, or both an IPv6 and IPv4 address with the default bearer to the IMS PDN as directed by the network in the "PDN Address" information element of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message. The device shall be capable of supporting a dual IP bearer to the IMS PDN connection, i.e. the device shall be capable of simultaneously associating both an IPv6 and an IPv4 address with the bearers to the IMS PDN. The

device shall be capable of supporting an IPv6 address and an IPv4 address for the IMS PDN connection that are unique to any IP addresses assigned to on-demand PDN connections. Verizon Wireless currently plans to use IPv6 addressing for the IMS PDN. *IPv4 addressing for the IMS PDN is reserved for future use.*

On network attach to the Internet PDN (or PDN identified by the class 3 APN) for devices that do NOT support IMS (i.e. normal operation), the device shall associate an IPv6 address, an IPv4 address, or both an IPv6 and IPv4 address with the default bearer to the attach Internet PDN as directed by the network in the "PDN Address" information element of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message. The device shall be capable of supporting a dual IP bearer to the attach Internet PDN connection, i.e. the device shall be capable of simultaneously associating both an IPv6 and an IPv4 address with the bearers to the attach Internet PDN. The device shall be capable of supporting an IPv6 address and an IPv4 address for the attach Internet PDN connection that are unique to any IP addresses assigned to on-demand PDN connections. If the APN for the attach PDN chosen by the network does not match any APN entries in the device's APN table, devices that do not support IMS shall treat this attach APN the same as the class 3 APN and route all internet traffic to this PDN. Devices that do not support IMS shall NOT make a PDN connection request using the class 3 APN in the APN table when the APN for the attach PDN chosen by the network does not match any APN entries in the device's APN table.

Refer to the *IPv6 Address Assignment* section of this document for additional details on IPv6 address assignment.

1.4.1.2.4.3 ~~IMS TEST MODE OPERATION~~ ~~VZ_REQ_LTEB13NAC_23562~~

1.4.1.2.4.4 IP ADDRESS ASSIGNMENT - IMS TEST MODE OPERATION

VZ_REQ_LTEB13NAC_6353

On network attach to the Internet PDN during IMS test mode operation, IMS capable devices shall associate an IPv6 address, an IPv4 address, or both an IPv6 and IPv4 address with the default bearer to the Internet PDN as directed by the network in the "PDN Address" information element of the

ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message. The device shall be capable of supporting a dual IP bearer to the Internet PDN connection, i.e. the device shall be capable of simultaneously associating both an IPv6 and an IPv4 address with the bearers to the Internet PDN connection. The device shall be capable of supporting an IPv6 address and an IPv4 address for the Internet PDN connection that are unique to any IP addresses assigned to other PDN connections.

Refer to the *IPv6 Address Assignment* section of this document for additional details on IPv6 address assignment.

1.4.1.2.5 NAS MESSAGING DURING LTE NETWORK ATTACHMENT VZ_REQ_LTEB13NAC_23563

1.4.1.2.5.1 ~~NAS MESSAGING DURING LTE NETWORK ATTACHMENT~~ VZ_REQ_LTEB13NAC_6354

1.4.1.2.5.2 ATTACH REQUEST MESSAGE VZ_REQ_LTEB13NAC_23564

1.4.1.2.5.3 NAS MESSAGING DURING LTE NETWORK ATTACHMENT - ATTACH REQUEST Message VZ_REQ_LTEB13NAC_6355

During the attach procedure, IMS-capable devices shall set the following information elements in the ATTACH REQUEST message as described below:
The device should set the "EPS Attach Type" to *EPS Attach*. The device may use *Combined EPS/IMSI Attach*. However, if the device uses *Combined EPS/IMSI Attach*, the Verizon Wireless

network will send an ATTACH ACCEPT message with an EMM cause value of 18 (CS domain not available) to indicate that non-EPS services are not available on the Verizon Wireless LTE network. The device shall comply with all Verizon Wireless LTE data retry requirements as per the Verizon Wireless LTE Data Retry Requirements regardless of the "EPS Attach Type".

1.4.1.2.5.4 ATTACH REQUEST Message - Data-Centric or IMS-Less Devices that Support SMS over NAS VZ_REQ_LTEB13NAC_39732

In addition to the requirements in VZ_REQ_LTEB13NAC_6355, data-centric or IMS-less devices that do NOT support IMS voice operation but do support SMS over NAS shall set the following information elements in the ATTACH REQUEST message as described below:

- The device shall set the "EPS Attach Type" to *Combined EPS/IMSI Attach*. Except for NB-IoT or Cat-M2 devices that support CIoT Optimization, which shall set the "EPS Attach type" to *EPS attach*.
- The device shall include the "Additional update type" information element set to "1 SMS Only".

IMS-Less devices that are Category M1 and below and support "attach without PDN" shall also support the following:

- The device shall read the "CIoT-optimization/attachWithoutPDN" from SystemInformationBlockType2 for LTE or SystemInformationBlockType1-NB for NB-IoT to define network support for "attach without PDN". Refer to section 5.2.2 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification* for additional details.
- The device shall advertise its support with "attachWithoutPDN" in the attach request. Refer to section 5.5.1 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, section 5.3.2.1 of 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access*, and section 5.3.3 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification* for additional details.
- For all on-demand PDN connections established after the initial attach, the APN shall be included in the PDN CONNECTIVITY REQUEST message. If a connection to an on-demand PDN is no longer required (i.e. the application(s) using the on-demand PDN have been closed), the device shall release the default bearer to the PDN by sending a PDN

DISCONNECT REQUEST message. Refer to VZ_REQ_LTEB13NAC_22722 of this document for more details.

1.4.1.2.5.5PDN CONNECTIVITY REQUEST MESSAGE VZ_REQ_LTEB13NAC_23565

1.4.1.2.5.6NAS MESSAGING DURING LTE NETWORK ATTACHMENT - PDN CONNECTIVITY REQUEST Message VZ_REQ_LTEB13NAC_6356

During the attach procedure, IMS-capable devices shall set the following information elements in the PDN CONNECTIVITY REQUEST message as described below:

- The device shall set the "Request Type" to *Initial Request*.
- The device shall set the "PDN Type" to the value in the "APN IP Type" field of the APN table in section 5.4.1 of this document (Currently, this value is *IPv4v6* for all PDN's).
- The device shall set the "ESM Information Transfer Flag" to indicate that ciphering of ESM information is requested.
- The device shall not include the APN (per section 6.5.1.2 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*).
- If the IMS PDN is used for network attach (i.e. normal operation), the device shall include the "Protocol Configuration Options", including requests for the IPv6 DNS IP addresses, IPv4 DNS IP addresses, IPv4 MTU size, and the IPv6 P-CSCF IP addresses. In addition, the device shall include the PCO container "P-CSCF Re-Selection Support" to indicate support for Verizon Wireless P-CSCF restoration procedure requirements (i.e. requirement VZ_REQ_LTEB13NAC_33802).
- If the internet PDN (or PDN identified by the class 3 APN) is used for network attach (i.e. IMS test mode operation or data retry scenario for IMS capable devices), the device shall include the "Protocol Configuration Options", including requests for the IPv6 DNS IP addresses, the IPv4 DNS IP addresses, and the IPv4 MTU size. The device SHALL NOT request a P-CSCF IP address or include the PCO container "P-CSCF Re-Selection Support" in the PCO field of a PDN CONNECTIVITY REQUEST message for the internet PDN (or PDN identified by the class 3 APN).

- The device shall also request the operator reserved PCO container FF00H. The device shall always set the MCC to "311" and the MNC to "480" for the operator reserved PCO container FF00H.
- The device shall also request the MSISDN (i.e. PCO item 000EH) in the "Protocol Configuration Options" for the attach PDN. The device shall NOT request the MSISDN (i.e. PCO item 000EH) in the "Protocol Configuration Options" for any post-attach/on demand PDN connection requests.

During the attach procedure, devices that do NOT support IMS shall set the following information elements in the PDN CONNECTIVITY REQUEST message as described below:

- The device shall set the "Request Type" to *Initial Request*.
- The device shall set the "PDN Type" to the value in the "APN IP Type" field for the class 3 APN in the APN table in section 5.4.1 of this document (Currently, this value is *IPv4v6* for all PDN's).
- The device shall NOT set the "ESM Information Transfer Flag" to indicate that ciphering of ESM information is requested. The device shall NOT request a specific APN at any point in attach procedure.
- The device shall include the "Protocol Configuration Options", including requests for the IPv6 DNS IP addresses, the IPv4 DNS IP addresses, and the IPv4 MTU size. The device SHALL NOT request a P-CSCF IP address or include the PCO container "P-CSCF Re-Selection Support" in the PCO field of a PDN CONNECTIVITY REQUEST message.
- The device shall also request the operator reserved PCO container FF00H. The device shall always set the MCC to "311" and the MNC to "480" for the operator reserved PCO container FF00H.
- The device shall also request the MSISDN (i.e. PCO item 000EH) in the "Protocol Configuration Options" for the attach PDN. The device shall NOT request the MSISDN (i.e. PCO item 000EH) in the "Protocol Configuration Options" for any post-attach/on demand PDN connection requests.

1.4.1.2.5.7ESM INFORMATION RESPONSE MESSAGE VZ_REQ_LTEB13NAC_23566

1.4.1.2.5.8NAS MESSAGING DURING LTE NETWORK ATTACHMENT - ESM INFORMATION RESPONSE Message VZ_REQ_LTEB13NAC_6357

The device shall include the APN in the ESM INFORMATION RESPONSE message in the network attach procedure.

1.4.1.2.5.9ATTACH ACCEPT MESSAGE VZ_REQ_LTEB13NAC_23567

1.4.1.2.5.10 NAS MESSAGING DURING LTE NETWORK ATTACHMENT - ATTACH ACCEPT Message VZ_REQ_LTEB13NAC_6358

The device shall be capable of receiving the following optional information elements in the ATTACH ACCEPT message during the network attach procedure:

- "GUTI"
- "EMM Cause". **NOTE:** By network policy, for an IMS-capable device, the network will include an EMM cause value of 18 (CS domain not available) in the ATTACH ACCEPT message in response to an ATTACH REQUEST with the "EPS Attach Type" set to *Combined EPS/IMSI Attach*.

1.4.1.2.5.11 ATTACH ACCEPT Message - Data-Centric or IMS-Less Devices that Supports SMS over NAS VZ_REQ_LTEB13NAC_39733

In addition to the requirements in VZ_REQ_LTEB13NAC_6358, data-centric or IMS-less devices that do NOT support IMS voice operation but do support SMS over NAS shall be capable of receiving the following optional information elements in the ATTACH ACCEPT message during the network attach procedure:

- "Additional update result". A combined EPS/IMSI attach request for SMS only shall be considered successful if the network omits this information element in the ATTACH ACCEPT message or if the network sets the "Additional update result" information element to either "0 0 No additional information" or "1 0 SMS only".

IMS-Less devices that are Category M1 and below and support "attach without PDN" shall also be capable of receiving the following during a network attach procedure:

- "attach without PDN" in the "Supported Network Behavior" with an *"ESM DUMMY MESSAGE"* if the network supports "attach without PDN". Refer to section 4.3.5.10 of 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access* and section 5.5.1.2.4 of 3GPP TS

24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

- An attach reject if the network does not support "attach without PDN";

1.4.1.2.5.12 ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST MESSAGE VZ_REQ_LTEB13NAC_23568

1.4.1.2.5.13 NAS MESSAGING DURING LTE NETWORK ATTACHMENT - ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST Message VZ_REQ_LTEB13NAC_6359

The device shall be capable of receiving the following optional information elements in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message during network attach:

- "APN-AMBR"
- "Protocol Configuration Options", will include DNS IP addresses, P-CSCF IP addresses (if the IMS PDN is used for network attach), and the IPv4 MTU size (if the network does not provide the MTU size, the device shall set the MTU size to 1428). If the network provides the operator reserved PCO container FF00H, the device shall make the contents of the FF00H container available to higher layers. If the network does not provide the operator reserved PCO container FF00H, the device shall not consider this to be an error and shall report to higher layers that the operator reserved PCO container FF00H is not available. If the network provides the PCO container 000EH (i.e. MSISDN), the device shall provide the contents of the PCO container to the UICC as described in VZ_REQ_LTEB13NAC_6299. If the network does not provide the PCO container 000EH (i.e. MSISDN), the device shall not consider this to be an error.

NOTE: For devices that do NOT support IMS, if the APN in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the attach PDN does not match any APN entries in the device's APN table, devices that do not support IMS shall treat this attach APN the same as the class 3 APN and route all internet traffic to this PDN. Devices that do not support IMS shall NOT make a PDN connection request using the class 3 APN in the APN table when the APN for the attach PDN chosen by the network does not match any APN entries in the device's APN table.

In addition, if an IMS-Less device of Category M1 and below supports "attach without PDN" and the network also supports "attach without PDN", then these devices shall:

- send an "attach complete" with an "ESM DUMMY MESSAGE" contained in the ESM message.
- not establish a PDN connectivity.

Refer to sections 4.3.5.10 and 5.3.2.1 of 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access* and section 5.5.1 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

1.4.1.2.5.14 ~~PIGGYBACKING SUPPORT~~ VZ_REQ_LTEB13NAC_23569

1.4.1.3 ON -DEMAND PDN CONNECTION ESTABLISHMENT VZ_REQ_LTEB13NAC_23570

1.4.1.3.1 ON -DEMAND PDN CONNECTION ESTABLISHMENT - NORMAL OPERATION VZ_REQ_LTEB13NAC_6360

After initial network attachment to the IMS PDN (i.e. normal operation) for IMS capable devices, the device shall establish a default bearer to the Internet PDN, the Administrative PDN, or the VZW Application PDN if an application(s) running on the device or a tethered laptop requires a bearer to any of these PDNs. Refer to the *LTE IPv6/IPv4 and Bearer Support* section of this document for additional details.

NOTE 1: In a data retry scenario where the device attaches to the LTE network using the internet PDN (or PDN identified by the class 3 APN), the device shall consider the internet PDN (or PDN identified by the class 3 APN) as an "always on" connection as opposed to an "on-demand" PDN

connection. In such a data retry scenario, the PDN CONNECTIVITY RQEUEST message for the internet PDN (or PDN identified by the class 3 APN) shall comply with section 4.1.2.4 of this document. If the device successfully attaches to the LTE network using the internet PDN (or PDN identified by the class 3 APN), the device shall consider the IMS PDN to be an "on-demand" PDN for the duration of the attach, and the PDN CONNECTIVITY REQUEST for the IMS PDN shall comply with section 4.1.3.3 of this document.

After initial network attachment for devices that do NOT support IMS (i.e. normal operation), the device shall establish a default bearer to the Administrative PDN or the VZW Application PDN if an application(s) running on the device or a tethered laptop requires a bearer to any of these PDNs. Refer to the *LTE IPv6/IPv4 and Bearer Support* section of this document for additional details. If the APN for the attach PDN chosen by the network does not match any APN entries in the device's APN table, devices that do not support IMS shall treat this attach APN the same as the class 3 APN and route all internet traffic to this PDN. Devices that do not support IMS shall NOT make a PDN connection request using the class 3 APN in the APN table when the APN for the attach PDN chosen by the network does not match any APN entries in the device's APN table.

NOTE 2: Devices that do NOT support IMS shall NOT request a connection to the IMS PDN at any time.

1.4.1.3.2 ON -DEMAND PDN CONNECTION ESTABLISHMENT - IMS TEST MODE OPERATION VZ_REQ_LTEB13NAC_6361

After initial network attachment to the Internet PDN during IMS test mode operation for IMS capable devices, the device shall establish a default bearer to the Administrative PDN or the VZW Application PDN if an application(s) running on the device or a tethered laptop requires a bearer to any of these PDNs. Refer to the *LTE IPv6/IPv4 and Bearer Support* and *LTE Network Attachment* sections of this document for additional details.

1.4.1.3.3 DEFAULT BEARERS AND IP ADDRESSES FOR ON-DEMAND PDN CONNECTIONS VZ_REQ_LTEB13NAC_23571

1.4.1.3.3.1 DEFAULT BEARERS AND IP ADDRESSES FOR ON-DEMAND PDN CONNECTIONS VZ_REQ_LTEB13NAC_6362

For the default bearers to on-demand PDNs, the device shall associate at least one IPv6 address, an IPv4 address, or both an IPv6 and IPv4 address as directed by the network in the "PDN Address" information element of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message. The device shall be capable of supporting a dual IP bearer to any on-demand PDN connection, i.e. the device shall be capable of simultaneously associating both an IPv6 and an IPv4 address with the default bearer to any on-demand PDN connection. The device shall be capable of supporting a unique IPv6 address and a unique IPv4 address for each PDN connection.

Refer to the *IPv6 Address Assignment* section of this document for additional details on IPv6 address assignment.

1.4.1.3.4 DEDICATED BEARERS FOR ON-DEMAND PDN CONNECTIONS VZ_REQ_LTEB13NAC_23572

1.4.1.3.4.1 DEDICATED BEARERS FOR ON-DEMAND PDN CONNECTIONS VZ_REQ_LTEB13NAC_6363

The device shall not request a dedicated bearer to any on-demand PDN.

1.4.1.3.5 NAS MESSAGING DURING ON DEMAND PDN CONNECTION ESTABLISHMENT VZ_REQ_LTEB13NAC_23573

1.4.1.3.5.1 NAS MESSAGING DURING ON DEMAND PDN CONNECTION ESTABLISHMENT VZ_REQ_LTEB13NAC_6364

Refer to the 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* and the sections below for additional details on the NAS messaging during on demand PDN connection establishment.

1.4.1.3.5.2 PDN CONNECTIVITY REQUEST MESSAGE VZ_REQ_LTEB13NAC_23574

1.4.1.3.5.3 NAS MESSAGING DURING ON DEMAND PDN CONNECTION ESTABLISHMENT - PDN CONNECTIVITY REQUEST Message VZ_REQ_LTEB13NAC_6365

The device shall set the following information elements in the PDN CONNECTIVITY REQUEST message as described below:

- The device shall set the "Request Type" to *Initial Request*.
- The device shall set the "PDN Type" to the value in the "APN IP Type" field of the APN table in section 5.4.1 of this document (Currently, this value is *IPv4v6* for all PDN's).
- The device shall omit the "ESM Information Transfer Flag".
- The device shall include the APN.
- The device shall include the "Protocol Configuration Options", including requests for the IPv6 DNS IP addresses, the IPv4 DNS IP addresses, and the IPv4 MTU size.
- If the PDN CONNECTIVITY REQUEST is for the IMS PDN (e.g. IMS test mode operation or data retry scenario), the device shall include requests for the IPv6 P-CSCF IP addresses in the "Protocol Configuration Options". In addition, the device shall include the PCO container "P-CSCF Re-Selection Support" to indicate support for Verizon Wireless P-CSCF restoration procedure requirements (i.e. requirement VZ_REQ_LTEB13NAC_33802). The device SHALL NOT request a P-CSCF IP address or include the PCO container "P-CSCF Re-Selection Support" in the PCO field of a PDN CONNECTIVITY REQUEST for any PDN other than the IMS PDN.

- The device shall also request the operator reserved PCO container FF00H. The device shall always set the MCC to "311" and the MNC to "480" for the operator reserved PCO container FF00H.

1.4.1.3.5.4 ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST MESSAGE VZ_REQ_LTEB13NAC_23575

1.4.1.3.5.5 NAS MESSAGING DURING ON DEMAND PDN CONNECTION ESTABLISHMENT - ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST Message VZ_REQ_LTEB13NAC_6366

The device shall be capable of receiving the following optional information elements in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message:

- "APN-AMBR"
- "Protocol Configuration Options", will include DNS IP addresses and the IPv4 MTU size (if the network does not provide the MTU size, the device shall set the MTU size to 1428). If the network provides the operator reserved PCO container FF00H, the device shall make the contents of the FF00H container available to higher layers. If the network does not provide the operator reserved PCO container FF00H, the device shall not consider this to be an error and shall report to higher layers that the operator reserved PCO container FF00H is not available.

1.4.1.4 PDN DISCONNECTION VZ_REQ_LTEB13NAC_23576

1.4.1.4.1 NETWORK INITIATED PDN DISCONNECTION VZ_REQ_LTEB13NAC_23577

1.4.1.4.1.1 NETWORK INITIATED PDN DISCONNECTION VZ_REQ_LTEB13NAC_6367

The network will initiate disconnection of a PDN connection if the network inactivity timer for that PDN connection has expired, usually by sending a DEACTIVATE EPS BEARER CONTEXT REQUEST message if the device is connected to two or more PDN's or by sending a DETACH REQUEST if the device is connected to only one PDN.

If the network disconnects the connection to the IMS PDN and the IMS capable device is still attached to the LTE network (through a different PDN connection), the IMS capable device shall attempt to re-establish the IMS PDN connection by sending a PDN CONNECTIVITY REQUEST message. For IMS-less device, If the network disconnects the connection to the internet PDN (or PDN identified by the class 3 APN) and the IMS-less device is still attached to the LTE network (through a different PDN connection), the IMS-less device shall attempt to re-establish the INTERNET PDN connection by sending a PDN CONNECTIVITY REQUEST message. If that PDN CONNECTIVITY REQUEST message is rejected by the network using a PDN CONNECTIVITY REJECT message or the network does not respond to the PDN CONNECTIVITY REQUEST message, the device shall follow Verizon Wireless data retry procedures for PDN connection requests as defined in the Verizon Wireless LTE Data Retry Requirements.

If the network disconnects the connection to the IMS PDN using a network initiated DETACH REQUEST message and the network indicates that a re-attach is required per the "Detach Type" information element in the DETACH REQUEST message, an IMS capable device shall acknowledge the detach procedure and then attempt to re-attach to the LTE network and the IMS PDN by sending an ATTACH REQUEST message. For IMS-less device, If the network disconnects the connection to the internet PDN (or PDN identified by the class 3 APN) using a network initiated DETACH REQUEST message and the network indicates that a re-attach is required per the "Detach Type" information element in the DETACH REQUEST message, an IMS-less device shall acknowledge the detach procedure and then attempt to re-attach to the LTE network and the INTERNET PDN by sending an ATTACH REQUEST message. Device behavior shall be per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, the Verizon Wireless LTE Data Retry Requirements, and this document.

If the network disconnects the connection to the IMS PDN using a network initiated DETACH REQUEST message and the network indicates that a re-attach is not required per the "Detach Type"

information element in the DETACH REQUEST message, an IMS capable device shall acknowledge the detach procedure and take appropriate action based on the EMM cause code in the DETACH REQUEST message. For IMS-less device, If the network disconnects the connection to the internet PDN (or PDN identified by the class 3 APN) using a network initiated DETACH REQUEST message and the network indicates that a re-attach is not required per the "Detach Type" information element in the DETACH REQUEST message, an IMS-less device shall acknowledge the detach procedure and take appropriate action based on the EMM cause code in the DETACH REQUEST message. Device behavior shall be per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, the Verizon Wireless LTE Data Retry Requirements, and this document.

If "attach without PDN" connection is supported, the network may at any time release all the PDN connections and IMS-Less devices that are Category M1 and below shall remain EPS attached, meaning EMM-REGISTERED state with SMS only. Refer to section 4.3.5.10 of 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access* and section 5.5.2 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

1.4.1.4.2 UE INITIATED PDN DISCONNECTION VZ_REQ_LTEB13NAC_23578

1.4.1.4.2.1 ~~UE INITIATED PDN DISCONNECTION - APN INACTIVITY TIMERS FOR PDN CONNECTIONS~~ ~~VZ_REQ_LTEB13NAC_23579~~

1.4.1.4.2.2 ~~UE INITIATED PDN DISCONNECTION UPDATE TO APN RELATED PARAMETERS~~ ~~VZ_REQ_LTEB13NAC_23580~~

1.4.1.4.2.3 UE Initiated PDN Disconnection Update to APN Related Parameters

VZ_REQ_LTEB13NAC_6368

If an APN network identifier or APN-related parameter (refer to the *Factory Programming* section of this document for additional details) is updated after a PDN connection using the APN has been established, the device shall release the PDN connection and then immediately re-establish the PDN connection using the updated APN parameter(s).

The device shall release the PDN connection by:

- sending a PDN DISCONNECT REQUEST message if the device is connected to two or more PDNs.
- sending a DETACH REQUEST if the device is connected to only one PDN connection.

If the device disconnects the connection to the IMS PDN and the IMS capable device is still attached to the LTE network (through a different PDN connection), the IMS capable device shall attempt to re-establish the IMS PDN connection by sending a PDN CONNECTIVITY REQUEST message. If that PDN CONNECTIVITY REQUEST message is rejected by the network using a PDN CONNECTIVITY REJECT message or the network does not respond to the PDN CONNECTIVITY REQUEST message, the device shall follow Verizon Wireless data retry procedures for PDN connection requests as defined in the Verizon Wireless LTE Data Retry Requirements.

If the device disconnects an on-demand PDN connection and the device is still attached to the LTE network (through a different PDN connection), the device shall attempt to re-establish the PDN connection by sending a PDN CONNECTIVITY REQUEST message and using the updated APN parameter(s). Device behavior shall be per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, the Verizon Wireless LTE Data Retry Requirements, and this document.

If the device disconnects the connection using a UE-initiated DETACH REQUEST message, the device shall complete the detach procedure and then attempt to re-attach to the LTE network by sending an ATTACH REQUEST message. All updated APN parameter(s) shall be used in the attach procedure and any subsequent PDN connection establishment procedures. Device behavior shall be per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage*

3, the Verizon Wireless LTE Data Retry Requirements, and this document. **NOTE:** Devices that do NOT support IMS shall not request a specific APN during the attach procedure.

1.4.1.4.2.4 ~~UE INITIATED PDN DISCONNECTION ALL OTHER CASES~~ ~~VZ_REQ_LTEB13NAC_2358~~

1.4.1.4.2.5 UE Initiated PDN Disconnection All Other Cases VZ_REQ_LTEB13NAC_6369

If the device is required to initiate a PDN disconnection for any reason other than in response to the expiration of an APN inactivity timer or in response to an update to an APN-related parameter, the device shall follow the requirements below.

Per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, the device shall release the PDN connection by:

- sending a PDN DISCONNECT REQUEST message if the device is connected to two or more PDNs.
- sending a DETACH REQUEST if the device is connected to only one PDN connection.

Device behavior shall be per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, the Verizon Wireless LTE Data Retry Requirements, and this document.

If "attach without PDN" connection is supported by an IMS-less device, then the device shall at any time release all the PDN connections and remain EPS attached, meaning EMM-REGISTERED state with SMS only. Refer to section 4.3.5.10 of 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access* and section 5.5.2 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details. These devices shall ONLY request PDN Connectivity on demand.

1.4.1.4.3 IMS DE-REGISTRATION DURING UE INITIATED IMS PDN DISCONNECTION VZ_REQ_LTEB13NAC_23582

1.4.1.4.3.1 IMS DE-REGISTRATION DURING UE INITIATED IMS PDN DISCONNECTION VZ_REQ_LTEB13NAC_6370

If the device has a valid IMS registration, the device shall terminate the subscription to the registration events package by sending a Subscribe message with expires= 0, followed by an IMS de-registration request message. This shall be done before sending a NAS PDN DISCONNECT REQUEST or DETACH REQUEST message. Upon the IMS client generating the initial SIP REGISTER message with expires=0, the device shall start an implementation specific timer with a value of 4 seconds. While this implementation specific timer is running, the device shall respond to all SIP messaging from the network, e.g. if the network challenges the de-registration request with a 401 Unauthorized. Upon expiration of this implementation specific timer, the device shall take no further action with respect to SIP messages from the network and execute the NAS detach procedure or NAS PDN disconnect procedure. The device shall stop the implementation specific timer and immediately execute the NAS detach procedure or NAS PDN disconnect procedure if a SIP 200 OK or a SIP 481 or a SIP 501 is received in response to the SIP REGISTER (with expires=0) before the implementation specific timer expires.

NOTE: The implementation specific timer is started when the IMS client generates the initial SIP REGISTER message with expires=0. The implementation specific timer shall run even if the IMS client cannot send the SIP REGISTER message to the modem for transmission because an IMS signaling connection could not be established.

1.4.1.5 TRACKING AREA UPDATES VZ_REQ_LTEB13NAC_23583

1.4.1.5.1 TRACKING AREA UPDATES VZ_REQ_LTEB13NAC_6371

Tracking area update procedures are per 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access* and 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*.

1.4.1.5.2 NAS MESSAGING DURING TRACKING AREA UPDATES VZ_REQ_LTEB13NAC_23584

1.4.1.5.2.1 NAS MESSAGING DURING TRACKING AREA UPDATES VZ_REQ_LTEB13NAC_6372

Refer to the 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* and the sections below for additional details on the NAS messaging during tracking area updates.

1.4.1.5.2.2 TRACKING AREA UPDATE REQUEST MESSAGE VZ_REQ_LTEB13NAC_40648

1.4.1.5.2.3 NAS MESSAGING DURING TRACKING AREA UPDATES - TRACKING AREA UPDATE REQUEST Message VZ_REQ_LTEB13NAC_40649

In addition to the requirements in VZ_REQ_LTEB13NAC_6372, the device shall set the following information elements in the TRACKING AREA UPDATE REQUEST message as described below when a combined tracking area update is required per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*:

- The device shall support the extended periodic timer and advertise support to the network in the "MS Network Capability" information element*

* Support for the extended periodic timer is **mandatory** for machine-to-machine (M2M) and internet of things (IoT devices); and optional for all other devices.

In addition to the requirements above and in VZ_REQ_LTEB13NAC_6372, data-centric or IMS-less devices that do NOT support IMS voice operation but do support SMS over NAS shall set the following information elements in the TRACKING AREA UPDATE REQUEST message as described below when a combined tracking area update is required per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*:

- The device shall set the "EPS Update Type" to *Combined TA/LA Updating* (i.e. combined tracking area update request).
- The device shall include the "Additional update type" information element set to "1 SMS Only".

1.4.1.5.2.4 TRACKING AREA UPDATE ACCEPT MESSAGE VZ_REQ_LTEB13NAC_23585

1.4.1.5.2.5 NAS MESSAGING DURING TRACKING AREA UPDATES - TRACKING AREA UPDATE ACCEPT Message VZ_REQ_LTEB13NAC_6373

The device shall be capable of receiving the following optional information elements in the TRACKING AREA UPDATE ACCEPT message:

- "T3412 Value", included if the MME configuration changes
- "T3412 Extended Value", if included by the MME*
- "GUTI", mandatory if the MME changes
- "TAI List", included in all cases

* Support for the extended periodic timer is **mandatory** for machine-to-machine (M2M) and internet of things (IoT devices); and optional for all other devices.

In addition to the requirements above and in VZ_REQ_LTEB13NAC_6372, data-centric or IMS-less devices that do NOT support IMS voice operation but do support SMS over NAS shall be capable of receiving the following information elements in the TRACKING AREA UPDATE ACCEPT message as described below when a combined tracking area update is required per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*:

- "Additional update result". A combined tracking area update request for SMS only shall be considered successful if the network omits this information element in the TRACKING AREA UPDATE ACCEPT message or if the network sets the "Additional update result" information element to either "0 0 No additional information" or "1 0 SMS only".

1.4.1.6 LTE NETWORK DETACHMENT VZ_REQ_LTEB13NAC_23586

1.4.1.6.1 LTE NETWORK DETACHMENT VZ_REQ_LTEB13NAC_6374

Upon device power down, device soft reset, power down of the LTE radio/modem (e.g. when entering airplane mode), or user initiated disconnect of the wireless connection, the device shall initiate the Detach Procedure. Refer to 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access* and to 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

1.4.1.6.2 IMS DE-REGISTRATION DURING UE INITIATED NETWORK DETACH VZ_REQ_LTEB13NAC_23587

1.4.1.6.2.1 IMS DE-REGISTRATION DURING UE INITIATED NETWORK DETACH VZ_REQ_LTEB13NAC_6375

If the device has a valid IMS registration, the device shall terminate the subscription to the registration events package by sending a Subscribe message with expires= 0, followed by an IMS de-registration request message. This shall be done before sending a NAS DETACH REQUEST message. Upon the IMS client generating the initial SIP REGISTER message with expires=0, the device shall start an implementation specific timer with a value of 4 seconds. While this implementation specific timer is running, the device shall respond to all SIP messaging from the network, e.g. if the network challenges the de-registration request with a 401 Unauthorized. Upon expiration of this implementation specific timer, the device shall take no further action with respect to SIP messages from the network and execute the NAS detach procedure. The device shall stop the implementation specific timer and immediately execute the NAS detach procedure if a SIP 200 OK or a SIP 481 or a SIP 501 is received in response to the SIP REGISTER (with expires=0) before the implementation specific timer expires.

