




















Identifier	Description	Updates	Requirement Type
	Technical Requirements and OEM Deliverables for IoT Modules		
Version:	2021.3		
Release Date:	11/10/2021		
Applicability	These requirements apply to IoT/M2M cellular modules that support LTE, LTE-M, NB-IoT, or non-standalone 5G NR technologies, and that will be integrated into devices that will operate on the US Cellular network and roaming partner networks using US Cellular SIM cards..		
	References - US Cellular Documents		
	US Cellular LTE Module Configuration Guidelines v1.5		
	USCC M2M Verification & Validation Test Plan for LTE Modules 3.6		
	USCC Data Throughput Test Specifications v2-2		
	Module Technical Requirements		
 HW	General Hardware Requirements for All Modules		
HW 1.1	The module must support an AT Commands interface	09/06/19	Mandatory
HW 1.2	The module must support a method of logging LTE messages from the modem (ex. using QXDM or equivalent)	09/06/19	Mandatory
HW 1.3	The module must recover to original firmware and functionality if the power supply is removed during an ongoing firmware update	09/06/19	Mandatory
HW 1.4	The module must have a date code, hardware ID, or equivalent, written on the surface of the IC	09/06/19	Mandatory
HW 1.5	The module must have FCC ID written on the surface of the IC	09/06/19	Mandatory
HW 1.6	Module must have 15 digit IMEI written on the surface	06/26/20	Mandatory
 LTE	LTE Requirements for Modules		
	<i>Section LTE1 applies for all modules Depending on the device LTE category, only one of sections 2, 3, 4, 5, 6 or 7 is applicable</i>		
 LTE 1	Requirements for all LTE Categories		
 LTE 1.1	LTE Requirements		
LTE 1.1.1	The device must support Multiple Frequency Band Indicators (MFBI) as defined in 3GPP TS 36.331 version 8.17.0 and 3GPP TS 36.307 version 8.7.0.	03/18/13	Mandatory
LTE 1.1.2	The module must support power class 3 (23dBm) per 3GPP TS 36.101	06/11/18	Mandatory
LTE 1.1.3	The module must support US Cellular MCC-MNC as follows: - Production LTE (4G): Range from 311-580 to 311-589 - Test Lab LTE (4G): Range from 311-220 to 311-229	09/06/19	Mandatory
LTE 1.1.4	The module must set the value of "Forbidden TAI clear timer" to 12 hours when UE gets attach reject #12, #13, and #15.	03/22/17	Mandatory
 LTE 1.4	LTE Authentication		
LTE 1.4.1	The module must support 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 must be supported.	03/17/11	Mandatory
 LTE 1.5	IPv6/IPv4 Support		
LTE 1.5.1	The module must support IPv4 and IPv6 addresses	03/17/11	Mandatory
LTE 1.5.2	The module must support dual-IP (IPv4 and IPv6) addresses	03/17/11	Mandatory
LTE 1.5.3	The module must perform the address allocation procedures for either IPv4 or IPv6, if no IP is assigned after default bearer activation as per 3GPP TS 23.401	03/25/11	Mandatory
LTE 1.5.4	The module capable of IPv4 and IPv6 must request for PDN type IPv4v6 as specified in 3GPP TS 23.401.	03/25/11	Mandatory
LTE 1.5.5	The module must conform to the "network preference" of the PDN-GW as specified in 3GPP TS 23.401.	03/25/11	Mandatory
LTE 1.5.6	The module must conform to procedures related to "single address bearers only" reason cause as specified in 3GPP TS 23.401.	03/25/11	Mandatory
LTE 1.5.7	The module must support the "protocol configuration options" as specified in 3GPP TS 23.401	03/25/11	Mandatory
LTE 1.5.8	Module must remove IP address when PDN connection is released	06/26/20	Mandatory
 LTE 1.6	Network connectivity		
LTE 1.6.2	The module must connect to the default PDN using PDP Context #1 and IPV4V6	06/26/20	Mandatory
LTE 1.6.5	Modules that do NOT support IMS must NOT request a connection to the IMS PDN at any time.	09/06/19	Mandatory
LTE 1.6.6	The module must support operator-defined QCLs (127-254) per 3GPP 24.301 sec. 9.9.4.3	09/06/19	Mandatory
 LTE 1.7	Time of the Day		
LTE 1.7.1	The module must support EMM Information message from the network as specified in 3GPP TS 24.301 and use the information to store the system time.	03/25/11	Mandatory
 LTE 1.8	Domain Name Service		
LTE 1.8.1	The module must obtain the primary & secondary DNS server addresses from the network.	03/17/11	Mandatory
LTE 1.8.2	The module must not allow hard coded DNS addresses.	03/17/11	Mandatory
LTE 1.8.3	The module and/or the embedded application must not cache DNS results past the session	03/17/11	Mandatory
LTE 1.8.4	The module DNS caches must be erased automatically during the power-cycle or any form of reset	03/17/11	Mandatory



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LTE 1.8.5	All the DNS cache control parameters such as Time-to-live or max-cache-time must be configurable during handshake.	03/22/17	Mandatory
 LTE 1.11	APN Requirement (with USCC SIM Card)		
LTE 1.11.1	The module must provide access to add and edit all APNs via module setting menu or using AT commands.	06/11/18	Mandatory
LTE 1.11.2	The module must allow the name of any APN to be up to 63 octets as per 3GPP TS 23.003 section 9.1.1.	06/11/18	Mandatory
LTE 1.11.3	The module default internet APN (PDP context #1) must not be set, i.e. it must be a empty string.	09/06/19	Mandatory
LTE 1.11.4	The module must use the network assigned APN in Attach Accept message as the default internet APN.	09/06/19	Mandatory
LTE 1.11.5	If the module receives an OPEN CHANNEL command from the UICC with an APN NI equal to "usccinternet", then the module must behave as follows: - If no PDN connection using this APN currently exists, the module must establish a PDN connection for this APN using standard 3GPP messaging. The module must not release the PDN connection prior to receiving a CLOSE CHANNEL command from the UICC. - If a PDN connection using this APN already exists, the module must report terminal status as "success" to the UICC and use the existing PDN connection. The module must not release the PDN connection prior to receiving a CLOSE CHANNEL command from the UICC.	09/06/19	Mandatory
LTE 1.11.6	When the module receives a CLOSE CHANNEL command from the UICC for the "usccinternet" APN, the module must behave as follows: - If the PDN connection for this APN is being used by other applications, then the module must not release the PDN connection. The module must report terminal status "success" to the UICC and leave the PDN connection intact. - If the PDN connection for this APN is not being used by any other applications, then the module must release the PDN connection using standard 3GPP messaging.	09/06/19	Mandatory
 LTE 1.12	Mode of Operation and Radio Access Technology		
LTE 1.12.1	The module must be set to operate on LTE only. All other RATs must be disabled.	10/10/19	Mandatory
LTE 1.12.2	The module mode of operation must be set to PS Mode 2 as per 3GPP TS 24.301	06/11/18	Mandatory
 LTE 1.13	RRC UE Feature Group Support		
LTE 1.13.1	Module must support the following feature group indicators defined in section B.1 of 3GPP TS 36.331: Cat-1 or above: 2, 4, 5, 6, 14, 16, 17, 20, 21, 31 Cat-M: 2, 5, 6, 31	06/11/18	Mandatory
LTE 1.13.2	When responding to the UECapabilityEnquiry RRC message (refer to 3GPP TS 36.331, clause 5.6.3), the indicators for all feature groups that are not supported by the module and the indicators for all feature groups with capabilities that have not been tested as a part of 3GPP standard conformance testing or USCC-specific testing must be set to "0"	03/25/11	Mandatory
 LTE 1.14	Network Selection/Reselection		
LTE 1.14.1	The module must trigger the system selection process as soon the UICC is inserted and the module is turned ON.	03/17/11	Mandatory
LTE 1.14.2	The module must support LTE cell selection and cell re-selection in both normal and enhanced coverage, per Sections 5.2.3.2 and 5.2.4.6a of 3GPP TS 36.304	06/11/18	Mandatory
