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	Technical Requirements and OEM Deliverables for IoT Integrated Devices		
Version:	2021.3		
Release Date:	11/10/2021		
Applicability	These requirements apply to non-stocked IoT/M2M integrated devices that support LTE, LTE-M, NB-IoT, or non-standalone 5G NR technologies, and that will operate on the US Cellular network and roaming partner networks using US Cellular SIM cards.		
	References - US Cellular Documents		
	USCC M2M Verification & Validation Test Plan for Integrated Devices 3.6		
	US Cellular LTE Module Configuration Guidelines v1.5		
	US Cellular LTE Over-the-Air Radiated Performance V 4.3		
	US Cellular Inbound Routing Guide V 15		
	Integrated Device Technical Requirements		
 Dev Gen	General Requirements For All Devices		
 Dev Gen 1	General Hardware Requirements		
Dev Gen 1.2	The device must have an external label showing the IMEI	09/06/19	Mandatory
Dev Gen 1.3	Device must support a method to read IMSI (using external cable, PC, smartphone, etc)	09/06/19	Mandatory
Dev Gen 1.4	Device must support a method to read module FW version (using external cable, PC, smartphone, etc)	06/26/20	Mandatory
Dev Gen 1.5	The device must support a method to remotely update the software from an OEM-hosted server using the cellular data connection	09/06/19	Mandatory
Dev Gen 1.6	*** For devices using a power supply or AC adapter. Not for battery powered devices *** The device must recover to normal functionality if the power supply is turned off during a software update	09/06/19	Mandatory
 Dev Gen 2	Factory Data Reset		
Dev Gen 2.2	If device has a removable memory card, the Factory Data Reset must not delete user-generated content from the memory card.	05/25/17	Mandatory
 Dev OTA	OTA Performance		
Dev OTA 1.1	Device must meet US Cellular Over-the-air performance requirements listed in the attached document "USCC_LTE_OvertheAir_Radiated_Performance V 4.2"	02/01/21	Mandatory
 Dev Mod 1	Module Integration - Only For Devices with Certified Modules		
	<i>This section applies to devices that use US Cellular certified modules and certified module firmware.</i>		
Dev Mod 1.1	The device must use US Cellular approved module firmware	09/06/19	Mandatory
Dev Mod 1.3	The device must incorporate all module-specific AT commands and settings from the US Cellular Application Note developed by the module OEM	09/06/19	Mandatory
 Dev Sec 1	Device Security		
Dev Sec 1.1	Device OEM must have a Terms of Service or Terms of Use statement for the device	02/01/21	Mandatory
Dev Sec 1.2	The Terms of Service or Terms of Use must include language about the device end-of-life conditions	02/01/21	Mandatory
Dev Sec 1.3	All physical and remote configuration and management interfaces must require authentication.	02/01/21	Mandatory
Dev Sec 1.4	*** For devices with LAN or WiFi Access Point capability (routers, hotspots, gateways) *** UPnP must be disabled by default	02/01/21	Mandatory
Dev Sec 1.5	*** For devices with LAN or WiFi Access Point capability (routers, hotspots, gateways) *** Device must not have any unnecessary services or ports listening on the supported LAN, WAN, WiFi or PAN interfaces.	02/01/21	Mandatory
Dev Sec 1.6	*** For devices with remote admin login (routers, hotspots, gateways) *** The factory default admin login password must be unique to each device sample. It must not be the same for all devices (ex. login with admin/admin must not be allowed)	02/01/21	Mandatory
Dev Sec 1.7	*** For devices with remote admin login (routers, hotspots, gateways) *** When changing the admin login password, the device must require the new password to be at least 8 characters long.	02/01/21	Mandatory
Dev Sec 1.8	*** For devices with remote admin login and with other user login accounts (routers, hotspots, gateways) *** When logged into admin account, the device must not expose passwords for other user accounts	02/01/21	Mandatory