NOTE: The implementation specific timer is started when the IMS client generates the initial SIP REGISTER message with expires=0. The implementation specific timer shall run even if the IMS client cannot send the SIP REGISTER message to the modem for transmission because an IMS signaling connection could not be established.

1.4.1.7 SYSTEM LOSS VZ_REQ_LTEB13NAC_23588

1.4.1.7.1 SYSTEM LOSS VZ_REQ_LTEB13NAC_6376

If radio link failure occurs (specifically an out-of-sync detection as defined in 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures)*, the device shall follow all procedures defined in the 3GPP Release 9 Specifications. Refer to 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification* and 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

1.4.1.7.2 TRACKING AREA UPDATE REQUEST Message after RLF VZ_REQ_LTEB13NAC_35805

If the device needs to send a TRACKING AREA UPDATE REQUEST message after LTE connection re-establishment following LTE radio-link failure (RLF)/system loss and the device has uplink data pending, the device shall set bit 4 of the "EPS Update Type" information element in the TRACKING AREA UPDATE REQUEST message to "*1 Bearer establishment requested*". Refer to 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* for additional details.

1.4.1.8 IPV6 ADDRESS ASSIGNMENT VZ_REQ_LTEB13NAC_23589

1.4.1.8.1 LINK-LOCAL ADDRESS AND GLOBALLY ROUTABLE IPV6 ADDRESS FORMATION VZ_REQ_LTEB13NAC_23590

1.4.1.8.1.1 LINK-LOCAL ADDRESS AND GLOBALLY ROUTABLE IPV6 ADDRESS FORMATION VZ_REQ_LTEB13NAC_6377

For IPv6 address assignment, the device shall use IPv6 Stateless Address Autoconfiguration. The device shall not initiate DHCP signaling for the purposes of securing an IPv6 address. The device shall use the Interface ID value received from the network in the "PDN Address" information element of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for its Interface ID when forming its link-local address; the device shall not alter the value for the Interface ID or use a different value when forming its link-local address.

The device shall use the values MAX_RTR_SOLICITATION_DELAY (1 second), MAX_RTR_SOLICITATIONS (3), and RTR_SOLICITATION_INTERVAL (4 seconds) from RFC 4861 as the default values for governing the sending of *Router Solicitation* messages. The device shall form its globally routable IPv6 address by combining the prefix received in the *Router*

Advertisement message with the devices Interface ID. When forming a globally routable IPv6 address, the device shall either use the Interface ID provided by the network in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message or choose an Interface ID in accordance with 3GPP TS 29.061: *Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN).* The device shall only form one globally routable IPv6 address when connected to the IMS PDN, and the device shall use that IPv6 address for the duration of the IMS PDN connection. The device should only form one globally routable IPv6 address per PDN connection when connecting to PDNs other than the IMS PDN.

1.4.1.8.1.2IPV6 ADDRESS LIFETIME VZ_REQ_LTEB13NAC_6378

The device shall use either the "Valid Lifetime" value or the "Router Lifetime" value received in the *Router Advertisement* message (refer to RFC 4861, section 4.6.2), whichever is shortest, to determine the valid lifetime of its IPv6 address per RFC 4862. The device shall use the "Preferred Lifetime" to determine when the IPv6 address is preferred or deprecated per RFC 4862. If the network sends an unsolicited *Router Advertisement* message, the device shall refresh its valid lifetime by using the values of "Valid Lifetime", and "Router Lifetime" from the new message and its preferred lifetime by using the "Preferred Lifetime". The device may refresh its IPv6 address by soliciting a new *Router Advertisement* message from the network. If the device needs to solicit a new *Router Advertisement* message, it shall use one of following two methods to determine the appropriate timing. Method 1: the device shall wait until at least 75% of the minimum of "Preferred Lifetime", "Valid Lifetime", or "Router Lifetime" has expired and then send a *Router Solicitation* message per RFC 4861 and RFC 4862. Method #2: the device shall wait until either "Preferred Lifetime" has expired or 75% of the valid lifetime (determined by taking the minimum of the "Valid Lifetime" and the "Router Lifetime") has expired before sending the *Router Solicitation* message.

1.4.1.8.1.3IPV6 ADDRESS ASSIGNMENT FOR LAN-SIDE DEVICES VZ_REQ_LTEB13NAC_23591

1.4.1.8.1.4IPv6 Address Assignment for LAN-Side Devices VZ_REQ_LTEB13NAC_6429

If the device supports a LAN and serves as a gateway for the LAN-side devices, the device shall assign globally routable IPv6 addresses to the LAN-side devices as follows:

- All traffic from the LAN-side devices shall be routed on the internet PDN (i.e. Class 3 APN).
- The device shall use the IPv6 prefix provided in the *Router Advertisement* for the Internet PDN for all LAN-side devices.
- To complete the globally routable IPv6 address for a given LAN-side device, the gateway device shall combine the IPv6 prefix provided in the *Router Advertisement* for the Internet PDN with a unique Interface ID created in accordance with 3GPP TS 29.061: *Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)*. The gateway device's WAN-side IPv6 address and all LAN-side IPv6 address shall be unique, i.e. the device shall not use any Interface ID more than once.
- The gateway device shall only assign one globally routable IPv6 address to each LAN-side device.

Refer to RFC 6434 and RFC 6204bis for additional details.

1.4.1.8.2 ~~ROUTER ADVERTISEMENT FAILURES~~VZ_REQ_LTEB13NAC_23592

1.4.1.8.2.1 ~~ROUTER ADVERTISEMENT FAILURE DURING INITIAL IPV6 ADDRESS FORMATION~~VZ_REQ_LTEB13NAC_23594

1.4.1.8.2.2 ~~ROUTER ADVERTISEMENT FAILURE DURING IPV6 ADDRESS REFRESH~~VZ_REQ_LTEB13NAC_23595

1.4.1.8.3 NEIGHBOR SOLICITATION MESSAGES VZ_REQ_LTEB13NAC_23593

1.4.1.8.3.1 NEIGHBOR SOLICITATION MESSAGES VZ_REQ_LTEB13NAC_6379

The device shall not send a *Neighbor Solicitation* message for any reason.

1.4.1.9 DHCP IP ADDRESS ASSIGNMENT/MODIFICATION VZ_REQ_LTEB13NAC_23602

1.4.1.9.1 DHCP IP ADDRESS ASSIGNMENT/MODIFICATION VZ_REQ_LTEB13NAC_6380

The device shall not use DHCP for assignment or modification of IP addresses.

1.4.1.10 DNS ADDRESS REQUESTS VZ_REQ_LTEB13NAC_23603

1.4.1.10.1 DNS SERVER IP ADDRESS ASSIGNMENT VZ_REQ_LTEB13NAC_6381

The device shall request DNS server addresses for a PDN connection using the "Protocol Configuration Options" information element in the PDN CONNECTIVITY REQUEST message.

For any PDN connection request, the device shall always request an IPv6 DNS server address and an IPv4 DNS server address from the network. The device shall be capable of accepting 2 IPv6 DNS server addresses, 2 IPv4 DNS server addresses, or both 2 IPv6 DNS server addresses and 2 IPv4 DNS server addresses for each PDN connection as directed by the network. The device shall be capable of supporting unique DNS server addresses for each PDN connection.

1.4.1.10.2 DNS SERVER PER PDN VZ_REQ_LTEB13NAC_6382

When performing DNS resolution on behalf of an application that connects via a specific PDN connection, the device shall utilize the DNS server that was assigned when the device set up the connection to that PDN. For example, if the device has connections to PDN A (with DNS servers A1 and A2) and PDN B (with DNS servers B1 and B2) and an application that connects through PDN B needs a DNS resolution, the device shall request the resolution from B1 or B2, not from A1 or A2.

1.4.1.10.3 DNS QUERY ORDER VZ_REQ_LTEB13NAC_6462

When performing a DNS resolution on behalf of an application that connects via a specific PDN connection, the device shall issue DNS queries in the following order:

1. Query to the first IPv6 DNS server address provided in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the given PDN.
2. Query to the first IPv4 DNS server address provided in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the given PDN.
3. Query to the second IPv6 DNS server address provided in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the given PDN (if a second IPv6 DNS server address is provided by the network).
4. Query to the second IPv4 DNS server address provided in the PCO of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the given PDN (if a second IPv4 DNS server address is provided by the network).

If the first DNS server in the list above does not respond to a query or returns a DNS server error, the device shall issue the request to the next server in the list and so on.

The device shall wait a minimum of 2 seconds before determining a DNS query has timed out.

After a first pass through the DNS server list without a response, the device should apply an incremental backoff to the timeout value for subsequent retries.

1.4.1.11 IMS TRAFFIC VZ_REQ_LTEB13NAC_23604

1.4.1.11.1 IMS TRAFFIC VZ_REQ_LTEB13NAC_6419

The device shall use the IMS PDN for all IMS traffic destined for the Verizon Wireless IMS network. The device SHALL NOT route any IMS traffic destined for the Verizon Wireless IMS network over any on-demand PDN.

1.4.1.12 NETWORK INITIATED BEARER MODIFICATION AND DEACTIVATION PROCEDURES VZ_REQ_LTEB13NAC_23605

1.4.1.12.1 NETWORK INITIATED BEARER MODIFICATION AND DEACTIVATION PROCEDURES VZ_REQ_LTEB13NAC_6425

The device shall support network initiated bearer modification and deactivation procedures as defined in 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*.

1.4.1.12.2 NAS MESSAGING FOR NETWORK INITIATED BEARER ACTIVATION, NETWORK INITIATED BEARER MODIFICATION, AND BEARER DEACTIVATION PROCEDURES VZ_REQ_LTEB13NAC_23606

1.4.1.12.2.1 MODIFY EPS BEARER CONTEXT REQUEST MESSAGE VZ_REQ_LTEB13NAC_23607

1.4.1.12.2.2 NAS MESSAGING FOR NETWORK INITIATED BEARER MODIFICATION - MODIFY EPS BEARER CONTEXT REQUEST Message VZ_REQ_LTEB13NAC_6426

The device shall be capable of receiving the following optional information elements in the MODIFY EPS BEARER CONTEXT REQUEST message:

- "New EPS QoS"
- "TFT". The device shall be capable of receiving and applying a TFT for a default bearer or a dedicated bearer.
- "APN-AMBR"
- "Protocol Configuration Options". If the network provides the operator reserved PCO container FF00H, the device shall make the contents of the FF00H container available to higher layers.

1.4.1.12.2.3 DEACTIVATE EPS BEARER CONTEXT REQUEST MESSAGE VZ_REQ_LTEB13NAC_23608

1.4.1.12.2.4 NAS MESSAGING FOR NETWORK INITIATED BEARER DEACTIVATION PROCEDURES - DEACTIVATE EPS BEARER CONTEXT REQUEST Message VZ_REQ_LTEB13NAC_6427

The device shall be capable of receiving the following optional information elements in the DEACTIVATE EPS BEARER CONTEXT REQUEST message:

- "Protocol Configuration Options". If the network provides the operator reserved PCO container FF00H, the device shall make the contents of the FF00H container available to higher layers.

1.4.1.12.2.5 ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST MESSAGE VZ_REQ_LTEB13NAC_23609

1.4.1.12.2.6 NAS MESSAGING FOR NETWORK INITIATED BEARER ACTIVATION - ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST Message VZ_REQ_LTEB13NAC_6463

The network may activate a dedicated bearer for any PDN. If the network activates a dedicated bearer for a given PDN, the device shall be capable of receiving and processing the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message per 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*.

1.4.1.13 NAS MESSAGE PIGGYBACKING SUPPORT VZ_REQ_LTEB13NAC_23610

1.4.1.13.1 PDN BEARER ACTIVATION DURING ATTACH VZ_REQ_LTEB13NAC_23611

1.4.1.13.1.1 NAS MESSAGE PIGGYBACKING SUPPORT - PDN BEARER ACTIVATION DURING ATTACH VZ_REQ_LTEB13NAC_6430

The device shall be capable of receiving the ATTACH ACCEPT message, the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the attach PDN, and up to two ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST messages for the attach PDN within the same *RRCConnectionReconfiguration* message.

1.4.1.13.2 PDN BEARER ACTIVATION AFTER ATTACH VZ_REQ_LTEB13NAC_23612

1.4.1.13.2.1 NAS MESSAGE PIGGYBACKING SUPPORT - PDN BEARER ACTIVATION AFTER ATTACH VZ_REQ_LTEB13NAC_6431

Upon sending a PDN CONNECTIVITY REQUEST message to the network for a given PDN (after attach), the device shall be capable of receiving the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the given PDN and up to two ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST messages for the given PDN within the same *RRCConnectionReconfiguration* message.

1.4.1.14 GUTI REALLOCATION COMMAND VZ_REQ_LTEB13NAC_23613

1.4.1.14.1 GUTI REALLOCATION COMMAND VZ_REQ_LTEB13NAC_6464

The device shall support the GUTI reallocation procedure per section 5.4.1 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*. The device shall be

capable of receiving the following optional information elements in the GUTI REALLOCATION COMMAND:

- "TAI List"

1.4.1.15 SON SUPPORT VZ_REQ_LTEB13NAC_39045

VOID

1.4.1.16 NON-CONTENTION BASED RANDOM ACCESS VZ_REQ_LTEB13NAC_23617

1.4.1.16.1 NON-CONTENTION BASED RANDOM ACCESS VZ_REQ_LTEB13NAC_6467

When receiving an *RRCConnectionReconfiguration* message with the handover command, the device shall support the *RACH-ConfigDedicated* field in the *MobilityControlInfo* IE if present.

The device shall support the ttibundling field in the radioResourceConfigDedicated IE under MAC-MainConfig.

Note: if ttibundling is enabled by the source eNB and contention-free RACH is used at the target eNB, the 3rd message (i.e., RRCConnectionConfigurationComplete message) during RACH shall use ttibundling.

Refer to 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification* for additional details.

1.4.1.17 ACCESS BARRING AND ACCESS CLASSES VZ_REQ_LTEB13NAC_23618

1.4.1.17.1 ACCESS BARRING AND ACCESS CLASSES VZ_REQ_LTEB13NAC_6468

The device shall support SIB2 and access barring per 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*, including all optional IE's in SIB2.

Devices that support Release 12 or later of the 3GPP standard shall support AC-BarringPerPLMN, and the SIB2 *AC-BarringPerPLMN-List-r12* and A*C-BarringPerPLMN-r12* IE's and all of their mandatory and optional component IE's.

1.4.1.17.2 ACCESS CLASSES AND HIGH PRIORITY ACCESS VZ_REQ_LTEB13NAC_6469

Per 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*, if the access class in the USIM of the device is in the range of 11-15, the device shall specify "highPriorityAccess" as the *establishmentCause* in all *RRCConnectionRequest* messages.

1.4.1.18 LTE FEMTOCELL INTERACTIONS VZ_REQ_LTEB13NAC_23619

1.4.1.18.1 LTE FEMTOCELL CELL SELECTION/RE-SELECTION VZ_REQ_LTEB13NAC_23620

1.4.1.18.1.1 LTE FEMTOCELL CELL SELECTION/RE-SELECTION VZ_REQ_LTEB13NAC_6473

The device shall support cell selection and re-selection with CSG cells per sections 5.2.4.1, 5.2.4.4, 5.2.4.6, 5.2.4.8, and 5.3.1 of 3GPP TS 36.304: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode*.

The device shall support manual CSG selection as specified in section 5.5.1 of 3GPP TS 36.304: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode* and section 5.5.4 of 3GPP TS 22.220: *Service requirements for Home Node B (HNB) and Home eNode B (HeNB)*. The device shall be capable of displaying available CSG cells to the end user through the device user interface or the remote access user interface (for devices operating in a tethered mode).

When a CSG ID which is not included in the device's Allowed CSG List is manually selected by the user, a NAS tracking area update procedure via the selected CSG cell shall be triggered immediately by the device to enable the network to perform CSG access control.

The device shall support section 5.2.4.9 of the Release 10 version of 3GPP TS 36.304: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode*.

1.4.1.18.2 CSG LIST SUPPORT VZ_REQ_LTEB13NAC_23621

1.4.1.18.2.1 CSG LIST SUPPORT VZ_REQ_LTEB13NAC_6474

The device shall support CSG lists as specified in section 5.3.2 of 3GPP TS 22.220: *Service requirements for Home Node B (HNB) and Home eNode B (HeNB)*. This support shall include, but not be limited to, the following:

- The device shall store CSG lists on the USIM as specified in 3GPP TS 31.102: *Characteristics of the Universal Subscriber Identity Module (USIM) application*.
- The device shall maintain two CSG lists:
    - Allowed CSG List
    - Operator CSG List
- The device shall allow the end user to add new CSG's to the Allowed CSG List through the manual CSG selection process.

1.4.1.18.3 MOBILITY BETWEEN CSG AND HYBRID CELLS VZ_REQ_LTEB13NAC_23622

1.4.1.18.3.1 MOBILITY BETWEEN CSG AND HYBRID CELLS VZ_REQ_LTEB13NAC_6475

The device shall support mobility to and from CSG and hybrid cells as specified in section 10.5 of 3GPP TS 36.300: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2*.

1.4.1.18.4 RRC AND RRM SUPPORT FOR FEMTOCELLS AND CSG CELLS VZ_REQ_LTEB13NAC_23623

1.4.1.18.4.1 ~~SIB1 AND SIB9 SUPPORT~~ VZ_REQ_LTEB13NAC_23624

1.4.1.18.4.2 RRC AND RRM SUPPORT FOR FEMTOCELLS AND CSG CELLS - SIB1 and SIB9 Support VZ_REQ_LTEB13NAC_6476

The device shall supporting and processing the following information elements in SystemInformationBlockType1 (SIB1) per 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*:

- "cellIdentity", i.e. E-CGI.
- "csg-Indication"
- "csg-Identity"

The device shall supporting and processing the following information elements in SystemInformationBlockType9 (SIB9) per 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*:

- "hnb-Name", i.e. the home eNB name.

1.4.1.18.4.3 ~~PROXIMITY INDICATION~~VZ_REQ_LTEB13NAC_23625

1.4.1.18.4.4 RRC AND RRM SUPPORT FOR CSG CELLS - Proximity Indication VZ_REQ_LTEB13NAC_6477

The device shall send a ProximityIndication message to the network whenever it detects or leaves the presence of CSG or hybrid cells if configured by the network to do so per section 5.3.14 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification* and section 10.5.1.2 of 3GPP TS 36.300: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2*.

1.4.1.18.4.5 ~~AUTONOMOUS GAPS~~VZ_REQ_LTEB13NAC_23626

1.4.1.18.4.6 RRC AND RRM SUPPORT FOR FEMTOCELLS AND CSG CELLS - Autonomous Gaps VZ_REQ_LTEB13NAC_6478

When directed to do so by the network, the device shall acquire system information and measurement information of targeted cells using autonomous gaps per section 5.5.3.1 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification* and per 3GPP TS 36.133: *Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management*.

1.4.1.18.4.7 ~~MEASUREMENT REPORTING~~ VZ_REQ_LTEB13NAC_23627

1.4.1.18.4.8 RRC AND RRM SUPPORT FOR FEMTOCELLS AND CSG CELLS - Measurement Reporting VZ_REQ_LTEB13NAC_6479

When directed by the network to do so during handover procedures, the device shall provide the following information in a measurement report for a target HeNB per section 10.5.1.2 of 3GPP TS 36.300: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2* and section 5.5.5 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*:

- *cellGlobalID* (e-CGI)
- *trackingAreaCode*
- *csgIdentity*
- *csgMemberStatus*

1.4.1.18.5 FEMTOCELL CONNECTIVITY INDICATOR VZ_REQ_LTEB13NAC_23629

1.4.1.18.5.1 FEMTOCELL CONNECTIVITY INDICATOR VZ_REQ_LTEB13NAC_6484

When a device is attached to the Verizon Wireless LTE network via an eNB whose ID (20 most significant bits of ECI) is within the range 1,024,000 to 1,048,575, the device shall provide an indicator (visual or audible) that the device is currently accessing the Verizon Wireless LTE network via a femtocell.

1.4.1.19 MEASUREMENT REPORTING VZ_REQ_LTEB13NAC_35801

1.4.1.19.1 Measurement Reporting VZ_REQ_LTEB13NAC_35802

When reporting measurement results (as per 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*), the device shall include the following optional fields in the *MeasResults* information element:

- plmn-IdentityList

When scanning and reporting based on the measurement report trigger configured by EUTRAN (per definition in section 5.5.4, 5.5.5 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*),), the UE shall use the following scanning and reporting order of frequencies/bands: measObjectID associated with the smallest measID will be scanned earlier (measIDs are listed in the MeasIdToAddModList presented in measConfigIE). The order configured by the EUTRAN shall be reflected in UE's stored measurement configuration in VarMeasConfig.

1.4.1.20 RRC CONNECTION STATE MISMATCH BETWEEN THE UE

AND NETWORK VZ_REQ_LTEB13NAC_36237

1.4.1.20.1 RRC CONNECTION STATE MISMATCH BETWEEN THE UE AND NETWORK VZ_REQ_LTEB13NAC_36238

If the device is in RRC_CONNECTED state and receives a paging message from the network, the device shall assume an RRC connection state mismatch has occurred between the device and the network, and the device shall take the following corrective action:

- After RRC connection is established, the device shall wait a configurable delay. During that delay, any paging message towards the UE shall be ignored. After the delay expires, UE shall start to process paging message towards the UE. If paged, the UE shall transition to RRC_IDLE state and initiate a new RRC connection request to respond to the page from the network.
- This delay shall be configurable from 0 to 10 seconds in 1 second increments on the device via a non-volatile memory setting. The default setting for the delay shall be 5 seconds. The vendor shall provide a lab application to modify this delay setting during device acceptance testing. The device vendor shall not allow the user to modify this delay setting through the device user interface or the remote access user interface for tethered devices.

1.4.1.21 LOW PRIORITY ACCESS & DELAY TOLERANT UE FEATURE SUPPORT VZ_REQ_LTEB13NAC_36994

1.4.1.21.1 Low Priority Access & Delay Tolerant UE Feature Support VZ_REQ_LTEB13NAC_36995

NOTE: This requirement only applies to certain data-centric M2M devices and internet-of-things devices.

The device shall support the handling of NAS signalling low priority indication as per Section 4.2A of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3.* The device shall only use low priority indication if indicated to do so based on the contents of the NAS configuration management object, EFNASCONFIG , in the UICC as specified in 3GPP TS 31.102: *Characteristics of the Universal Subscriber Identity Module (USIM) application* and 3GPP TS 24.368: *Non-Access Stratum (NAS) configuration Management Object (MO).*

If the device is configured for low priority access as described above, the device shall support the use of the RRC connection *establishmentCause* delayTolerantAccess as specified in 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* and 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification.* If the device is configured for low priority access as described above, the device shall support the handling of the *extendedWaitTime* parameter in the *RRCConnectionReject* and *RRCConnectionRelease* messages as defined in 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification.* The device shall only use low priority indication if indicated to do so based on the contents of the NAS configuration management object, EFNASCONFIG , in the UICC as specified in 3GPP TS 31.102: *Characteristics of the Universal Subscriber Identity Module (USIM) application* and 3GPP TS 24.368: *Non-Access Stratum (NAS) configuration Management Object (MO).*

If the device is configured for low priority access as described above, the device shall support SIB14 and Extended Access Barring as defined in 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification.* The device shall only use Extended Access Barring if indicated to do so based on the contents of the NAS configuration management object, EFNASCONFIG, in the UICC as specified in 3GPP TS 31.102: *Characteristics of the Universal Subscriber Identity Module (USIM) application* and 3GPP TS 24.368: *Non-Access Stratum (NAS) configuration Management Object (MO).*

The device may support dual priority as specified in 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3.* The device shall only use dual priority if it is configured for low access priority and Extended Access Barring and is also configured for override of low access priority and Extended Access Barring, based on the contents of the NAS configuration management object, EFNASCONFIG, in the USIM as specified in 3GPP TS 24.368: *Non-Access Stratum (NAS) configuration Management Object (MO).* For devices supporting dual priority, only certain non-delay-tolerant applications may be permitted for overriding low access priority and Extended Access Barring restrictions, and the usage of overriding low access priority and Extended

Access Barring, such as the amount of PDN connection activations and RRC connection requests and the duration of PDN connections and RRC connections with low access priority and Extended Access Barring overridden, shall be agreed upon with Verizon Wireless. Device vendors must contact Verizon Wireless prior to implementing dual priority on any devices.

1.4.1.21.2 Power Saving Mode (PSM) VZ_REQ_LTEB13NAC_40930

NOTE: This requirement only applies to certain data-centric M2M devices and internet-of-things devices.

Machine-to-Machine (M2M) and Internet of Things (IoT) devices that are data-centric and do NOT support voice operation may request the use of Power Saving Mode (PSM).

If the device supports PSM and wants to use PSM, it shall request PSM in every ATTACH REQUEST and TRACKING AREA UPDATE REQUEST message by including the Active Time (T3324) value IE. It is recommended that the device also include the Periodic TAU Timer (T3412) extended value IE. The requested Active Time value and Periodic TAU Timer value shall be set based on device application needs. When the T3412 extended value IE is included, it shall be set to a value no lower than 186 minutes, to avoid excessive periodic TAU exchanges. If the device application cannot tolerate mobile termination (MT) delay of 186 minutes or higher, it shall not request PSM, and may use extended idle-mode DRX (eDRX) for power saving purpose. Refer to VZ_REQ_LTEB13NAC_4355562 for details on eDRX.

The device shall use the Active Time value provided by the network in the last ATTACH ACCEPT or TRACKING AREA UPDATE ACCEPT message. The device shall NOT use PSM if the network does not include a value for Active Time in the last ATTACH ACCEPT or TRACKING AREA UPDATE ACCEPT message.

Refer to sections 5.1.3.2.4.7, 5.3.11, 5.5.1.2.2, 5.5.1.2.4, 5.5.3.2.2, 5.5.3.2.4 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, and section 4.7.2.8 of 3GPP TS 24.008: *Mobile radio interface Layer 3 specification; Core network protocols; Stage 3* for additional details of PSM operation.

The device modem shall provide an interface to the application layer such that applications can request the use of PSM and/or request to stop using PSM, set or change the requested Active Time value and Periodic TAU Timer value, query the Active Time value and Periodic TAU Timer value requested by device, and query the Active Time value and Periodic TAU Timer value provided by network and in use by device for PSM activation/deactivation.

The device shall support AT commands for PSM per sections 7.38, 10.1.22 of the Release 12 version of 3GPP TS 27.007: *AT command set for User Equipment (UE)*.

The device vendor shall provide a test application (for use during device acceptance testing) to request the use of PSM and/or request to stop using PSM, to set or change the requested Active Time value and Periodic TAU Timer value, to query the Active Time value and Periodic TAU Timer value requested by device, and to query the Active Time value and Periodic TAU Timer value provided by network and in use by the device.

1.4.1.21.3 EXTENDED IDLE-MODE DRX VZ_REQ_LTEB13NAC_4355562

NOTE: This requirement only applies to certain M2M devices and internet-of-things (IoT) devices.

Machine-to-Machine (M2M) and Internet of Things (IoT) devices may request the use of extended idle-mode DRX (idle mode eDRX), to reduce power consumption.

If the device supports idle mode eDRX and wants to use idle mode eDRX, it shall request idle mode eDRX in every ATTACH REQUEST and TRACKING AREA UPDATE REQUEST message by including the Extended DRX parameters IE. The requested eDRX value shall be set based on device application needs, for example by considering the delay tolerance of the mobile terminating services on the device. The device shall request eDRX values that are within the ranges defined in 3GPP TS 24.008 section-10.5.5.32

The device shall use the Extended DRX parameter values provided by the network in the last ATTACH ACCEPT or TRACKING AREA UPDATE ACCEPT message. The device shall NOT use idle mode eDRX if the network does not include the Extended DRX parameters IE in the last ATTACH ACCEPT or TRACKING AREA UPDATE ACCEPT message.

Refer to Sections 5.3.12, 5.5.1.2.2, 5.5.1.2.4, 5.5.3.2.2, 5.5.3.2.4 and 5.6.2.2.1.1 of the Release 13 version of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, and Section 10.5.5.32 of the Release 13 version of 3GPP TS 24.008: *Mobile radio interface Layer 3 specification; Core network protocols; Stage 3*.

When configured by NAS layer to use idle mode eDRX, the device shall only use idle mode eDRX if idle mode eDRX is allowed in the cell that the UE camps on, as indicated in SIB1 or SIB1-BR, per Release 13 version of 3GPP TS 36.331. The device shall stop using idle mode eDRX if idle mode eDRX is not allowed in the cell.

When the device is in idle mode eDRX, the device shall monitor paging per Section 7.3 of the Release 13 version of 3GPP TS 36.304, shall perform system information modification per Sections 5.2.1.3, 5.2.2.4 and 5.3.2.3 of the Release 13 version of 3GPP TS 36.331, and shall perform cell reselection per the Radio Resource Management requirements in Section 4.2.2 of the Release 13 version of 3GPP TS 36.133.

The device modem shall provide an interface to the application layer such that applications can request the use of idle mode eDRX and/or request to stop using idle mode eDRX, set or change the requested Extended DRX parameter values, query the Extended DRX parameter values requested by device, and query the Extended DRX parameter values provided by the network and in use by device.

The device shall support the AT commands for idle mode eDRX, per Sections 7.40 and 7.41 of the Release 13 version of 3GPP TS 27.007: *AT command set for User Equipment (UE)*.

The device vendor shall provide a means (for example a test application) to test idle mode eDRX in device acceptance testing. It shall provide capabilities to request the use of idle mode eDRX and/or request to stop using idle mode eDRX, to set or change the requested Extended DRX parameter values, to query the Extended DRX parameter values requested by device, and to query the Extended DRX parameter values provided by network and in use by the device.

1.4.1.22 LTE DOWNLINK MONITORING VZ_REQ_LTEB13NAC_38506

1.4.1.22.1 Downlink Supervision Failures VZ_REQ_LTEB13NAC_38507

For all downlink supervision failures that are NOT defined in 3GPP (section 5.3.11 of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*) during RRC-CONNECTED mode (before or after HO, including MIB/SIB read failure), the device shall consider the cell (the EARFCN/PCI where the device failed downlink supervision) for connectivity/selection/reselection purpose no later than a configurable delay after the failure (for example, continue RRC connection without any interruption fulfills this requirement). This delay shall be configurable from 0 to 10 seconds in 1 second increments on the device via a non-volatile memory setting. The default setting for the delay shall be 5 seconds. The vendor shall provide a lab application to modify this delay setting during device acceptance testing. The device vendor shall not allow the user to modify this delay setting through the device user interface or the remote access user interface for tethered devices.

1.4.1.22.2 Non-Essential SIB Information VZ_REQ_LTEB13NAC_38508

In RRC-CONNECTED mode, any non-essential system information detection failure (non-essential system information are any system information other than *MasterInformationBlock*, *SystemInformationBlockType1*, and *SystemInformationBlockType2*) shall NOT trigger downlink supervision failure and shall not cause any interruption of an existing RRC connection.

1.4.1.22.3 MIB/SIB1/SIB2 Acquisition Failure VZ_REQ_LTEB13NAC_41059993119510 87

While operating on the Verizon Wireless LTE network or any HPLMN/EHPLMN, if a cell is to be treated as if the cell status is "barred" due to the device being unable to acquire the *MasterInformationBlock* (or *MasterInformationBlock-NB*), the *SystemInformationBlockType1* (or *SystemInformationBlockType1-BR* message or *SystemInformationBlockType1-NB*), or the *SystemInformationBlockType2* (or *SystemInformationBlockType2-NB*), then the device shall exclude the barred cell as a candidate for cell selection/reselection for TCellBarring_MSIB seconds. TCellBarring_MSIB shall be device configurable with a range of 0-300 seconds (in increments of 10 seconds). The default value for TCellBarring_MSIB shall be in the range of 5 to 30 seconds - the exact value is left to UE implementation. The device vendor shall provide a lab application to modify the default value of TCellBarring_MSIB during device acceptance testing. The device vendor shall not

allow the user to modify the value of TCellBarring_MSIB through the device user interface or the remote access user interface for tethered devices.