LTE 1.14.3	The module must support extended timers for radio link failure (RLF)/handover failure (T300/T301/T304) of 3GPP TS 36.331	06/11/18	Mandatory
LTE 1.14.4	The module must 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 3GPP TS 36.133	06/11/18	Mandatory
 LTE 1.15	SMS over NAS		
LTE 1.15.1	M2M/IoT device shall support the transport of NAS messages procedure to carry SMS messages in an encapsulated form, to/from the network as defined in 3GPP TS 24.301.	02/01/21	Mandatory
LTE 1.15.2	Upon receiving the DOWNLINK NAS TRANSPORT message, the EMM entity in the M2M/IoT device shall forward the contents of the NAS message container IE to the SMS entity as defined in 3GPP TS 24.301.	02/01/21	Mandatory
LTE 1.15.3	For delivery of short messages targeted for the network, the EMM entity in the UE shall initiates the NAS messages procedure by sending an UPLINK NAS TRANSPORT message including the SMS message in the NAS message container IE as defined in 3GPP TS 24.301.	02/01/21	Mandatory
LTE 1.15.4	M2M/IoT module shall support registration for SMS as defined in 3GPP TS 23.272.	02/01/21	Mandatory
LTE 1.15.5	M2M/IoT module shall support removal of registration for SMS as defined in 3GPP TS 23.272.	02/01/21	Mandatory
LTE 1.15.6	M2M/IoT module shall support MO Forward Short Message procedure as defined in 3GPP TS 23.040.	02/01/21	Mandatory
LTE 1.15.7	M2M/IoT module shall support MT Forward Short Message procedure as defined in 3GPP TS 23.040.	02/01/21	Mandatory
LTE 1.15.8	M2M/IoT module shall support 3GPP format binary messaging and User Data Header (UDH) binary structure as defined in 3GPP TS 23.040.	02/01/21	Mandatory
 LTE 2	Additional Requirements for LTE Category M1		
	<i>Section LTE1 applies for all modules Depending on the device LTE category, only one of sections 2, 3, 4, 5, 6 or 7 is applicable</i>		
 LTE 2.1	3GPP Release Compliance		
LTE 2.1.1	The module must support latest version of the 3GPP Release 13 Specifications.	05/12/17	Mandatory
 LTE 2.2	LTE Frequency and Bandwidth Support		
LTE 2.2.1	The module must support LTE Cat-M1 Band 2 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101.	06/11/18	Mandatory
LTE 2.2.2	The module must support LTE Cat-M1 Band 4 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101.	06/11/18	Mandatory





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LTE 2.2.3	The module must support LTE Cat-M1 Band 12 using 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101.	06/11/18	Mandatory
LTE 2.2.4	The module must support LTE Cat-M1 Band 5 using 5, and 10 MHz channel bandwidths as defined in 3GPP TS 36.101.	06/26/20	Mandatory
LTE 2.2.5	Cat-M1 modules must 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.	06/11/18	Mandatory
LTE 2.2.6	The module must support LTE Band 13 using 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.	04/17/15	Highly Desired
 LTE 2.3	Cat-M1 Enhancements		
LTE 2.3.1	The module must support UE Power Saving Mode as per release 12 of 3GPP 24.301 section 5.3.11 and 23.682 section 4.5.4.	05/25/17	Mandatory
LTE 2.3.2	The module must include Active Timer T3324 in every ATTACH REQUEST and TRACKING AREA UPDATE REQUEST message when requesting Power Saving Mode.	06/14/18	Mandatory
LTE 2.3.4	The module must use the Active Time value and Periodic TAU Timer value provided by the network in the last ATTACH ACCEPT or TRACKING AREA UPDATE ACCEPT message. The module must 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	06/11/18	Mandatory
LTE 2.3.5	The module must support Coverage Enhancement Mode A and PRACH CE levels 0 and 1 at Random Access as specified in TS 36.211, 36.212, 36.213, 36.331 and 36.321	06/11/18	Mandatory
LTE 2.3.6	The module must support CSI reporting when in CE mode A, per Section 7.2 of Release 13 version of 3GPP TS 36.213	06/11/18	Mandatory
LTE 2.3.7	The module must support UL power control when in CE mode A, per Section 5.1 of Release 13 version of 3GPP TS 36.213	06/11/18	Mandatory
LTE 2.3.9	The module must support Extended Idle mode Discontinuous Reception (eDRX) as defined in 3GPP TS 23.401 section 5.13a	06/11/18	Mandatory
LTE 2.3.10	The module must request idle mode eDRX in every ATTACH REQUEST and TRACKING AREA UPDATE REQUEST message by including the Extended DRX parameters IE when requesting eDRX.	06/11/18	Mandatory
LTE 2.3.11	The module must use the Extended DRX parameter values provided by the network in the last ATTACH ACCEPT or TRACKING AREA UPDATE ACCEPT message.	06/14/18	Mandatory
LTE 2.3.12	The module must 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.	06/14/18	Mandatory
LTE 2.3.13	When configured by NAS layer to use idle mode eDRX, the module must 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.	06/14/18	Mandatory
LTE 2.3.14	The module must stop using idle mode eDRX if idle mode eDRX is not allowed in the cell.	06/14/18	Mandatory
LTE 2.3.15	When the module is in idle mode eDRX, the module must monitor paging per Section 7.3 of 3GPP TS 36.304, must perform system information modification per Sections 5.2.1.3, 5.2.2.4 and 5.3.2.3 of 3GPP TS 36.331, and must perform cell reselection per the Radio Resource Management requirements in Section 4.2.2 of 3GPP TS 36.133.	06/11/18	Mandatory
LTE 2.3.16	The module must support frequency hopping for SIB1-BR and other SI messages, PUCCH, PRACH, MPDCCH (Type 0/1/2 CSS and USS), PDSCH, and PUSCH, per 3GPP TS 36.211, 36.212, and 36.23	06/11/18	Mandatory
LTE 2.3.17	The module must support PDSCH TM1 and TM2 in CE mode A; further, the module should support PDSCH TM6 and TM9 in CE mode A, per Section 7.1 of Release 13 version of 3GPP TS 36.213.	06/14/18	Mandatory
LTE 2.3.18	The module must support CSI reporting when in CE mode A, per Section 7.2 of Release 13 version of 3GPP TS 36.213.	06/14/18	Mandatory
LTE 2.3.19	The module must support UL power control when in CE mode A, per Section 5.1 of Release 13 version of 3GPP TS 36.213.	06/14/18	Mandatory
 LTE 2.4	Network Selection/Reselection		
LTE 2.4.1	The module must support the bandwidth-reduced (BR) version of System Information Blocks (SIBs), including SIB1, SIB2, SIB3, SIB4, SIB5, SIB14, and SIB16.	06/14/18	Mandatory
LTE 2.4.2	The module must support system information acquisition and modification, per Release 13 version of 3GPP TS 36.331	06/14/18	Mandatory
 LTE 2.5	Radio Access Technology		
LTE 2.5.1	NB-IOT must be disabled on Cat-M1 modules.	06/26/20	Mandatory
 LTE 3	Additional Requirements for LTE Category 1		
	<i>Section LTE1 applies for all modules Depending on the device LTE category, only one of sections 2, 3, 4, 5, 6 or 7 is applicable</i>		
 LTE 3.1	3GPP Release Compliance		
LTE 3.1.1	The module must support latest version of the 3GPP Release 8 Specifications. At minimum, module must support all 3GPP Release 8 CRs as of December 2010.	03/15/13	Mandatory
 LTE 3.2	LTE Frequency and Bandwidth Support		
LTE 3.2.1	The module must support LTE Band 2 using 1.4, 3, 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101.	04/17/15	Mandatory
LTE 3.2.2	The module must support LTE Band 4 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Mandatory
LTE 3.2.3	The module must support LTE Band 12 using 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Mandatory









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LTE 3.2.4	The module must support LTE Band 5 using 1.4, 3, 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101	06/11/18	Mandatory
LTE 3.2.5	The module must support LTE Band 13 using 10 MHz channel bandwidths as defined in 3GPP TS 36.101	04/17/15	Highly Desired
LTE 3.2.6	The module must support LTE Band 25 using 5 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Highly Desired
LTE 3.2.7	The module must support LTE Band 66 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	04/01/21	Mandatory