Dev Sec 1.9	*** For devices with remote admin login (routers, hotspots, gateways) *** If user attempts to login with incorrect password more than 10 times, the device should prohibit login for at least 5 minutes	02/01/21	Mandatory
 Dev LTE	LTE Requirements for Devices		
	<i>Section 1 applies to all devices Depending on the device LTE category, only one of sections 2, 3 or 4 is applicable</i>		
 Dev SMS	SMS over NAS Requirements for All LTE Categories		
Dev SMS 1.1	The device 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


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Dev SMS 1.2	The device must support SMS over NAS per 3GPP 24.301 and 23.272	02/01/21	Mandatory
Dev SMS 1.3	The device must support 3GPP format SMS messaging per 23.040	02/01/21	Mandatory
 Dev ISMS	SMS over IMS Requirements (if applicable)		
	<i>SMS over IMS requirements apply to devices that use SMS over IMS instead of SMS over NAS</i>		
Dev ISMS 1.1	Device must comply with US Cellular IMS requirements & settings if using SMS over IMS. Contact your US Cellular POC or check the "US Cellular Module Configuration Guidelines" document for implementation details and work with the module manufacturer to enable this service.	02/01/21	Mandatory
 Dev LTE 1	General LTE Requirements for All LTE Categories		
Dev LTE 1.2	The device must use PDP context #1 for all data traffic (default internet PDN)	09/06/19	Mandatory
Dev LTE 1.3	The device must set the default internet APN to an empty value, unless a different APN is specified by US Cellular	09/06/19	Mandatory
Dev LTE 1.4	The device 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	06/26/20	Mandatory
Dev LTE 1.5	The device must default the data roaming option to enabled	06/26/20	Mandatory
Dev LTE 1.6	The device must not be SIM locked to US Cellular network, and must operate with any operators SIM card.	06/26/20	Mandatory
Dev LTE 1.7	The device must be set to operate on LTE only. All other RATs such as GSM, CDMA, UMTS must be disabled.	06/26/20	Mandatory
Dev LTE 1.8	The device mode of operation must be set to Data-Centric i.e. PS Mode 2 as per 3GPP TS 24.301	06/26/20	Mandatory
Dev LTE 1.9	The device must support Multiple Frequency Band Indicators (MFBIs) as defined in 3GPP TS 36.331 version 8.17.0 and 3GPP TS 36.307 version 8.7.0. Feature Group Indicator 31 in the UECapabilityInformation message must be set to "1".	06/26/20	Mandatory
Dev LTE 1.10	Device must support a method to collect diagnostic logs about network connectivity. Use of additional cables, memory cards, is permitted.	06/26/20	Mandatory
 Dev LTE 2	Additional LTE requirements only for LTE Cat 1 and above		
Dev LTE 2.1	The device must set default the TCP Receive Window (RWIN) size for an LTE data connection to a value which is equal to or greater than 512KB.	07/06/12	Mandatory
Dev LTE 2.2	The device must set the size of MTU (Maximum transmission unit) to 1422 bytes.	04/17/15	Mandatory
Dev LTE 2.3	The device must enforce its own MTU size when tethering.	04/17/15	Mandatory
Dev LTE 2.4	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
Dev LTE 2.5	The module must support LTE Band 4 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101	04/17/15	Mandatory
Dev LTE 2.6	The module must support LTE Band 12 using 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101	04/17/15	Mandatory
Dev LTE 2.7	The module must support LTE Band 5 using 1.4, 3, 5 and 10 MHz channel bandwidths as defined in 3GPP TS 36.101	04/17/15	Mandatory
Dev LTE 2.8	The module must support LTE Band 13 using 10 MHz channel bandwidths as defined in 3GPP TS 36.101	04/17/15	Mandatory
Dev LTE 2.9	The module must support LTE Band 25 using 5 MHz channel bandwidths as defined in 3GPP TS 36.101	04/17/15	Mandatory
Dev LTE 2.10	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
Dev LTE 2.11	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
 Dev LTE 3	Additional LTE requirements only for LTE Cat 6 and above		
Dev LTE 3.1	Device must meet all Cat-1 requirements in section LTE 2 above	04/01/21	Mandatory
Dev LTE 3.2	The device 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