NOTE 1: All other requirements in 3GPP TS 36.304 shall apply.

NOTE 2: When operating on a roaming LTE network that is not an EHPLMN, the device may bar the cell for up to 300 seconds as allowed per 3GPP TS 36.304.

1.4.1.23 SERVICE GAP CONTROL AND SGC TIMER T3447

VZ_REQ_LTEB13NAC_41059931949142

1.4.1.23.1 SERVICE GAP CONTROL AND SGC TIMER T3447

VZ_REQ_LTEB13NAC_41059931949143

Service Gap Control is a 3GPP release 15 feature and intended for MTC/CIoT UEs to control the frequency at which these UEs can access the network. That is, to ensure a minimum time gap between consecutive Mobile Originated data communications initiated by the UE. Cat-M1 and NB-IoT devices should support this requirement.

Note: Time critical applications, such as emergency services and regulatory prioritized services can suffer from the latency caused by the Service Gap Control feature. Therefore Service Gap Control feature is not recommended for subscriptions with such applications and services.

The UE supporting service gap control shall indicate its support for service gap control in the ATTACH REQUEST and TRACKING AREA UPDATE REQUEST message via UE network capability information element.

The UE supporting service gap control also shall support service gap timer T3347 included in the ATTACH ACCEPT message or TRACKING AREA UPDATE ACCEPT message and shall stay in RRC-IDLE mode for at least the whole duration of the Service Gap timer before triggering Mobile Originated user data transmission, except for procedures that are exempted (see TS 24.301).

The UE shall start the SGC timer T3447 when the NAS signalling connection is released was mobile originated request for uplink data and SGC timer value is non-zero (see TS 24.301).

The ATTACH/TRACKING AREA UPDATE ACCEPT message contains the T3447 value IE, then the UE shall store the new T3447 value, erase any previous stored T3447 value if exists and use the the new T3447 value with the T3447 timer next time it is started. And if the ATTACH/TRACKING AREA UPDATE ACCEPT message does not contain the T3447 value IE, then the UE shall erase any previous stored T3447 value if it exists and stop the T3447 timer if running.

For detail requirement of service gap control, refer to Sections 5.3.17, 5.5.1.2, 5.5.1.3, 5.5.3, 9.9.3.34 of the Release 15 *3GPP TS 24.301: Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, and Section 4.3.7.4, 4.3.17.9, 5.3.2, 5.3.3, 5.7.5 of the Release 15 *3GPP TS 23.401: General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access*.

For detail requirement of service gap control timer T3447, refer to Sections 5.3.1, 5.3.17, 5.5.1.2, 5.5.1.3, 5.5.3, 5.6.1, 5.6.3 and 6.5.1.5 of the Release 15 *3GPP TS 24.301: Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage*.

1.4.2 UICC ERROR CONDITIONS VZ_REQ_LTEB13NAC_40796

1.4.2.1 NO UICC PRESENT or UICC REMOVED VZ_REQ_LTEB13NAC_40797

If no UICC is present or if the device cannot detect a UICC that is present, then the device shall not attempt to access any LTE network.

The device shall detect the removal of the UICC from the device within 30 seconds of removal.

If the device detects that the UICC has been removed while the device is connected to a LTE network, then the device shall immediately cease operation on the LTE network except for the exception noted below. The device shall detach from any LTE network that it was attached to at the time of UICC removal. All normal LTE detach procedures per this document shall apply (refer to VZ_REQ_LTEB13NAC_6374 and VZ_REQ_LTEB13NAC_6375 for additional details). The device shall not attempt to access any LTE network until a UICC is inserted except for the exception noted below.

EXCEPTION: The device shall allow emergency calling regardless of whether a UICC is inserted or not.

1.4.3 NIDD/SCEF REQUIREMENT FOR LTE CAT M1 and NB-IOT
VZ_REQ_LTEB13NAC_12083025

The Cat-M1 and NB-IoT devices that support Non-IP data delivery through SCEF shall support requirements in this section. **NOTE:** The requirements in this section apply to Cat-M1 and NB-IoT devices only, and are in addition to the other requirements in this document.

1.4.3.1 NON-IP APN SUPPORT VZ_REQ_LTEB13NAC_12084129

For NIDD/SCEF supporting devices, when requesting a connection to a PDN, the device shall use the APN associated with that PDN based on the APN class as defined in requirement VZ_REQ_LTEB13NAC_6326 of this document and in addition to that the device shall also use Non-IP APNs as described below.

- The device shall use the Class 10 APN (VZWSCEF) for the non-IP Application PDN.
- The device shall use the Class 11 APN (VZWSCEFADMIN) for the non-IP administrative PDN

When the device is operated with a Verizon Wireless UICC, the device shall comply with the requirements VZ_REQ_LTEB13NAC_6385 of this document. In addition to APNs listed in requirement VZ_REQ_LTEB13NAC_6385, non-IP APNs shall also be stored on the device in non-

volatile memory and factory provisioned. Non-IP APNs are detailed in the table below:

APN Class	APN NI	APN IP Type	APN Bearer	APN Enable/ Disable	APN MAX_CONN and MAX_CONN_T	APN WAIT_TIME	Description
10	VZWSCEF	Non-IP	LTE	Enabled	MAX_CONN: 20 MAX_CONN_T: 300	0	Verizon Wireless Non-IP Application PDN
11	VZWSCEFADMIN	Non-IP	LTE	Enabled	MAX_CONN: 20 MAX_CONN_T: 300	0	Verizon Wireless Non-IP Administrative PDN

Design Notes:

- SCEF service will be a newly added APN service that can be added to existing IP APN services.
- This Non-IP APN can be used for other IMSI ranges other than 311270 and 311480.
- VZWSCEFADMIN will be dedicated to VZW Device Management and SIM-OTA

1.4.3.2 NON-IP PDN CONNECTION FOR NETWORK ATTTACHMENT AND ON-DEMAND PDN ESTABLISHMENT VZ_REQ_LTEB13NAC_12086437

The devices supporting NIDD/SCEF shall support PDN connection requirement as defined in requirement VZ_REQ_LTEB13NAC_6349 of this document and on-demand PDN connection as defined in requirement VZ_REQ_LTEB13NAC_23570 of this document. In addition to those, the device shall also support below,

- In normal operation for devices that do NOT support IMS and support SCEF, the device shall NOT specify an APN when attaching to the LTE network.

- As the attach PDN for devices that do not support IMS, the device shall specify PDN type to either "IPV4V6" or "non IP" (i.e. the device shall allow the network to choose the attach APN based on PDN type mentioned by the device). The network will use the Internet PDN (or PDN identified by the Class 3 APN) when PDN type set to "IPV4V6" or the Non-IP Application PDN (or PDN identified by Class 10) when PDN type set to "Non IP".
- After initial network attachment to the IMS PDN (i.e. normal operation) for IMS capable devices, the device shall establish a default bearer to the Internet PDN, the Administrative PDN, the VZW Application PDN, the Non-IP application PDN or the Non-IP administrative PDN if an application(s) running on the device or a tethered laptop requires a bearer to any of these PDNs. Refer to the *LTE IPv6/IPv4 and Bearer Support* section of this document for additional details.
- For devices that do NOT support IMS (i.e. normal operation) and after initial network attachment to the Internet PDN (Class-3), the device shall establish a default bearer to the Administrative PDN, the VZW Application PDN, the Non-IP application PDN or the Non-IP administrative PDN if an application(s) running on the device or a tethered laptop requires a bearer to any of these PDNs. Refer to the *LTE IPv6/IPv4 and Bearer Support* section of this document for additional details.
- For devices that do NOT support IMS (i.e. normal operation) and after initial network attachment to the Non-IP application PDN (Class 10), the device shall establish a default bearer to the Internet PDN, the Administrative PDN, the VZW Application PDN or the Non-IP administrative PDN if an application(s) running on the device or a tethered laptop requires a bearer to any of these PDNs. Refer to the *LTE IPv6/IPv4 and Bearer Support* section of this document for additional details.
- For all on-demand PDN connections established after the initial attach, the APN shall be included in the PDN CONNECTIVITY REQUEST message. If a connection to an on-demand PDN is no longer required (i.e. the application(s) using the on-demand PDN have been closed), the device shall release the default bearer to the PDN by sending a PDN DISCONNECT REQUEST message. Refer to VZ_REQ_LTEB13NAC_22722 of this document for more details.

1.4.3.3 NON-IP DATA DELIVERY VZ_REQ_LTEB13NAC_12087280

Device shall support Non IP data delivery through SCEF using Non IP APNs as mentioned in requirement VZ_REQ_LTEB13NAC_12084129 of this document. Refer to section 6.5.1 of 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3* and

sections 4.3.17.8 and 5.10 of 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access* for additional detail.

Device performing PDN connection request for PDN type= Non-IP shall not include Protocol or Container ID 8021H (IPCP- Internet protocol control protocol) via ePCO, which is not supported by SCEF.

1.4.3.4 SUPPORT OF SERVING PLMN AND APN RATE CONTROL VZ_REQ_LTEB13NAC_12087372

Device shall support **APN rate control** for both control and user plane data transfer. *APN rate control from SCEF/PDN GW is as defined in 4.7.7 of 3GPP TS 23.401: General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access by limiting the Uplink data PDU rate with user data. The UE shall include an APN rate control support indicator and an additional APN rate control for exception data support indicator in the protocol configuration options IE or extended protocol configuration options IE. ¿The UE shall limit the rate at which it generates uplink user data messages to comply with the APN rate control policy. Refer to sections 6.3.9, 6.4.1, 6.5.1.2 and 9.9.4.11 of 3GPP TS 24.301: Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3 for additional details.*

Device shall also support **Serving PLMN ¿rate control** for control plane (NAS) data PDUs either using PDN GW or SCEF. The MME can inform the UE of any local serving PLMN rate control during the default EPS bearer context activation procedure. The UE shall limit the rate at which it generates uplink NAS messages with user data over control plane to comply with the serving PLMN policy provided by the network. *Refer to sections 4.7.7, 5.3.4 of 3GPP TS 23.401: General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access and 6.3.9, 6.4.1, 9.9.4.11 of 3GPP TS 24.301: Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3 for additional details.*

1.4.3.5 RELIABLE DATA SERVICE PROTOCOL VZ_REQ_LTEB13NAC_12087390

Device shall support RDS (Reliable data service) protocol. *RDS supports peer-to-peer data transfers and shall provide reliable data delivery between the UE and the SCEF. The data is transferred via a PDN connection between the UE and SCEF. This service provides a mechanism for the SCEF to determine if the data was successfully delivered to the UE and for UE to determine if the data was*

successfully delivered to the SCEF. Refer to 3GPP TS 24.250 and section 4.5.14.3 of 3GPP TS 23.682 for additional details.

1.4.3.6 CIoT EPS OPTIMIZATION SUPPORT FOR NIDD/SCEF VZ_REQ_LTEB13NAC_37620650603417 46

Device shall support Control plane CIoT Optimisation in able to support Non-IP data delivery through SCEF and device shall indicate the CP CIoT Optimisation support in UE Network Capability during attach or tracking area updating procedure. Refer to section 6.5.1 of 3GPP TS 24.301; also sections 4.3.17.8 & 4.7.1 of 3GPP TS 23.401 for more details.

1.4.3.7 GCF CERTIFICATION REQUIREMENT FOR NIDD/SCEF VZ_REQ_LTEB13NAC_37620990651405 18

To be certified for NIDD/SCED functionality, device shall complete NIDD/SCEF functionality testing using all related test cases from 3GPP 36.523-1 protocol conformance test document during GCF certification. Test cases to be completed are including but not limited to TC#22.1.1, 22.5.21 for NB-IoT and TC#23.1 for Cat-M1.

1.5 PROVISIONING VZ_REQ_LTEB13NAC_1885

1.5.1 ~~LTE CREDENTIAL STORAGE~~ VZ_REQ_LTEB13NAC_1886

1.5.1.1 ~~LTE CREDENTIAL STORAGE~~ VZ_REQ_LTEB13NAC_6383

1.5.2 PROVISIONING SEQUENCE VZ_REQ_LTEB13NAC_1887

1.5.2.1 PROVISIONING SEQUENCE VZ_REQ_LTEB13NAC_6384

The device shall support provisioning/updates to the UICC/USIM using the Envelope SMS-PP Data Download as per 3GPP TS 31.111: *Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)* and the Bearer Independent Protocol-related class E commands as specified in ETSI TS 102 223: *Smart cards; Card Application Toolkit (CAT), Release 8*.

NOTE: The device shall implement the BIP connection establishment and processing exclusively on the baseband processor of the modem (as opposed to on an application processor in the device).

1.5.3 ~~SPECIFIC LTE PROGRAMMING PARAMETERS~~ VZ_REQ_LTEB13NAC_1888

1.5.4 FACTORY LTE PROGRAMMING VZ_REQ_LTEB13NAC_1889

1.5.4.1 ~~APN'S~~ VZ_REQ_LTEB13NAC_23652

1.5.4.1.1 FACTORY LTE PROGRAMMING - APN'S VZ_REQ_LTEB13NAC_6385

When the device is operated with a Verizon Wireless UICC, the device shall comply with the requirements in this section. APNs for the IMS PDN, the Administrative PDN, the Internet PDN, and the VZW Application PDN shall be stored on the device in non-volatile memory and factory provisioned with the

- APN Class
- APN Network Identifier
- APN IP Type
- APN Bearer
- APN Enable/Disable
- APN MAXCONN, MAXCONN_T, WAIT_TIME

detailed in the table below:

APN Class	APN NI	APN IP Type**	APN Bearer	APN Enable/ Disable	APN MAX_CONN+ and MAX_CONN_T+	APN WAIT_TIME+	Description
1++	IMS	IPv4v6	LTE	Enabled	MAX_CONN: 20 MAX_CONN_T: 300	0	Verizon Wireless IMS PDN
2	VZWADMIN	IPv4v6	LTE	Enabled	MAX_CONN: 20 MAX_CONN_T: 300	0	Verizon Wireless Administrative PDN
3	VZWINTERNET	IPv4v6	LTE	Enabled	MAX_CONN: 20 MAX_CONN_T: 300	0	Verizon Wireless Internet PDN
4	VZWAPP	IPv4v6	LTE	Enabled*	MAX_CONN: 20 MAX_CONN_T: 300	0	Verizon Wireless Application PDN

* VOID

** Per the *Scenarios* section of this document, the device shall set the "PDN Type" to *IPv4v6* for all PDN CONNECTIVITY REQUEST messages regardless of the Type listed in the table above. For the IMS PDN, the network will most likely only provide an IPv6 address.

+ MAX_CONN, MAX_CONN_T, and WAIT_TIME are per the Verizon Wireless LTE Data Retry Requirements. **NOTE:** These parameters are not configurable via OTADM.

++ Applies to IMS capable devices ONLY. Devices that do NOT support IMS shall NOT populate this row in the APN table.

The device shall provide the capability of updating all APN parameters in the table above through OTADM except MAX_CONN, MAX_CONN_T, and WAIT_TIME (i.e. MAX_CONN, MAX_CONN_T, and WAIT_TIME are NOT OTADM configurable). Refer to the *OTADM* section of this document for additional details. The device shall not allow the user to update the following APN related parameters through the device user interface or the remote access user interface for tethered devices:

- APN Class
- APN IP Type
- APN Bearer
- APN Enable/Disable
- APN MAXCONN, MAXCONN_T, WAIT_TIME

If any APN parameter in the table above is updated after a PDN connection using the APN has been established, the device shall release the PDN connection and then immediately re-establish the PDN connection using the updated APN parameter(s). If any APN parameter in the table above is updated for an APN for which the device has no current PDN connection, the device shall use the updated APN parameter(s) in all future PDN connections using the APN. Refer to the *Scenarios* section of this document for additional details.

The device shall maintain the contents of the APN table during a device software update, i.e. the contents of the APN table after the software update shall be the same as before the software update.

1.5.4.2 ~~SMS FORMAT PARAMETER~~VZ_REQ_LTEB13NAC_23653

1.5.4.2.1 FACTORY LTE PROGRAMMING - SMS FORMAT PARAMETER VZ_REQ_LTEB13NAC_6386

IMS capable devices shall store the smsformat parameter described in the table below in non-volatile memory. This parameter shall be factory provisioned with the parameter set to "3gpp2". Refer to the Verizon Wireless LTE SMS Requirements for additional details.

Parameter	Value	Description
smsformat	3gpp2	The device shall use 3GPP2 SMS format per 3GPP2 C.S0015-A v1.0 *"Short Message Service (SMS) for Wideband Spread Spectrum Systems"* for SMS over IMS (i.e. SMS messages sent from the device using SMS over IMS)
	3gpp	The device shall use 3GPP SMS format per 3GPP TS 23.204: *Support of Short Message Service (SMS) over generic 3GPP Internet Protocol (IP) access; Stage 2* for SMS over IMS (i.e. SMS messages sent from the device using SMS over IMS)

NOTE: For SMS over NAS, this requirement does NOT apply. SMS over NAS always uses 3GPP format.

1.5.5 ~~USER LTE PROGRAMMING~~ VZ_REQ_LTEB13NAC_1890

1.5.5.1 ~~SMSWRITEUICC PARAMETER~~ ~~VZ_REQ_LTEB13NAC_23654~~

1.5.5.1.1 ~~USER LTE PROGRAMMING - SMSWRITEUICC PARAMETER~~ ~~VZ_REQ_LTEB13NAC_6387~~

1.6 PERFORMANCE - Cat 1 and Higher Devices VZ_REQ_LTEB13NAC_1891

1.6.1 LTE UE MINIMUM PERFORMANCE REQUIREMENTS VZ_REQ_LTEB13NAC_1892

- Test environments for 3GPP standard RF and signaling conformance shall be per 3GPP TS 36.508: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Common test environments for User Equipment (UE) conformance testing.*

1.6.1.1 ~~LTE RF AND RRM CONFORMANCE REQUIREMENTS~~ ~~VZ_REQ_LTEB13NAC_23655~~

1.6.1.1.1 LTE RF AND RRM CONFORMANCE REQUIREMENTS VZ_REQ_LTEB13NAC_6388

The device shall meet all RF and RRM conformance requirements for 3GPP Release 9, including all RF and RRM requirements and conformance test cases defined in:

- 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*
- 3GPP TS 36.133: *Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management*
- 3GPP TS 36.521-1: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: conformance testing*
- 3GPP TS 36.521-3: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Radio Resource Management conformance testing*

with the following exceptions:

- The value used in RF conformance testing (per 3GPP TS 36.521-1: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: conformance testing*) for REFSENS for a 10 MHz channel in 3GPP Band 13 shall be -97 dBm with an uplink RB allocation of 15 RB starting at RB 0. Refer to the *Receiver Sensitivity QPSK Modulation* section of this document for additional details.
- The tolerance for the UE power class 3 in Table 6.2.2-1 of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception* for 3GPP Band 13 shall be +2/-1 dB. Refer to the *Maximum Conducted Output Power* section of this document for additional details.
- For 3GPP Band 13 operation, Table 6.2.5-1 in 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception* shall be replaced with the table in the *Configured Output Power* section of this document.

NOTE 1: 3GPP Band 13 is not included under Note 2 in Table 6.2.2-1 of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*. As a result, the 1.5 dB relaxation in the transmitter requirements below for uplink allocations within 4 MHz of a band edge are not applicable to LTE 3GPP Band 13 devices:

- UE maximum output power (section 6.2.2 of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*)
- Configured transmitted power (section 6.2.5 of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*)

- Power control (section 6.3.5 of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*)

NOTE 2: All transmitter signal quality and transmitter emissions requirements defined by 3GPP in 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*) that are **relative measurements** (e.g. carrier leakage, in-band emissions, adjacent channel leakage ratio, etc.) shall be met both conducted (at the UE antenna ports) and radiated.

1.6.1.2 ~~LTE SIGNALING CONFORMANCE~~ VZ_REQ_LTEB13NAC_23656

1.6.1.2.1 LTE SIGNALING CONFORMANCE VZ_REQ_LTEB13NAC_6389

The device shall meet all signaling requirements for 3GPP Release 9, including all signaling requirements and conformance test cases defined in:

- 3GPP TS 36.523-1: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification*
- The Verizon Wireless LTE Supplementary Signaling Conformance Test Plan

1.6.1.3 ~~GCF CERTIFICATION~~ VZ_REQ_LTEB13NAC_23657

1.6.1.3.1 GCF CERTIFICATION VZ_REQ_LTEB13NAC_6390

The device shall be GCF certified for LTE operation in Band 13. Refer to the Verizon Wireless LTE 3GPP Band 13 Device Conformance Test Process for additional details.

1.6.2 VERIZON WIRELESS-SPECIFIC LTE 3GPP BAND 13 RF PERFORMANCE REQUIREMENTS VZ_REQ_LTEB13NAC_1893

Verizon Wireless-specific RF performance requirements for 3GPP Band 13 build on the RF minimum performance requirements in 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*. Compliance to all Verizon Wireless-specific LTE 3GPP Band 13 RF performance requirements shall be per the Verizon Wireless LTE 3GPP Band 13 Supplementary RF Conformance Test Plan unless indicated otherwise.

1.6.2.1 MAXIMUM TRANSMITTER OUTPUT POWER AND CONFIGURED OUTPUT POWER VZ_REQ_LTEB13NAC_23658

1.6.2.1.1 ~~MAXIMUM CONDUCTED OUTPUT POWER~~ VZ_REQ_LTEB13NAC_23659

1.6.2.1.1.1 MAXIMUM CONDUCTED OUTPUT POWER VZ_REQ_LTEB13NAC_6391

The device shall be a UE Power Class 3 device with the following exception: the device conducted output power shall be +22 dBm minimum for all resource block (RB) allocations in a 10 MHz channel where the allowable Maximum Power Reduction (MPR) and Additional Maximum Power Reduction

(A-MPR) are both 0 dB (for cases where MPR and A-MPR is applicable, the output power may be reduced by the corresponding values of MPR and A-MPR).

Maximum Power Reduction (MPR) may be applied based on RB allocation size and modulation type per 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*.

1.6.2.1.2 ~~MAXIMUM RADIATED OUTPUT POWER~~ ~~VZ_REQ_LTEB13NAC_23660~~

1.6.2.1.2.1 MAXIMUM RADIATED OUTPUT POWER VZ_REQ_LTEB13NAC_6392

The Total Radiated Power (TRP) shall meet the requirements in the table below for all RB allocations in a 10 MHz channel where the allowable MPR and A-MPR are both 0 dB (for cases where MPR and A-MPR is applicable, the values in the table may be reduced by the corresponding values of MPR and A-MPR).

These requirements apply for all valid mechanical use modes of the device, all antenna types, and for both the antenna extended or retracted in the case of devices with retractable antennas. Valid mechanical modes comprise all the mechanical use modes for the device that an end user would be expected to encounter in the course of normal operation of the device. Radiated output power testing shall be per the Verizon Wireless LTE Over the Air Radiated Performance Test Plan.

For any mode in which the device supports voice operation against the head, the device shall meet the requirements in the table below for all valid mechanical modes of the device for the following:

- Free space (FS)
- Head with right hand phantom, i.e. beside head and hand right side (BHHR)
- Head with left hand phantom, i.e. beside head and hand left side (BHHL)
- Right hand only phantom, i.e. hand right (HR)
- Left hand only phantom, i.e. hand left (HL)

NOTE 1: If the device supports voice operation against the head in a given mechanical mode and is wider than 72mm, then the device shall be tested using the CTIA wide grip hand phantom, and the BHHR/BHHL and HR/HL requirements below shall apply.

In the case of devices that support operation against the head in at least one mode, for any mode in which the device does not support voice operation against the head but does support data operation, the device shall meet the requirements in the table below for all valid mechanical modes of the device for the following:

- Free space (FS)
- Right hand only phantom, i.e. hand right (HR)
- Left hand only phantom, i.e. hand left (HL)

For data-centric devices that do not support voice operation against the head, the device shall meet the requirements in the table below for all valid mechanical modes of the device for the following:

- Free space (FS)

NOTE 2: Foldable devices with a vertical or horizontal hinge that support voice operation against the head shall apply the requirements in the table below as follows:

- ***Open Mechanical Use Case***: FS, HR/HL (if the device fits in the hand phantom in the open mechanical use case), BHHR/BHHL (if the device supports voice against the head in the open mechanical use case and fits in the hand phantom in the open mechanical use case)
- ***Closed Mechanical Use Case***: FS, HR/HL (if the device fits in the hand phantom in the closed mechanical use case), BHHR/BHHL (if the device supports voice against the head in the closed mechanical use case and fits in the hand phantom in the closed mechanical use case)

The conducted output power of devices submitted for Verizon Wireless over-the-air performance testing shall not exceed the conducted output power of devices submitted for FCC SAR testing. If the conducted output power of devices submitted for Verizon Wireless over-the-air performance testing exceed the conducted output power of devices submitted for FCC SAR testing, Verizon Wireless will adjust the TRP results downward accordingly to determine compliance to Verizon Wireless TRP requirements.

Device Held Up to Head (Yes/No)	Antenna Type	Device Mode	3GPP Band 13 (dBm, Minimum)			
			FS	BH (BHL and BHR)	BHHR/BHHL	HR/HL
Yes(1)	Embedded	LTE	+17	+15	+10	+15
	Stub Or Retractable	LTE	+19	+16	+11	+16
No(2)	All	LTE	+18	N/A	N/A	N/A

(1) "Yes" applies if the device supports a mode of operation against the head.

(2) "No" would be applicable to data centric devices that are not held up to the head, e.g. data cards, USB dongles, embedded laptop modules, etc.

1.6.2.1.2.2 ~~RADIATED OUTPUT POWER REDUCTION FOR TABLETS~~ ~~VZ_REQ_LTEB13NAC_23661~~

1.6.2.1.2.3 Radiated Output Power Reduction for Tablets VZ_REQ_LTEB13NAC_6481

Tablet devices may reduce radiated output power to meet FCC SAR requirements. If radiated output reduction is implemented in a tablet device, the tablet device shall meet the following requirements:

- The tablet device shall implement a proximity sensor such that radiated output power reduction is only applied when the tablet device is in close proximity to a human body. The tablet device shall not apply radiated output power reduction when the tablet device is not in close proximity to a human body (e.g. lying on a table).
- The tablet device shall be designed such that the radiated output power reduction needed to meet FCC SAR requirements for LTE operation in 3GPP Band 13 shall not exceed 7 dB.

- The device vendor shall provide a lab application to apply the radiated output power reduction setting during device acceptance testing. The device vendor shall not allow the user to modify the radiated output power setting through the device user interface or the remote access user interface for tethered devices.
- TRP shall be measured and reported with and without the radiated output power reduction applied.

1.6.2.1.3 ~~CONFIGURED OUTPUT POWER~~VZ_REQ_LTEB13NAC_23662

1.6.2.1.3.1 CONFIGURED OUTPUT POWER VZ_REQ_LTEB13NAC_6393

The device shall meet the requirements in section 6.2.5 of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception* with the following exception. For 3GPP Band 13 operation, Table 6.2.5-1 in 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception* shall be replaced with the table below:

P_{CMAX} (dBm)	Tolerance T(P_{CMAX}) (dB)
21 <= P_{CMAX} <= 23	+2.0/-1.0
0 <= P_{CMAX} < 21	+/- 2.0
-40 <= P_{CMAX} < 0	+/- 7.0

1.6.2.2 TRANSMITTER EMISSIONS AND TRANSMIT SIGNAL QUALITY VZ_REQ_LTEB13NAC_23663

1.6.2.2.1 ~~NS_06 EMISSIONS~~ VZ_REQ_LTEB13NAC_23664

1.6.2.2.1.1 NS_06 EMISSIONS VZ_REQ_LTEB13NAC_6394

When attached to the Verizon Wireless LTE network using 3GPP Band 13, the device shall at all times meet the additional spectrum emissions requirements associated with a network signaled value of "NS_06" per 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*. The NS_06 emissions mask insures compliance with FCC Part 27 requirements.

1.6.2.2.2 ~~NS_07 EMISSIONS~~ VZ_REQ_LTEB13NAC_23665

1.6.2.2.2.1 NS_07 EMISSIONS VZ_REQ_LTEB13NAC_6395

When signaled by the network, the device shall meet the additional spectrum and spurious emissions requirements associated with a network signaled value of "NS_07" per 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*.

Additional Maximum Power Reduction (A-MPR) may be applied to meet the additional spurious emissions requirement per section 6.2.4 of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception* with the following

exception: For 3GPP Band 13 operation of devices that support voice operation and are LTE category 2 or higher, Table 6.2.4-2 in 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception* shall be replaced with the table below:

Parameters	Region A	Region B		Region C
RB_start[1]	0 - 12	13-18	19-42	43-49
L_CRB[2] [RBs]	>= 16	>= 25	<= 30	<= 7
A-MPR [dB]	<= 4	<= 3	0	0

Note

1. RB_start indicates the lowest RB index of transmitted resource blocks
2. L_CRB is the length of a contiguous resource block allocation
3. For intra-subframe frequency hopping between two regions, notes 1 and 2 apply on a per slot basis.
4. For intra-subframe frequency hopping between two regions, the larger A-MPR value of the two regions may be applied for both slots in the subframe.

NOTE: Devices that do NOT support voice operation against the head may apply A-MPR as defined in Table 6.2.4-2 per 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*. Category 1 devices that support voice operation against the head may apply A-MPR as defined in Table 6.2.4-2 per 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*.

If NS_07 is deployed in a cell, Verizon Wireless will also allow the network option to implement PUCCH (Physical Uplink Control Channel) over-provisioning in that cell. As a result, the device shall support PUCCH over-provisioning. In the NS_07 with PUCCH over-dimensioning scenario, the RBs used for transmitting the PUCCH would be within Region B (refer to the NS_07 A-MPR table in 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE)*

radio transmission and reception for a description of the regions). Unused or "blanked" PUCCH RBs in Regions A and C would be re-allocated for PUSCH (Physical Uplink Shared Channel) transmission. *Verizon Wireless deployment details are in development. Additional details will be included in a future release.*

1.6.2.2.3 ~~SPURIOUS EMISSIONS FOR UE CO-EXISTENCE WITH OTHER 3GPP FREQUENCY BANDS~~ ~~VZ_REQ_LTEB13NAC_23666~~

1.6.2.2.3.1 SPURIOUS EMISSIONS FOR UE CO-EXISTENCE WITH OTHER 3GPP FREQUENCY BANDS VZ_REQ_LTEB13NAC_6396

The device shall meet the requirements in the table below for emissions into other 3GPP frequency bands. These emission requirements shall apply to UE transmitter emissions into the downlink bands of 3GPP Bands 2, 4, 5, 10, 12, 14, and 17 (3GPP band definition is per 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*).

Uplink RB Allocation Size	UE Transmit Power	Emission Requirement
<= 15 RB	<= Maximum UE output power	<= -60 dBm/MHz
> 15 RB and <= 50 RB	<= +10 dBm	<= -60 dBm/MHz
> 15 RB and <= 50 RB	> +10 dBm	<= -50 dBm/MHz

1.6.2.2.4 ~~UE TRANSMITTER LO AND IMAGE SUPPRESSION~~ ~~VZ_REQ_LTEB13NAC_23667~~

1.6.2.2.4.1 UE TRANSMITTER LO AND IMAGE SUPPRESSION

VZ_REQ_LTEB13NAC_6397

The device shall meet the requirements in the table below for transmitter LO and image suppression.

UE Transmitter Output Power	Limit	
	LO	Image
Output power > 0 dBm	-28 dBc	-30 dB
-30 dBm <= Output power <= 0 dBm	-20 dBc	-25 dB
-40 dBm <= Output power < -30 dBm	-10 dBc	-25 dB

~~1.6.2.2.5 SPURIOUS EMISSIONS FOR UE CO-EXISTENCE WITH GPS~~

~~VZ_REQ_LTEB13NAC_23668~~

1.6.2.2.5.1 SPURIOUS EMISSIONS FOR UE CO-EXISTENCE WITH GPS

VZ_REQ_LTEB13NAC_6398

The device shall meet the requirements in the table below for transmitter emissions into the GPS frequency band for all uplink RB allocations and output power levels.