LTE 3.2.8	The module must support LTE Band 71 using 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101	04/01/21	Mandatory
 LTE 4	Additional Requirements for LTE Category 4 and above		
	<i>Section LTE1 applies for all modules Depending on the device LTE category, only one of sections 2, 3, 4, 5, 6 or 7 is applicable</i>		
 LTE 4.1	3GPP Release Compliance		
LTE 4.1.1	The module must support latest version of the 3GPP Release 8 Specifications. At minimum, module must support all 3GPP Release 8 CRs as of December 2010.	03/15/13	Mandatory
 LTE 4.2	LTE Frequency and Bandwidth Support		
LTE 4.2.1	The module must support LTE Band 2 using 1.4, 3, 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101:	04/17/15	Mandatory
LTE 4.2.2	The module must support LTE Band 4 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Mandatory
LTE 4.2.3	The module must support LTE Band 12 using 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.10	03/15/13	Mandatory
LTE 4.2.4	The module must support LTE Band 5 using 1.4, 3, 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Mandatory
LTE 4.2.5	The module must support LTE Band 13 using 10 MHz channel bandwidths as defined in 3GPP TS 36.101	04/17/15	Highly Desired
LTE 4.2.6	The module must support LTE Band 25 using 5 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Highly Desired
 LTE 4.4	MIMO Support Transmit Diversity		
LTE 4.4.1	The module must support downlink 2x2 and 4x2 transmit diversity as defined in the 3GPP Release 8 Specifications for all module categories.	03/25/11	Mandatory
 LTE 4.5	MIMO Support Spatial Multiplexing		
LTE 4.5.1	As defined in the 3GPP Release 8 Specifications, the module must support: - Downlink 2x2 and 4x2 open loop spatial multiplexing. - Downlink 2x2 and 4x2 closed loop spatial multiplexing (single layer and 2 layers)	11/11/15	Mandatory
LTE 4.5.2	Module must support downlink MIMO Transmission Mode 9	09/09/19	Mandatory
 LTE 5	Additional Requirements for LTE Category 6 and above		
	<i>Section LTE1 applies for all modules Depending on the device LTE category, only one of sections 2, 3, 4, 5, 6 or 7 is applicable</i>		
 LTE 5.1	3GPP Compliance		
LTE 5.1.1	module supporting Carrier Aggregation must comply with Release 11 of 3GPP TR 36.307 for all supported CA band combinations.	04/08/17	Mandatory
LTE 5.1.2	module supporting Carrier Aggregation must comply with Carrier Aggregation sections of Release 12 3GPP TR 36.521.	10/10/14	Mandatory
LTE 5.1.3	module supporting Carrier Aggregation must comply with Carrier Aggregation sections of Release 12 3GPP TR 36.523.	10/10/14	Mandatory
LTE 5.1.4	module supporting Carrier Aggregation must comply with Carrier Aggregation sections of Release 12 3GPP TR 36.508.	10/10/14	Mandatory
 LTE 5.2	LTE Frequency and Bandwidth Support		
LTE 4.2.1	The module must support LTE Band 2 using 1.4, 3, 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101:	04/17/15	Mandatory
LTE 4.2.2	The module must support LTE Band 4 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Mandatory
LTE 4.2.3	The module must support LTE Band 12 using 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.10	03/15/13	Mandatory
LTE 4.2.4	The module must support LTE Band 5 using 1.4, 3, 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Mandatory
LTE 4.2.5	The module must support LTE Band 13 using 10 MHz channel bandwidths as defined in 3GPP TS 36.101	04/17/15	Highly Desired
LTE 4.2.6	The module must support LTE Band 25 using 5 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Highly Desired
LTE 4.2.7	The module must support LTE Band 66 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	04/01/21	Mandatory
LTE 4.2.8	The module must support LTE Band 71 using 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101	04/01/21	Mandatory
LTE 4.2.9	The module must support LTE Band 41 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	04/01/21	Mandatory
 LTE 5.3	Carrier Aggregation Band Requirements - 2 CC		









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LTE 5.3.1	The device must support Downlink CA_2A-2A, BW Combination Set 0.	03/02/16	Mandatory
LTE 5.3.3	The device must support Downlink CA_2A-4A, BW Combination Set 0.	03/04/16	Mandatory
LTE 5.3.5	The device must support Downlink CA_2A-5A, BW Combination Set 0.	03/02/16	Mandatory
LTE 5.3.6	The device must support Downlink CA_2A-12A, BW Combination Set 0.	03/02/16	Mandatory
LTE 5.3.7	The device must support Downlink CA_2A-71A, BW Combination Set 0.	03/02/16	Mandatory
LTE 5.3.8	The device must support Downlink CA_4A-4A, BW Combination Set 0.	03/02/16	Mandatory
LTE 5.3.9	The device must support Downlink CA_4A-5A, BW Combination Set 1.	03/02/16	Mandatory
LTE 5.3.10	The device must support Downlink CA_4A-12A, BW Combination Set 1, 2 or 4.	03/02/16	Mandatory
LTE 5.3.11	The device must support Downlink CA_4A-71A, BW Combination Set 0.	03/02/16	Mandatory
LTE 5.3.12	The device must support Downlink CA_66A-66A, BW Combination Set 0.	03/02/16	Mandatory
LTE 5.3.13	The device must support Downlink CA_2A-66A, BW Combination Set 0.	03/02/16	Mandatory
LTE 5.3.14	The device must support Downlink CA_12A-66A, BW Combination Set 0.	03/02/16	Mandatory
LTE 5.3.15	The device must support Downlink CA_5A-66A, BW Combination Set 0.	03/02/16	Mandatory
LTE 5.3.16	The device must support Downlink CA_66A-71A, BW Combination Set 0.	03/02/16	Mandatory
 LTE 6	Additional Requirements for LTE Category 9 and above		
	<i>Section LTE1 applies for all modules Depending on the device LTE category, only one of sections 2, 3, 4, 5, 6 or 7 is applicable</i>		
 LTE 6.1	3GPP Compliance		
LTE 6.1.1	module supporting Carrier Aggregation must comply with Release 11 of 3GPP TR 36.307 for all supported CA band combinations.	04/08/17	Mandatory
LTE 6.1.2	module supporting Carrier Aggregation must comply with Carrier Aggregation sections of Release 12 3GPP TR 36.521.	10/10/14	Mandatory
LTE 6.1.3	module supporting Carrier Aggregation must comply with Carrier Aggregation sections of Release 12 3GPP TR 36.523.	10/10/14	Mandatory
LTE 6.1.4	module supporting Carrier Aggregation must comply with Carrier Aggregation sections of Release 12 3GPP TR 36.508.	10/10/14	Mandatory
 LTE 6.2	LTE Frequency and Bandwidth Support		
LTE 6.2.1	The module must support LTE Band 2 using 1.4, 3, 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101:	04/17/15	Mandatory
LTE 6.2.2	The module must support LTE Band 4 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Mandatory
LTE 6.2.3	The module must support LTE Band 12 using 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.10	03/15/13	Mandatory
LTE 6.2.4	The module must support LTE Band 5 using 1.4, 3, 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Mandatory
LTE 6.2.5	The module must support LTE Band 13 using 10 MHz channel bandwidths as defined in 3GPP TS 36.101	04/17/15	Highly Desired
LTE 6.2.6	The module must support LTE Band 25 using 5 MHz channel bandwidths as defined in 3GPP TS 36.101	03/15/13	Highly Desired
LTE 6.2.7	The module must support LTE Band 66 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	04/01/21	Mandatory
LTE 6.2.8	The module must support LTE Band 71 using 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101	04/01/21	Mandatory
LTE 6.2.9	The module must support LTE Band 41 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	04/01/21	Mandatory
LTE 6.2.10	The module must support LTE Band 48 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	04/01/21	Mandatory
 LTE 6.3	Quadrature Amplitude Modulation (QAM)		
LTE 6.3.1	LTE Uplink Cat 13 or higher modules must support uplink 64 QAM modulation as defined in 3GPP TS 36.211 V12.8 and later, in section 5.3.2 and 7.1.	03/10/17	Mandatory
LTE 6.3.2	LTE category 11 or higher modules must support downlink 256 QAM modulation as defined in 3GPP TS 36.211 V12.8 and later, in section 6.3.2	03/10/17	Mandatory