Dev LTE 3.3	The device must support 2-band downlink Carrier Aggregation	04/01/21	Mandatory
 Dev LTE 4	Additional LTE requirements only for LTE Cat 9 and above		
Dev LTE 4.1	Device must meet all Cat-6 requirements in section LTE 3 above	04/01/21	Mandatory
Dev LTE 4.2	The device 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
Dev LTE 4.3	The device must support 3-band downlink Carrier Aggregation	04/01/21	Mandatory
Dev LTE 4.4	LTE Uplink Cat 13 or higher devices 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
Dev LTE 4.5	LTE category 11 or higher devices 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
 Dev LTEM	Additional LTE requirements only for LTE-M		
Dev LTEM 1	Device must be set to only use LTE Cat-M1. NB-IOT must be disabled	10/10/19	Mandatory
Dev LTEM 2	The device must support LTE-M Band 2 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101.	06/26/20	Mandatory
Dev LTEM 3	The device must support LTE-M Band 4 using 5, 10, 15 and 20 MHz channel bandwidths as defined in 3GPP TS 36.101.	06/26/20	Mandatory

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Dev LTEM 4	The device must support LTE-M Band 5 using 5 and 10MHz channel bandwidths as defined in 3GPP TS 36.101.	06/26/20	Mandatory
Dev LTEM 5	The device must support LTE-M Band 12 using 5, 10, 15 channel bandwidths as defined in 3GPP TS 36.101.	06/26/20	Mandatory
Dev LTEM 6	The device must support LTE-M Band 13 using 10MHz channel bandwidth as defined in 3GPP TS 36.101.	04/01/21	Mandatory
 Dev NB	Additional requirements only for NB-IOT		
Dev NB 1	Device must support 3GPP Release 13 NB-IOT	12/22/20	Mandatory
Dev NB 2	Device must be set to only use NB-IOT. LTE-M must be disabled	12/22/20	Mandatory
Dev NB 3	The device must support inband, guardband and standalone NB-IOT deployment modes	12/22/20	Mandatory
Dev NB 4	NB-IoT device 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 device.	12/22/20	Mandatory
Dev NB 5	NB-IoT device shall be configured to indicate NAS signaling low priority by including the Device 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
Dev NB 6	The device must support NB-IOT Band 2	12/22/20	Mandatory
Dev NB 7	The device must support NB-IOT Band 4	12/22/20	Mandatory
Dev NB 8	The device must support NB-IOT Band 5	12/22/20	Mandatory
Dev NB 9	The device must support NB-IOT Band 12	12/22/20	Mandatory
Dev NB 10	The device must support NB-IOT Band 85	12/22/20	Mandatory
 Dev NR	5G NR NSA Requirements for Devices		
 Dev NR 1	3GPP Release Compliance		
Dev NR 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
Dev NR 1.1	The device must support Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Architecture as per 3GPP TS 36.300.	04/01/21	Mandatory
 Dev NR 2	NR Band Support		
Dev NR 2.1	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
Dev NR 2.2	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
Dev NR 2.3	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
Dev NR 2.4	The device must support 3GPP NR Band n41 in NSA mode with Power Class 2 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
Dev NR 2.5	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
Dev NR 2.6	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
Dev NR 2.8	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
Dev NR 2.9	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
Dev NR 2.10	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
Dev NR 2.11	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
 Dev NR 3	EN-DC Band Combinations for FR1		
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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

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Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 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
Dev NR 3.39	The device must support the EN-DC band combination DC_2A_66A_n260(l) per 3GPP TS 38.101-3 V15, section 5.2B.	04/01/21	Mandatory
Dev NR 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
Dev NR 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