Frequency	Emission Requirement

1559.00 MHz -1574.42 MHz	<= -60 dBm/MHz
1574.42 MHz -1576.42 MHz	<= -80 dBm/MHz
1576.42 MHz -1610.00 MHz	<= -60 dBm/MHz

1.6.2.3 RECEIVER SENSITIVITY QPSK MODULATION VZ_REQ_LTEB13NAC_23669

1.6.2.3.1 ~~CONDUCTED SENSITIVITY~~ VZ_REQ_LTEB13NAC_23670

1.6.2.3.1.1 CONDUCTED SENSITIVITY VZ_REQ_LTEB13NAC_6399

The device conducted reference sensitivity (with QPSK modulation) shall meet the requirements in the table below for a 10 MHz channel bandwidth:

Maximum Sensitivity	Uplink RB Allocation Size	Minimum UE Transmit Power
-97 dBm, Dual Receiver -94 dBm, Single Receiver	<= 12 RB	+22 dBm (QPSK)
-97 dBm, Dual Receiver -94 dBm, Single Receiver	> 12 RB and <= 15 RB	+21 dBm (QPSK)
-97 dBm, Dual Receiver -94 dBm, Single Receiver	> 15 RB and <= 50 RB	+0 dBm (QPSK)

Single receiver testing is per the Verizon Wireless LTE 3GPP Band 13 Supplementary RF Conformance Test Plan.

1.6.2.3.2 ~~RADIATED SENSITIVITY~~ VZ_REQ_LTEB13NAC_23671

1.6.2.3.2.1 RADIATED SENSITIVITY VZ_REQ_LTEB13NAC_6400

When operating in LTE Band 13, the radiated sensitivity with QPSK modulation and with all receivers enabled on the device in a manner that is consistent with the normal operation of the device shall meet the Combined Total Isotropic Sensitivity (C-TIS) requirements in the table below.

These requirements apply for all valid mechanical use modes of the device, all antenna types, and for both the antenna extended or retracted in the case of devices with retractable antennas. Valid mechanical modes comprise all the mechanical use modes for the device that an end user would be expected to encounter in the course of normal operation of the device. Radiated sensitivity testing shall be per the Verizon Wireless LTE Over the Air Radiated Performance Test Plan.

For any mode in which the device supports voice operation against the head, the device shall meet the requirements in the table below for all valid mechanical modes of the device for the following:

- Free space (FS)
- Head with right hand phantom, i.e. beside head and hand right side (BHHR)
- Head with left hand phantom, i.e. beside head and hand left side (BHHL)
- Right hand only phantom, i.e. hand right (HR)
- Left hand only phantom, i.e. hand left (HL)

NOTE 1: If the device supports voice operation against the head in a given mechanical mode and is wider than 72mm, then the device shall be tested using the CTIA wide grip hand phantom, and the BHHR/BHHL and HR/HL requirements below shall apply.

In the case of devices that support operation against the head in at least one mode, for any mode in which the device does not support voice operation against the head but does support data operation, the device shall meet the requirements in the tables below for all valid mechanical modes of the device for the following:

- Free space (FS)
- Right hand only phantom, i.e. hand right (HR)
- Left hand only phantom, i.e. hand left (HL)

For data-centric devices that do not support voice operation against the head, the device shall meet the requirements in the tables below for all valid mechanical modes of the device for the following:

- Free space (FS)

NOTE 2: Foldable devices with a vertical or horizontal hinge that support voice operation against the head shall apply the requirements in the table below as follows:

- ***Open Mechanical Use Case***: FS, HR/HL (if the device fits in the hand phantom in the open mechanical use case), BHHR/BHHL (if the device supports voice against the head in the open mechanical use case and fits in the hand phantom in the open mechanical use case)
- ***Closed Mechanical Use Case***: FS, HR/HL (if the device fits in the hand phantom in the closed mechanical use case), BHHR/BHHL (if the device supports voice against the head in the closed mechanical use case and fits in the hand phantom in the closed mechanical use case)

Device Held Up to Head	Antenna Type	3GPP Band 13 C-TIS, 10 MHz Channel Bandwidth (3) dBm (Maximum)

(Yes/No)		FS	BHR/BHL	BHHR/BHHL	HR/HL
Yes (1)	Embedded	-93.5	-88.5	-82.5	-88.5
	Stub or Retractable	-93.5	-90.5	-84.5	-90.5
No (2)	All	-93.5	N/A		

(1) "Yes" applies if the device supports a mode of operation against the head.

(2) "No" would be applicable to data centric devices that are not held up to the head, e.g. data cards, USB dongles, embedded laptop modules, etc.

(3) For 5 MHz channel bandwidth, reduce the values above by 3 dB.

(4) For LTE Category 1bis, the single receiver TIS values are equal to the C-TIS values above plus 2.5 dB.

1.6.2.3.2.2~~PRIMARY RECEIVER~~VZ_REQ_LTEB13NAC_23672

1.6.2.3.2.3~~RADIATED SENSITIVITY - Primary Receiver~~VZ_REQ_LTEB13NAC_6401

1.6.2.3.2.4 ~~SECONDARY MIMO RECEIVER~~ VZ_REQ_LTEB13NAC_23673

1.6.2.3.2.5 ~~RADIATED SENSITIVITY - Secondary MIMO Receiver~~ VZ_REQ_LTEB13NAC_6402

1.6.2.3.2.6 ~~MIMO ANTENNA ENVELOPE CORRELATION COEFFICIENT~~ VZ_REQ_LTEB13NAC_23674

1.6.2.3.2.7 MIMO Antenna Envelope Correlation Coefficient VZ_REQ_LTEB13NAC_6403

The device shall meet the following performance requirements when tested in free space (FS) in the MIMO OTA (TM3) environment defined in the latest "in force" version of the CTIA Test Plan for 2x2 Downlink MIMO and Transmit Diversity Over-the-Air Performance:

- The device shall meet 70% of the theoretical maximum throughput in all 12 azimuthal orientations.

- The device shall meet 90% of the theoretical maximum throughput in at least 10 of the 12 azimuthal orientations.
- The device shall meet 95% of the theoretical maximum throughput in at least 10 of the 12 azimuthal orientations.
- The MARSS spatially averaged value for DL SIR for the 70% outage point shall not exceed 23.5 dB. The MARSS spatially averaged value for DL SIR for the 90% and 95% outage points shall not exceed 26 dB.

NOTE: If the device supports 4 receiver operation on Band 13, then MIMO OTA testing for Band 13 shall be performed with all 4 receivers enabled.

1.6.2.4 RECEIVER OUT-OF-BAND INTERFERERS VZ_REQ_LTEB13NAC_23675

1.6.2.4.1 ~~BLOCKING~~ VZ_REQ_LTEB13NAC_23676

1.6.2.4.1.1 BLOCKING VZ_REQ_LTEB13NAC_6404

The device receiver shall be capable of rejecting the inband and out-of-band signals in the table below:

Signal Type	Center Frequency	Channel BW	Signal Level
ATSC	689 MHz	6 MHz	-15 dBm
ATSC	695 MHz	6 MHz	-15 dBm
LTE	719 MHz	5 MHz	-44 dBm
LTE	723 MHz	10 MHz	-44 dBm

LTE	731.5 MHz	5 MHz	-44 dBm
LTE	735 MHz	10 MHz	-44 dBm
LTE	741 MHz	10 MHz	-44 dBm
LTE	743.5 MHz	5 MHz	-44 dBm
LTE	760.5 MHz	5 MHz	-44 dBm
LTE	763 MHz	10 MHz	-44 dBm
CW tone	769-775 MHz	N/A	-30 dBm

For additional details on ATSC signals, refer to A/53: *ATSC Digital Television Standard, Parts 1-6, 2007*.

1.6.2.4.2 ~~INTERMODULATION~~ ~~VZ_REQ_LTEB13NAC_23677~~

1.6.2.4.2.1 INTERMODULATION VZ_REQ_LTEB13NAC_6405

The device receiver shall be capable of rejecting intermodulation distortion from the following pairs of out-of-band signals:

Pair #	Interferer #1 (type, center frequency, channel BW, level)	Interferer #2 (type, center frequency, channel BW, level)
1	ATSC, 689 MHz, 6 MHz, -15 dBm	LTE, 719.5 MHz, 5 MHz, -44 dBm
2	ATSC, 695 MHz, 6 MHz, -15 dBm	LTE, 723 MHz, 10 MHz, -44 dBm
3	LTE, 738.5 MHz, 5 MHz, -44 dBm	LTE, 743.5 MHz, 5 MHz, -44 dBm
4	LTE, 719.5 MHz, 5 MHz, -44 dBm	LTE, 735 MHz, 10 MHz, -44 dBm
5	LTE, 719.5 MHz, 5 MHz, -44 dBm	LTE, 739 MHz, 10 MHz, -44 dBm

6	LTE, 723 MHz, 10 MHz, -44 dBm	LTE, 735 MHz, 10 MHz, -44 dBm
7	LTE, 723 MHz, 10 MHz, -44 dBm	LTE, 739 MHz, 10 MHz, -44 dBm
8	LTE, 731.5 MHz, 5 MHz, -44 dBm	LTE, 741 MHz, 10 MHz, -44 dBm
9	LTE, 735 MHz, 10 MHz, -44 dBm	LTE, 743.5 MHz, 5 MHz, -44 dBm
10	LTE, 760.5 MHz, 5 MHz, -44 dBm	LTE, 765.5 MHz, 5 MHz, -44 dBm
11	LTE, 763 MHz, 10 MHz, -44 dBm	CW tone, 775 MHz, -30 dBm
12	LTE, 760.5 MHz, 5 MHz, -44 dBm	CW tone, 770 MHz, -30 dBm
13	LTE, 765.5 MHz, 5 MHz, -44 dBm	CW tone, 775 MHz, -30 dBm
14	LTE, 701.5 MHz, 5 MHz, -25 dBm	LTE, 723 MHz, 10 MHz, -44 dBm
15	LTE, 712.5 MHz, 5 MHz, -25 dBm	LTE, 734 MHz, 10 MHz, -44 dBm

For additional details on ATSC signals, refer to A/53: *ATSC Digital Television Standard, Parts 1-6, 2007*.

1.6.2.5 RF PERFORMANCE OVER TEMPERATURE AND VOLTAGE VZ_REQ_LTEB13NAC_23678

1.6.2.5.1 ~~AMBIENT TEMPERATURE~~ ~~VZ_REQ_LTEB13NAC_23679~~

1.6.2.5.1.1 AMBIENT OPERATING TEMPERATURE RANGE VZ_REQ_LTEB13NAC_6406

Verizon Wireless-specific RF performance requirements for 3GPP Band 13 apply across the temperature ranges for both the normal and extreme conditions defined in 3GPP TS 36.101: *Evolved*

Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception.

1.6.2.5.1.2 EXTENDED AMBIENT OPERATING TEMPERATURE RANGE

VZ_REQ_LTEB13NAC_6407

The device vendor may design the device to operate over an extreme temperature range that extends from -30° to + 60° C. For devices designed to operate over an extreme temperature range of -30° to + 60° C, 3GPP UE minimum performance requirements per the *LTE UE Minimum Performance Requirements* section of this document and Verizon Wireless-specific RF performance requirements for 3GPP Band 13 apply across the temperature ranges for both the normal and extreme conditions defined in 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception* with the following exceptions:

- The extreme temperature range (refer to section E.2.1 of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*) shall be -30° to + 60° C.
- At ambient temperatures greater than +55° C, the following RF requirements may be relaxed:
    - The conducted output power in the *Maximum Conducted Output Power* section of this document may be relaxed by 2 dB, i.e. the device may apply an additional A-MPR of 2 dB for all uplink RB allocations.
    - The maximum radiated output power (i.e. TRP) in the *Maximum Radiated Output Power* section of this document may be relaxed by 2 dB.
    - The dual receiver and single receiver sensitivity requirements in the *Conducted Sensitivity* section of this document may be relaxed by 2 dB.
    - The radiated sensitivity requirement (i.e. TIS) for the primary receiver in the *Radiated Sensitivity* section of this document may be relaxed by 2 dB.

~~1.6.2.5.2 POWER SUPPLY/BATTERY VOLTAGE~~ ~~VZ_REQ_LTEB13NAC_23680~~

1.6.2.5.2.1 POWER SUPPLY/BATTERY VOLTAGE VZ_REQ_LTEB13NAC_6408

The device manufacturer shall provide the range of operating power supply/battery voltages for the device. The device shall comply with the voltage requirements in 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*, and 3GPP TS 36.508: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Common test environments for User Equipment (UE) conformance testing*. Verizon Wireless-specific RF performance requirements for 3GPP Band 13 apply across the operating voltage of the device.

1.6.3 LTE DATA CALL PERFORMANCE VZ_REQ_LTEB13NAC_1894

The requirements in this section assume an optimal network environment, i.e.:

- One UE per cell
- eNodeB, Serving Gateway, and PDN Gateway are co-located

1.6.3.1 ~~NETWORK ATTACHMENT TIME~~ VZ_REQ_LTEB13NAC_23681

1.6.3.1.1 ~~NETWORK ATTACHMENT TIME~~ VZ_REQ_LTEB13NAC_6409

1.6.3.2 ~~TRANSITION FROM RRC_IDLE TO RRC_CONNECTED~~ VZ_REQ_LTEB13NAC_23682

1.6.3.2.1 ~~TRANSITION FROM RRC_IDLE TO RRC_CONNECTED~~ ~~VZ_REQ_LTEB13NAC_6410~~

1.6.3.3 ~~ROUND TRIP DELAY~~ ~~VZ_REQ_LTEB13NAC_23683~~

1.6.3.3.1 ~~ROUND TRIP DELAY~~ ~~VZ_REQ_LTEB13NAC_6411~~

1.6.3.4 DATA THROUGHPUT PERFORMANCE VZ_REQ_LTEB13NAC_23684

Compliance to the LTE data throughput performance requirements shall be per the Verizon Wireless LTE 3GPP Band 13 Data Throughput Test Plan.

1.6.3.4.1 ~~DOWNLINK DATA THROUGHPUT~~ ~~VZ_REQ_LTEB13NAC_23685~~

1.6.3.4.1.1 DOWNLINK DATA THROUGHPUT VZ_REQ_LTEB13NAC_6412

The device shall be capable of meeting the downlink data throughput requirements in the table below:

UE Category***	Peak Physical Layer Throughput* (Mbps)	Average Throughput Range at the TCP/UDP Layer** (Mbps)
1 (or 1bis)	10	0.050 to >= 8.2
2	50	0.050 to >= 41.0
3, 4, 6, 9	73	0.050 to >= 51.6
>= 11	97	0.050 to >= 72.3

* In a channel without impairments and with sufficient SNR, the device shall be capable of supporting the peak downlink data throughput rate at the physical layer for its given UE Category operating in a 10 MHz channel with the maximum possible transport block size and two layer spatial multiplexing per 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities* and 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*.

** The device shall be capable of operating across this entire range of throughput values for a 10 MHz channel, and dependent on channel conditions (i.e. modulation and coding, signal strength, AWGN, multipath, fading).

*** If the device includes *ue-CategoryDL* field in *UE-EUTRA-Capability* information element, the UE Category in the above table shall take the value set by field *ue-CategoryDL*. Otherwise, it shall take the maximum value set by the field *ue-Category* in the *UE-EUTRA-Capability* information element. Refer to the Release 12 version of 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities*, and the Release 12 version of 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) Protocol Specification*.

1.6.3.4.2 ~~UPLINK DATA THROUGHPUT~~ ~~VZ_REQ_LTEB13NAC_23686~~

1.6.3.4.2.1 UPLINK DATA THROUGHPUT VZ_REQ_LTEB13NAC_6413

The device shall be capable of meeting the uplink data throughput requirements in the table below:

UE Category	Peak Physical Layer Throughput* (Mbps)	Average Throughput Range at the TCP/UDP Layer** (Mbps)
1 (or 1bis)	5	0.050 to >= 3.8
2	25	0.050 to >= 19.0
>= 3	28	0.050 to >= 19.0

* In a channel without impairments and with sufficient SNR, the device shall be capable of supporting the peak uplink data throughput rate at the physical layer for its given UE Category operating in a 10 MHz channel with the maximum possible transport block size as per 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities* and 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*.

** The device shall be capable of operating across this entire range of throughput values for a 10 MHz channel, and dependent on channel conditions (i.e. modulation and coding, signal strength, AWGN, multipath, fading).

1.6.3.5 ~~LTE-TO-LTE HANDOVER PERFORMANCE~~ ~~VZ_REQ_LTEB13NAC_23687~~

1.6.3.5.1 ~~LTE-TO-LTE HANDOVER PERFORMANCE~~ VZ_REQ_LTEB13NAC_6414

1.6.4 VERIZON WIRELESS-SPECIFIC LTE 3GPP BAND 13 RRM PERFORMANCE REQUIREMENTS VZ_REQ_LTEB13NAC_1895

Verizon Wireless-specific RRM performance requirements for 3GPP Band 13 build on the RRM minimum performance requirements in 3GPP TS 36.133: *Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management*. Compliance to all Verizon Wireless-specific LTE 3GPP Band 13 RRM performance requirements shall be per the Verizon Wireless LTE 3GPP Band 13 Supplementary RRM Conformance Test Plan unless indicated otherwise.

1.6.4.1 RSRP ACCURACY VZ_REQ_LTEB13NAC_23688

1.6.4.1.1 ~~RSRP ABSOLUTE ACCURACY~~ VZ_REQ_LTEB13NAC_23690

1.6.4.1.1.1 RSRP ABSOLUTE ACCURACY VZ_REQ_LTEB13NAC_6420

The device shall meet the requirements in the table below for the absolute accuracy of RSRP measurements in RRC_CONNECTED mode (with and without connected mode DRX) and with L3 filtering enabled.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±4	±6	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Inter-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±4	±6	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth.				

The device shall meet the accuracy requirements in the table below for the mean of the absolute RSRP values in RRC_IDLE mode with a default idle mode DRX setting of 1.28 seconds.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±4	±6	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Inter-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±4	±6	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth.				

The device shall meet the accuracy requirements in the table below for the standard deviation of the absolute RSRP values in RRC_IDLE mode with a default idle mode DRX setting of 1.28 seconds.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±FFS	±FFS	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Inter-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±FFS	±FFS	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth.				

1.6.4.1.1.2 ~~RSRP ABSOLUTE ACCURACY FOR FEICIC~~ VZ_REQ_LTEB13NAC_37647

1.6.4.1.2 ~~RSRP RELATIVE ACCURACY~~ VZ_REQ_LTEB13NAC_23691

1.6.4.1.2.1 RSRP RELATIVE ACCURACY VZ_REQ_LTEB13NAC_6421

The device shall meet the requirements in the table below for the relative accuracy of RSRP measurements in RRC_CONNECTED mode (with and without connected mode DRX) and with L3 filtering enabled.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±2	±3	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Inter-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±4	±6	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth. Note 2. The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.				

The device shall meet the accuracy requirements in the table below for the mean of the relative RSRP values in RRC_IDLE mode with a default idle mode DRX setting of 1.28 seconds.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±2	±3	-121dBm/15kHz & -50dBm/ $BW_{Channel}$

Inter-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±4	±6	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth. Note 2. The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.				

The device shall meet the accuracy requirements in the table below for the standard deviation of the relative RSRP values in RRC_IDLE mode with a default idle mode DRX setting of 1.28 seconds.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±FFS	±FFS	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Inter-Frequency RSRP for Ês/Iot [3] -6 dB	dBm	±FFS	±FFS	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth. Note 2. The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.				

1.6.4.1.2.2 ~~RSRP RELATIVE ACCURACY FOR FEICIC~~ ~~VZ_REQ_LTEB13NAC_37648~~

1.6.4.2 RSRQ ACCURACY VZ_REQ_LTEB13NAC_23689

1.6.4.2.1 ~~RSRQ ABSOLUTE ACCURACY~~ ~~VZ_REQ_LTEB13NAC_23692~~

1.6.4.2.1.1 RSRQ ABSOLUTE ACCURACY VZ_REQ_LTEB13NAC_6422

The device shall meet the requirements in the table below for the absolute accuracy of RSRQ measurements in RRC_CONNECTED mode (with and without connected mode DRX) and with L3 filtering enabled.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±2.5	±4	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Inter-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±2.5	±4	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth.				

The device shall meet the accuracy requirements in the table below for the mean of the absolute RSRQ values in RRC_IDLE mode with a default idle mode DRX setting of 1.28 seconds.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±2.5	±4	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Inter-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±2.5	±4	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth.				

The device shall meet the accuracy requirements in the table below for the standard deviation of the absolute RSRQ values in RRC_IDLE mode with a default idle mode DRX setting of 1.28 seconds.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±FFS	±FFS	-121dBm/15kHz & -50dBm/ $BW_{Channel}$

Inter-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±FFS	±FFS	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth.				

1.6.4.2.1.2 ~~RSRQ ABSOLUTE ACCURACY FOR FEICIC~~ VZ_REQ_LTEB13NAC_37649

1.6.4.2.2 ~~RSRQ RELATIVE ACCURACY~~ VZ_REQ_LTEB13NAC_23693

1.6.4.2.2.1 RSRQ RELATIVE ACCURACY VZ_REQ_LTEB13NAC_6423

The device shall meet the requirements in the table below for the relative accuracy of RSRQ measurements in RRC_CONNECTED mode (with and without connected mode DRX) and with L3 filtering enabled.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±3	±4	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Inter-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±3	±4	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth. Note 2. The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.				

The device shall meet the accuracy requirements in the table below for the mean of the relative RSRQ values in RRC_IDLE mode with a default idle mode DRX setting of 1.28 seconds.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±3	±4	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Inter-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±3	±4	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth. Note 2. The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.				

The device shall meet the accuracy requirements in the table below for the standard deviation of the relative RSRQ values in RRC_IDLE mode with a default idle mode DRX setting of 1.28 seconds.

Parameter	Unit	Accuracy [dB]		Conditions[1]
		0° to +40°C	-10° to +55°C -30° to +60°C	Band 13 Io
Intra-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±FFS	±FFS	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Inter-Frequency RSRQ when RSRP Ês/Iot [3] -6 dB	dBm	±FFS	±FFS	-121dBm/15kHz & -50dBm/ $BW_{Channel}$
Note 1. Io is assumed to have constant EPRE across the bandwidth. Note 2. The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.				

1.6.4.2.2.2 ~~RSRQ RELATIVE ACCURACY FOR FEICIC~~ VZ_REQ_LTEB13NAC_37650

1.6.5 eICIC Performance and CRS IC without ABS VZ_REQ_LTEB13NAC_36962

1.6.5.1 ~~Req-1~~VZ_REQ_LTEB13NAC_36963

1.6.5.2 ~~Req-2~~VZ_REQ_LTEB13NAC_36964

1.6.5.3 ~~Req-3~~VZ_REQ_LTEB13NAC_36965

1.6.5.4 ~~Req-4~~VZ_REQ_LTEB13NAC_36966

1.6.5.5 ~~Req-5~~VZ_REQ_LTEB13NAC_36967

1.6.5.6 ~~Req-6~~ VZ_REQ_LTEB13NAC_36968

1.6.5.7 ~~Req-7~~ VZ_REQ_LTEB13NAC_36969

1.6.5.8 CRS IC WITHOUT ABS VZ_REQ_LTEB13NAC_37651

The device shall support CRS IC capability when there is zero ABS subframe configured to achieve the following benefits in a macro-macro cell configuration:

- With colliding CRS
  - Channel estimation improvement (energy, phase)
    - Improves PDSCH decoding as well (UE throughput)
  - Better RSRP accuracy (benefit from averaging channel estimation over energy) than **the more stringent requirement** between either the RSRP and RSRQ measurement accuracy requirements in this document or the RSRP and RSRQ measurement accuracy requirements as specified in section 9.1.2.5, 9.1.2.6, 9.1.5.3, Annex A.9.1.14, A.9.2.15,B.3.11, B.3.12 of 3GPP TS 36.133
- With non-colliding CRS
  - Improved PDCCH and PDSCH decoding results (removing CRS tones from noise estimate for better UE throughput)

1.6.5.9 ~~FEATURE INTERACTION~~ VZ_REQ_LTEB13NAC_37652

1.6.6 LTE CoMP (Coordinated Multi-Point) RF and RRM Performance VZ_REQ_LTEB13NAC_37815

1.6.6.1 RF and RRM Performance for LTE TM9 DL CoMP VZ_REQ_LTEB13NAC_37816

The device shall support and meet PDSCH demodulation performance requirements with UE-specific reference signals for single-layer and dual-layer spatial multiplexing, as specified in sections 8.3.1.1, 8.3.1.1A, 8.3.1.1B, 8.3.1.2 of the Release 11 version of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment(UE) Radio Transmission and Reception*.

The device shall support and meet CSI (CQI, PMI, and RI) reporting performance requirements, as specified in sections 9.2.3.1, 9.3.1.2.1, 9.3.2.2.1, 9.3.5.2.1, 9.4.1.3.1, 9.4.2.3.1, 9.5.2.1 of the Release 11 version of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment(UE) Radio Transmission and Reception*.

1.6.6.2 RF and RRM Performance for LTE TM10 DL CoMP VZ_REQ_LTEB13NAC_37817

The device shall support and meet PDSCH demodulation performance requirements with UE-specific reference signals for DCI format 2D and non Quasi Co-located Antenna Ports, as specified in sections 8.3.1.3 of the Release 11 version of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment(UE) Radio Transmission and Reception*.

The device shall support and meet CSI (CQI and RI) reporting performance requirements, as specified in sections 9.2.4.1, 9.3.6.1, 9.5.5.1 of the Release 11 version of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment(UE) Radio Transmission and Reception*.

1.6.7 ~~ePDCCH Performance~~ VZ_REQ_LTEB13NAC_38377

1.6.7.1 ~~EPDCCH RF Performance~~ VZ_REQ_LTEB13NAC_38378

1.6.8 256QAM Performance VZ_REQ_LTEB13NAC_39751

1.6.8.1 256QAM RF Performance VZ_REQ_LTEB13NAC_39752

The device shall support and meet receiver maximum input level performance requirements for 256QAM, as specified in sections 7.4.1, 7.4.1A of the Release 12 version of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment(UE) Radio Transmission and Reception*.

The device shall support and meet PDSCH demodulation performance requirements for 256QAM, as specified in sections 8.2.1.4.2, 8.3.1.1 of the Release 12 version of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment(UE) Radio Transmission and Reception*.

The device shall support and meet sustained downlink data rate performance requirements for 256QAM, as specified in section 8.7.1 of the Release 12 version of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment(UE) Radio Transmission and Reception*.

The device shall support and meet CQI reporting performance requirements for 256QAM, as specified in sections 9.2.1.7, 9.3.1.2.3 of the Release 12 version of 3GPP TS 36.101: *Evolved*

Universal Terrestrial Radio Access (E-UTRA); User Equipment(UE) Radio Transmission and Reception.

1.6.9 SU-MIMO IC RF Performance VZ_REQ_LTEB13NAC_39981

1.6.9.1 SU-MIMO IC RF Performance VZ_REQ_LTEB13NAC_39982

The device shall support and meet receiver maximum input level performance requirements for SU-MIMO IC (Enhanced Performance Requirements Type C), for all transmission modes that are supported on Verizon's network as specified in sections 8.2.1.3.1.B (FDD, TM3), 8.2.1.4.2.A (FDD, TM4), 8.3.1.2.A (TM9/TM10) of the Release 12 version of 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment(UE) Radio Transmission and Reception.*

1.6.10 ~~Blind Data IC~~ VZ_REQ_LTEB13NAC_1238214

1.7 PERFORMANCE - Cat M1 VZ_REQ_LTEB13NAC_4297448

1.7.1 LTE CAT M1 MINIMUM PERFORMANCE REQUIREMENTS VZ_REQ_LTEB13NAC_4297528

1.7.1.1 LTE CAT M1 3GPP/GCF CONFORMANCE VZ_REQ_LTEB13NAC_4297605

LTE category M1 devices should be output power class 3. LTE category M1 devices may be output power class 5 (but power class 3 is strongly recommended).

LTE category M1 devices shall meet all 3GPP RF and RRM conformance requirements for LTE category M1, including all RF and RRM requirements and conformance test cases for LTE category M1 defined in:

- 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*
- 3GPP TS 36.133: *Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management*
- 3GPP TS 36.521-1: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: conformance testing*
- 3GPP TS 36.521-3: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Radio Resource Management conformance testing*
-

LTE category M1 devices shall meet all 3GPP signaling requirements for LTE category M1, including all signaling requirements and conformance test cases for LTE category M1 defined in:

- 3GPP TS 36.523-1: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification*

LTE category M1 devices shall be GCF certified for LTE category M1 operation in Band 13.

1.7.2 LTE CAT M1 RADIATED PERFORMANCE VZ_REQ_LTEB13NAC_4297533

1.7.2.1 LTE CAT M1 MAXIMUM RADIATED OUTPUT POWER

VZ_REQ_LTEB13NAC_4297578

All non-wearable Cat-M1 devices (with the exception of "small form factor" devices) shall meet the free space (FS) requirements for Total Radiated Power (TRP) in the table below for all RB allocations in a Cat-M1 channel.

"Small Form Factor" devices shall meet the free space (FS) Small Form Factor requirements for Total Radiated Power (TRP) in the table below for all RB allocations in a Cat-M1 channel. A "Small Form Factor" device is a device with no surfaces that individually exceed 2500 mm2 in area.

Wrist worn Cat-M1 wearable devices should meet the forearm requirements for Total Radiated Power (TRP) in the table below for all RB allocations in a Cat-M1 channel. Wrist worn wearable devices shall be tested per the Verizon Wireless LTE Over the Air Radiated Performance Test Plan using the CTIA forearm phantom.

Chest worn Cat-M1 wearable devices should meet the chest requirements for Total Radiated Power (TRP) in the table below for all RB allocations in a Cat-M1 channel. Chest worn wearable devices shall be tested per the Verizon Wireless LTE Over the Air Radiated Performance Test Plan using the CTIA chest phantom.

Use Case	Band 13 TRP (dBm, Minimum)	
	Power Class 3	Power Class 5
FS	+18	+15
FS - Small Form Factor	+10	+7
Forearm (WR/WL)	+8	+5
Chest (ChW)	+10	+7

1.7.2.2 LTE CAT M1 SPURIOUS EMISSIONS FOR UE CO-EXISTENCE WITH GPS VZ_REQ_LTEB13NAC_4299281

LTE category M1 devices shall meet the requirements in the table below for transmitter emissions into the GPS frequency band for all uplink RB allocations and output power levels.

Frequency	Emission Requirement
1559.00 MHz - 1574.42 MHz	<= -40 dBm/MHz
1574.42 MHz - 1576.42 MHz	<= -65 dBm/MHz
1576.42 MHz - 1610.00 MHz	<= -40 dBm/MHz

1.7.2.3 LTE CAT M1 RADIATED SENSITIVITY VZ_REQ_LTEB13NAC_4297600

All non-wearable Cat-M1 devices (with the exception of "small form factor" devices) shall meet the free space (FS) requirements for Total Isotropic Sensitivity (TIS) in the table below for all uplink RB allocations and transmitter output levels.

"Small Form Factor" devices shall meet the free space (FS) Small Form Factor requirements for Total Isotropic Sensitivity (TIS) in the table below for all RB allocations in a Cat-M1 channel. A "Small Form Factor" device is a device with no surfaces that individually exceed 2500 mm2 in area.

Wrist worn Cat-M1 wearable devices should meet the forearm requirements for Total Isotropic Sensitivity (TIS) in the table below for all uplink RB allocations and transmitter output levels. Wrist worn wearable devices shall be tested per the Verizon Wireless LTE Over the Air Radiated Performance Test Plan using the CTIA forearm phantom.

Chest worn Cat-M1 wearable devices should meet the chest requirements for Total Isotropic Sensitivity (TIS) in the table below for all uplink RB allocations and transmitter output levels. Chest worn wearable devices shall be tested per the Verizon Wireless LTE Over the Air Radiated Performance Test Plan using the CTIA chest phantom.

Use Case	TIS (dBm, Maximum)
	Band 13
FS	-97
FS - Small Form Factor	-88
Forearm (WR/WL)	-86
Chest (ChW)	-86.5

1.8 ~~REQUIRED VERIZON WIRELESS DEVICE COMPLIANCE TEST PLANS~~ ~~VZ_REQ_LTEB13NAC_1896~~

1.9 REFERENCES VZ_REQ_LTEB13NAC_1897

<Industry Standards References>
Change requests may cause modification to the specifications listed below. Please refer to www.3gpp.org for the latest version of the 3GPP specifications. Verizon Wireless LTE 3GPP Band 13 specifications are available at opennetwork.verizonwireless.com.