 LTE 6.4	Carrier Aggregation Band Requirements - 3 CC		
LTE 6.4.1	The device must support Downlink CA_2A-2A-4A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.2	The device must support Downlink CA_2A-2A-5A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.3	The device must support Downlink CA_2A-2A-12A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.4	The device must support Downlink CA_2A-2A-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.5	The device must support Downlink CA_2A-4A-4A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.6	The device must support Downlink CA_2A-4A-5A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.7	The device must support Downlink CA_2A-4A-12A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.8	The device must support Downlink CA_2A-4A-71A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.9	The device must support Downlink CA_2A-5A-12A, BW Combination Set 0.	04/01/21	Highly Desired
LTE 6.4.10	The device must support Downlink CA_2A-5A-66A, BW Combination Set 0.	04/01/21	Mandatory








Identifier	Description	Updates	Requirement Type
LTE 6.4.11	The device must support Downlink CA_2A-12A-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.12	The device must support Downlink CA_2A-12B, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.13	The device must support Downlink CA_2A-48A-48A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.14	The device must support Downlink CA_2A-48A-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.15	The device must support Downlink CA_2A-48A-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.16	The device must support Downlink CA_2A-48C, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.17	The device must support Downlink CA_2A-66A-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.18	The device must support Downlink CA_2A-66A-71A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.19	The device must support Downlink CA_4A-4A-5A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.20	The device must support Downlink CA_4A-4A-12A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.21	The device must support Downlink CA_4A-5A-12A, BW Combination Set 0.	04/01/21	Highly Desired
LTE 6.4.22	The device must support Downlink CA_4A-12B, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.23	The device must support Downlink CA_4A-48C, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.24	The device must support Downlink CA_5A-12B, BW Combination Set 0.	04/01/21	Highly Desired
LTE 6.4.25	The device must support Downlink CA_5A-48A-48A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.26	The device must support Downlink CA_5A-48A-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.27	The device must support Downlink CA_5A-48C, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.28	The device must support Downlink CA_5A-66A-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.29	The device must support Downlink CA_12A-66A-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.30	The device must support Downlink CA_12B-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.31	The device must support Downlink CA_48A-48A-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.32	The device must support Downlink CA_48A-48A-71A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.33	The device must support Downlink CA_48A-48C, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.34	The device must support Downlink CA_48A-66A-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.35	The device must support Downlink CA_48C-66A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.36	The device must support Downlink CA_48C-71A, BW Combination Set 0.	04/01/21	Mandatory
LTE 6.4.37	The device must support Downlink CA_48D, BW Combination Set 0.	04/01/21	Mandatory
 NB	Additional Requirements for NB-IOT		
	<i>Section LTE1 applies for all modules Depending on the device LTE category, only one of sections 2, 3, 4, 5, 6 or 7 is applicable</i>		
NB.1	The module must support latest version of the 3GPP Release 13 Specifications for NB-IOT.	12/22/20	Mandatory
NB.2	The module must support NB-IOT Band 2	12/22/20	Mandatory
NB.3	The module must support NB-IOT Band 4	12/22/20	Mandatory
NB.4	The module must support NB-IOT Band 5	12/22/20	Mandatory
NB.5	The module must support NB-IOT Band 12	12/22/20	Mandatory
NB.6	The module must support NB-IOT Band 85	12/22/20	Mandatory
NB.7	The module must support inband, guardband and standalone NB-IOT deployment modes	12/22/20	Mandatory
NB.8	module must be set to only use NB-IOT. LTE-M must be disabled	12/22/20	Mandatory
NB.9	NB-IoT module shall be capable of communicating over a PDN connection with the enterprise application. Note: The PDN connection refers to Control Plane CioT EPS optimization with S11-U Tunneling or traditional S1-U data transfer. Both options must be supported by the NB-IoT module.	12/22/20	Mandatory
NB.10	NB-IoT module shall be configured to indicate NAS signaling low priority by including the module properties IE in the appropriate NAS message and setting the low priority indicator to "MS is configured for NAS signalling low priority"	12/22/20	Mandatory
 NR	5G NR NSA Requirements for Modules		
 NR 1.1	3GPP Release Compliance		
NR 1.1.1	The device must support EUTRA-NR Dual Connectivity (EN-DC) Non-Stand Alone mode Option 3x with EPC as per 3GPP Release 15 TS 37.340.	04/01/21	Mandatory
NR 1.1.2	The device must support Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Architecture as per 3GPP TS 36.300.	04/01/21	Mandatory
 NR 2.1	5G NR Frequency and Bandwidth Support		
NR 2.1.1	The device must support 3GPP NR Band n2 in NSA mode using 5, 10, 15, and 20 channel bandwidths as defined in section 5.2B of 3GPP TS 38.101-3 V15.	04/01/21	Mandatory
NR 2.1.2	The device must support 3GPP NR Band n5 in NSA mode using 5 and 10 channel bandwidths as defined in section 5.2B of 3GPP TS 38.101-3 V15.	04/01/21	Mandatory
NR 2.1.3	The device must support 3GPP NR Band n12 in NSA mode using 5 and 10 MHz channel bandwidths as defined in section 5.2B of 3GPP TS 38.101-3 V15.	04/01/21	Mandatory
NR 2.1.4	The device must support 3GPP NR Band n25 in NSA mode using 5, 10, 15, and 20 channel bandwidths as defined in section 5.2B of 3GPP TS 38.101-3 V15.	04/01/21	Mandatory


Identifier	Description	Updates	Requirement Type
NR 2.1.5	The device must support 3GPP NR Band n41 in NSA mode using 40, 60, 80, and 100 MHz channel bandwidths as defined in section 5.2B of 3GPP TS 38.101-3 V15.	04/01/21	Mandatory
NR 2.1.6	The device must support 3GPP NR Band n66 in NSA mode using 5, 10, 15, and 20 channel bandwidths as defined in section 5.2B of 3GPP TS 38.101-3 V15.	04/01/21	Mandatory
NR 2.1.7	The device must support 3GPP NR Band n71 in NSA mode using 5, 10, and 15 MHz channel bandwidths as defined in section 5.2B of 3GPP TS 38.101-3 V15.	04/01/21	Mandatory
NR 2.1.8	The device must support 3GPP NR Band n258 in NSA mode using 50 MHz, 100 MHz, and 400 MHz channel bandwidth as defined in section 5.2B of 3GPP TS 38.101-3 V15.	04/01/21	Mandatory
NR 2.1.9	The device must support 3GPP NR Band n260 in NSA mode using 50 MHz, 100 MHz, and 400 MHz channel bandwidth as defined in section 5.2B of 3GPP TS 38.101-3 V15.	04/01/21	Mandatory
NR 2.1.10	The device must support 3GPP NR Band n261 in NSA mode using 50 MHz, 100 MHz, and 400 MHz channel bandwidth as defined in section 5.2B of 3GPP TS 38.101-3 V15.	04/01/21	Mandatory
NR 2.1.12	The device must support 3GPP NR Band n77 in NSA mode with Power Class 2 using 10, 15, 20, 40, 50, 60, and 100 MHz channel bandwidths with SCS of 15 and 30 kHz as defined in section 5.2B of 3GPP TS 38.101-1 V15.	04/01/21	Mandatory
 NR 2.2	EUTRA-NR Dual Connectivity (EN-DC)		