Dev NR 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
 Dev NR 4	EN-DC Band Combinations for FR2		
Dev NR 4.1	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
Dev NR 4.2	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
Dev NR 4.3	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
Dev NR 4.4	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
Dev NR 4.5	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
Dev NR 4.6	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
Dev NR 4.7	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 12A-n260A, 12A-n260G, 12A-n260H, 12A-n260I DL only: 12A-n260J, 12A-n260K, 12A-n260L, 12A-n260M	04/01/21	Mandatory
Dev NR 4.8	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
Dev NR 4.9	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

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Dev NR 4.10	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
Dev NR 4.11	The device must support EN-DC combinations per 3GPP 38.101-2 and 38.101-3: DL & UL: 12A-n261A	04/01/21	Mandatory
Dev NR 4.12	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
Dev NR 4.13	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
Dev NR 4.14	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
 Dev NR UI	5G NR User Interface Requirements		
Dev NR UI 1	The device must display "5G" when all the following conditions are met: 1. The device is registered with LTE. 2. The DCNR bit is set to "dual connectivity with NR supported" in the ATTACH REQUEST (or TRACKING AREA UPDATE REQUEST) message. 3. The network is advertising 5G NR in SIB2 via the upperLayerIndication field of PLMN-InfoList-r15. 4. The device has received the ATTACH ACCEPT (or TRACKING AREA UPDATE ACCEPT) message with the "RestrictDCNR" bit in the "EPS Network Feature Support" IE set to "Use of dual connectivity with NR is not restricted."	04/01/21	Mandatory
 Dev UICC	UICC Requirements for All Devices		
Dev UICC 1.1	The device must support 2FF, 3FF or 4FF Universal Integrated Circuit Card (UICC) form factor as defined in ETSI TS 102 221, or MFF1/2 as defined in ETSI TS 102.671.	06/14/18	Mandatory
Dev UICC 1.3	Electrical and mechanical interface contacts for activation and de-activation of the UICC must be compliant with ETSI TS 102 221.	03/17/11	Mandatory
Dev UICC 1.4	Contact c6 must be supported as specified in ETSI TS 102 221 or ETSI TS 102 971 depending on form factor.	06/11/18	Mandatory
Dev UICC 1.5	The device must support both Class B (3V) and Class C (1.8V) power supply as specified in ETSI TS 102 221 or ETSI TS 102 971 depending on form factor..	06/11/18	Mandatory
Dev UICC 1.6	The device must be compliant to the interface electrical characteristic as defined in ETSI TS 102 221 or ETSI TS 102 971 depending on form factor..	06/11/18	Mandatory
Dev UICC 1.7	The device must support interface requirements for LTE as specified in 3GPP 31.101.	06/11/18	Mandatory
Dev UICC 1.8	The device must support TA1=97h per ISO/IEC-7816-2 for the Interface protocol and communication speed selection. The device must support fallback to TA1=96h as per ISO/IEC-7816-2.	03/17/11	Mandatory
Dev UICC 1.9	The device must support USIM Application Toolkit (USAT) as specified in 3GPP TS 31.111 and ETSI 102 223	06/26/20	Mandatory
 Dev Ret	Requirements for Devices Sold in US Cellular Retail Stores		
 Brand 1	Go To Market Requirements		
Brand 1.2.1	The device packaging must include the (1) Product Safety & Warranty Guide, (2) Quick Start Guide, and (3) Digital User Manual.	10/28/21	Mandatory
Brand 1.2.2	The Quick Start Guide must have the UScellular support phone number on front cover as follows: UScellular Customer Care: 1-888-944-9400	10/28/21	Mandatory
Brand 1.3.5	The device must not exceed any of the safe harbor limits specified in the State of California's Proposition 65. If any of the limits is being exceeded, the device box must show warnings about significant exposures to chemicals that cause cancer, birth defects or other reproductive harm as per Proposition 65.	10/28/21	Mandatory