1. 3GPP TS 21.201: *Technical Specifications and Technical Reports relating to an Evolved Packet System (EPS) based 3GPP system*, Release 9
2. 3GPP TR 21.900: *Technical Specification Group working methods*, Release 9
3. 3GPP TS 22.016: *International Mobile Equipment Identities (IMEI)*, Release 9
4. 3GPP TS 22.220: *Service requirements for Home Node B (HNB) and Home eNode B (HeNB)*, Release 9
5. 3GPP TS 23.003: *Numbering, addressing and identification*, Release 9
6. 3GPP TS 23.038: *Alphabets and language-specific information*, Release 9
7. 3GPP TS 23.040: *Technical realization of Short Message Service (SMS)*, Release 9
8. 3GPP TS 23.041: *Technical realization of Cell Broadcast Service (CBS)*, Release 9
9. 3GPP TS 23.060: *General Packet Radio Service (GPRS); Service description; Stage 2*, Release 9
10. 3GPP TS 23.122: *Non-Access Stratum (NAS) functions related to Mobile Station (MS) in idle mode*, Release 9
11. 3GPP TS 23.203: *Policy and charging control architecture*, Release 9
12. 3GPP TS 23.204: *Support of Short Message Service (SMS) over generic 3GPP Internet Protocol (IP) access; Stage 2*, Release 9
13. 3GPP TS 23.401: *General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access*, Release 9
14. 3GPP TS 24.007: *Mobile radio interface signalling layer 3; General Aspects*, Release 9
15. *3GPP TS 24.008: Mobile radio interface Layer 3 specification; Core network protocols; Stage 3, Release 9*
16. 3GPP TS 24.167: *3GPP IMS Management Object (MO); Stage 3*, Release 9
17. 3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*, Release 9
18. 3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, Release 9
19. 3GPP TS 29.061: *Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)*, Release 9
20. 3GPP TS 29.274: *3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3*, Release 9
21. 3GPP TS 29.275: *Proxy Mobile IPv6 (PMIPv6) based Mobility and Tunnelling protocols; Stage 3*, Release 9

22. 3GPP TS 31.101: *UICC-terminal interface; Physical and logical characteristics*, Release 9
23. 3GPP TS 31.102: *Characteristics of the Universal Subscriber Identity Module (USIM) application*, Release 9
24. 3GPP TS 31.103: *Characteristics of the IP Multimedia Services Identity Module (ISIM) application*, Release 9
25. 3GPP TS 31.111: *Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)*, Release 9
26. 3GPP TS 33.203: *3G security; Access security for IP-based services*, Release 9
27. 3GPP TS 33.401: *3GPP System Architecture Evolution (SAE); Security architecture*, Release 9
28. 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*, Release 9
29. 3GPP TS 36.133: *Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management*, Release 9
30. 3GPP TS 36.211: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation*, Release 9
31. 3GPP TS 36.212: *Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding*, Release 9
32. 3GPP TS 36.213: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures*, Release 9
33. 3GPP TS 36.214: *Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements*, Release 9
34. 3GPP TS 36.300: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2*, Release 9
35. 3GPP TS 36.304: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode*, Release 9
36. 3GPP TS 36.306: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities*, Release 9
37. 3GPP TS 36.321: *Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification*, Release 9
38. 3GPP TS 36.323: *Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) specification*, Release 9
39. 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*, Release 9
40. 3GPP TS 36.413: *Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)*, Release 9

41. 3GPP TS 36.508: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Common test environments for User Equipment (UE) conformance testing*, Release 9
42. 3GPP TS 36.509: *Evolved Universal Terrestrial Radio Access (E-UTRA); Special conformance testing function for User Equipment (UE)* , Release 9
43. 3GPP TS 36.521-1: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 1: conformance testing*, Release 9
44. 3GPP TS 36.521-2: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 2: Implementation Conformance Statement (ICS)*, Release 9
45. 3GPP TS 36.521-3: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Radio Resource Management conformance testing*, Release 9
46. 3GPP TS 36.523-1: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification*, Release 9
47. 3GPP TS 36.523-2: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 2: ICS*, Release 9
48. 3GPP TS 36.523-3: *Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 3: Test suites*, Release 9
49. 3GPP RP-101431, CR#532: Splitting FGI bit 3 (CR to 3GPP TS 36.331: *Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification*)
50. 3GPP2 C.S0015-A v1.0 *"Short Message Service (SMS) for Wideband Spread Spectrum Systems"*
51. ETSI TS 102 221: *Smart Cards UICC-Terminal Interface; Physical and Logical Characteristics, Release 8*
52. ETSI TS 102 223: *Smart cards; Card Application Toolkit (CAT), Release 8*
53. ISO/IEC-7816-2: *1999/AM1: 2004, Identification cards - Integrated circuit(s) cards with contacts - Part 2: Dimension and location of the contacts, Amendment 1: Assignment of contacts for C4 and C8*
54. ISO/IEC-7816-3: *Information technology - Identification cards - Integrated circuit(s) cards with contacts - Part 3: Electronic signals and transmission protocols*
55. A/53: *ATSC Digital Television Standard, Parts 1-6, 2007*, Advanced Television Systems Committee.
56. CTIA Test Plan for Wireless Device Over the Air Performance
57. IETF, RFC 3261 SIP: Session Initiation Protocol

58. IETF, RFC 4861 Neighbor Discovery for IP Version 6 (IPv6)
59. IETF, RFC 4862 IPv6 Stateless Address Autoconfiguration
60. IETF, RFC 6434 IPv6 Node Requirements
61. IETF, RFC 6204bis Basic Requirements for IPv6 Customer Edge Routers
62. ATIS-TIA-J-STD-100 Joint ATIS/TIA CMAS Mobile Device Behavior Specification
63. GSMA SGP.02: Remote Provisioning Architecture for Embedded UICC Technical Specification, Version 3.2, 26 June 2017
64. GSMA SGP.21: RSP Architecture, Version 2.2, 31 August 2017
65. GSMA SGP.22: RSP Technical Specification, Version 2.2.2, 05 June 2020
66. SIMalliance eUICC Profile Package: Interoperable Format Technical Specification, Version 2.1, 24 February 2017
67. GlobalPlatform Card Specification, Version 2.3, October 2015, GPC_SPE_034
68. GlobalPlatform Card Confidential Card Content Management Card Specification v2.3 - Amendment A, Version 1.1, November 2015, GPC_SPE_007
69. GlobalPlatform Card Remote Application Management over HTTP Card Specification v2.2 Amendment B, Version 1.1.3, May 2015, GPC_SPE_011
70. GlobalPlatform Card Technology Secure Channel Protocol 03 Card Specification v2.2 - Amendment D, Version 1.1.1, July 2014, GPC_SPE_014
71. GlobalPatform Card Technology Security Upgrade for Card Content Management Card Specification v2.3 – Amendment E, Version 1.1, October 2016, GPC_SPE_042
72. GlobalPlatform Card Secure Channel Protocol '11' Card Specification v2.3 – Amendment F, Version 1.1, July 2017, GPC_SPE_093
73. GlobalPlatform Card Contactless Services Card Specification v2.2 - Amendment C, Version 1.0. February 2010
74. GlobalPlatform Device Technology, Secure Element Access Control, Version 1.1, September 2014, GPD_SPE_013
75. GSMA SGP.01 GSMA 'Remote Provisioning Architecture for Embedded UICC' Version 4.2, 07 July 2020
76. ETSI TS 102 226: Remote APDU structure for UICC based applications, Release 9
77. GSMA SGP.02 GSMA 'Remote Provisioning Architecture for Embedded UICC, Technical Specification' Version 4.2 07 July 2020
78. SIMalliance/TrustedConnectivityAlliance eUICC Profile Package: Interoperable Format Technical Specification, Version 2.3.1, 26 November 2019

<Verizon Specific Documentation References>

1. "Verizon Wireless LTE 3GPP Band 13 Supplementary RF Conformance Test Plan"
2. "Verizon Wireless LTE Supplementary Signaling Conformance Test Plan"
3. "Verizon Wireless LTE Over the Air Radiated Performance Test Plan"

4. "Verizon Wireless LTE Data Retry Test Plan"
5. "Verizon Wireless LTE 3GPP Band 13 Safe for Network Test Plan"
6. "Verizon Wireless LTE Device-UICC (USIM, ISIM) Interaction Test Plan"
7. "Verizon Wireless LTE Data Retry Requirements"
8. "Verizon Wireless LTE OTADM Device Requirements"
9. "Verizon Wireless LTE SMS Requirements"
10. "Verizon Wireless LTE SMS Test Plan"
11. "Verizon Wireless LTE AT Commands for Test Automation Requirements"
12. "Verizon Wireless LTE AT Commands for Test Automation Test Plan"
13. "Verizon Wireless LTE OTADM Test Plan"
14. "Verizon Wireless LTE 3GPP Band 13 Device Conformance Test Procedures"
15. "Verizon Wireless LTE 3GPP Band 13 Data Throughput Test Plan"
16. "Verizon Wireless LTE 3GPP Band 13 Supplementary RRM Conformance Test Plan"

<Other Applicable References>

1. N/A

TestPlanCoverageForRequirement

3GPP RELEASE 9 SPECIFICATIONS VZ_REQ_LTEB13NAC_6264

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

FCC COMPLIANCE VZ_REQ_LTEB13NAC_6265

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00

DEVICE TESTING ON THE VERIZON WIRELESS LTE 3GPP BAND 13 NETWORK VZ_REQ_LTEB13NAC_6266

Test Case Name	Test Plan Id	Created By	Created Date
LTE 3GPP Band 13 Safe for Network	3GPPB13SAFE	Admin User	11-08-2013 00:00:00

UICC SUPPORT - FORM FACTOR VZ_REQ_LTEB13NAC_6267

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

LTE SPECIFICATION - LTE CATEGORY 1 AND HIGHER VZ_REQ_LTEB13NAC_6268

Test Case Name	Test Plan Id	Created By	Created Date
(VOID) Transmit Diversity Throughput Measure - Uplink QPSK - FTP	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID) HTTP Browsing	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID) LTE INTEROPERABILITY SECTION 4.3	SCSVPDIOT	Admin User	11-08-2013 00:00:00
(VOID) LTE INTEROPERABILITY SECTION 6	SCSVPDIOT	Admin User	11-08-2013 00:00:00
(VOID) LTE INTEROPERABILITY SECTIONS 3.1, 3.6 THROUGH 3.20 AND 3.22 THROUGH 3.24	SCSVPDIOT	Admin User	11-08-2013 00:00:00
(VOID) LTE INTEROPERABILITY SECTIONS 3.2 THROUGH 3.5 AND 3.21	SCSVPDIOT	Admin User	11-08-2013 00:00:00
(VOID) LTE INTEROPERABILITY SECTIONS 4.1.1 AND 4.1.2	SCSVPDIOT	Admin User	11-08-2013 00:00:00
(VOID) LTE INTEROPERABILITY SECTIONS 4.1.3 THROUGH 4.1.6	SCSVPDIOT	Admin User	11-08-2013 00:00:00
(VOID) LTE INTEROPERABILITY SECTIONS 4.2.1 AND 4.2.2	SCSVPDIOT	Admin User	11-08-2013 00:00:00
(VOID) LTE INTEROPERABILITY SECTIONS 4.4 THROUGH 4.6	SCSVPDIOT	Admin User	11-08-2013 00:00:00
(VOID) LTE INTEROPERABILITY SECTIONS 5.1,	SCSVPDIOT	Admin	11-08-2013

5.2, 5.3 AND 5.4.1 THROUGH 5.4.9		User	00:00:00
(VOID) LTE INTEROPERABILITY SECTIONS 5.4.10, 5.4.11 AND 5.4.12	SCSVPDIOT	Admin User	11-08-2013 00:00:00
(VOID) Network Selection Manual Mode Empty Preferred PLMN List	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID) Network Selection Manual Mode More than 32 entries on Preferred PLMN List	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID) Transmit Diversity Throughput Measure Downlink QPSK - UDP	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)ATTACH REJECT, CAUSE #11 PLMN NOT ALLOWED	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)ATTACH REJECT, CAUSE #14 EPS SERVICES NOT ALLOWED IN THIS PLMN SINGLE PLMN ENVIRONMENT	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)ATTACH REJECT, CAUSE #7 EPS SERVICES NOT ALLOWED	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)Attach Reject Cause Code #15 (No Suitable Cells in Tracking Area)	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)DETACH WITHOUT POWER-OFF	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)E-UTRA Handover, S1 Based default bearer	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)E-UTRA Handover, X2 Based default bearer	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)E-UTRA Handover, inter-MME default bearer	LTEB13IOT	Admin User	11-08-2013 00:00:00

(VOID)E-UTRA Handover, intra eNodeB Handover default bearer	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)Idle Mode E-UTRA Intra-Frequency Reselection	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)Multiple PDN Connections secondary PDN connectivity Disconnect	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)Network Selection - Change of Selection Mode - Automatic to Manual Mode	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)Network Selection - Change of Selection Mode - Manual to Automatic Mode	LTEB13IOT	Admin User	11-08-2013 00:00:00
(VOID)Network Selection Manual Mode Network on Forbidden List	LTEB13IOT	Admin User	11-08-2013 00:00:00
3.5Invalid	LTEB13IOT	Admin User	11-08-2013 00:00:00
5.4.12 Closed Loop Spatial Multiplexing Throughput Measure - Downlink & Uplink - UDP	LTEB13IOT	Admin User	11-08-2013 00:00:00
5.4.6 Transmit Diversity Throughput Measure - Downlink & Uplink - UDP	LTEB13IOT	Admin User	11-08-2013 00:00:00
5.4.9Open Loop Spatial Multiplexing Throughput Measure - Downlink + Uplink - FTP	LTEB13IOT	Admin User	11-08-2013 00:00:00
ATTACH AND DEFAULT EPS BEARER CONTEXT ACTIVATION	LTEFIELD	Admin User	11-08-2013 00:00:00
Attach Reject Cause Code #12 (Tracking Area Not Allowed) (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Attach Reject Cause Code #6 (Illegal ME) (VOID)	LTEB13IOT	Admin	11-08-2013

		User	00:00:00
Basic Attach with NAS Security Algorithms	LTEB13IOT	Admin User	11-08-2013 00:00:00
CBRA, Re-Synchronization of UL	LTEB13IOT	Admin User	11-08-2013 00:00:00
CBRA, Schedule Request (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Closed Loop Spatial Multiplexing Delay of Ping (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Closed Loop Spatial Multiplexing Delay of Ping (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Closed Loop Spatial Multiplexing Throughput Measure - Downlink - UDP	LTEB13IOT	Admin User	11-08-2013 00:00:00
Closed Loop Spatial Multiplexing Throughput Measure - Downlink QPSK & Uplink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Closed Loop Spatial Multiplexing Throughput Measure - Downlink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Closed Loop Spatial Multiplexing Throughput Measure - Uplink - FTP	LTEB13IOT	Admin User	11-08-2013 00:00:00
Closed Loop Spatial Multiplexing Throughput Measure - Uplink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
DELAY OF LONG PING (IPV4)	LTEFIELD	Admin User	11-08-2013 00:00:00
DELAY OF LONG PING (IPV6)	LTEFIELD	Admin User	11-08-2013 00:00:00

DELAY OF SHORT PING (IPV4) VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
DELAY OF SHORT PING (IPV6) VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
DETACH WITH POWER-OFF	LTEB13IOT	Admin User	11-08-2013 00:00:00
DETACH WITH POWER-OFF	LTEFIELD	Admin User	11-08-2013 00:00:00
DETACH WITHOUT POWER-OFF	LTEFIELD	Admin User	11-08-2013 00:00:00
E-UTRA HANDOVER, DEFAULT BEARER (MOBILE)	LTEFIELD	Admin User	11-08-2013 00:00:00
FTP DOWNLINK VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
FTP UPLINK VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
HTTP BROWSING	LTEFIELD	Admin User	11-08-2013 00:00:00
IDLE MODE E-UTRA INTRA-FREQUENCY RESELECTION (MOBILE)	LTEFIELD	Admin User	11-08-2013 00:00:00
INTRA-LTE FREQUENCY AUTOMATIC NEIGHBOR RELATION (ANR) FUNCTION	BAND2IOT	Admin User	02-12-2014 00:00:00
INTRA-LTE FREQUENCY AUTOMATIC NEIGHBOR RELATION (ANR) FUNCTION	BAND4IOT	Admin User	02-12-2014 00:00:00
Idle to Active Transition Paging	LTEB13IOT	Admin	11-08-2013

		User	00:00:00
Idle to Active Transition Service Request	LTEB13IOT	Admin User	11-08-2013 00:00:00
Intra-LTE Frequency Automatic Neighbor Relation (ANR) Function	LTEB13IOT	Admin User	11-08-2013 00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
LTE System Lost in RRC_CONNECTED	LTEB13IOT	Admin User	11-08-2013 00:00:00
LTE System Lost in RRC_IDLE	LTEB13IOT	Admin User	11-08-2013 00:00:00
MULTIPLE PDN CONNECTIONS SECONDARY PDN CONNECTIVITY DISCONNECT	LTEFIELD	Admin User	11-08-2013 00:00:00
MULTIPLE PDN CONNECTIONS SECONDARY PDN CONNECTIVITY REQUEST	LTEFIELD	Admin User	11-08-2013 00:00:00
Multiple PDN Connections secondary PDN connectivity Request	LTEB13IOT	Admin User	11-08-2013 00:00:00
NETWORK SELECTION MANUAL MODE	LTEFIELD	Admin User	11-08-2013 00:00:00
NETWORK SELECTION SELECTION MODE FOLLOWING SWITCH OFF	LTEFIELD	Admin User	11-08-2013 00:00:00
NORMAL TRACKING AREA UPDATE WITHOUT ISR ACTIVATION; SUCCESSFUL	LTEB13IOT	Admin User	11-08-2013 00:00:00
NORMAL TRACKING AREA UPDATE WITHOUT ISR ACTIVATION; SUCCESSFUL (MOBILE)	LTEFIELD	Admin User	11-08-2013 00:00:00

Open Loop Spatial Multiplexing Throughput Measure - Downlink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Open Loop Spatial Multiplexing Delay of Ping (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Open Loop Spatial Multiplexing Delay of Ping (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Open Loop Spatial Multiplexing Throughput Measure - Downlink - FTP	LTEB13IOT	Admin User	11-08-2013 00:00:00
Open Loop Spatial Multiplexing Throughput Measure - Downlink QPSK + Uplink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Open Loop Spatial Multiplexing Throughput Measure - Uplink - UDP	LTEB13IOT	Admin User	11-08-2013 00:00:00
Open Loop Spatial Multiplexing Throughput Measure - Uplink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
PDCCH Ordered Re-synchronization	LTEB13IOT	Admin User	11-08-2013 00:00:00
PDN CONNECTIVITY REJECT, CAUSE #27 MISSING OR UNKNOWN APN	LTEFIELD	Admin User	11-08-2013 00:00:00
PDN CONNECTIVITY REQUEST ESM INFORMATION TRANSFER FLAG=TRUE	LTEFIELD	Admin User	11-08-2013 00:00:00
PDN Connectivity Reject cause #27 Missing or unknown APN	LTEB13IOT	Admin User	11-08-2013 00:00:00
PDN Connectivity Request ESM Information transfer flag = TRUE	LTEB13IOT	Admin User	11-08-2013 00:00:00
PDN Gateway Disconnect Procedure Network Initiated	LTEB13IOT	Admin	11-08-2013

		User	00:00:00
PDN Gateway Disconnect Procedure UE Initiated	LTEB13IOT	Admin User	11-08-2013 00:00:00
PERIODIC TRACKING AREA UPDATE; SUCCESSFUL	LTEFIELD	Admin User	11-08-2013 00:00:00
PING A REMOTE DESTINATION (IPV4) VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
PING A REMOTE DESTINATION (IPV6) VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
Periodic Tracking Area Update; Successful	LTEB13IOT	Admin User	11-08-2013 00:00:00
SIMO Delay of Ping (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
SIMO Delay of Ping (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
SIMO Throughput Measure - Uplink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
SIMO Throughput Measure - Uplink QPSK UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
SIMO Throughput Measure Downlink QPSK + Uplink QPSK - FTP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
SIMO Throughput Measure Downlink QPSK + Uplink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
SIMO Throughput Measure Downlink QPSK - FTP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00

SIMO Throughput Measure Downlink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
SIMULTANEOUS FTP DOWNLINK AND FTP UPLINK VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
THROUGHPUT MEASURE DOWNLINK FTP (MOBILE)	LTEFIELD	Admin User	11-08-2013 00:00:00
THROUGHPUT MEASURE DOWNLINK & UPLINK FTP	LTEFIELD	Admin User	11-08-2013 00:00:00
THROUGHPUT MEASURE DOWNLINK & UPLINK FTP (MOBILE)	LTEFIELD	Admin User	11-08-2013 00:00:00
THROUGHPUT MEASURE DOWNLINK FTP	LTEFIELD	Admin User	11-08-2013 00:00:00
THROUGHPUT MEASURE UPLINK FTP	LTEFIELD	Admin User	11-08-2013 00:00:00
THROUGHPUT MEASURE UPLINK FTP (MOBILE)	LTEFIELD	Admin User	11-08-2013 00:00:00
Time Alignment Timer Expiry	LTEB13IOT	Admin User	11-08-2013 00:00:00
Tracking Area Update Reject, cause code #9 (UE identity cannot be derived by the network)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Transmit Diversity Throughput Measure - Downlink QPSK & Uplink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Transmit Diversity Throughput Measure Downlink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Transmit Diversity Delay of Ping (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00

Transmit Diversity Delay of Ping (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00
Transmit Diversity Throughput Measure - Uplink QPSK - FTP and UDP (VOID)	LTEB13IOT	Admin User	11-08-2013 00:00:00

LTE DEVICE CATEGORY VZ_REQ_LTEB13NAC_6269

Test Case Name	Test Plan Id	Created By	Created Date
BIDIRECTIONAL FTP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
BIDIRECTIONAL UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
CQI AND RI REPORTING WITH FREQUENCY SELECTIVE INTERFERENCE	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
DOWNLINK FTP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
DOWNLINK POWER SWEEP UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
DOWNLINK UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
DOWNLINK UDP THROUGHPUT WITH ADVANCED CHANNEL MODELS	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
DOWNLINK UDP THROUGHPUT WITH DYNAMIC CORRELATION AND ANTENNA GAIN IMBALANCE	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00

DOWNLINK UDP THROUGHPUT WITH VARIABLE REFERENCE MEASUREMENT CHANNELS	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
NETWORK ATTACHMENT TIME	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
RRC_IDLE TO RRC_CONNECTED CONTROL PLANE LATENCY	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
SIMULTANEOUS IPV4 AND IPV6 UDP DATA TRANSFERS	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
STRESS TEST FTP THROUGHPUT (DOWNLINK)	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
STRESS TEST UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
UPLINK FTP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
UPLINK UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
USER PLANE ROUND TRIP DELAY	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00

RRC UE FEATURE GROUP SUPPORT - MANDATORY FGI'S VZ_REQ_LTEB13NAC_6270

Test Case Name	Test Plan Id	Created By	Created Date

2.2RRC UE CAPABILITY TRANSFER	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
RRC UE FEATURE GROUP SUPPORT	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

RRC UE FEATURE GROUP SUPPORT - OPTIONAL FGI'S VZ_REQ_LTEB13NAC_6271

Test Case Name	Test Plan Id	Created By	Created Date
2.2RRC UE CAPABILITY TRANSFER	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
RRC UE FEATURE GROUP SUPPORT	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

RRC UE FEATURE GROUP SUPPORT - RRC MESSAGING VZ_REQ_LTEB13NAC_6272

Test Case Name	Test Plan Id	Created By	Created Date
2.2RRC UE CAPABILITY TRANSFER	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
RRC UE FEATURE GROUP SUPPORT	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

LTE FREQUENCY BAND VZ_REQ_LTEB13NAC_6273

Test Case Name	Test Plan Id	Created By	Created Date
RF Conformance Test Cases	3GPPB4SC	Admin User	11-08-2013 00:00:00

MIMO ANTENNA REQUIREMENTS VZ_REQ_LTEB13NAC_6274

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

TX ANTENNA SWITCHING VZ_REQ_LTEB13NAC_6275

Test Case Name	Test Plan Id	Created By	Created Date
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

Transmit Diversity (Applies to All Device Categories) VZ_REQ_LTEB13NAC_6276

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

Spatial Multiplexing VZ_REQ_LTEB13NAC_6277

Test Case Name	Test Plan Id	Created By	Created Date

External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

TESTABILITY VZ_REQ_LTEB13NAC_6278

Test Case Name	Test Plan Id	Created By	Created Date
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

ACTIVATION/DE-ACTIVATION OF CONTACTS TO THE UICC VZ_REQ_LTEB13NAC_6279

Test Case Name	Test Plan Id	Created By	Created Date
Bit-character duration - Terminal to the UICC	USIMISIMINT	Admin User	01-06-2014 00:00:00
Bit-character duration - UICC toTerminal	USIMISIMINT	Admin User	01-06-2014 00:00:00
Case 2 command	USIMISIMINT	Admin User	01-06-2014 00:00:00
Case 4 command - 6100	USIMISIMINT	Admin User	01-03-2014 00:00:00
Case 4 command - 61xx	USIMISIMINT	Admin User	01-06-2014 00:00:00
Clock stop 1,8V	USIMISIMINT	Admin User	01-06-2014 00:00:00

Clock stop 3V	USIMISIMINT	Admin User	01-06-2014 00:00:00
Command processing, ACK, NACK, NULL	USIMISIMINT	Admin User	01-06-2014 00:00:00
Command processing, multiple NULL	USIMISIMINT	Admin User	01-03-2014 00:00:00
Command processing, warning and error status	USIMISIMINT	Admin User	01-06-2014 00:00:00
Electrical tests on contact C1, Test 1	USIMISIMINT	Admin User	01-06-2014 00:00:00
Electrical tests on contact C1, Test 2	USIMISIMINT	Admin User	01-06-2014 00:00:00
Electrical tests on contact C2	USIMISIMINT	Admin User	01-06-2014 00:00:00
Electrical tests on contact C3	USIMISIMINT	Admin User	01-06-2014 00:00:00
Electrical tests on contact C7	USIMISIMINT	Admin User	01-06-2014 00:00:00
Error correction	USIMISIMINT	Admin User	01-06-2014 00:00:00
Error detection	USIMISIMINT	Admin User	01-06-2014 00:00:00
Reaction of a Terminal receiving no ATR	USIMISIMINT	Admin User	01-06-2014 00:00:00
Speed Enhancement	USIMISIMINT	Admin User	01-06-2014 00:00:00

Timing	USIMISIMINT	Admin User	01-06-2014 00:00:00

POWER SUPPLY VZ_REQ_LTEB13NAC_6280

Test Case Name	Test Plan Id	Created By	Created Date
Bit-character duration - Terminal to the UICC	USIMISIMINT	Admin User	01-06-2014 00:00:00
Bit-character duration - UICC toTerminal	USIMISIMINT	Admin User	01-06-2014 00:00:00
Case 2 command	USIMISIMINT	Admin User	01-06-2014 00:00:00
Case 4 command - 6100	USIMISIMINT	Admin User	01-03-2014 00:00:00
Case 4 command - 61xx	USIMISIMINT	Admin User	01-06-2014 00:00:00
Clock stop 1,8V	USIMISIMINT	Admin User	01-06-2014 00:00:00
Clock stop 3V	USIMISIMINT	Admin User	01-06-2014 00:00:00
Command processing, ACK, NACK, NULL	USIMISIMINT	Admin User	01-06-2014 00:00:00
Command processing, multiple NULL	USIMISIMINT	Admin User	01-03-2014 00:00:00
Command processing, warning and error status	USIMISIMINT	Admin User	01-06-2014 00:00:00

Error correction	USIMISIMINT	Admin User	01-06-2014 00:00:00
Error detection	USIMISIMINT	Admin User	01-06-2014 00:00:00
Speed Enhancement	USIMISIMINT	Admin User	01-06-2014 00:00:00
Timing	USIMISIMINT	Admin User	01-06-2014 00:00:00

DEVICE INTERFACE VZ_REQ_LTEB13NAC_6281

Test Case Name	Test Plan Id	Created By	Created Date
Bit-character duration - Terminal to the UICC	USIMISIMINT	Admin User	01-06-2014 00:00:00
Bit-character duration - UICC toTerminal	USIMISIMINT	Admin User	01-06-2014 00:00:00
CHANGE OF PIN	LTEFIELD	Admin User	11-08-2013 00:00:00
CHANGE OF PIN, NEW PIN WRONG (3 DIGITS LONG)	LTEFIELD	Admin User	11-08-2013 00:00:00
CHANGE OF PIN, OLD PIN WRONG	LTEFIELD	Admin User	11-08-2013 00:00:00
CHANGE OF PIN, WHEN BLOCKED	LTEFIELD	Admin User	11-08-2013 00:00:00
CHANGE OF PIN, WHEN DEACTIVATED	LTEFIELD	Admin	11-08-2013

		User	00:00:00
CHANGE OF PIN, WRONG REPEATING OF NEW PIN	LTEFIELD	Admin User	11-08-2013 00:00:00
CHANGE OF PIN2 VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
CHANGE OF PIN2, NEW PIN2 WRONG (3 DIGITS LONG) VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
CHANGE OF PIN2, OLD PIN2 WRONG VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
CHANGE OF PIN2, WHEN BLOCKED VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
CHANGE OF PIN2, WRONG REPEATING OF NEW PIN2 VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
Case 2 command	USIMISIMINT	Admin User	01-06-2014 00:00:00
Case 4 command - 6100	USIMISIMINT	Admin User	01-03-2014 00:00:00
Case 4 command - 61xx	USIMISIMINT	Admin User	01-06-2014 00:00:00
Clock stop 1,8V	USIMISIMINT	Admin User	01-06-2014 00:00:00
Clock stop 3V	USIMISIMINT	Admin User	01-06-2014 00:00:00
Command processing, ACK, NACK, NULL	USIMISIMINT	Admin User	01-06-2014 00:00:00

Command processing, multiple NULL	USIMISIMINT	Admin User	01-03-2014 00:00:00
Command processing, warning and error status	USIMISIMINT	Admin User	01-06-2014 00:00:00
Error correction	USIMISIMINT	Admin User	01-06-2014 00:00:00
Error detection	USIMISIMINT	Admin User	01-06-2014 00:00:00
Speed Enhancement	USIMISIMINT	Admin User	01-06-2014 00:00:00
Timing	USIMISIMINT	Admin User	01-06-2014 00:00:00
UNBLOCKING OF BLOCKED PIN	LTEFIELD	Admin User	11-08-2013 00:00:00
UNBLOCKING OF BLOCKED PIN2 VOID	LTEFIELD	Admin User	11-08-2013 00:00:00

ISO/IEC-7816 SPEED VZ_REQ_LTEB13NAC_6282

Test Case Name	Test Plan Id	Created By	Created Date
Bit-character duration - Terminal to the UICC	USIMISIMINT	Admin User	01-06-2014 00:00:00
Bit-character duration - UICC toTerminal	USIMISIMINT	Admin User	01-06-2014 00:00:00
Case 2 command	USIMISIMINT	Admin User	01-06-2014 00:00:00

Case 4 command - 6100	USIMISIMINT	Admin User	01-03-2014 00:00:00
Case 4 command - 61xx	USIMISIMINT	Admin User	01-06-2014 00:00:00
Clock stop 1,8V	USIMISIMINT	Admin User	01-06-2014 00:00:00
Clock stop 3V	USIMISIMINT	Admin User	01-06-2014 00:00:00
Command processing, ACK, NACK, NULL	USIMISIMINT	Admin User	01-06-2014 00:00:00
Command processing, multiple NULL	USIMISIMINT	Admin User	01-03-2014 00:00:00
Command processing, warning and error status	USIMISIMINT	Admin User	01-06-2014 00:00:00
Error correction	USIMISIMINT	Admin User	01-06-2014 00:00:00
Error detection	USIMISIMINT	Admin User	01-06-2014 00:00:00
Speed Enhancement	USIMISIMINT	Admin User	01-06-2014 00:00:00
Timing	USIMISIMINT	Admin User	01-06-2014 00:00:00