NR 2.2.1	The device must support MCG bearer, SCG bearer and split bearer functionality as defined in 3GPP TS 37.340.	04/01/19	Mandatory
NR 2.2.2	The device must support aggregation of NR PDCP PDUs over NR and LTE RATs.	03/27/19	Mandatory
NR 2.2.3	The device must support dynamic spectrum sharing on LTE Bands 2, 5, 12, 25, 41, 66, and 71 with BW 5 MHz and higher.	12/15/20	Mandatory
NR 2.2.4	The device must support the security mechanisms and procedures described in Annex E.3 of 3GPP TS 33.401 for EN-DC.	03/27/19	Mandatory
NR 2.2.5	The device must support flexible bearer split capability between LTE and FR2 NR per TS38.300, TS38.331, TS38.322, TS38.323, and RF inter-band DC TS38.101-3.	04/15/20	Mandatory
 NR 2.3	EN-DC Band Combinations		
NR 2.3.1	The device must support the EN-DC band combination DC_12A_n2A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.2	The device must support the EN-DC band combination DC_2A_n5A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.3	The device must support the EN-DC band combination DC_2A-66A_n5A with uplink EN-DC DC_2A_n5A and DC_66A_n5A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.4	The device must support the EN-DC band combination DC_66A_n5A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.5	The device must support the EN-DC band combination DC_2A_n12A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.6	The device must support the EN-DC band combination DC_2A-66A_n12A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.7	The device must support the EN-DC band combination DC_66A_n12A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.8	The device must support the EN-DC band combination DC_5A_n66A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.9	The device must support the EN-DC band combination DC_12A_n66A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.10	The device must support the EN-DC band combination DC_2A_n41A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.11	The device must support the EN-DC band combination DC_66A_n41A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.12	The device must support the EN-DC band combination DC_2A_n71A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.13	The device must support the EN-DC band combination DC_2A-66A_n71A with uplink EN-DC DC_2A_n71A and DC_66A_n71A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.14	The device must support the EN-DC band combination DC_66A_n71A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.15	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 2A-n258A, 2A-n258G, 2A-n258H, 2A-n258I DL only: 2A-n258J, 2A-n258K, 2A-n258L, 2A-n258M	04/01/21	Mandatory
NR 2.3.16	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 5A-n258A, 5A-n258G, 5A-n258H, 5A-n258I DL only: 5A-n258J, 5A-n258K, 5A-n258L, 5A-n258M	04/01/21	Mandatory
NR 2.3.17	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 12A-n258A, 12A-n258G, 12A-n258H, 12A-n258I DL only: 12A-n258J, 12A-n258K, 12A-n258L, 12A-n258M	04/01/21	Mandatory
NR 2.3.18	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 66A-n258A, 66A-n258G, 66A-n258H, 66A-n258I DL only: 66A-n258J, 66A-n258K, 66A-n258L, 66A-n258M	04/01/21	Mandatory
NR 2.3.19	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 2A-n260A, 2A-n260G, 2A-n260H, 2A-n260I DL only: 2A-n260J, 2A-n260K, 2A-n260L, 2A-n260M	04/01/21	Mandatory
NR 2.3.20	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 5A-n260A, 5A-n260G, 5A-n260H, 5A-n260I DL only: 5A-n260J, 5A-n260K, 5A-n260L, 5A-n260M	04/01/21	Mandatory

Identifier	Description	Updates	Requirement Type
NR 2.3.21	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 12A-n260A, 12A-n260G, 12A-n260H, 1 2A-n260I DL only: 12A-n260J, 12A-n260K, 12A-n260L, 12A-n260M	04/01/21	Mandatory
NR 2.3.22	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 66A-n260A, 66A-n260G, 66A-n260H, 66A-n260I DL only: 66A-n260J, 66A-n260K, 66A-n260L, 66A-n260M	04/01/21	Mandatory
NR 2.3.23	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 2A-n261A, 2A-n261G, 2A-n261H, 2A-n261I DL only: 2A-n261J, 2A-n261K, 2A-n261L, 2A-n261M	04/01/21	Mandatory
NR 2.3.24	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 5A-n261A, 5A-n261G, 5A-n261H, 5A-n261I DL only: 5A-n261J, 5A-n261K, 5A-n261L, 5A-n261M	04/01/21	Mandatory
NR 2.3.25	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 12A-n261A	04/01/21	Mandatory
NR 2.3.26	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 66A-n261A, 66A-n261G, 66A-n261H, 66A-n261I DL only: 66A-n261J, 66A-n261K, 66A-n261L, 66A-n261M	04/01/21	Mandatory
NR 2.3.27	The device must support the EN-DC band combination DC_5A_n2A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.28	The device must support the EN-DC band combination DC_66A_n2A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.29	The device must support the EN-DC band combination DC_66A-5A_n2A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.30	The device must support the EN-DC band combination DC_66A-12A_n2A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.31	The device must support the EN-DC band combination DC_2A_n66A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.32	The device must support the EN-DC band combination DC_2A-5A_n66A with uplink EN-DC DC_2A_n66A and DC_5A_n66A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.33	The device must support the EN-DC band combination DC_2A-12A_n66A with uplink EN-DC DC_2A_n66A and DC_12A_n66A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.34	The device must support the EN-DC band combination DC_2A_66A_n71AA per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.35	The device must support the EN-DC band combination DC_2A_12A_n66A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.36	The device must support the EN-DC band combination DC_2A_66A_n41A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.37	The device must support the EN-DC band combination DC_12A_n25A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.38	The device must support the EN-DC band combination DC_2A_66A_n261(2A) per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.39	The device must support the EN-DC band combination DC_2A_66A_n260(I) per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.40	The device must support the EN-DC band combination DC_13A_n2A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.41	The device must support the EN-DC band combination DC_13A_n5A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.42	The device must support the EN-DC band combination DC_13A_n66A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.43	The device must support the EN-DC band combination DC_13A_n260A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
NR 2.3.44	The device must support the EN-DC band combination DC_13A_n261A per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
 NR 2.4	5G NR MIMO Support Transmit Diversity		
NR 2.4.1	The device must support downlink 2x2 MIMO and 4x2 MIMO with transmit diversity in all supported FR1 NR bands as defined in 3GPP TS38.214.	04/01/21	Mandatory
NR 2.4.2	The device must support downlink 2x2 MIMO in all supported FR2 NR bands as defined in 3GPP TS38.214.	04/01/21	Mandatory
NR 2.4.3	The device must support uplink 2x2 MIMO in all supported FR2 NR bands as defined in 3GPP TS38.214.	04/01/21	Mandatory
 NR 2.5	Device Capabilities		
NR 2.5.1	The device must disable NR capabilities when VoLTE is not enabled.	04/01/21	Mandatory
NR 2.5.2	The device must disable Standalone (SA) mode.	04/01/21	Mandatory
 NR 2.6	5G-NR Carrier Aggregation		
NR 2.6.1	The device must support up to 8CC downlink CA (800MHz aggregation) in all supported FR2 NR bands as defined in 3GPP TS38.214 and 3GPP TS38.211.	04/01/21	Mandatory