 PL 4	Device Label Requirements		
PL 4.1	The device ESN barcode label must be in a Code 128 or Code 39 format with a minimum barcode height of 2mm.	10/28/21	Mandatory
PL 4.2	The device ESN barcode label must be readable and scanable in decimal format without any reading aids.	10/28/21	Mandatory
PL 4.3	The device ESN barcode label (readable and scanable) must include a MFR date code in the format of mm/yy.	10/28/21	Mandatory
PL 4.4	The device must have a label placed either under the removable battery (for devices with removable batteries) or somewhere inside the device (for devices with non-removable batteries) that has the IMEI in 15 character decimal format.	10/28/21	Mandatory
 PL 8	Forward Logistics		
PL 8.1.1	The supplier of the device must comply with all requirements for shipment appointment scheduling, ASN guidelines, packaging, labeling, and pallet configurations for inbound shipments to FedEx Supply Chain facility for the UScellular operations as documented in the attached Rev 15 US Cellular Inbound Routing Guide.	10/28/21	Mandatory
PL 8.1.2	The supplier of the device with a battery must provide the Material Safety Data Sheet (MSDS). Please specify the UN classification(s) and attach the MSDS.	10/28/21	Mandatory
 Dev Qual	USCC Device Quality Requirements		
 DQ 1	General Quality Management System		
DQ 1.1	The device must be certified to ISO 9001:2015 standards of manufacturing.	10/28/21	Mandatory
DQ 1.2	The device must be certified to TL9000 standards of manufacturing.	10/28/21	Mandatory
 DQ 2.1	Environment Stress Testing - Common		

Identifier	Description	Updates	Requirement Type
DQ 2.1.1	<p>Ingress Protection:</p> <p>The device must pass particle and water ingress protection conditions for IP52 as specified in the IEC 60529 and EN 60529 standards.</p>	10/28/21	Mandatory
DQ 2.1.2	<p>Cold Temperature Operation:</p> <p>The device must pass a cold ambient air test equivalent to or greater than conditions described in the IEC standard 60068-2-1:2007 Test A Cold where</p> <ol style="list-style-type: none"> 1) Test Type = Ae, 2) Temperature = -20 degrees C, 3) Duration = 2 hrs, 4) no pre-conditioning. <p>This test can be performed with external power applied to the device, but it must have a battery installed.</p>	10/28/21	Mandatory
DQ 2.1.3	<p>Hot Temperature Operation:</p> <p>The device must pass a hot ambient air test equivalent to or greater than conditions described in the IEC standard 60068-2-2:2007 Test B Dry Heat where</p> <ol style="list-style-type: none"> 1) Test Type = Be, 2) Temperature = +60 degrees C, 3) Duration = 2 hrs, 4) no pre-conditioning 	10/28/21	Mandatory
DQ 2.1.4	<p>Storage at Temperature Extremes:</p> <p>The device must pass all functional tests at standard ambient temperature AFTER exposure to conditions equal to or greater than those described by IEC standards 60068-2-1:2007 and 60068-2-2:2007 where,</p> <ol style="list-style-type: none"> 1) Temperatures = -40 and +70 degrees C. respectively, 2) Duration = 72 hrs., 3) Test Types Ad and Bd respectively are followed, 4) no preconditioning, 5) test measurements are taken only after device has returned to ambient temperature for each test. 	10/28/21	Mandatory
DQ 2.1.5	<p>Thermal Shock:</p> <p>The device must pass a temperature shock test equivalent or greater to the conditions described in the IEC standard 60068-2-14:2009 Test Na - Change of Temperature With Prescribed Time of Transfer where,</p> <ol style="list-style-type: none"> 1) TA <= -40 degrees C., 2) TB >= +70 degrees C., 3) t1 = 1 hr., 4) t2 <= 1 min., 5) Number of cycles = 30, 6) Number of test samples = 6 	10/28/21	Mandatory
DQ 2.1.6	<p>Humidity:</p> <p>The device must pass a Damp Heat test equivalent to or greater than the conditions described in the IEC standard 60068-2-78:2012 Test Cab: Damp heat, steady-state where,</p> <ol style="list-style-type: none"> 1) T = +50 deg. C., 2) Relative Humidity (RH) = 95%, 3) Duration = 96 hrs., 4) recovery time = 2 hours 	10/28/21	Mandatory