FALLBACK SUPPORT VZ_REQ_LTEB13NAC_6283

Test Case Name	Test Plan Id	Created By	Created Date

Bit-character duration - Terminal to the UICC	USIMISIMINT	Admin User	01-06-2014 00:00:00
Bit-character duration - UICC toTerminal	USIMISIMINT	Admin User	01-06-2014 00:00:00
Case 2 command	USIMISIMINT	Admin User	01-06-2014 00:00:00
Case 4 command - 6100	USIMISIMINT	Admin User	01-03-2014 00:00:00
Case 4 command - 61xx	USIMISIMINT	Admin User	01-06-2014 00:00:00
Clock stop 1,8V	USIMISIMINT	Admin User	01-06-2014 00:00:00
Clock stop 3V	USIMISIMINT	Admin User	01-06-2014 00:00:00
Command processing, ACK, NACK, NULL	USIMISIMINT	Admin User	01-06-2014 00:00:00
Command processing, multiple NULL	USIMISIMINT	Admin User	01-03-2014 00:00:00
Command processing, warning and error status	USIMISIMINT	Admin User	01-06-2014 00:00:00
Error correction	USIMISIMINT	Admin User	01-06-2014 00:00:00
Error detection	USIMISIMINT	Admin User	01-06-2014 00:00:00
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00

Speed Enhancement	USIMISIMINT	Admin User	01-06-2014 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00
Timing	USIMISIMINT	Admin User	01-06-2014 00:00:00

LTE TEST APPLICATION PROTOCOL SUITE VZ_REQ_LTEB13NAC_6284

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

LTE TEST MODE SUPPORT VZ_REQ_LTEB13NAC_6285

Test Case Name	Test Plan Id	Created By	Created Date
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

LTE DIAGNOSTIC MONITOR CAPABILITY VZ_REQ_LTEB13NAC_6286

Test Case Name	Test Plan Id	Created By	Created Date
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

FIELD TEST MENU VZ_REQ_LTEB13NAC_6287

Test Case Name	Test Plan Id	Created By	Created Date
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

USB DEVICE DRIVER VZ_REQ_LTEB13NAC_6288

Test Case Name	Test Plan Id	Created By	Created Date
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

LTE Test Application for Antenna Testing Requirements VZ_REQ_LTEB13NAC_6289

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

Antenna Information Request Message VZ_REQ_LTEB13NAC_6290

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

Antenna Information Response Message VZ_REQ_LTEB13NAC_6291

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL ISOTROPIC SENSITIVITY	OTARADPERF	Admin	11-08-2013

(TIS)		User	00:00:00

Antenna Configuration Request Message VZ_REQ_LTEB13NAC_6292

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

Antenna Error Response Message VZ_REQ_LTEB13NAC_6293

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

Antenna Configuration Status Request Message VZ_REQ_LTEB13NAC_6294

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

Antenna Configuration Status Response Message VZ_REQ_LTEB13NAC_6295

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

RSSI and Relative Phase Measurements, Accuracy, and Averaging VZ_REQ_LTEB13NAC_6296

Test Case Name	Test Plan Id	Created By	Created Date

TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

USIM and ISIM VZ_REQ_LTEB13NAC_6470

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

NAA applications on the UICC VZ_REQ_LTEB13NAC_6471

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

SUPPORT FOR USIM VZ_REQ_LTEB13NAC_6297

Test Case Name	Test Plan Id	Created By	Created Date
Access Control Information handling	USIMISIMINT	Admin User	01-06-2014 00:00:00
Access Point Name Control List handling	USIMISIMINT	Admin User	01-06-2014 00:00:00
Adding FPLMN to the Forbidden PLMN list	USIMISIMINT	Admin User	01-06-2014 00:00:00
Change of PIN Void Part of GCF Certification	USIMISIMINT	Admin User	01-06-2014 00:00:00
Change of PIN on multi-verification capable UICCs	USIMISIMINT	Admin User	01-06-2014 00:00:00

Change of PIN2 Void Part of GCF Certification	USIMISIMINT	Admin User	01-06-2014 00:00:00
Change of PIN2 on multi-verification capable UICCs	USIMISIMINT	Admin User	01-06-2014 00:00:00
Correct reading of a Short Message on the USIM	USIMISIMINT	Admin User	01-06-2014 00:00:00
Correct storage of a Short Message on the USIM	USIMISIMINT	Admin User	01-06-2014 00:00:00
Device Identification after changed IMSI	USIMISIMINT	Admin User	01-06-2014 00:00:00
Device Identification by GUTI	USIMISIMINT	Admin User	01-06-2014 00:00:00
Device Identification by GUTI	USIMISIMINT	Admin User	01-06-2014 00:00:00
Device deleting forbidden PLMNs	USIMISIMINT	Admin User	01-06-2014 00:00:00
Device identification by short IMSI	USIMISIMINT	Admin User	01-06-2014 00:00:00
Device identification by short IMSI	USIMISIMINT	Admin User	01-06-2014 00:00:00
Device updating forbidden PLMNs	USIMISIMINT	Admin User	01-06-2014 00:00:00
Device updating the User controlled PLMN	USIMISIMINT	Admin User	01-06-2014 00:00:00
Entry of PIN Void Part of GCF Certification	USIMISIMINT	Admin User	01-06-2014 00:00:00

Entry of PIN on multi-verification capable UICCs	USIMISIMINT	Admin User	01-06-2014 00:00:00
Entry of PIN2	USIMISIMINT	Admin User	01-06-2014 00:00:00
Entry of PIN2	USIMISIMINT	Admin User	01-06-2014 00:00:00
NAS security context parameter	USIMISIMINT	Admin User	01-06-2014 00:00:00
NAS security context parameter	USIMISIMINT	Admin User	01-06-2014 00:00:00
NAS security context parameter	USIMISIMINT	Admin User	01-06-2014 00:00:00
Network provided APN handling	USIMISIMINT	Admin User	01-06-2014 00:00:00
Reserved	USIMISIMINT	Admin User	01-06-2014 00:00:00
UICC presence detection	USIMISIMINT	Admin User	01-06-2014 00:00:00
Unblock PIN	USIMISIMINT	Admin User	01-06-2014 00:00:00
Unblock PIN	USIMISIMINT	Admin User	01-06-2014 00:00:00
Unblock PIN2	USIMISIMINT	Admin User	01-06-2014 00:00:00
Unblock PIN2 Void Part of GCF Certification	USIMISIMINT	Admin	01-06-2014

		User	00:00:00

SUPPORT FOR ISIM VZ_REQ_LTEB13NAC_6298

Test Case Name	Test Plan Id	Created By	Created Date
Handling Private User Identity	USIMISIMINT	Admin User	01-06-2014 00:00:00
Handling of Public User Identity for mobile originating IMS sessions	USIMISIMINT	Admin User	01-06-2014 00:00:00
Handling of Public User Identity in IMS registration	USIMISIMINT	Admin User	01-06-2014 00:00:00
Home Domain Usage	USIMISIMINT	Admin User	01-06-2014 00:00:00
IMS AKA BASED AUTHENTICATION	LTEFIELD	Admin User	11-08-2013 00:00:00
P-CSCF Usage	USIMISIMINT	Admin User	01-06-2014 00:00:00

SUPPORT FOR APPLICATION TOOLKIT VZ_REQ_LTEB13NAC_6299

Test Case Name	Test Plan Id	Created By	Created Date
CLOSE CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
CLOSE CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00

CLOSE CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
Contents of the TERMINAL PROFILE	USIMISIMINT	Admin User	01-06-2014 00:00:00
EVENT DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
EVENT DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
EVENT DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
EVENT DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
EVENT DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
GET CHANNEL STATUS	USIMISIMINT	Admin User	01-06-2014 00:00:00
GET CHANNEL STATUS	USIMISIMINT	Admin User	01-06-2014 00:00:00
GET CHANNEL STATUS	USIMISIMINT	Admin User	01-06-2014 00:00:00
LTE CONNECT AND REGISTRATION	CLNR_DEVICE	Admin User	02-11-2014 00:00:00
More time	USIMISIMINT	Admin User	01-06-2014 00:00:00
NEW UICC ACTIVATION	LTEFIELD	Admin User	11-08-2013 00:00:00

OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
POLLING OFF	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROFILE DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
Poll Interval	USIMISIMINT	Admin	01-06-2014

		User	00:00:00
RECEIVE DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00

SEND DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND SHORT MESSAGE	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND SHORT MESSAGE	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND SHORT MESSAGE	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND SHORT MESSAGE	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND SHORT MESSAGE	USIMISIMINT	Admin User	01-06-2014 00:00:00
SMS-PP Data Download over IMS	USIMISIMINT	Admin User	01-06-2014 00:00:00
SMS-PP Data Download over IMS	USIMISIMINT	Admin User	01-06-2014 00:00:00
SMS-PP Data Download over IMS	USIMISIMINT	Admin User	01-06-2014 00:00:00
SMS-PP Data Download over IMS	USIMISIMINT	Admin User	01-06-2014 00:00:00
Servicing of proactive UICC commands	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER EXPIRATION	USIMISIMINT	Admin User	01-06-2014 00:00:00

TIMER EXPIRATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
UPDATE TO USIM AND ISIM FILES IN LTE MODE VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
UPDATES OF MULTIPLE FILES VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
UPDATES OF SINGLE FILE VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
UPDATES TO ONLY SPECIFIC CARD VENDOR FILES (FFS) VOID	LTEFIELD	Admin User	11-08-2013 00:00:00
a CLOSE CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
a OPEN CHANNEL	USIMISIMINT	Admin	01-06-2014

		User	00:00:00
a PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
b OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
c OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
d OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00

LOGICAL CHANNELS VZ_REQ_LTEB13NAC_6300

Test Case Name	Test Plan Id	Created By	Created Date
CLOSE CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
CLOSE CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
CLOSE CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
Contents of the TERMINAL PROFILE	USIMISIMINT	Admin User	01-06-2014 00:00:00
EVENT DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
EVENT DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
EVENT DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
EVENT DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
EVENT DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00

External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
GET CHANNEL STATUS	USIMISIMINT	Admin User	01-06-2014 00:00:00
GET CHANNEL STATUS	USIMISIMINT	Admin User	01-06-2014 00:00:00
GET CHANNEL STATUS	USIMISIMINT	Admin User	01-06-2014 00:00:00
More time	USIMISIMINT	Admin User	01-06-2014 00:00:00
OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
POLLING OFF	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROFILE DOWNLOAD	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
Poll Interval	USIMISIMINT	Admin User	01-06-2014 00:00:00
RECEIVE DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00

REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
REFRESH	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND DATA	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND SHORT MESSAGE	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND SHORT MESSAGE	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND SHORT MESSAGE	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND SHORT MESSAGE	USIMISIMINT	Admin User	01-06-2014 00:00:00
SEND SHORT MESSAGE	USIMISIMINT	Admin User	01-06-2014 00:00:00

SMS-PP Data Download over IMS	USIMISIMINT	Admin User	01-06-2014 00:00:00
SMS-PP Data Download over IMS	USIMISIMINT	Admin User	01-06-2014 00:00:00
SMS-PP Data Download over IMS	USIMISIMINT	Admin User	01-06-2014 00:00:00
SMS-PP Data Download over IMS	USIMISIMINT	Admin User	01-06-2014 00:00:00
Servicing of proactive UICC commands	USIMISIMINT	Admin User	01-06-2014 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00
TIMER EXPIRATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER EXPIRATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
TIMER MANAGEMENT	USIMISIMINT	Admin User	01-06-2014 00:00:00
a CLOSE CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
a OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
a PROVIDE LOCAL INFORMATION	USIMISIMINT	Admin User	01-06-2014 00:00:00
b OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00

c OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00
d OPEN CHANNEL	USIMISIMINT	Admin User	01-06-2014 00:00:00

PLMN SUPPORT VZ_REQ_LTEB13NAC_6301

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
NETWORK INDICATOR	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE DECODES UP TO 6 PLMN IDS	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE PRIORITIZES HOME PLMN OVER ROAMING PLMN	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE SUPPORTS EHPLMN LIST SENT BY UICC	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE SUPPORTS OPLMNWACT LIST SENT BY UICC	USIMISIMINT	Admin User	01-03-2014 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

LTE AUTHENTICATION VZ_REQ_LTEB13NAC_6302

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

BIP OVER THE CLASS 2 APN VZ_REQ_LTEB13NAC_6424

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

DEVICE BEHAVIOR IN RESPONSE TO REFRESH COMMAND VZ_REQ_LTEB13NAC_6461

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

UICC DNS IP Address Retrieval from the Network VZ_REQ_LTEB13NAC_36250

Test Case Name	Test Plan Id	Created By	Created Date
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO	CLASS3APN	Admin User	01-02-2015 00:00:00

LAPTOP AND POWERED BUT NOT CONNECTED			

SYSTEM SELECTION/RESELECTION VZ_REQ_LTEB13NAC_6303

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
PLMN OPERATIONS, UE PRIORITIZES HOME PLMN OVER ROAMING PLMN	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE SUPPORTS EHPLMN LIST SENT BY UICC	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE SUPPORTS OPLMNWACT LIST SENT BY UICC	USIMISIMINT	Admin User	01-03-2014 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

MULTIPLE PLMN SUPPORT VZ_REQ_LTEB13NAC_6304

Test Case Name	Test Plan Id	Created By	Created Date
NETWORK INDICATOR	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE DECODES UP TO 6 PLMN IDS	USIMISIMINT	Admin User	01-03-2014 00:00:00

PLMN OPERATIONS, UE PRIORITIZES HOME PLMN OVER ROAMING PLMN	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE SUPPORTS EHPLMN LIST SENT BY UICC	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE SUPPORTS OPLMNWACT LIST SENT BY UICC	USIMISIMINT	Admin User	01-03-2014 00:00:00

SERVICE AREA RESOLUTION IN M-PLMN VZ_REQ_LTEB13NAC_6415

Test Case Name	Test Plan Id	Created By	Created Date
NETWORK INDICATOR	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE PRIORITIZES HOME PLMN OVER ROAMING PLMN	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE SUPPORTS EHPLMN LIST SENT BY UICC	USIMISIMINT	Admin User	01-03-2014 00:00:00
PLMN OPERATIONS, UE SUPPORTS OPLMNWACT LIST SENT BY UICC	USIMISIMINT	Admin User	01-03-2014 00:00:00

LTE-TO-LTE HANDOVERS VZ_REQ_LTEB13NAC_6305

Test Case Name	Test Plan Id	Created By	Created Date
(VOID) 7.7 VIDEO CALL AND DATA HANDOVER, INTER-ENODEB S1 BASED	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)11.1 VIDEO CALL AND DATA HANDOVER, INTRA-ENODEB - 15MHZ TO 15	VOLTEIOP	Admin User	12-31-2013 00:00:00

MHZ			
(VOID)11.2 VOICE CALL AND DATA HANDOVER, INTRA-ENODEB - 20MHZ TO 20MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)11.4 VIDEO CALL AND DATA HANDOVER, INTER-ENODEB S1 BASED - 5MHZ TO 5MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)11.5 VIDEO CALL AND DATA HANDOVER, INTER-ENODEB S1 BASED 5MHZ TO 10MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)11.8 VIDEO CALL AND DATA HANDOVER, INTER-ENODEB S1 BASED 20MHZ TO 20MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)7.2 VOICE CALL AND DATA HANDOVER, INTER-ENODEB X2 BASED	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)7.3 VOICE CALL AND DATA HANDOVER, INTER-ENODEB S1 BASED	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)7.4 VOICE CALL AND DATA HANDOVER, INTER-MME	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)7.5 VIDEO CALL AND DATA HANDOVER, INTRA-ENODEB	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)7.6 VIDEO CALL AND DATA HANDOVER, INTER-ENODEB X2 BASED	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)7.8 VIDEO CALL AND DATA HANDOVER, INTER-MME	VOLTEIOP	Admin User	12-31-2013 00:00:00
LTE CELL RESELECTION	LTESTRESS	Admin User	11-08-2013 00:00:00

VIDEO CALL AND DATA HANDOVER, INTER-ENODEB S1 BASED - 20MHZ TO 20MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
VIDEO CALL AND DATA HANDOVER, INTER-ENODEB S1 BASED 10MHZ TO 10MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
VIDEO CALL AND DATA HANDOVER, INTER-ENODEB S1 BASED 10MHZ TO 20MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
VOICE CALL AND DATA HANDOVER, INTER-ENODEB S1 BASED - 5MHZ TO 5MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00

LTE SIGNALING VZ_REQ_LTEB13NAC_6306

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (APN DISABLED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (APN DISABLED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) 3 PDNS SCENARIO	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) -3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
NETWORK INITIATED PDN DISCONNECT (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-	LTESUPSIGCONF	Admin	11-20-2013

UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO		User	00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-IDLE) - 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED LTE DETACH UPDATE TO APN PARAMETERS	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

IPV6/IPV4 SUPPORT VZ_REQ_LTEB13NAC_6307

Test Case Name	Test Plan Id	Created By	Created Date
IPv6 ADDRESS ASSIGNMENT-DEVICE POWERING UP IN LTE	LTESTRESS	Admin User	11-08-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN	LTESUPSIGCONF	Admin	11-20-2013

CONNECTION (EMM-IDLE)		User	00:00:00

UE PDN Support VZ_REQ_LTEB13NAC_6308

Test Case Name	Test Plan Id	Created By	Created Date
MME INITIATED DETACH (EMM-CONNECTED) 3 PDNS SCENARIO	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) -3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-IDLE) - 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

UE BEARER AND PDN SUPPORT VZ_REQ_LTEB13NAC_6309

Test Case Name	Test Plan Id	Created By	Created Date

Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

PDN Type VZ_REQ_LTEB13NAC_63 10

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
IPv6 ADDRESS ASSIGNMENT-DEVICE POWERING UP IN LTE	LTESTRESS	Admin User	11-08-2013 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) 3 PDNS SCENARIO	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) -3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-IDLE) - 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00

UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

IMS PDN Bearer VZ_REQ_LTEB13NAC_6311

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
IPV6 ADDRESS ASSIGNMENT	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
IPV6 ADDRESS ASSIGNMENT	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

PDN Connection Request During Attach VZ_REQ_LTEB13NAC_6312

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014

			00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
IPV6 ADDRESS ASSIGNMENT	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
IPV6 ADDRESS ASSIGNMENT	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00

On-Demand PDN Bearer VZ_REQ_LTEB13NAC_6313

Test Case Name	Test Plan Id	Created By	Created Date
MME INITIATED DETACH (EMM-CONNECTED) 3 PDNS SCENARIO	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00

MME INITIATED DETACH (EMM-CONNECTED) -3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-IDLE) - 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE	CLASS3APN	Admin	01-02-

NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT		User	2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00

On-Demand PDN Connection Request VZ_REQ_LTEB13NAC_6314

Test Case Name	Test Plan Id	Created By	Created Date
MME INITIATED DETACH (EMM-CONNECTED) 3 PDNS SCENARIO	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00

MME INITIATED DETACH (EMM-CONNECTED) -3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-IDLE) - 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00

IP MOBILITY VZ_REQ_LTEB13NAC_6315

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH	TCLTEMBSUPSIGCONF	Admin	02-03-2014

(WITHOUT PIGGYBACKING)		User	00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
IPV6 ADDRESS ASSIGNMENT	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
IPV6 ADDRESS ASSIGNMENT	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) 3 PDNS SCENARIO	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) -3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

IP HEADER COMPRESSION VZ_REQ_LTEB13NAC_6316

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

BEARER QOS VZ_REQ_LTEB13NAC_6317

Test Case Name	Test Plan Id	Created By	Created Date
2.1BASIC VOLTE CALL SETUP	IMSVOIP	Admin User	11-12-2013 00:00:00
NETWORK INITIATED EPS BEARER MODIFICATION WITH QOS UPDATE (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
NETWORK INITIATED EPS BEARER MODIFICATION WITHOUT QOS UPDATE (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED INTERNET PDN CONNECTION WITH QOS (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

VOLTE CALL SETUP WITH RINGBACK TONE	IMSVOIP	Admin User	11-12-2013 00:00:00
VOLTE CALL TEARDOWN -- NETWORK INITIATED	IMSVOIP	Admin User	11-12-2013 00:00:00
VOLTE CALL TEARDOWN -- UE INITIATED	IMSVOIP	Admin User	11-12-2013 00:00:00

BEARER QOS and TESTING VZ_REQ_LTEB13NAC_6318

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

Traffic Flow Template Support VZ_REQ_LTEB13NAC_6428

Test Case Name	Test Plan Id	Created By	Created Date
NETWORK INITIATED EPS DEDICATED BEARER ACTIVATION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED INTERNET PDN CONNECTION WITH QOS (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

Uplink Traffic Shaping VZ_REQ_LTEB13NAC_22729

Test Case Name	Test Plan Id	Created By	Created Date

LTE CONNECT AND REGISTRATION	CLNR_DEVICE	Admin User	02-11-2014 00:00:00
RSRP INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
RSRP INTRA-FREQUENCY ACCURACY IN RRC_IDLE MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
RSRQ INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
RSRQ INTRA-FREQUENCY ACCURACY IN RRC_IDLE MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00

MTU SIZE VZ_REQ_LTEB13NAC_6319

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00
INTERNET PDN MTU SIZE ENFORCEMENT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00

DNS Server Support VZ_REQ_LTEB13NAC_6320

Test Case Name	Test Plan Id	Created By	Created Date
UE SUPPORT OF MULTIPLE DNS ADDRESSES	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

Applications and DNS Results Caching VZ_REQ_LTEB13NAC_6321

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

Device DNS Resolver Software Caching VZ_REQ_LTEB13NAC_6322

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

DOMAIN NAME MAXIMUM LENGTH VZ_REQ_LTEB13NAC_6323

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

DATA RETRY REQUIREMENTS VZ_REQ_LTEB13NAC_6324

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

IMSI SUPPORT FOR LTE VZ_REQ_LTEB13NAC_6325

Test Case Name	Test Plan Id	Created By	Created Date

External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

PDN CONNECTION REQUESTS VZ_REQ_LTEB13NAC_6326

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
IPV6 ADDRESS ASSIGNMENT	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
IPV6 ADDRESS ASSIGNMENT	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) 3 PDNS SCENARIO	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
MME INITIATED DETACH (EMM-	LTESUPSIGCONF	Admin	11-20-

CONNECTED) -3 PDNS SCENARIO		User	2013 00:00:00
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-IDLE) - 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO	CLASS3APN	Admin User	01-02-2015

73578) EHRPD ENVIRONMENT			00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00

APN ENABLE/DISABLE VZ_REQ_LTEB13NAC_6327

Test Case Name	Test Plan Id	Created By	Created Date
EUTRAN INITIAL ATTACH (APN DISABLED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00

EUTRAN INITIAL ATTACH (APN DISABLED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
UE INITIATED PDN CONNECTION (APN DISABLED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (APN DISABLED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00

VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00

APN CONTENT VZ_REQ_LTEB13NAC_6328

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

IPV6 ADDRESS ASSIGNMENT	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
IPV6 ADDRESS ASSIGNMENT	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) 3 PDNS SCENARIO	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) -3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-IDLE) - 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION	LTESUPSIGCONF	Admin	11-20-

(EMM-CONNECTED)		User	2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00

VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00

UICC APN Verification Enabled VZ_REQ_LTEB13NAC_6329

Test Case Name	Test Plan Id	Created By	Created Date
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR	CLASS3APN	Admin	01-02-2015

STATIC IP- UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND		User	00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00

UICC APN Verification Disabled VZ_REQ_LTEB13NAC_6330

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL	CLASS3APN	Admin User	01-02-2015 00:00:00

UPDATE VALIDATION			
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00

APN STORAGE VZ_REQ_LTEB13NAC_6331

Test Case Name	Test Plan Id	Created By	Created Date
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING	CLASS3APN	Admin	01-02-2015

APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES		User	00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

APN STORAGE AND UPDATES VZ_REQ_LTEB13NAC_6332

Test Case Name	Test Plan Id	Created	Created

		By	Date
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00

VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW Internal Compliance	VZWRC	Admin User	10-28-2013 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00

MULTIPLE PDN CONNECTIONS USING THE SAME APN VZ_REQ_LTEB13NAC_6333

Test Case Name	Test Plan Id	Created By	Created Date
MULTI-PDN ATTACH	VOLTEIOP	Admin User	12-30-2013 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP	CLASS3APN	Admin	01-02-2015

APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT		User	00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

APPLICATION ACCESS TO APN PARAMETERS VZ_REQ_LTEB13NAC_6417

Test Case Name	Test Plan Id	Created By	Created Date
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD	CLASS3APN	Admin User	01-02-2015 00:00:00

ENVIRONMENT			
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

IMEI and IMEISV VZ_REQ_LTEB13NAC_6334

Test Case Name	Test Plan Id	Created By	Created Date
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00

VZW Internal Compliance	VZWRC	Admin User	10-28-2013 00:00:00
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

IMEI Display VZ_REQ_LTEB13NAC_6335

Test Case Name	Test Plan Id	Created By	Created Date
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

SMS over IMS Support VZ_REQ_LTEB13NAC_6336

Test Case Name	Test Plan Id	Created By	Created Date
2.12VOID - Replaced by TC 2.74 - MOBILE ORIGINATED SMS MESSAGE- 3GPP2 SMS	LTESMS	Admin User	01-07-2014 00:00:00
2.132.132.132.13VOID - Replaced by TC 2.75 - MOBILE ORIGINATED SMS MESSAGE- 3GPP SMS	LTESMS	Admin User	01-07-2014 00:00:00
2.7VOID DEVICE INITIAL REGISTRATION IMS TEST MODE IS SET TO ENABLE	IMSREGRTY	Admin User	04-02-2014 00:00:00
MOBILE TERMINATED SMS MESSAGE- 3GPP SMS	LTESMS	Admin User	01-07-2014 00:00:00
SMS over NAS	SMS OVER NAS	Admin User	02-16-2016 00:00:00
Vendor Compliance	VZWRC	Admin	10-28-2013

		User	00:00:00
[Retired]Mobile Terminated SMS message- 3GPP2 SMS	LTESMS	Admin User	01-07-2014 00:00:00

IMS CLIENT VZ_REQ_LTEB13NAC_6337

Test Case Name	Test Plan Id	Created By	Created Date
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

IMS Test Mode VZ_REQ_LTEB13NAC_6338

Test Case Name	Test Plan Id	Created By	Created Date
2.7VOID DEVICE INITIAL REGISTRATION IMS TEST MODE IS SET TO ENABLE	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION - IMS TEST MODE IS SET TO	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION- IMS TEST MODE IS SET TO ENABLE	MMIMSREGRTY	Admin User	11-08-2013 00:00:00

PDN and Bearer Selection VZ_REQ_LTEB13NAC_6432

Test Case Name	Test Plan Id	Created By	Created Date
2.1DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	11-08-2013 00:00:00
BEARER ESTABLISHMENT (ESTABLISHING 1	VOLTEIOP	Admin	12-30-2013

BEARER)		User	00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND IMS-AKA USING IPSEC AUTHENTICATION - OPTIONAL	IMSREGRTY	Admin User	11-08-2013 00:00:00
MULTI-BEARER ESTABLISHMENT (ESTABLISHING 2 BEARERS)	VOLTEIOP	Admin User	12-30-2013 00:00:00
MULTI-BEARER TEARDOWN (KEEPING 1 BEARER UP VOICE)	VOLTEIOP	Admin User	12-31-2013 00:00:00

Proxy-CSCF Discovery VZ_REQ_LTEB13NAC_6433

Test Case Name	Test Plan Id	Created By	Created Date
2.1DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND IMS-AKA USING IPSEC AUTHENTICATION - OPTIONAL	IMSREGRTY	Admin User	11-08-2013 00:00:00

Registration with the Proxy-CSCF and S-CSCF VZ_REQ_LTEB13NAC_6434

Test Case Name	Test Plan Id	Created By	Created Date

2.1DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND IMS-AKA USING IPSEC AUTHENTICATION - OPTIONAL	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION, NETWORK SENDS MULTIPLE CONTACT HEADERS	IMSREGRTY	Admin User	02-07-2016 00:00:00

Authentication during registration VZ_REQ_LTEB13NAC_6435

Test Case Name	Test Plan Id	Created By	Created Date
2.1DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND IMS-AKA USING IPSEC AUTHENTICATION - OPTIONAL	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY REGISTRATION TIMER EXPIRES WHILE THROTTLING	IMSREGRTY	Admin User	04-02-2014 00:00:00

URI formatting VZ_REQ_LTEB13NAC_6436

Test Case Name	Test Plan Id	Created By	Created Date
2.1DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND IMS-AKA USING IPSEC AUTHENTICATION - OPTIONAL	IMSREGRTY	Admin User	11-08-2013 00:00:00

Subscription to the reg event package VZ_REQ_LTEB13NAC_6437

Test Case Name	Test Plan Id	Created By	Created Date
2.1DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND IMS-AKA USING IPSEC AUTHENTICATION - OPTIONAL	IMSREGRTY	Admin User	11-08-2013 00:00:00
UE INITIATED RE-SUBSCRIBE	IMSREGRTY	Admin User	04-02-2014 00:00:00

Reregistration VZ_REQ_LTEB13NAC_6438

Test Case Name	Test Plan Id	Created By	Created Date
2.8VOID UE INITIATED DEVICE REREGISTRATION WITHOUT NETWORK CHALLENGE	IMSREGRTY	Admin User	04-02-2014 00:00:00
UE INITIATED DEVICE REREGISTRATION WITH NETWORK CHALLENGE	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
UE INITIATED DEVICE REREGISTRATION WITH NETWORK CHALLENGE	IMSREGRTY	Admin User	11-08-2013 00:00:00
UE INITIATED DEVICE REREGISTRATION WITH NETWORK CHALLENGE	IMSREGRTY	Admin User	04-02-2014 00:00:00
UE INITIATED DEVICE REREGISTRATION WITHOUT NETWORK CHALLENGE	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
UE INITIATED DEVICE REREGISTRATION WITHOUT NETWORK CHALLENGE	IMSREGRTY	Admin User	11-08-2013 00:00:00

Deregistration VZ_REQ_LTEB13NAC_6439

Test Case Name	Test Plan Id	Created By	Created Date
DEVICE INITIATED DE-REGISTRATION UE INITIATED LTE DETACH ON POWER DOWN	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIATED DE-REGISTRATION - UE INITIATED LTE DETACH ON POWER DOWN	MMIMSREGRTY	Admin User	11-08-2013 00:00:00

DEVICE INITIATED DE-REGISTRATION - UE INITIATED LTE DETACH ON POWER DOWN	IMSREGRTY	Admin User	11-08-2013 00:00:00
NETWORK INITIATED DE-REGISTRATION	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
NETWORK INITIATED DE-REGISTRATION	IMSREGRTY	Admin User	11-08-2013 00:00:00
NETWORK INITIATED DE-REGISTRATION	IMSREGRTY	Admin User	04-02-2014 00:00:00
UE INITIATED DE-REGISTRATION AIRPLANE MODE	IMSREGRTY	Admin User	04-02-2014 00:00:00
UE INITIATED DE-REGISTRATION - AIRPLANE MODE	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
UE INITIATED DE-REGISTRATION - UE INITIATED IMS PDN DISCONNECT	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
UE INITIATED DE-REGISTRATION - UE INITIATED IMS PDN DISCONNECT	IMSREGRTY	Admin User	11-08-2013 00:00:00
UE INITIATED DE-REGISTRATION - AIRPLANE MODE	IMSREGRTY	Admin User	11-08-2013 00:00:00
VOID UE INITIATED DE-REGISTRATION UE INITIATED IMS PDN DISCONNECT	IMSREGRTY	Admin User	04-02-2014 00:00:00

Device Identity and Related Parameters VZ_REQ_LTEB13NAC_6440

Test Case Name	Test Plan Id	Created By	Created Date
2.1DEVICE INITIAL REGISTRATION USING	IMSREGRTY	Admin	11-08-

THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION		User	2013 00:00:00
2.4DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI - MSISDN-BASED SIP URI INVALID	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN NOT PROVISIONED ON THE USIM	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN-BASED SIP URI INVALID	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN NOT PROVISIONED ON THE USIM	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN-BASED SIP URI INVALID	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI- MSISDN NOT PROVISIONED ON THE USIM	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND IMS-AKA USING IPSEC AUTHENTICATION - OPTIONAL	IMSREGRTY	Admin User	11-08-2013 00:00:00