NR 2.6.2	The device must support up to 4CC uplink CA (400 MHz aggregation) in all supported FR2 NR bands as defined in 3GPP TS38.214 and 3GPP TS38.211.	04/01/21	Mandatory
NR 2.6.3	The device must support downlink intra-band non-contiguous CA (400 MHz aggregation) in all supported FR2 NR bands as defined in 3GPP TS38.214 and 3GPP TS38.211.	04/01/21	Mandatory
 NR 2.7	Reference Signal		

Identifier	Description	Updates	Requirement Type
NR 2.7.1	The device must support Type-1 DMRS for all NR bands as specified in 3GPP TS38.214.	04/01/21	Mandatory
NR 2.7.2	The device must support 2 CSI-RS ports per process for all supported FR2 NR bands as specified in 3GPP TS38.214.	04/01/21	Mandatory
 NR 2.8	Modulation Schemes		
NR 2.8.1	The device must support downlink 64QAM and 256QAM in all supported FR1 NR bands as specified in 3GPP TS38.211.	04/01/21	Mandatory
NR 2.8.2	The device must support uplink 64QAM in all supported FR1 NR bands as specified in 3GPP TS38.211.	04/01/21	Mandatory
NR 2.8.3	The device must support downlink 64QAM in all supported FR2 NR bands as specified in 3GPP TS38.211.	04/01/21	Mandatory
NR 2.8.4	The device must support uplink 64QAM in all supported FR2 NR bands as specified in 3GPP TS38.211.	04/01/21	Mandatory
 NR 2.9	Subcarrier Spacing		
NR 2.9.1	The device must support 15kHz and 30kHz subcarrier spacing in all supported FR1 NR bands as specified in 3GPP TS38.211.	04/01/21	Mandatory
NR 2.9.2	The device must support 60kHz, 120kHz and 240kHz subcarrier spacing in all supported FR2 NR bands as specified in 3GPP TS38.211.	04/01/21	Mandatory
 NR 2.10	Bearer Management		
NR 2.10.1	The device must support DL PDCP Aggregation as specified in 3GPP TS37.340.	04/01/21	Mandatory
NR 2.10.2	The device must support multiple bearers in NSA mode in 3GPP TS37.340.	04/01/21	Mandatory
 NR 2.11	Mobility		
NR 2.11.1	The device must support NR Intra-frequency SCG changes with the same LTE MCG as specified in 3GPP TS37.340.	04/01/21	Mandatory
NR 2.11.2	The device must support NR Inter-Frequency FDD Sub6-Sub6 SCG changes with same LTE MCG as specified in 3GPP TS37.340.	04/01/21	Mandatory
NR 2.11.3	The device must support NR Inter-Frequency mmW-mmW SCG changes with same LTE MCG as specified in 3GPP TS37.340.	04/01/21	Mandatory
 NR 2.12	Waveforms		
NR 2.12.1	The device must support CP-OFDM in the downlink and uplink as specified in 3GPP TS38.211.	04/01/21	Mandatory
NR 2.12.2	The device must support DFT-s-OFDM in the uplink as specified in 3GPP TS38.211.	04/01/21	Mandatory
 NR 2.13	Other modem features		
NR 2.13.1	The device must support C-DRX as specified in 3GPP TS 38.321.	04/01/21	Mandatory
NR 2.13.2	The device must support 3-symbol PDCCH as specified in 3GPP TS 38.213.	04/01/21	Mandatory
NR 2.13.3	The device must set the size of MTU (Maximum transmission unit) to 1422 bytes for all traffic that traverses the Internet APN.	04/01/21	Mandatory
NR 2.13.4	The device must enforce its own MTU size when tethering.	04/01/21	Mandatory
 UICC	UICC Requirements for all Modules		
 UICC 1	UICC Support Requirements		
UICC 1.1	The module must support logical channels at least to accommodate USIM and ISIM.	04/03/19	Mandatory
UICC 1.2	The module must support UICC in a multi-applications (USIM and ISIM) environment	04/03/19	Mandatory
UICC 1.3	The module must support Bearer Independent Protocol (BIP) for data communication as specified in ETSI TS 102.223	09/06/11	Mandatory
UICC 1.4	The module must support logical channels as specified in 3GPP TS 31.102	03/28/11	Mandatory
UICC 1.5	The module must support at least 4 logical channels	03/17/11	Mandatory
UICC 1.6	The module must deliver any data received from the network in the response to the command initiated by the UICC	03/17/11	Mandatory
UICC 1.7	The module must return all the mandatory parameters for the PLI (Provide Location Information) command issued by UICC applications. In addition, the module must return the following parameters for the PLI command: Language, timing advance, access technology and Search Mode	09/09/11	Mandatory
UICC 1.8	The module must support delivering the "Proof of Receipt" SMS from UICC as specified by 3GPP TS 31.111.	07/12/12	Mandatory
UICC 1.9	The module must manage the following proactive commands: More time, Open Channel (TCP and UDP), Send data, Receive data, Close Channel, Set-up event list, Timer management, Poll interval, PLI (Date, Time and Time_Zone), PLI (IMEI, IMEISV), PLI (MCC, MNC, LAC, ECI), Refresh (NAA Init and FFCN), Display Text, Set-Up Menu, Select Item, and Polling Off	11/11/15	Mandatory
UICC 1.10	The module must support the "Menu selection" envelope command.	09/06/11	Mandatory
UICC 1.11	The module must support the following events: Terminal profile, Data Available, Status, Timer Expiration, Download- Access Technology Change, Download-Channel Status, Terminal Response, and Location Status	11/11/15	Mandatory
UICC 1.12	The module must send status command every 30 seconds as specified in 3GPP TS 51.011 section 11.2.8.	09/06/11	Mandatory
UICC 1.13	The module must provide "Terminal Profile" while booting via the profile download command, clearly indicating its capabilities.	09/06/11	Mandatory
UICC 1.14	The module must not ignore any proactive commands from UICC.	09/06/11	Mandatory
UICC 1.15	The module must return appropriate error code when not supporting a proactive command or option and continue to work correctly.	09/06/11	Mandatory

Identifier	Description	Updates	Requirement Type
UICC 1.16	The module must reread all Elementary Files (EFs) upon receiving an REFRESH command from UICC.	09/06/11	Mandatory
UICC 1.17	If the UICC is not communicating, the module must treat this as "no UICC" scenario and discontinue all ongoing sessions except for emergency calls.	09/06/11	Mandatory
UICC 1.18	The module must support provisioning/updates to the UICC/USIM using the Envelope SMS-PP Data Download as per 3GPP TS 31.111	02/01/21	Mandatory
 UICC 2	USIM Application Requirements		
UICC 2.1	The module must support interaction with USIM application in UICC as specified in 3GPP TS 31.102	03/28/11	Mandatory
UICC 2.2	The module must support USIM Application Toolkit (USAT) as specified in 3GPP TS 31.111.	03/17/11	Mandatory
UICC 2.3	The module must support the file structure and management procedures as specified in 3GPP TS 31.102 and 3GPP TS 31.111	03/28/11	Mandatory
UICC 2.4	The module must support all the mandatory parameters as specified in 3GPP TS 31.102. In addition, the module must support the following optional parameters: EF_OPLMNwAcT, EF_HPLMNwAcT, EF_EHPLMN, EF_LOCIGPRS, EF_Kc, EF_KcGPRS, EF_SPN, EF_MSISDN, EF_PNN, EF_OPL, EF_EPSLOC	09/21/11	Mandatory
UICC 2.5	The module must support at least 100 PLMN entries each for OPLMNwAcT and HPLMNwAcT.	03/25/11	Mandatory
UICC 2.6	The module must support a 10 digit MDN that will be sent to the module during the first SIM OTA activation and update.	06/26/20	Mandatory
 IMS	SMS over IMS Requirements (if supported by module)		
 UICC 3	ISIM application requirements for modules supporting SMS over IMS Technology		
UICC 3.1	The module must support ISIM application as specified in 3GPP TS 31.103	04/03/19	Mandatory
UICC 3.2	The module must support the file structure and management procedures as specified in 3GPP TS 31.103	04/03/19	Mandatory
UICC 3.3	The module must support UICC enhancements for Generic Bootstrapping Architecture specified in 3GPP TS 33.220.	04/03/19	Mandatory
 IMS 1	General SMS over IMS Requirements		
 IMS 1.1	3GPP Release Compliance		
IMS 1.1.1	The module must support latest version of the 3GPP Release 10 Specifications. At minimum, module must support all 3GPP Release 10 CRs as of December 2013.	04/03/19	Mandatory
 IMS 1.2	General Requirements		
IMS 1.2.1	The module must be able to access PS domain (LTE), and IP Multimedia Subsystem (IMS) domain.	04/03/19	Mandatory