DQ 2.1.7	<p>Corrosion:</p> <p>Device must pass a corrosion resistance test equivalent to or greater than the conditions described by IEC standard 60068-2-11:1981 Test Ka - Salt Mist where,</p> <ol style="list-style-type: none"> 1) initial visual inspection (connectors) and functional testing are required, 2) No pre-conditioning, 3) Salt solution concentration 5 ± 1% by weight, 4) pH value of the solution is between 6.5 and 7.2, at a temperature of 35±2 °C, 5) Device is powered OFF, 6) Conditioning duration = 16 hrs., 7) Recovery time - 2 hours, wipe with clean dry cloth only, 8) Final measurement must include functional testing including use of all tethering connections (e.g. USB / charging port, headphone jack, SD card, etc.) <p>Optional Test Method: This test can also be run at the component level using the same environmental conditions. Components must pass a Low Level Contact Resistance (LLRC) test with no more than 10 milliohms maximum increase in resistance between pre and post environment measurements.</p>	10/28/21	Mandatory
 DQ 3.1			
DQ 3.1.1	<p>Mechanical Actuation:</p> <p>The device must be tested to validate that all mechanical actuation functions (e.g., buttons, latches, hinges, etc.) as applicable to the device, passes all functional testing before and after the following conditions:</p> <p>Switch: 5000 actuations at full rated pressure (AFRP) Button: 15,000 actuations at full rated pressure Battery Cover Latch: 500 Hinge Mechanism (e.g. Flip): 25,000 cycles</p>	10/28/21	Mandatory

Identifier	Description	Updates	Requirement Type
DQ 3.1.2	<p>Mechanical Shock - High impact force:</p> <p>The device must pass all functional tests AFTER exposure to conditions equal to or greater than those described by IEC standards 60068-2-31:2008 Test Ec: Rough Handling Shocks / Free Fall - Procedure 1 (Free fall) where,</p> <p>1) Fall height = Handset: 1250 mm 2) Facility (surface) = concrete or steel (per standard section 5.1.2) or granite, 3) Drop orientation = all 6 faces and all 4 corners, 4) Number of test cycles = 2. Cosmetic blemishing is allowed.</p>	10/28/21	Mandatory
DQ 3.1.3	<p>Mechanical Shock - Low impact force:</p> <p>The device must pass all functional tests AFTER exposure to conditions equal to or greater than those described by IEC standards 60068-2-31:2008 Test Ec: Rough Handling Shocks / Free Fall Repeated - Procedure 2 (Free fall repeated) where,</p> <p>1) Fall height = 80 mm, 2) Facility (surface) = carpeted steel or rigid acrylic, 3) Drop orientation = random, 4) Number of drops = 1000</p>	10/28/21	Mandatory
DQ 3.1.4	<p>Bending Force:</p> <p>The device must be tested to validate that it passes all functional testing before and after the following bend conditions:</p> <p>Force Direction: Z-Axis, perpendicular to X & Y axis, non-rotational Load: 8kgf minimum Center load with end supports</p> <p>(Note: Applicable to Smart phones, Feature phones and Tablets only.)</p>	10/28/21	Mandatory
DQ 3.1.5	<p>Vibration - Random:</p> <p>The device must pass all functional tests AFTER exposure to conditions equal to or greater than those described by IEC standards 60068-2-64:2008 Test Fh: Vibration, broadband random where conditions for the test are defined by: Spectrum = A.1 - Transportation, Category = 3 - Telecommunications equipment.</p>	10/28/21	Mandatory
DQ 3.1.6	<p>Twisting Force (Torsion):</p> <p>The device must pass all functional and cosmetic tests AFTER exposure to a mechanical stress test that applies a moment-force (torque) of 1.5 Nm x 500 times around the Y-axis of the device. (Notes: 1) See attached reference drawing, 2) Applicable to Smart phones, Feature phones, and Tablets only.)</p>	10/28/21	Mandatory
 DQ 4.1	General Safety - Common		