SMS over IMS Control VZ_REQ_LTEB13NAC_6441

Test Case Name	Test Plan Id	Created By	Created Date
2.6VOID DEVICE INITIAL REGISTRATION SMS_OVER_IP_NETWORKS_INDICATION IS SET TO DISABLE	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION - IMS TEST MODE IS SET TO	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION - SMS_OVER_IP_NETWORKS_INDICATION IS SET TO DISABLE	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION - SMS_OVER_IP_NETWORKS_INDICATION IS SET TO DISABLE	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION- IMS TEST MODE IS SET TO ENABLE	MMIMSREGRTY	Admin User	11-08-2013 00:00:00

SIP Timers for IMS VZ_REQ_LTEB13NAC_6442

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

MSISDN and MSISDN-based SIP URI Validity VZ_REQ_LTEB13NAC_6443

Test Case Name	Test Plan Id	Created By	Created Date
2.1DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-	IMSREGRTY	Admin User	11-08-2013

AKAV2 AUTHENTICATION			00:00:00
2.4DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI - MSISDN-BASED SIP URI INVALID	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN NOT PROVISIONED ON THE USIM	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN-BASED SIP URI INVALID	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN NOT PROVISIONED ON THE USIM	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN-BASED SIP URI INVALID	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI- MSISDN NOT PROVISIONED ON THE USIM	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND IMS-AKA USING IPSEC AUTHENTICATION - OPTIONAL	IMSREGRTY	Admin User	11-08-2013 00:00:00

IMS Registration/Re-Registration Retry Algorithm VZ_REQ_LTEB13NAC_6444

Test Case Name	Test Plan Id	Created	Created

		By	Date
IMS REGISTRATION RETRY GENERAL CASE, NETWORK IGNORES REQUEST	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REGISTRATION RETRY GENERAL CASE, NETWORK REJECTS REQUEST	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP ERROR CODES 500, 503, 480, 486, 600	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REGISTRATION RETRY - GENERAL CASE, NETWORK IGNORES REQUEST	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY - GENERAL CASE, NETWORK IGNORES REQUEST	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY - GENERAL CASE, NETWORK REJECTS REQUEST	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY - GENERAL CASE, NETWORK REJECTS REQUEST	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 400, 402	MMIMSREGRTY	Admin User	11-08-2013 00:00:00

ERROR CODES			
IMS REGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP ERROR CODES 500, 503	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY- NETWORK REJECTS REQUEST WITH SIP ERROR CODES 500, 503	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY GENERAL CASE, NETWORK IGNORES REQUEST	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REREGISTRATION RETRY GENERAL CASE, NETWORK REJECTS REQUEST	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP ERROR CODES 500, 503, 480, 486, 600	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REREGISTRATION RETRY - GENERAL CASE, NETWORK IGNORES REQUEST	MMIMSREGRTY	Admin User	11-08-2013 00:00:00

IMS REREGISTRATION RETRY - GENERAL CASE, NETWORK IGNORES REQUEST	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY - GENERAL CASE, NETWORK REJECTS REQUEST	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP ERROR CODES 500, 503	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP ERROR CODES 500, 503	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY -GENERAL CASE, NETWORK REJECTS REQUEST	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY -NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	IMSREGRTY	Admin User	11-08-2013 00:00:00
LOWER LAYER FAILURE DURING IMS REGISTRATION RETRY	IMSREGRTY	Admin User	04-02-2014 00:00:00
VOID IMS REGISTRATION RETRY	IMSREGRTY	Admin	04-02-2014

THROTTLING TIMERS ACROSS SYSTEM TRANSITIONS		User	00:00:00

Network Rejects the IMS Registration/Re-registration with a 'SIP 400', 'SIP 402', 'SIP 421', or 'SIP 484' Message VZ_REQ_LTEB13NAC_6452

Test Case Name	Test Plan Id	Created By	Created Date
IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REREGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES	IMSREGRTY	Admin User	11-08-2013 00:00:00

Network Rejects the IMS Registration/Re-registration with a 'SIP 403' or 'SIP 404' Message VZ_REQ_LTEB13NAC_6453

Test Case Name	Test Plan Id	Created By	Created Date

IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REREGISTRATION RETRY - NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REREGISTRATION RETRY -NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES	IMSREGRTY	Admin User	11-08-2013 00:00:00

IMS Registration Timer Expires while Throttling VZ_REQ_LTEB13NAC_6454

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

IMS Registration/Re-Registration Throttling Across System Transitions VZ_REQ_LTEB13NAC_6455

Test Case Name	Test Plan Id	Created By	Created Date

IMS REGISTRATION RETRY THROTTLING TIMERS ACROSS SYSTEM TRANSITIONS	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION RETRY THROTTLING TIMERS ACROSS SYSTEM TRANSITIONS	IMSREGRTY	Admin User	11-08-2013 00:00:00
RESET OF IMS REGISTRATION RETRY THROTTLING TIMERS ON NEW BEARER ACTIVATION	IMSREGRTY	Admin User	02-07-2016 00:00:00
VOID IMS REGISTRATION RETRY THROTTLING TIMERS ACROSS SYSTEM TRANSITIONS	IMSREGRTY	Admin User	04-02-2014 00:00:00

Reset of Throttling Counters and Timers on Power Cycle and on USIM/ISIM Replacement/Refresh VZ_REQ_LTEB13NAC_6456

Test Case Name	Test Plan Id	Created By	Created Date
RESET OF IMS REGISTRATION RETRY THROTTLING TIMERS ON POWER CYCLE	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
RESET OF IMS REGISTRATION RETRY THROTTLING TIMERS ON POWER CYCLE	IMSREGRTY	Admin User	11-08-2013 00:00:00
RESET OF IMS REGISTRATION RETRY THROTTLING TIMERS ON POWER CYCLE	IMSREGRTY	Admin User	04-02-2014 00:00:00

SIP 501 or SIP 481 in Response to a Deregistration Request VZ_REQ_LTEB13NAC_6457

Test Case Name	Test Plan Id	Created By	Created Date
2.342.342.34VOID DE-REGISTRATION REJECTED WITH SIP ERROR CODE 501	IMSREGRTY	Admin User	04-02-2014 00:00:00

CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

IMS Signaling and Lower Layer Failures VZ_REQ_LTEB13NAC_6480

Test Case Name	Test Plan Id	Created By	Created Date
2.352.352.35VOID CONNECTION FAILURE PRIOR TO IMS REGISTRATION	IMSREGRTY	Admin User	04-02-2014 00:00:00
2.37VOID SUBSCRIBE TIMEOUT AFTER LOWER LAYER FAILURE	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REGISTRATION AFTER SIGNALING CONDITION ESTABLISHED	IMSREGRTY	Joseph Kuhn	10-11-2016 17:58:21
LOWER LAYER FAILURE DURING IMS REGISTRATION RETRY	IMSREGRTY	Admin User	04-02-2014 00:00:00

IMS REGISTRATION ON SYSTEM TRANSITIONS VZ_REQ_LTEB13NAC_6458

Test Case Name	Test Plan Id	Created By	Created Date
2.27VOID IMS REGISTRATION BEHAVIOR ACROSS SYSTEM TRANSITIONS	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS EHRPD TO LTE TRANSITION, ALL CONTEXTS MAINTAINED	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS EHRPD TO LTE TRANSITION, CHANGE IN P-CSCF	MMIMSREGRTY	Admin User	11-08-2013 00:00:00

IMS REGISTRATION BEHAVIOR ACROSS EHRPD TO LTE TRANSITION, HANDOVER ATTACH REJECTED BY THE LTE NETWORK	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS EHRPD TO LTE TRANSITION, IP CONTINUITY NOT MAINTAINED	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS EHRPD TO NO SERVICE TO LTE TRANSITION	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS LTE TO EHRPD TRANSITION, ALL CONTEXTS MAINTAINED	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS LTE TO EHRPD TRANSITION, HANDOVER PDN ATTACH REJECTED BY THE EHRPD NETWORK	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS LTE TO EHRPD TRANSITION, IP CONTINUITY NOT MAINTAINED	MMIMSREGRTY	Admin User	02-02-2015 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS LTE TO NO SERVICE TO EHRPD TRANSITION	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS SYSTEM TRANSITIONS	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR AFTER ENCOUNTERING NO SERVICE CONDITION	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR AFTER ENCOUNTERING NO SERVICE CONDITION	IMSREGRTY	Admin User	11-08-2013 00:00:00

IMS REGISTRATION BEHAVIOR AFTER ENCOUNTERING NO SERVICE CONDITION	IMSREGRTY	Admin User	04-02-2014 00:00:00

IMS REGISTRATION ON SYSTEM TRANSITIONS - EXAMPLES 1-7
VZ_REQ_LTEB13NAC_6459

Test Case Name	Test Plan Id	Created By	Created Date
2.27VOID IMS REGISTRATION BEHAVIOR ACROSS SYSTEM TRANSITIONS	IMSREGRTY	Admin User	04-02-2014 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS EHRPD TO LTE TRANSITION, ALL CONTEXTS MAINTAINED	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS EHRPD TO LTE TRANSITION, CHANGE IN P-CSCF	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS EHRPD TO LTE TRANSITION, HANDOVER ATTACH REJECTED BY THE LTE NETWORK	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS EHRPD TO LTE TRANSITION, IP CONTINUITY NOT MAINTAINED	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS EHRPD TO NO SERVICE TO LTE TRANSITION	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS LTE TO EHRPD TRANSITION, ALL CONTEXTS MAINTAINED	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS	MMIMSREGRTY	Admin	11-08-2013

LTE TO EHRPD TRANSITION, HANDOVER PDN ATTACH REJECTED BY THE EHRPD NETWORK		User	00:00:00
IMS REGISTRATION BEHAVIOR ACROSS LTE TO EHRPD TRANSITION, IP CONTINUITY NOT MAINTAINED	MMIMSREGRTY	Admin User	02-02-2015 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS LTE TO NO SERVICE TO EHRPD TRANSITION	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR ACROSS SYSTEM TRANSITIONS	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR AFTER ENCOUNTERING NO SERVICE CONDITION	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR AFTER ENCOUNTERING NO SERVICE CONDITION	IMSREGRTY	Admin User	11-08-2013 00:00:00
IMS REGISTRATION BEHAVIOR AFTER ENCOUNTERING NO SERVICE CONDITION	IMSREGRTY	Admin User	04-02-2014 00:00:00

IMS REGISTRATION DUE TO NEW IMS PDN BEARER ACTIVATION
VZ_REQ_LTEB13NAC_6460

Test Case Name	Test Plan Id	Created By	Created Date
2.30VOID REGISTRATION BEHAVIOR AFTER A NETWORK INITIATED DISCONNECT OF THE IMS PDN	IMSREGRTY	Admin User	04-02-2014 00:00:00
REGISTRATION BEHAVIOR AFTER A NETWORK INITIATED DETACH	MMIMSREGRTY	Admin User	11-08-2013 00:00:00

REGISTRATION BEHAVIOR AFTER A NETWORK INITIATED DETACH	IMSREGRTY	Admin User	11-08-2013 00:00:00
REGISTRATION BEHAVIOR AFTER A NETWORK INITIATED DETACH	IMSREGRTY	Admin User	04-02-2014 00:00:00
REGISTRATION BEHAVIOR AFTER A NETWORK INITIATED DISCONNECT OF THE IMS PDN	MMIMSREGRTY	Admin User	11-08-2013 00:00:00
REGISTRATION BEHAVIOR AFTER A NETWORK INITIATED DISCONNECT OF THE IMS PDN	IMSREGRTY	Admin User	11-08-2013 00:00:00

IMS REGISTRATION AFTER UICC REFRESH OR UICC INSERTION VZ_REQ_LTEB13NAC_6483

Test Case Name	Test Plan Id	Created By	Created Date
Type 4 - Hot Swap	SIMAPPINT	Admin User	11-08-2013 00:00:00

P-CSCF Restoration Procedures VZ_REQ_LTEB13NAC_33802

Test Case Name	Test Plan Id	Created By	Created Date
LTE CONNECT AND REGISTRATION	CLNR_DEVICE	Admin User	02-11-2014 00:00:00

Network Rejects a re-SUBSCRIBE Request VZ_REQ_LTEB13NAC_36126

Test Case Name	Test Plan Id	Created By	Created Date
RE-SUBSCRIBE REJECTED WITH SIP ERROR CODE 481	IMSREGRTY	Admin User	04-02-2014 00:00:00

SYSTEM TIME AND LOCAL TIME VZ_REQ_LTEB13NAC_6339

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00
TIME RETRIEVAL VIA SIB16 MESSAGE	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

CIPHERING AND INTEGRITY PROTECTION VZ_REQ_LTEB13NAC_6340

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

UE MODE OF OPERATION VZ_REQ_LTEB13NAC_6341

Test Case Name	Test Plan Id	Created By	Created Date
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

PRIMARY AND SECONDARY SYNCHRONIZATION SIGNAL RECEPTION VZ_REQ_LTEB13NAC_6342

Test Case Name	Test Plan Id	Created By	Created Date

CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00
Loss of One eNodeb Antenna Path While Device is in Idle Mode	LTEB13IOT	Admin User	05-11-2015 00:00:00
Loss of one eNodeB antenna path While Device is in Connected Mode	LTEB13IOT	Admin User	05-11-2015 00:00:00

INDICATION OF CMAS NOTIFICATION VZ_REQ_LTEB13NAC_6343

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

WARNING MESSAGE PROCESSING VZ_REQ_LTEB13NAC_6344

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

SYSTEMINFORMATIONBLOCKTYPE12 INFORMATION ELEMENT VZ_REQ_LTEB13NAC_6345

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

DEVICE BEHAVIOR VZ_REQ_LTEB13NAC_6346

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

SCHEDULING REQUESTS OVER PRACH VZ_REQ_LTEB13NAC_6418

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

LTE FEMTOCELL SUPPORT VZ_REQ_LTEB13NAC_6472

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

Req-1 VZ_REQ_LTEB13NAC_36950

Test Case Name	Test Plan Id	Created By	Created Date
feICIC Idle Mode Qoffset support	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

Req-2 VZ_REQ_LTEB13NAC_36951

Test Case Name	Test Plan Id	Created By	Created Date
eICIC FEATURE GROUP and UE Capability SUPPORT	LTESUPSIGCONF	Admin User	01-27-2015 00:00:00

Req-3 VZ_REQ_LTEB13NAC_36952

Test Case Name	Test Plan Id	Created By	Created Date
2.41feICIC GCF Signaling and Protocol Test Cases	LTESUPSIGCONF	Admin User	01-27-2015 00:00:00
eICIC GCF RRM Conformance Test Cases	3GPPB13SUPRRM	Admin	01-27-2015

		User	00:00:00
eICIC UE Resets measSubframePcell at RRC Connection Re-establish	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC Idle Mode Qoffset support	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

Req-4 VZ_REQ_LTEB13NAC_36953

Test Case Name	Test Plan Id	Created By	Created Date
2.41feICIC GCF Signaling and Protocol Test Cases	LTESUPSIGCONF	Admin User	01-27-2015 00:00:00
eICIC GCF RRM Conformance Test Cases	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
eICIC UE Resets measSubframePcell at RRC Connection Re-establish	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

Req-5 VZ_REQ_LTEB13NAC_36954

Test Case Name	Test Plan Id	Created By	Created Date
2.41feICIC GCF Signaling and Protocol Test Cases	LTESUPSIGCONF	Admin User	01-27-2015 00:00:00
eICIC GCF RRM Conformance Test Cases	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
eICIC UE Resets measSubframePcell at RRC Connection Re-establish	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

CRS Interference Management VZ_REQ_LTEB13NAC_36957

Test Case Name	Test Plan Id	Created By	Created Date
Band 4- eICIC Data Throughput Performance Tests in VICTIM CELL	LTEMBDATATHRU	Admin User	01-27-2015 00:00:00
eICIC DOWNLINK FTP THROUGHPUT IN VICTIM CELL	LTEB13DATATHRU	Admin User	01-27-2015 00:00:00

eICIC DOWNLINK UDP THROUGHPUT IN VICTIM CELL	LTEB13DATATHRU	Admin User	01-27-2015 00:00:00
eICIC FEATURE GROUP and UE Capability SUPPORT	LTESUPSIGCONF	Admin User	01-27-2015 00:00:00
eICIC FTP THROUGHPUT in AGGRESSOR CELL	LTEB13DATATHRU	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

Req-1 VZ_REQ_LTEB13NAC_36959

Test Case Name	Test Plan Id	Created By	Created Date
2.41feICIC GCF Signaling and Protocol Test Cases	LTESUPSIGCONF	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00

Req-2 VZ_REQ_LTEB13NAC_36960

Test Case Name	Test Plan Id	Created By	Created Date
eICIC GCF RRM Conformance Test Cases	3GPPB13SUPRRM	Admin	01-27-2015

		User	00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

PDSCH Decoding in Transmission Mode 9 (TM9) VZ_REQ_LTEB13NAC_37808

Test Case Name	Test Plan Id	Created By	Created Date
DL CoMP GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	05-05-2015 00:00:00

CSI (Channel State Information) Reporting in TM9 VZ_REQ_LTEB13NAC_37809

Test Case Name	Test Plan Id	Created By	Created Date
DL CoMP GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	05-05-2015 00:00:00

RRC Signaling for TM9 VZ_REQ_LTEB13NAC_37810

Test Case Name	Test Plan Id	Created By	Created Date
DL CoMP GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	05-05-2015 00:00:00

PDSCH Decoding in Transmission Mode 10 (TM10) VZ_REQ_LTEB13NAC_37812

Test Case Name	Test Plan Id	Created By	Created Date
DL COMP DATA THROUGHPUT TESTS WITH PDSCH IN MBSFN SUBFRAMES	LTEB13DATATHRU	Admin User	05-05-2015 00:00:00
DL COMP DATA THROUGHPUT TESTS WITH THREE TRANSMISSION POINTS	LTEB13DATATHRU	Admin User	05-05-2015 00:00:00
DL COMP DATA THROUGHPUT TESTS WITH TWO TRANSMISSION POINTS	LTEB13DATATHRU	Admin User	05-05-2015 00:00:00
DL CoMP Data Throughput Tests in Band 4 and Band 13 + Band 4 Downlink Carrier Aggregation	LTEMBDATATHRU	Admin User	05-05-2015 00:00:00
DL CoMP GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	05-05-2015 00:00:00

CSI Reporting in TM10 VZ_REQ_LTEB13NAC_37813

Test Case Name	Test Plan Id	Created By	Created Date
DL CoMP GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	05-05-2015 00:00:00

RRC Signaling for TM10 VZ_REQ_LTEB13NAC_37814

Test Case Name	Test Plan Id	Created By	Created Date
DL COMP DATA THROUGHPUT TESTS WITH PDSCH IN MBSFN SUBFRAMES	LTEB13DATATHRU	Admin User	05-05-2015 00:00:00
DL COMP DATA THROUGHPUT TESTS WITH THREE TRANSMISSION POINTS	LTEB13DATATHRU	Admin User	05-05-2015 00:00:00

DL COMP DATA THROUGHPUT TESTS WITH TWO TRANSMISSION POINTS	LTEB13DATATHRU	Admin User	05-05-2015 00:00:00
DL CoMP Data Throughput Tests in Band 4 and Band 13 + Band 4 Downlink Carrier Aggregation	LTEMBDATATHRU	Admin User	05-05-2015 00:00:00
DL CoMP GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	05-05-2015 00:00:00
DL CoMP HANDOVER WITH TRANSMISSION MODE CHANGE	LTESUPSIGCONF	Admin User	05-06-2015 00:00:00
DL CoMP UE CAPABILITY SUPPORT	LTESUPSIGCONF	Admin User	05-06-2015 00:00:00

Enhanced Physical Downlink Control Channel (ePDCCH) VZ_REQ_LTEB13NAC_38376

Test Case Name	Test Plan Id	Created By	Created Date
DATA THROUGHPUT STRESS TEST WITH EPDCCH SCHEDULING	LTEB13DATATHRU	Admin User	09-21-2015 00:00:00
Downlink Carrier Aggregation with EPDCCH Scheduling	LTEMBDATATHRU	Admin User	09-21-2015 00:00:00
EPDCCH GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	09-21-2015 00:00:00
EPDCCH GCF Signalling and Protocol Conformance Test Cases	LTESUPSIGCONF	Admin User	09-21-2015 00:00:00
EPDCCH Supplementary RF Conformance Test Cases	SUPRFCONF13	Admin User	09-21-2015 00:00:00

EPDCCH UE CAPABILITY SUPPORT	LTESUPSIGCONF	Admin User	09-21-2015 00:00:00

RADIO LINK AND HANDOVER FAILURE REPORTING VZ_REQ_LTEB13NAC_6465

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00
UE INDICATES RACH REPORT CAPABILITY	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE REPORTS RACH INFORMATION UPON REQUEST BY NETWORK	LTESUPSIGCONF	Admin User	11-22-2013 00:00:00

RACH INFORMATION REPORTING VZ_REQ_LTEB13NAC_6466

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00
UE INDICATES RACH REPORT CAPABILITY	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE REPORTS RACH INFORMATION UPON REQUEST BY NETWORK	LTESUPSIGCONF	Admin User	11-22-2013 00:00:00

SMS over NAS (Data-Centric or IMS-Less Devices ONLY) VZ_REQ_LTEB13NAC_39731

Test Case Name	Test Plan Id	Created By	Created Date

SMS over NAS	SMS OVER NAS	Admin User	02-16-2016 00:00:00

DL 256QAM Support VZ_REQ_LTEB13NAC_39749

Test Case Name	Test Plan Id	Created By	Created Date
256QAM DATA THROUGHPUT TEST	LTEB13DATATHRU	Admin User	09-22-2015 00:00:00
256QAM Data Throughput Tests	LTEMBDATATHRU	Admin User	09-22-2015 00:00:00
256QAM Supplementary RF Conformance Test Cases	SUPRFCONF13	Admin User	09-22-2015 00:00:00
256QAM UE Capacity Support	LTESUPSIGCONF	Admin User	09-22-2015 00:00:00
HANDOVER WITH MCS&CQI TABLE CHANGE	LTESUPSIGCONF	Admin User	09-22-2015 00:00:00

LTE SYSTEM SELECTION VZ_REQ_LTEB13NAC_6347

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

LTE NETWORK ATTACHMENT VZ_REQ_LTEB13NAC_6348

Test Case Name	Test Plan Id	Created By	Created Date

External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

PDN CONNECTION FOR NETWORK ATTACHMENT - NORMAL OPERATION VZ_REQ_LTEB13NAC_6349

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

PDN CONNECTION FOR NETWORK ATTACHMENT - IMS TEST MODE OPERATION VZ_REQ_LTEB13NAC_6350

Test Case Name	Test Plan Id	Created By	Created Date
2.7VOID DEVICE INITIAL REGISTRATION IMS TEST MODE IS SET TO ENABLE	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIAL REGISTRATION - IMS TEST MODE IS SET TO	IMSREGRTY	Admin User	11-08-2013 00:00:00
DEVICE INITIAL REGISTRATION- IMS TEST MODE IS SET TO ENABLE	MMIMSREGRTY	Admin User	11-08-2013 00:00:00

DEVICE MO SMS FORMAT SETTING-DEFAULT	TCLTEMMM	Admin User	11-08-2013 00:00:00

IMS PDN DEDICATED BEARER SETUP VZ_REQ_LTEB13NAC_6351

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

IP ADDRESS ASSIGNMENT - NORMAL OPERATION VZ_REQ_LTEB13NAC_6352

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
IPV6 ADDRESS ASSIGNMENT	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
IPV6 ADDRESS ASSIGNMENT	LTESUPSIGCONF	Admin	11-20-2013

		User	00:00:00

IP ADDRESS ASSIGNMENT - IMS TEST MODE OPERATION
VZ_REQ_LTEB13NAC_6353

Test Case Name	Test Plan Id	Created By	Created Date
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

NAS MESSAGING DURING LTE NETWORK ATTACHMENT
VZ_REQ_LTEB13NAC_6354

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

NAS MESSAGING DURING LTE NETWORK ATTACHMENT - ATTACH REQUEST Message VZ_REQ_LTEB13NAC_6355

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
UE INITIATED LTE DETACH UPDATE TO APN PARAMETERS	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

NAS MESSAGING DURING LTE NETWORK ATTACHMENT - PDN CONNECTIVITY REQUEST Message VZ_REQ_LTEB13NAC_6356

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013

			00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
UE INITIATED LTE DETACH UPDATE TO APN PARAMETERS	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00

VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00

NAS MESSAGING DURING LTE NETWORK ATTACHMENT - ESM INFORMATION RESPONSE Message VZ_REQ_LTEB13NAC_6357

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
UE INITIATED LTE DETACH UPDATE TO APN PARAMETERS	LTESUPSIGCONF	Admin User	11-20-2013

			00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00

NAS MESSAGING DURING LTE NETWORK ATTACHMENT - ATTACH ACCEPT Message VZ_REQ_LTEB13NAC_6358

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00

EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
UE INITIATED LTE DETACH UPDATE TO APN PARAMETERS	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

NAS MESSAGING DURING LTE NETWORK ATTACHMENT - ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST Message VZ_REQ_LTEB13NAC_6359

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
UE INITIATED LTE DETACH UPDATE TO APN PARAMETERS	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00

ON -DEMAND PDN CONNECTION ESTABLISHMENT - NORMAL OPERATION VZ_REQ_LTEB13NAC_6360

Test Case Name	Test Plan Id	Created By	Created Date
LTE CALL QUALITY	LTESTRESS	Admin User	11-08-2013 00:00:00
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) 3 PDNS SCENARIO	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
MME INITIATED DETACH (EMM-CONNECTED) -3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-IDLE) - 3 PDNS	LTESUPSIGCONF	Admin User	11-20-2013

SCENARIO			00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR	CLASS3APN	Admin User	01-02-2015 00:00:00

EXISTING DEVICE WITH MOBILE BROADBAND			
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00

ON -DEMAND PDN CONNECTION ESTABLISHMENT - IMS TEST MODE OPERATION VZ_REQ_LTEB13NAC_6361

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

DEFAULT BEARERS AND IP ADDRESSES FOR ON-DEMAND PDN CONNECTIONS VZ_REQ_LTEB13NAC_6362

Test Case Name	Test Plan Id	Created By	Created Date
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

DEDICATED BEARERS FOR ON-DEMAND PDN CONNECTIONS VZ_REQ_LTEB13NAC_6363

Test Case Name	Test Plan Id	Created By	Created Date
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

NAS MESSAGING DURING ON DEMAND PDN CONNECTION ESTABLISHMENT VZ_REQ_LTEB13NAC_6364

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

NAS MESSAGING DURING ON DEMAND PDN CONNECTION ESTABLISHMENT - PDN CONNECTIVITY REQUEST Message VZ_REQ_LTEB13NAC_6365

Test Case Name	Test Plan Id	Created By	Created Date
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE RE-INITIATED CONNECTION TO IMS PDN AFTER DISCONNECTED	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE SUPPORT OF MULTIPLE DNS ADDRESSES	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00

VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00

NAS MESSAGING DURING ON DEMAND PDN CONNECTION ESTABLISHMENT - ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST Message
VZ_REQ_LTEB13NAC_6366

Test Case Name	Test Plan Id	Created By	Created Date
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION	TCLTEMBSUPSIGCONF	Admin	02-03-2014

(EMM-IDLE)		User	00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE RE-INITIATED CONNECTION TO IMS PDN AFTER DISCONNECTED	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE SUPPORT OF MULTIPLE DNS ADDRESSES	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

NETWORK INITIATED PDN DISCONNECTION VZ_REQ_LTEB13NAC_6367

Test Case Name	Test Plan Id	Created By	Created Date
NETWORK INITIATED PDN DISCONNECT (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE RE-INITIATED CONNECTION TO IMS PDN AFTER DISCONNECTED	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE RECEIVES DEACTIVATE EPS BEARER CONTEXT REQUEST MESSAGE FROM THE NETWORK 2 PDN CONNECTIONS OPEN	DATARTRY	Admin User	11-20-2013 00:00:00
UE RECEIVES DETACH REQUEST MESSAGE FROM THE NETWORK 1 PDN	DATARTRY	Admin User	11-20-2013 00:00:00

CONNECTION OPEN			

UE Initiated PDN Disconnection Update to APN Related Parameters VZ_REQ_LTEB13NAC_6368

Test Case Name	Test Plan Id	Created By	Created Date
UE INITIATED LTE DETACH UPDATE TO APN PARAMETERS	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE RESPONSE TO PDN DISCONNECT REJECT CODE 43	LTESUPSIGCONF	Admin User	09-27-2014 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00

UE Initiated PDN Disconnection All Other Cases VZ_REQ_LTEB13NAC_6369

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

IMS DE-REGISTRATION DURING UE INITIATED IMS PDN DISCONNECTION VZ_REQ_LTEB13NAC_6370

Test Case Name	Test Plan Id	Created By	Created Date
UE INITIATED DE-REGISTRATION - UE INITIATED IMS PDN DISCONNECT	IMSREGRTY	Admin User	11-08-2013 00:00:00
VOID UE INITIATED DE-REGISTRATION UE INITIATED IMS PDN DISCONNECT	IMSREGRTY	Admin User	04-02-2014 00:00:00

TRACKING AREA UPDATES VZ_REQ_LTEB13NAC_6371

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
NORMAL TRACKING AREA UPDATE WITHOUT ISR ACTIVATION; SUCCESSFUL	BAND2IOT	Admin User	02-12-2014 00:00:00
NORMAL TRACKING AREA UPDATE WITHOUT ISR ACTIVATION; SUCCESSFUL	BAND4IOT	Admin User	02-12-2014 00:00:00
PERIODIC TRACKING AREA UPDATE; SUCCESSFUL	BAND2IOT	Admin User	02-12-2014 00:00:00
PERIODIC TRACKING AREA UPDATE; SUCCESSFUL	BAND4IOT	Admin User	02-12-2014 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

NAS MESSAGING DURING TRACKING AREA UPDATES VZ_REQ_LTEB13NAC_6372

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
NORMAL TRACKING AREA UPDATE WITHOUT ISR ACTIVATION; SUCCESSFUL	BAND2IOT	Admin User	02-12-2014 00:00:00
NORMAL TRACKING AREA UPDATE WITHOUT ISR ACTIVATION; SUCCESSFUL	BAND4IOT	Admin User	02-12-2014 00:00:00
PERIODIC TRACKING AREA UPDATE; SUCCESSFUL	BAND2IOT	Admin User	02-12-2014 00:00:00
PERIODIC TRACKING AREA UPDATE; SUCCESSFUL	BAND4IOT	Admin User	02-12-2014 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

NAS MESSAGING DURING TRACKING AREA UPDATES - TRACKING AREA UPDATE ACCEPT Message VZ_REQ_LTEB13NAC_6373

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00

NORMAL TRACKING AREA UPDATE WITHOUT ISR ACTIVATION; SUCCESSFUL	BAND2IOT	Admin User	02-12-2014 00:00:00
NORMAL TRACKING AREA UPDATE WITHOUT ISR ACTIVATION; SUCCESSFUL	BAND4IOT	Admin User	02-12-2014 00:00:00
PERIODIC TRACKING AREA UPDATE; SUCCESSFUL	BAND2IOT	Admin User	02-12-2014 00:00:00
PERIODIC TRACKING AREA UPDATE; SUCCESSFUL	BAND4IOT	Admin User	02-12-2014 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00
TRACKING AREA UPDATE ACCEPT (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00

LTE NETWORK DETACHMENT VZ_REQ_LTEB13NAC_6374

Test Case Name	Test Plan Id	Created By	Created Date
UE INITIATED DETACH FOR E-UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-IDLE) - 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

IMS DE-REGISTRATION DURING UE INITIATED NETWORK DETACH VZ_REQ_LTEB13NAC_6375

Test Case Name	Test Plan Id	Created By	Created Date
DEVICE INITIATED DE-REGISTRATION UE INITIATED LTE DETACH ON POWER DOWN	IMSREGRTY	Admin User	04-02-2014 00:00:00
DEVICE INITIATED DE-REGISTRATION -UE INITIATED LTE DETACH ON POWER DOWN	IMSREGRTY	Admin User	11-08-2013 00:00:00
UE INITIATED DE-REGISTRATION AIRPLANE MODE	IMSREGRTY	Admin User	04-02-2014 00:00:00
UE INITIATED DE-REGISTRATION - AIRPLANE MODE	IMSREGRTY	Admin User	11-08-2013 00:00:00