IMS 1.2.2	The module must support an architecture that allows having only a single registration to the IMS network per module. See GSMA PRD-RCC.07, "SMS" portion of section 2.2.3 apply.	04/03/19	Mandatory
IMS 1.2.3	The module must follow the procedures described in 3GPP TS 24.229 for dealing with failures during Initial Registration (5.1.1.2) and section 4.5 of RFC 5626. This requirement clarifies the retry logic to be followed by the UE in terms of timers and number of attempts.	04/03/19	Mandatory
IMS 1.2.4	The module must follow the procedures described in 3GPP TS 24.229 for dealing with failures during Re-Registration(5.1.1.4). This requirement implies that the UE must try the initial registration with the currently connected P-CSCF before initiating switch-over.	04/03/19	Mandatory
IMS 1.2.5	The module must follow the procedures described in section 5.1.2A.1.6 of 3GPP TS 24.229 for dealing with failures related to non-REGISTER methods. This requirement clarifies the behavior for INVITE failures including 504.	04/03/19	Mandatory
IMS 1.2.7	The module must honor the Retry-After header whenever present in 500 or 503 SIP response messages.	04/03/19	Mandatory
 IMS 1.3	IP Requirements		
IMS 1.3.1	The module must support both IPv4 and IPv6 protocols used for the following applications: SIP and HTTP	04/03/19	Mandatory
IMS 1.3.2	The module must support TCP and UDP transport protocols.	04/03/19	Mandatory
IMS 1.3.3	The module must prefer IPv6 over IPv4 address when registering with an IMS network.	04/03/19	Mandatory
IMS 1.3.4	The module must prefer IPv6 over IPv4 address for all IMS application communications.	04/03/19	Mandatory
 IMS 1.4	LTE Modem Requirements		
IMS 1.4.1	The module must support UE procedures specified in Annex L.2.2 and L 3.1 of 3GPP TS 24.229.	06/26/20	Mandatory
IMS 1.4.2	The module must support P-CSCF discovery according to Annex L.2.2.1/Method II in 3GPP TS 24.229.	04/03/19	Mandatory
IMS 1.4.3	The module must request both a DNS Server IPv6 address and a DNS Server IPv4 address via the Protocol Configuration Options information element when activating an EPS bearer context according to 3GPP TS 24.301.	04/03/19	Mandatory
IMS 1.4.6	The module must support combination of radio bearers specified in GSMA PRD IR.92 and Annex B in 3GPP TS 36.331.	04/03/19	Mandatory
IMS 1.4.7	The module must support RLC configurations specified in GSMA PRD IR.92 and 3GPP TS 36.322.	04/03/19	Mandatory
IMS 1.4.8	The module must always use the IMS APN for any IMS applications as specified in GSMA PRD IR.88, section 6.3.2.	04/03/19	Mandatory
IMS 1.4.9	The module must not use the IMS APN for any non-IMS applications.	04/03/19	Mandatory
IMS 1.4.10	The module must establish a unique PDN connection with APN set to "ims" for all IMS applications after the default internet PDN connection is established	09/06/19	Mandatory
IMS 1.4.11	The module must support default EPS bearer with QCI value of five (5) for SIP signaling.	04/03/19	Mandatory
IMS 1.4.12	The module must support NAS procedures specified in 3GPP TS 24.301.	04/03/19	Mandatory
IMS 1.4.13	The module must request PDN type of IPv4v6 when establishing the IMS PDN for default and dedicated bearers, as specified in 3GPP TS 23.401.	09/06/19	Mandatory

Identifier	Description	Updates	Requirement Type
IMS 1.4.14	The module must support "IMS voice over PS session supported" network indication specified in 3GPP TS 23.401.	04/03/19	Mandatory
IMS 1.4.15	The module must support Idle Mode Signaling Reduction (ISR) specified in 3GPP TS 23.401 and 3GPP TS 24.301.	04/03/19	Mandatory
IMS 1.5	IMS APN		
	The module must set the IMS APN as "ims" with type IPV4V6 and must include it in the PDN Connection Request when establishing the IMS PDN connection	09/17/19	Mandatory
 IMS 1.6	Session Control Protocols Requirement		
IMS 1.6.1	The module must support Session Initiation Protocol (SIP) specified in RFC 3261.	04/03/19	Mandatory
IMS 1.6.3	The module must support SIP registration procedures specified in GSMA PRD IR.92.	04/03/19	Mandatory
IMS 1.6.4	The module must support addressing requirements specified in GSMA PRD IR.92.	04/03/19	Mandatory
IMS 1.6.5	The module must not utilize SIP compression procedures specified in RFC 3320 and updated with RFC 4896 when communicating with a P-CSCF.	04/03/19	Mandatory
IMS 1.6.6	The module must comply with session setup procedures specified in 3GPP TS 26.114.	04/03/19	Mandatory
IMS 1.6.7	The module must comply with session control procedures specified in 3GPP TS 26.114.	04/03/19	Mandatory
IMS 1.6.8	The module must comply with loss of PDN connectivity behavior specified in GSMA PRD IR.92.	04/03/19	Mandatory
IMS 1.6.9	The module must comply with loss of media bearer and radio connection behavior specified in GSMA PRD IR.92.	04/03/19	Mandatory
IMS 1.6.10	The module must support DSCP marking of CS5 for IMS Signaling.	04/03/19	Mandatory
IMS 1.6.11	The module must use IMSI-based IMPU for SIP registration.	04/03/19	Mandatory
IMS 1.6.12	The module must provide the version of the current module software build in the User Agent string as part of the SIP message header.	04/03/19	Mandatory
IMS 1.6.13	The module must support Public User Identities as defined in section 13.4 of 3GPP TS 23.003, and use SIP-URI when addressing called party.	04/03/19	Mandatory
IMS 1.6.14	The module must set the expiry for SIP SUBSCRIBE message to 7200 sec.	04/03/19	Mandatory
IMS 1.6.15	The module must set SIP Registration Expiry timer to 7200 sec.	04/03/19	Mandatory
IMS 1.6.16	The module must set SIP timers to value as defined in 3gpp 24.229 fig. 7.7.1. column no 3.	04/03/19	Mandatory
IMS 1.6.17	module must prefer UDP for SIP communication and switch to TCP when the MSS is over 1080 bytes for IPv6 per RFC 3261.	04/03/19	Mandatory
 IMS 1.7	Access Security Protocols Requirements		
IMS 1.7.1	The module must support access security requirements specified in 3GPP TS 33.203.	04/03/19	Mandatory
IMS 1.7.2	The module must support authentication procedures specified in PRD IR.92.	04/03/19	Mandatory
IMS 1.7.4	The module must support reference point Ub by implementing Digest AKA protocol specified in RFC 3310, 3GPP TS 33.220, and 3GPP TS 24.109.	04/03/19	Mandatory
IMS 1.7.5	The module must support reference point Ua specified in 3GPP TS 33.220 and 3GPP TS 24.109.	04/03/19	Mandatory
IMS 1.7.6	The module must support the Generic Authentication Architecture procedures specified in 3GPP TS 24.623, 3GPP TS 33.222 and 3GPP TS 24.109.	04/03/19	Mandatory
IMS 1.7.7	The module signaling access security functions must comply with requirements from GSMA PRD RCC.07, section 2.13.1.	04/03/19	Mandatory
IMS 1.7.8	The module signaling access security functions must comply with requirements from GSMA PRD IR.92.	04/03/19	Mandatory
 IMS 2.1	General SMS Requirements		
IMS 2.1.1	The module must implement domain selection according to GSMA PRD IR.92, section A.2.	04/03/19	Mandatory
 IMS 2.3	Session Control Protocols Requirement		
IMS 2.3.3	The module MUST clean up the existing IMS and LTE sessions whenever it is restarted, powered off, switched to airplane mode or even when the SIM card is pulled out. The module must unsubscribe from any subscribed events, de-register from IMS, disconnect the IMS PDN and detach from LTE network.	04/03/19	Mandatory
 IMS 2.4	SMS Client Requirements		
IMS 2.4.1	The module must support SMS over IP over LTE according to the requirements specified in GSMA PRD IR.92 and 3GPP TS 24.341.	04/03/19	Mandatory
 IMS 2.5	SMS over IMS Roaming		
IMS 2.5.1	The module must comply with roaming requirements specified in GSMA PRD IR.92, section 5.3.	04/03/19	Mandatory
 AT	AT Commands to Read Module Information		
	<i>The module must support the following AT commands as defined in 3GPP 27.007</i>		
AT 1	AT+COPS to turn detach/attach from network and check operator status. The setting must persist after reboot	09/05/19	Mandatory
AT 2	AT+CFUN=[0 thru 4] to set module functionality	09/05/19	Mandatory
AT 3	AT+CNUM to read the 10 digit Mobile Directory Number (MDN).	09/05/19	Mandatory
AT 4	AT+CIMI to read International Mobile Subscriber Identity (IMSI).	09/05/19	Mandatory
AT 6	AT+CGSN to read the module IMEI	09/05/19	Mandatory
AT 7	AT+CCID to read UICCID	09/05/19	Mandatory
AT 9	AT+CGMR to read firmware version	09/05/19	Mandatory
AT 10	AT+CGMM to read HW model	09/05/19	Mandatory

Identifier	Description	Updates	Requirement Type
AT 11	AT+CEREG? to check LTE network registration status, Active Time and Periodic TAU timers	09/05/19	Mandatory
AT 12	AT+CIREG? to check IMS network registration status (only for IMS-capable modules)	09/05/19	Mandatory
AT 13	AT+CESQ to read LTE RSRP and RSRQ	09/05/19	Mandatory
AT 14	AT+CGCONTRDP to read dynamic PDP parameters	09/05/19	Mandatory
AT 15	AT+CGDCONT to set/read PDP context & APN settings	09/05/19	Mandatory
AT 16	AT+CEMODE to set/read the UE CS/PS Mode of operation.	09/05/19	Mandatory
AT 17	AT+CCLK? to read the clock	09/05/19	Mandatory
AT 18	AT+CPSMS for Power Saving Mode (Cat-M and NB-IOT only)	06/11/18	Mandatory
AT 19	AT+CEDRXS and AT+CEDRXRDP for eDRX (Cat-M and NB-IOT only)	06/11/18	Mandatory
AT 20	Module must support AT command to set RAT to LTE-only.	09/05/19	Mandatory
AT 21	Cat-M1/NB-IOT module must support AT command to set RAT to LTE Cat-M1 only with NB-IOT disabled, or to NB-IOT only with Cat-M1 disabled.	10/10/19	Mandatory
AT 22	Module must support AT command to enable/disable LTE bands.	09/05/19	Mandatory
AT 23	Module must support AT command to read LTE EARFCN.	09/05/19	Mandatory
AT 24	SMS-capable module must support AT command to send/receive SMS (OEM TO SPECIFY AT COMMANDS)	09/05/19	Mandatory
AT 25	Module must support AT command to enable/disable 5G NR bands.	04/01/21	Mandatory
AT 26	Module must support AT command to read ENDC registration status	04/01/21	Mandatory
AT 27	Module must support AT command to read the network configured NR band during ENDC operation	04/01/21	Mandatory
	Module OEM Deliverables (TEC)		
Mod Doc	OEM Deliverable - Module Documentation		
Mod Doc 1	Software Release Notes or equivalent, with a list of all known issues, if any.	09/10/19	Mandatory
Mod Doc 2	Users Manual (Hard or Soft copy) - Quick Start Guide		Mandatory
Mod Doc 3	USCC Application Note listing all AT commands and settings needed for compliance to USCC Technical Requirements and for operation on USCC LTE network. This document will be used by device OEMs when using this module for US Cellular devices.	09/10/19	Mandatory
Mod Doc 4	AT Command Manual	09/10/19	Mandatory
Mod Doc 5	Procedure to flash the firmware to the module	09/10/19	Mandatory
Mod Smp	OEM Deliverable - Module Samples		
Mod Smp 1	<p>Total Units: 3 units for LTE Cat-6 and above modules 2 units for Cat-1, Cat-M1, NB-IOT modules</p> <p>RF Test Connectors: External RF connectors must be provided for all antenna paths including all MIMO antenna paths. The RF connectors must be easily accessible (e.g., not behind the battery).</p> <p>If RF adapter cables are required for testing, please include and provide loss figures for LTE Bands 2, 4, 5, 12.</p> <p>Please ensure that all Modules are individually packaged, or boxed with cables, charger, and batteries.</p> <p>Modules entering the Lab must not panic, power cycle, power-down or power off randomly, sporadically or permanently during the testing. If these items listed above occur, your Modules will be returned."</p>	09/10/19	Mandatory
Mod Smp 2	USB drivers (If Applicable)	09/10/19	Mandatory
Mod Smp 3	Data cable (USB, RS232 etc.) for each unit	09/10/19	Mandatory
Mod Smp 4	2 batteries or battery emulators, if applicable	09/10/19	Mandatory
Mod Tool	OEM Deliverable - Module Support Tools		
Mod Tool 1	Product Support Tool (if new, please include)	09/10/19	Mandatory
Mod Tool 2	Instructions to communicate with modem diagnostic logging tools (ex. Qualcomm QXDM, Intel STT)	09/10/19	Mandatory
Mod Fcc	OEM Deliverable - Module FCC		
Mod Fcc 1	<p>FCC Grant listing frequency ranges for the following LTE bands (if supported)</p> <p>B2 (BW 1.4, 3, 5, 10, 15, 20 MHz) B4 (BW 5, 10, 15, 20 MHz) B66 (BW 5, 10, 15, 20 MHz) B5 (BW 1.4, 3, 5, 10 MHz) B12 (BW 5, 10 MHz) B13 (BW 10 MHz) B25 (BW 5 MHz) B71 (BW 5, 10, 15 MHz) B46 (BW 10, 20 MHz) B26 (BW 1.4, 3, 5, 10, 15 MHz) B41 (BW 5, 10, 15, 20 MHz) B48 (BW 5, 10, 15, 20 MHz)</p>	09/10/19	Mandatory

Identifier	Description	Updates	Requirement Type
Mod Fcc 2	FCC Grant listing frequency ranges for the following 5G NR bands (if supported) n2 (BW 5, 10, 15, 20 MHz) n4 (BW 5, 10, 15, 20 MHz) n66 (BW 5, 10, 15, 20 MHz) n5 (BW 5, 10 MHz) n12 (BW 5, 10 MHz) n71 (BW 5, 10, 15 MHz) n25 (BW 5, 10, 15, 20 MHz) n41 (BW 40, 60, 80, 100 MHz) n258 (BW 50, 100, 400 MHz) n260 (BW 50, 100, 400 MHz) n261 (BW 50, 100, 400 MHz)	04/01/21	Mandatory
Mod Test	OEM Deliverable - LTE Test Results		
Mod Test 1	GCF Certification from Certified Lab		
Mod Test 1.1	OEM to deliver GCF test reports showing compliance to the following 3GPP requirements for LTE Band 5 (BW 5/10 MHz), LTE Band 2 (BW 5/10/15/20 MHz), LTE Band 4/66 (BW 5/10/15/20 MHz) , LTE Band 12 (BW 5/10 MHz), LTE Band 13 (BW 10 MHz), LTE Band 25 (BW 5 MHz) LTE: TS 36.521-1, TS 36.521-3, TS 36.523-1 USIM / USAT : 3GPP TS 31.121, TS 31.124, ETSI 102 230 When leveraging test results during GCF certification, please provide the Initial submission test results for the Parent module.	06/26/20	Mandatory
Mod Test 2	USCC Test Plan results from GCF certified lab *** For LTE Cat-6 or above modules only ***		
Mod Test 2.1	Data Throughput results Based on attached USCC Data Tput Test Specifications v2-2.xlsx	09/10/19	Mandatory
Mod Test 3	Network LTE IOT Results *** Depending on LTE modem, USCC may already have these on file ***		
Mod Test 3.1	Modem LTE Interoperability Test Results from Ericsson IOT Lab	09/10/19	Mandatory
Mod Test 3.2	Modem LTE Interoperability Test Results from Nokia IOT Lab.	09/10/19	Mandatory
Mod NR Test	OEM Deliverable - 5G NR Test Results		
Mod NR Test 1	GCF Certification from Certified Lab		
Mod NR Test 1.1	5G NSA Option 3x UE Minimum Performance Results for 3GPP Rel 15 RF: 3GPP TS 38.521.1~4 for EN-DC bands DC_2_n[71, 5, 12, 41], DC_2-66_n[71, 5, 12, 41], DC_66_n[71, 5, 12, 41], (DC_[2, 5, 12, 66]_n[258, 260, 261]), DC_13_n[2, 5, 66, 260, 261], DC_12_n25, DC_12_n[2, 66], DC_5_n[2, 66] RRM: 3GPP TS 38.533 for EN-DC bands DC_2_n[71, 5, 12, 41], DC_2-66_n[71, 5, 12, 41], DC_66_n[71, 5, 12, 41], (DC_[2, 5, 12, 66]_n[258, 260, 261]), DC_13_n[2, 5, 66, 260, 261], DC_12_n25, DC_12_n[2, 66], DC_5_n[2, 66]	04/01/21	Mandatory
Mod NR Test 1.2	5G NSA Option 3x Signaling Conformance Results for 3GPP Rel 15 Result of signaling conformance test cases defined in 3GPP TS 38.523-1 for EN-DC bands DC_2_n[71, 5, 12, 41], DC_2-66_n[71, 5, 12, 41], DC_66_n[71, 5, 12, 41], (DC_[2, 5, 12, 66]_n[258, 260, 261]), DC_13_n[2, 5, 66, 260, 261], DC_12_n25, DC_12_n[2, 66], DC_5_n[2, 66]	04/01/21	Mandatory
Mod VnV	OEM Deliverable - Module V&V Testing		
Mod VnV 1	Results for "USCC M2M Verification & Validation Test Plan for LTE Modules" (See attachment for latest version).. US Cellular will provide one standard and one QPP SIM card for testing.	06/26/20	Mandatory
Mod Fw	OEM Deliverable - Module Firmware		
Mod Fw 1	Submit module software/firmware binary file	09/10/19	Mandatory
	Revisions Since Previous Release		
	Removed PTCRB as option for 3GPP compliance. Only GCF allowed now.		
	n41 and n77 band reqmnts updated with Power Class 2		
	n48 band removed		
	n77 and n258 band moved to Future status		
	GCF, FCC band lists updated		