SYSTEM LOSS VZ_REQ_LTEB13NAC_6376

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

TRACKING AREA UPDATE REQUEST Message after RLF VZ_REQ_LTEB13NAC_35805

Test Case Name	Test Plan Id	Created By	Created Date
UE INITIATED TRACKING AREA UPDATE AFTER RADIO LINK FAILURE	LTESUPSIGCONF	Admin User	09-25-2014 00:00:00

LINK-LOCAL ADDRESS AND GLOBALLY ROUTABLE IPV6 ADDRESS FORMATION VZ_REQ_LTEB13NAC_6377

Test Case Name	Test Plan Id	Created By	Created Date
IPV6 ADDRESS ASSIGNMENT	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
IPV6 ADDRESS ASSIGNMENT	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
IPv6 ADDRESS ASSIGNMENT-DEVICE POWERING UP IN LTE	LTESTRESS	Admin User	11-08-2013 00:00:00

IPV6 ADDRESS LIFETIME VZ_REQ_LTEB13NAC_6378

Test Case Name	Test Plan Id	Created By	Created Date
IPV6 ADDRESS ASSIGNMENT	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
IPV6 ADDRESS ASSIGNMENT	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

IPv6 Address Assignment for LAN-Side Devices VZ_REQ_LTEB13NAC_6429

Test Case Name	Test Plan Id	Created By	Created Date
ASSOCIATE WITH A 802.11G WIFI DEVICE WHILE CONNECTED TO LTE	WFMH	Admin User	11-12-2013 00:00:00
ASSOCIATE WITH A 802.11N WIFI DEVICE WHILE CONNECTED TO EHRPD	WFMH	Admin User	11-12-2013 00:00:00

SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP- UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00

NEIGHBOR SOLICITATION MESSAGES VZ_REQ_LTEB13NAC_6379

Test Case Name	Test Plan Id	Created By	Created Date

Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

DHCP IP ADDRESS ASSIGNMENT/MODIFICATION VZ_REQ_LTEB13NAC_6380

Test Case Name	Test Plan Id	Created By	Created Date
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

DNS SERVER IP ADDRESS ASSIGNMENT VZ_REQ_LTEB13NAC_6381

Test Case Name	Test Plan Id	Created By	Created Date
UE SUPPORT OF MULTIPLE DNS ADDRESSES	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

DNS SERVER PER PDN VZ_REQ_LTEB13NAC_6382

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00
LTE CONNECT AND REGISTRATION	CLNR_DEVICE	Admin User	02-11-2014 00:00:00
RSRP INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
RSRP INTRA-FREQUENCY ACCURACY IN RRC_IDLE MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
RSRQ INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00

RSRQ INTRA-FREQUENCY ACCURACY IN RRC_IDLE MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
UE ROUTES DNS QUERIES	LTESUPSIGCONF	Admin User	10-13-2014 00:00:00

DNS QUERY ORDER VZ_REQ_LTEB13NAC_6462

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

IMS TRAFFIC VZ_REQ_LTEB13NAC_6419

Test Case Name	Test Plan Id	Created By	Created Date
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

NETWORK INITIATED BEARER MODIFICATION AND DEACTIVATION PROCEDURES VZ_REQ_LTEB13NAC_6425

Test Case Name	Test Plan Id	Created By	Created Date
NETWORK INITIATED EPS DEDICATED BEARER ACTIVATION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

NAS MESSAGING FOR NETWORK INITIATED BEARER MODIFICATION - MODIFY EPS BEARER CONTEXT REQUEST Message VZ_REQ_LTEB13NAC_6426

Test Case Name	Test Plan Id	Created By	Created Date

NETWORK INITIATED EPS BEARER MODIFICATION WITH QOS UPDATE (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
NETWORK INITIATED EPS BEARER MODIFICATION WITHOUT QOS UPDATE (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00

NAS MESSAGING FOR NETWORK INITIATED BEARER DEACTIVATION PROCEDURES - DEACTIVATE EPS BEARER CONTEXT REQUEST Message VZ_REQ_LTEB13NAC_6427

Test Case Name	Test Plan Id	Created By	Created Date
NETWORK INITIATED PDN DISCONNECT (NO DATA USAGE AVAILABLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

NAS MESSAGING FOR NETWORK INITIATED BEARER ACTIVATION - ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST Message VZ_REQ_LTEB13NAC_6463

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

NAS MESSAGE PIGGYBACKING SUPPORT - PDN BEARER ACTIVATION DURING ATTACH VZ_REQ_LTEB13NAC_6430

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

NAS MESSAGE PIGGYBACKING SUPPORT - PDN BEARER ACTIVATION AFTER ATTACH VZ_REQ_LTEB13NAC_6431

Test Case Name	Test Plan Id	Created By	Created Date
UE INITIATED INTERNET PDN CONNECTION WITH QOS (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

GUTI REALLOCATION COMMAND VZ_REQ_LTEB13NAC_6464

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

NON-CONTENTION BASED RANDOM ACCESS VZ_REQ_LTEB13NAC_6467

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

ACCESS BARRING AND ACCESS CLASSES VZ_REQ_LTEB13NAC_6468

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

ACCESS CLASSES AND HIGH PRIORITY ACCESS VZ_REQ_LTEB13NAC_6469

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

LTE FEMTOCELL CELL SELECTION/RE-SELECTION VZ_REQ_LTEB13NAC_6473

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

CSG LIST SUPPORT VZ_REQ_LTEB13NAC_6474

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

MOBILITY BETWEEN CSG AND HYBRID CELLS VZ_REQ_LTEB13NAC_6475

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

RRC AND RRM SUPPORT FOR FEMTOCELLS AND CSG CELLS - SIB1 and SIB9 Support VZ_REQ_LTEB13NAC_6476

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

RRC AND RRM SUPPORT FOR CSG CELLS - Proximity Indication VZ_REQ_LTEB13NAC_6477

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

RRC AND RRM SUPPORT FOR FEMTOCELLS AND CSG CELLS - Autonomous Gaps VZ_REQ_LTEB13NAC_6478

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

RRC AND RRM SUPPORT FOR FEMTOCELLS AND CSG CELLS - Measurement Reporting VZ_REQ_LTEB13NAC_6479

Test Case Name	Test Plan Id	Created By	Created Date
CR in Queue	VZWRC	Admin User	10-28-2013 00:00:00

Measurement Reporting VZ_REQ_LTEB13NAC_35802

Test Case Name	Test Plan Id	Created By	Created Date
INTER-FREQUENCY MEASUREMENT REPORT ORDER	TCLTEMBSUPSIGCONF	Admin User	05-20-2015 00:00:00

Low Priority Access & Delay Tolerant UE Feature Support VZ_REQ_LTEB13NAC_36995

Test Case Name	Test Plan Id	Created By	Created Date
LOW PRIORITY, DELAY TOLERANT, AND EAB SIGNALING TEST CASES	LTESUPSIGCONF	Admin User	01-23-2015 00:00:00

Power Saving Mode (PSM) VZ_REQ_LTEB13NAC_40930

Test Case Name	Test Plan Id	Created By	Created Date
PSM GCF Signalling and Protocol Conformance Test Cases	LTESUPSIGCONF	Admin User	04-05-2016 00:00:00

Downlink Supervision Failures VZ_REQ_LTEB13NAC_38507

Test Case Name	Test Plan Id	Created By	Created Date
UE DOWNLINK SUPERVISION	LTESUPSIGCONF	Admin User	05-20-2015 00:00:00

Non-Essential SIB Information VZ_REQ_LTEB13NAC_38508

Test Case Name	Test Plan Id	Created By	Created Date
NON-ESSENTIAL SYSTEM INFORMATION DETECTION FAILURE	LTESUPSIGCONF	Admin User	05-20-2015 00:00:00

LTE CREDENTIAL STORAGE VZ_REQ_LTEB13NAC_6383

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

FACTORY LTE PROGRAMMING - APN'S VZ_REQ_LTEB13NAC_6385

Test Case Name	Test Plan Id	Created By	Created Date
E-UTRAN INITIAL ATTACH (WITHOUT PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (APN DISABLED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (APN DISABLED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
EUTRAN INITIAL ATTACH (WITH PIGGYBACKING)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
NETWORK INITIATED PDN DISCONNECT (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
SIM SWAP - CHANGING SIMS WITHIN ONE DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
SIM SWAP BETWEEN DEVICES CHANGING APN ASSIGNMENT (NORMAL TO STATIC IP) ON DEVICES	CLASS3APN	Admin User	01-02-2015 00:00:00
UE INITIATED DETACH FOR E-	LTESUPSIGCONF	Admin	11-20-

UTRAN (EMM-CONNECTED) 3 PDNS SCENARIO		User	2013 00:00:00
UE INITIATED DETACH FOR E-UTRAN (EMM-IDLE) - 3 PDNS SCENARIO	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (APN DISABLED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (APN DISABLED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	TCLTEMBSUPSIGCONF	Admin User	02-03-2014 00:00:00
UE INITIATED PDN CONNECTION (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-CONNECTED)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00
UE INITIATED PDN DISCONNECTION UPDATE TO APN PARAMETERS (EMM-IDLE)	LTESUPSIGCONF	Admin User	11-20-2013 00:00:00

VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) APN MANUAL UPDATE VALIDATION	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN DYNAMIC (SFO 73578) EHRPD ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW PRIVATE NETWORK IP APN STATIC (SFO 73584) IN 4G ENVIRONMENT	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR EXISTING DEVICE WITH MOBILE BROADBAND	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZW STATIC IP APN FOR STATIC IP-UNRESTRICTED (SFO 76443) FOR NEW DEVICE	CLASS3APN	Admin User	01-02-2015 00:00:00
VERIFICATION OF VZWINTERNET SERVICE FOR PRIVATE, DYNAMIC (NATD) IP	CLASS3APN	Admin User	01-02-2015 00:00:00
VZW STATIC IP APN ADD AND REMOVE FEATURE WHEN DEVICE IS INSERTED INTO LAPTOP AND POWERED BUT NOT CONNECTED	CLASS3APN	Admin User	01-02-2015 00:00:00
Vendor Compliance	VZWRC	Admin User	10-28-2013 00:00:00

FACTORY LTE PROGRAMMING - SMS FORMAT PARAMETER VZ_REQ_LTEB13NAC_6386

Test Case Name	Test Plan Id	Created By	Created Date
2.10VOID - Replaced by TC 2.74 - DEVICE MO SMS FORMAT SETTING- DEFAULT	LTESMS	Admin User	01-07-2014 00:00:00
2.11VOID - Replaced by TC 2.75 - DEVICE MO SMS FORMAT SETTING- MODIFIED	LTESMS	Admin User	01-07-2014 00:00:00
SMS over NAS	SMS OVER NAS	Admin User	02-16-2016 00:00:00

USER LTE PROGRAMMING - SMSWRITEUICC PARAMETER VZ_REQ_LTEB13NAC_6387

Test Case Name	Test Plan Id	Created By	Created Date
SMS MESSAGES STORAGE SETTING (DEFAULT) - 3GPP SMS	LTESMS	Admin User	01-07-2014 00:00:00
SMS MESSAGES STORAGE SETTING (MODIFIED) - 3GPP SMS	LTESMS	Admin User	01-07-2014 00:00:00

LTE RF AND RRM CONFORMANCE REQUIREMENTS VZ_REQ_LTEB13NAC_6388

Test Case Name	Test Plan Id	Created By	Created Date
CONFIGURED OUTPUT POWER	SUPRFCONF13	Admin User	11-08-2013 00:00:00

External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
MAXIMUM OUTPUT POWER NO MPR OR A-MPR	SUPRFCONF13	Admin User	11-08-2013 00:00:00
MAXIMUM OUTPUT POWER WITH MPR	SUPRFCONF13	Admin User	11-08-2013 00:00:00
REFERENCE SENSITIVITY DUAL RECEIVER (QPSK)	SUPRFCONF13	Admin User	11-08-2013 00:00:00
REFERENCE SENSITIVITY SINGLE RECEIVER (QPSK)	SUPRFCONF13	Admin User	11-08-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

LTE SIGNALING CONFORMANCE VZ_REQ_LTEB13NAC_6389

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

GCF CERTIFICATION VZ_REQ_LTEB13NAC_6390

Test Case Name	Test Plan Id	Created By	Created Date
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00

MAXIMUM CONDUCTED OUTPUT POWER VZ_REQ_LTEB13NAC_6391

Test Case Name	Test Plan Id	Created By	Created Date
MAXIMUM OUTPUT POWER NO MPR OR A-MPR	SUPRFCONF13	Admin User	11-08-2013 00:00:00
MAXIMUM OUTPUT POWER WITH MPR	SUPRFCONF13	Admin User	11-08-2013 00:00:00

MAXIMUM RADIATED OUTPUT POWER VZ_REQ_LTEB13NAC_6392

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL RADIATED POWER (TRP) NO MPR OR A-MPR	OTARADPERF	Admin User	11-08-2013 00:00:00

CONFIGURED OUTPUT POWER VZ_REQ_LTEB13NAC_6393

Test Case Name	Test Plan Id	Created By	Created Date
CONFIGURED OUTPUT POWER	SUPRFCONF13	Admin User	11-08-2013 00:00:00
NS_07 SPURIOUS EMISSIONS	SUPRFCONF13	Admin User	11-08-2013 00:00:00

NS_06 EMISSIONS VZ_REQ_LTEB13NAC_6394

Test Case Name	Test Plan Id	Created By	Created Date
TRANSMITTER SPECTRUM EMISSION	SUPRFCONF13	Admin	11-08-2013

MASK (NS_06)		User	00:00:00

NS_07 EMISSIONS VZ_REQ_LTEB13NAC_6395

Test Case Name	Test Plan Id	Created By	Created Date
NS_07 SPURIOUS EMISSIONS	SUPRFCONF13	Admin User	11-08-2013 00:00:00
PUCCH OVER-PROVISIONING FUNCTIONAL TEST	SUPRFCONF13	Admin User	11-08-2013 00:00:00
SPURIOUS EMISSIONS WITH TX GATING	SUPRFCONF13	Admin User	11-08-2013 00:00:00

SPURIOUS EMISSIONS FOR UE CO-EXISTENCE WITH OTHER 3GPP FREQUENCY BANDS VZ_REQ_LTEB13NAC_6396

Test Case Name	Test Plan Id	Created By	Created Date
SPURIOUS EMISSION BAND UE CO-EXISTENCE	SUPRFCONF13	Admin User	11-08-2013 00:00:00
SPURIOUS EMISSIONS WITH TX GATING	SUPRFCONF13	Admin User	11-08-2013 00:00:00

UE TRANSMITTER LO AND IMAGE SUPPRESSION VZ_REQ_LTEB13NAC_6397

Test Case Name	Test Plan Id	Created By	Created Date
TRANSMITTER LO AND IMAGE SUPPRESSION (IQ COMPONENT AND	SUPRFCONF13	Admin User	11-08-2013 00:00:00

IMAGE)			

SPURIOUS EMISSIONS FOR UE CO-EXISTENCE WITH GPS
VZ_REQ_LTEB13NAC_6398

Test Case Name	Test Plan Id	Created By	Created Date
SPURIOUS EMISSION BAND UE CO-EXISTENCE	SUPRFCONF13	Admin User	11-08-2013 00:00:00
SPURIOUS EMISSIONS WITH TX GATING	SUPRFCONF13	Admin User	11-08-2013 00:00:00

CONDUCTED SENSITIVITY VZ_REQ_LTEB13NAC_6399

Test Case Name	Test Plan Id	Created By	Created Date
REFERENCE SENSITIVITY DUAL RECEIVER (QPSK)	SUPRFCONF13	Admin User	11-08-2013 00:00:00
REFERENCE SENSITIVITY SINGLE RECEIVER (QPSK)	SUPRFCONF13	Admin User	11-08-2013 00:00:00

RADIATED SENSITIVITY VZ_REQ_LTEB13NAC_6400

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

RADIATED SENSITIVITY - Primary Receiver VZ_REQ_LTEB13NAC_6401

Test Case Name	Test Plan Id	Created By	Created Date

TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

RADIATED SENSITIVITY - Secondary MIMO Receiver VZ_REQ_LTEB13NAC_6402

Test Case Name	Test Plan Id	Created By	Created Date
TOTAL ISOTROPIC SENSITIVITY (TIS)	OTARADPERF	Admin User	11-08-2013 00:00:00

MIMO Antenna Envelope Correlation Coefficient VZ_REQ_LTEB13NAC_6403

Test Case Name	Test Plan Id	Created By	Created Date
RECEIVER ENVELOPE CORRELATION COEFFICIENT AND MIMO PERFORMANCE	OTARADPERF	Admin User	11-08-2013 00:00:00

BLOCKING VZ_REQ_LTEB13NAC_6404

Test Case Name	Test Plan Id	Created By	Created Date
RECEIVER BLOCKING	SUPRFCONF13	Admin User	11-08-2013 00:00:00

INTERMODULATION VZ_REQ_LTEB13NAC_6405

Test Case Name	Test Plan Id	Created By	Created Date
RECEIVER INTERMODULATION CHARACTERISTICS	SUPRFCONF13	Admin User	11-08-2013 00:00:00

AMBIENT OPERATING TEMPERATURE RANGE VZ_REQ_LTEB13NAC_6406

Test Case Name	Test Plan Id	Created By	Created Date
RF PERFORMANCE OVER TEMPERATURE AND VOLTAGE	SUPRFCONF13	Admin User	11-08-2013 00:00:00

EXTENDED AMBIENT OPERATING TEMPERATURE RANGE VZ_REQ_LTEB13NAC_6407

Test Case Name	Test Plan Id	Created By	Created Date
RF PERFORMANCE OVER TEMPERATURE AND VOLTAGE	SUPRFCONF13	Admin User	11-08-2013 00:00:00

POWER SUPPLY/BATTERY VOLTAGE VZ_REQ_LTEB13NAC_6408

Test Case Name	Test Plan Id	Created By	Created Date
RF PERFORMANCE OVER TEMPERATURE AND VOLTAGE	SUPRFCONF13	Admin User	11-08-2013 00:00:00

NETWORK ATTACHMENT TIME VZ_REQ_LTEB13NAC_6409

Test Case Name	Test Plan Id	Created By	Created Date
LTE CALL SET UP	LTESTRESS	Admin User	11-08-2013 00:00:00
NETWORK ATTACHMENT TIME	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00

TRANSITION FROM RRC_IDLE TO RRC_CONNECTED VZ_REQ_LTEB13NAC_6410

Test Case Name	Test Plan Id	Created By	Created Date
RRC_IDLE TO RRC_CONNECTED CONTROL PLANE LATENCY	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00

ROUND TRIP DELAY VZ_REQ_LTEB13NAC_6411

Test Case Name	Test Plan Id	Created By	Created Date
USER PLANE ROUND TRIP DELAY	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00

DOWNLINK DATA THROUGHPUT VZ_REQ_LTEB13NAC_6412

Test Case Name	Test Plan Id	Created By	Created Date
256QAM DATA THROUGHPUT TEST	LTEB13DATATHRU	Admin User	09-22-2015 00:00:00
BIDIRECTIONAL FTP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
BIDIRECTIONAL UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
CQI AND RI REPORTING WITH FREQUENCY SELECTIVE INTERFERENCE	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
DOWNLINK FTP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00

DOWNLINK POWER SWEEP UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
DOWNLINK UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
DOWNLINK UDP THROUGHPUT WITH ADVANCED CHANNEL MODELS	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
DOWNLINK UDP THROUGHPUT WITH DYNAMIC CORRELATION AND ANTENNA GAIN IMBALANCE	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
DOWNLINK UDP THROUGHPUT WITH VARIABLE REFERENCE MEASUREMENT CHANNELS	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
SIMULTANEOUS IPV4 AND IPV6 UDP DATA TRANSFERS	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
STRESS TEST FTP THROUGHPUT (DOWNLINK)	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
STRESS TEST UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00

UPLINK DATA THROUGHPUT VZ_REQ_LTEB13NAC_6413

Test Case Name	Test Plan Id	Created By	Created Date
BIDIRECTIONAL FTP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
BIDIRECTIONAL UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00

SIMULTANEOUS IPV4 AND IPV6 UDP DATA TRANSFERS	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
STRESS TEST UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
UPLINK FTP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00
UPLINK UDP THROUGHPUT	LTEB13DATATHRU	Admin User	11-08-2013 00:00:00

LTE-TO-LTE HANDOVER PERFORMANCE VZ_REQ_LTEB13NAC_6414

Test Case Name	Test Plan Id	Created By	Created Date
(VOID)12.1 LTEVIDEO CALL INTER-BAND HANDOVER, WITH MEASUREMENTS DIFFERENT BW - BAND 4 5MHZ TO BAND 13 10MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)12.2 LTE VOICE CALL INTER-BAND HANDOVER, WITH MEASUREMENTS BAND 4 10MHZ TO BAND 13 10MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)12.3 LTE VIDEO CALL INTER-BAND HANDOVER, WITH MEASUREMENTS - BAND 4 10MHZ TO BAND13 10MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)12.4 LTE VIDEO CALL INTER-BAND HANDOVER, WITH MEASUREMENTS DIFFERENT BW - BAND 4 15MHZ TO BAND13 10MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)13.1 LTE VOICE CALL INTER-BAND	VOLTEIOP	Admin	12-31-2013

HANDOVER, WITH MEASUREMENTS A4 (or A5) EVENT BASED - BAND 13 10MHZ TO BAND 4 5MHZ		User	00:00:00
(VOID)13.2 LTE VIDEO CALL INTER-BAND HANDOVER, WITH MEASUREMENTS A4 (or A5) EVENT BASED - BAND 13 10MHZ TO BAND 4 10MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)13.3 LTE VOICE CALL INTER-BAND HANDOVER, WITH MEASUREMENTS A4 (or A5) EVENT BASED - BAND 13 10MHZ TO BAND 4 10MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
(VOID)7.1 VOICE CALL AND DATA HANDOVER, INTRA-ENODEB	VOLTEIOP	Admin User	12-31-2013 00:00:00
External Certification Process	VZWRC	Admin User	10-28-2013 00:00:00
LTE VIDEO CALL INTER-BAND HANDOVER, WITH MEASUREMENTS A4 (or A5) EVENT BASED - BAND 13 10MHZ TO BAND 4 20MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
LTE VIDEO CALL INTER-BAND HANDOVER, WITH MEASUREMENTS DIFFERENT BW - BAND 4 20MHZ TO BAND13 10MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
LTE VOICE CALL INTER-BAND HANDOVER, WITH MEASUREMENTS DIFFERENT BW BAND 4 20HZ TO BAND13 10MHZ	VOLTEIOP	Admin User	12-31-2013 00:00:00
Standards Requirement Doc	VZWRC	Admin User	10-28-2013 00:00:00
Standards Test Doc	VZWRC	Admin User	11-20-2013 00:00:00

VOLTE VIDEO CALL AND DATA HANDOVER	VOLTEFIELD	Admin User	12-02-2013 00:00:00
VOLTE VOICE CALL HANDOVER	VOLTEFIELD	Admin User	12-02-2013 00:00:00

RSRP ABSOLUTE ACCURACY VZ_REQ_LTEB13NAC_6420

Test Case Name	Test Plan Id	Created By	Created Date
BAND 13-BAND 4 RSRP INTER-FREQUENCY ACCURACY IN RRC_CONNECTED MODE WITH BAND 13 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRP INTER-FREQUENCY ACCURACY IN RRC_CONNECTED MODE WITH BAND 4 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRP INTER-FREQUENCY ACCURACY IN RRC_IDLE MODE WITH BAND 13 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRP INTER-FREQUENCY ACCURACY IN RRC_IDLE MODE WITH BAND 4 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
RSRP INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
RSRP INTRA-FREQUENCY ACCURACY IN RRC_IDLE MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00

RSRP RELATIVE ACCURACY VZ_REQ_LTEB13NAC_6421

Test Case Name	Test Plan Id	Created	Created

		By	Date
BAND 13-BAND 4 RSRP INTER-FREQUENCY ACCURACY IN RRC_CONNECTED MODE WITH BAND 13 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRP INTER-FREQUENCY ACCURACY IN RRC_CONNECTED MODE WITH BAND 4 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRP INTER-FREQUENCY ACCURACY IN RRC_IDLE MODE WITH BAND 13 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRP INTER-FREQUENCY ACCURACY IN RRC_IDLE MODE WITH BAND 4 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
RSRP INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
RSRP INTRA-FREQUENCY ACCURACY IN RRC_IDLE MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00

RSRQ ABSOLUTE ACCURACY VZ_REQ_LTEB13NAC_6422

Test Case Name	Test Plan Id	Created By	Created Date
BAND 13-BAND 4 RSRQ INTER-FREQUENCY ACCURACY IN RRC_CONNECTED MODE WITH BAND 13 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRQ INTER-FREQUENCY ACCURACY IN RRC_CONNECTED MODE WITH BAND 4	LTEINTERBAND	Admin User	11-08-2013 00:00:00

SERVING CELL			
BAND 13-BAND 4 RSRQ INTER-FREQUENCY ACCURACY IN RRC_IDLE MODE WITH BAND 13 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRQ INTER-FREQUENCY ACCURACY IN RRC_IDLE MODE WITH BAND 4 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
RSRQ INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
RSRQ INTRA-FREQUENCY ACCURACY IN RRC_IDLE MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00

RSRQ RELATIVE ACCURACY VZ_REQ_LTEB13NAC_6423

Test Case Name	Test Plan Id	Created By	Created Date
BAND 13-BAND 4 RSRQ INTER-FREQUENCY ACCURACY IN RRC_CONNECTED MODE WITH BAND 13 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRQ INTER-FREQUENCY ACCURACY IN RRC_CONNECTED MODE WITH BAND 4 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRQ INTER-FREQUENCY ACCURACY IN RRC_IDLE MODE WITH BAND 13 SERVING CELL	LTEINTERBAND	Admin User	11-08-2013 00:00:00
BAND 13-BAND 4 RSRQ INTER-FREQUENCY ACCURACY IN RRC_IDLE	LTEINTERBAND	Admin User	11-08-2013 00:00:00

MODE WITH BAND 4 SERVING CELL			
RSRQ INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00
RSRQ INTRA-FREQUENCY ACCURACY IN RRC_IDLE MODE	3GPPB13SUPRRM	Admin User	11-08-2013 00:00:00

Req-1 VZ_REQ_LTEB13NAC_36963

Test Case Name	Test Plan Id	Created By	Created Date
eICIC GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	01-27-2015 00:00:00
eICIC GCF RRM Conformance Test Cases	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

Req-2 VZ_REQ_LTEB13NAC_36964

Test Case Name	Test Plan Id	Created By	Created Date
eICIC GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	01-27-2015 00:00:00

eICIC GCF RRM Conformance Test Cases	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

Req-3 VZ_REQ_LTEB13NAC_36965

Test Case Name	Test Plan Id	Created By	Created Date
eICIC GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	01-27-2015 00:00:00
eICIC GCF RRM Conformance Test Cases	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

Req-4 VZ_REQ_LTEB13NAC_36966

Test Case Name	Test Plan Id	Created By	Created Date

eICIC GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	01-27-2015 00:00:00
eICIC GCF RRM Conformance Test Cases	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC BAND 4 RSRP INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC BAND 4 RSRQ INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC RSRP INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC RSRQ INTRA-FREQUENCY ACCURACY IN RRC_CONNECTED MODE	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

Req-5 VZ_REQ_LTEB13NAC_36967

Test Case Name	Test Plan Id	Created By	Created Date
eICIC GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension	3GPPB13SUPRRM	Admin	01-27-2015

(10MHz BW)		User	00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

Req-6 VZ_REQ_LTEB13NAC_36968

Test Case Name	Test Plan Id	Created By	Created Date
eICIC GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	01-27-2015 00:00:00
feICIC PBCH INTERFERENCE CANCELLATION PERFORMANCE	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

Req-7 VZ_REQ_LTEB13NAC_36969

Test Case Name	Test Plan Id	Created By	Created Date
eICIC GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	01-27-2015 00:00:00

feICIC UE Handover Range Extension (10MHz BW)	3GPPB13SUPRRM	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW)	LTEINTERBAND	Admin User	01-27-2015 00:00:00
feICIC UE Handover Range Extension (20MHz BW, Single Interferer)	LTEINTERBAND	Admin User	01-27-2015 00:00:00

CRS IC WITHOUT ABS VZ_REQ_LTEB13NAC_37651

Test Case Name	Test Plan Id	Created By	Created Date
B4 Single Cell Data Throughput Test while CRS-AssistanceInfoList-r11 is Present	LTEMBDATATHRU	Admin User	05-19-2015 00:00:00
CRS IC (Colliding CRS) DOWNLINK FTP THROUGHPUT, Neighbour NOT Loaded	LTEB13DATATHRU	Admin User	05-18-2015 00:00:00
CRS IC (non-Colliding CRS) DOWNLINK FTP THROUGHPUT, Neighbour Fully Loaded with OCNG	LTEB13DATATHRU	Admin User	05-18-2015 00:00:00
CRS IC (non-Colliding CRS) DOWNLINK FTP THROUGHPUT, Neighbour NOT Loaded	LTEB13DATATHRU	Admin User	05-18-2015 00:00:00
CRS IC (non-Colliding CRS) DOWNLINK FTP THROUGHPUT, Neighbour NOT Loaded	LTEMBDATATHRU	Admin User	05-19-2015 00:00:00
Intra-Frequency RSRP and RSRQ Accuracy Test while CRS-AssistanceInfoList-r11 is Present	3GPPB13SUPRRM	Admin User	05-19-2015 00:00:00

Intra-frequency RSRP and RSRQ Accuracy Test while CRS-AssistanceInfoList-r11 is Present	LTEINTERBAND	Admin User	05-19-2015 00:00:00
RRCConnectionConfiguration when CRS-AssistanceInfoList-r11 is present	TCLTESUPSIGCONF	Admin User	05-18-2015 00:00:00
RRCConnectionReConfiguration when CRS-AssistanceInfoList-r11 is present	LTESUPSIGCONF	Admin User	05-18-2015 00:00:00
Single Cell Data Thruput Test while CRS-AssistanceInfoList-r11 is Present	LTEB13DATATHRU	Admin User	05-18-2015 00:00:00
eICIC FEATURE GROUP and UE Capability SUPPORT	LTESUPSIGCONF	Admin User	01-27-2015 00:00:00

RF and RRM Performance for LTE TM9 DL CoMP VZ_REQ_LTEB13NAC_37816

Test Case Name	Test Plan Id	Created By	Created Date
DL CoMP GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	05-05-2015 00:00:00

RF and RRM Performance for LTE TM10 DL CoMP VZ_REQ_LTEB13NAC_37817

Test Case Name	Test Plan Id	Created By	Created Date
DL COMP DATA THROUGHPUT TESTS WITH PDSCH IN MBSFN SUBFRAMES	LTEB13DATATHRU	Admin User	05-05-2015 00:00:00

DL COMP DATA THROUGHPUT TESTS WITH THREE TRANSMISSION POINTS	LTEB13DATATHRU	Admin User	05-05-2015 00:00:00
DL COMP DATA THROUGHPUT TESTS WITH TWO TRANSMISSION POINTS	LTEB13DATATHRU	Admin User	05-05-2015 00:00:00
DL CoMP Data Throughput Tests in Band 4 and Band 13 + Band 4 Downlink Carrier Aggregation	LTEMBDATATHRU	Admin User	05-05-2015 00:00:00
DL CoMP GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	05-05-2015 00:00:00

EPDCCH RF Performance VZ_REQ_LTEB13NAC_38378

Test Case Name	Test Plan Id	Created By	Created Date
DATA THROUGHPUT STRESS TEST WITH EPDCCH SCHEDULING	LTEB13DATATHRU	Admin User	09-21-2015 00:00:00
Downlink Carrier Aggregation with EPDCCH Scheduling	LTEMBDATATHRU	Admin User	09-21-2015 00:00:00
EPDCCH GCF RF Conformance Test Cases	SUPRFCONF13	Admin User	09-21-2015 00:00:00
EPDCCH Supplementary RF Conformance Test Cases	SUPRFCONF13	Admin User	09-21-2015 00:00:00

256QAM RF Performance VZ_REQ_LTEB13NAC_39752

Test Case Name	Test Plan Id	Created By	Created Date
256QAM DATA THROUGHPUT	LTEB13DATATHRU	Admin	09-22-2015

TEST		User	00:00:00
256QAM Data Throughput Tests	LTEMBDATATHRU	Admin User	09-22-2015 00:00:00
256QAM Supplementary RF Conformance Test Cases	SUPRFCONF13	Admin User	09-22-2015 00:00:00