DQ 4.1.1	<p>Non-Removable Battery:</p> <p>1) Any device with a battery that is NOT removable by the end-user must have a cover that can only be removed in a service environment using special tools and/or processes. Furthermore, the device must be designed such that any attempt by the end user to open the device without said special tools will result in permanent damage to the device housing, and provide a clear indication that the device has been tampered with. 2) In the case where the battery is non-removable but the cover is intentionally designed for removal (e.g. for SIM card access), the perimeter gap between the battery pack and device housing must be covered by a label so as to discourage removal attempts, and an additional label must clearly call out that a) the battery is not removable, b) attempting to remove the battery will void the device warranty and c) attempting to remove the battery may result in bodily injury.</p> <p>(Note: This requirement is not applicable to a device with a removable battery.)</p>	10/28/21	Mandatory
DQ 4.1.2	<p>The device manufacturer must prove compliance to the battery charging specification applicable to the method(s) implemented in the device. In the case where a proprietary quick-charge method is used, and/or the method's specification states it is meant to only be an extension of a USB battery charging specification, then compliance to the appropriate USB battery charging specifications must also be proven by submission of those relevant test results. This requirement also applies to any wireless charging method implemented in the device.</p> <p>Proof of compliance can be fulfilled by 1) submitting a certificate of compliance from an authorized, independent test lab approved by the appropriate defining standards group (e.g. USB-IF, Qualcomm Quick Charge, etc.) or 2) submitting results from internal testing that follows the specified test plan from the appropriate defining standards group.</p>	10/28/21	Mandatory
DQ 4.1.3	<p>The device manufacturer must submit the CTIA certificate of accreditation of battery testing services for either IEEE 1725 (for single cell battery pack devices such as cellular telephones) or IEEE 1625 (for multi-cell battery pack devices) at the time of lab entry.</p>	10/28/21	Mandatory
	Integrated Device OEM Deliverables (TEC)		
	<i>Please submit all OEM deliverables to US Cellular certification contact</i>		
Dev Doc	OEM Deliverable - Device Documentation		
Dev Doc 1	Software Release Notes or equivalent, with a list of all known issues, if any.	09/10/19	Mandatory
Dev Doc 2	Users Manual (Hard or Soft copy) & Quick Start Guide with complete instructions for bringing the device online.	09/10/19	Mandatory
Dev Doc 3	Antenna Layout	09/10/19	Mandatory
Dev Doc 4	OEM Hosted FOTA Solution Overview and Instruction sheet	09/10/19	Mandatory
Dev Doc 5	Procedure to flash the software to the device	09/10/19	Mandatory
Dev Doc 6	Terms of Service or Terms of Use statement for the device, stating device end-of-life conditions	12/21/20	Mandatory
Dev Doc 7	Description of any and all cloud services used for normal operation of the device, or for maintenance of the device	12/21/20	Mandatory
Dev Smp	OEM Deliverable - Device Samples		

Identifier	Description	Updates	Requirement Type
Dev Smp 1	<p>2 complete units with all necessary accessories for normal network use.</p> <p>SIM cards must be pre-installed if units are permanently sealed and not serviceable by US Cellular</p> <p>The device SW should already include all applicable US Cellular specific configurations without any manual configuration needed prior to testing.</p> <p>Please ensure that all devices are individually packaged, or boxed with cables, charger, and batteries.</p> <p>Devices 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 devices will be returned.</p>	09/10/19	Mandatory
Dev Smp 2	USB drivers (If Applicable)	09/10/19	Mandatory
Dev Smp 3	Cable for data logging, diagnostics or management (USB, RS232 etc.) for each unit	09/10/19	Mandatory
Dev Smp 4	2 batteries or battery emulators, if applicable	09/10/19	Mandatory
Dev Tool	OEM Deliverable - Device Support Tools		
Dev Tool 1	Product Support Tool (if new, please include)	09/10/19	Mandatory
Dev Tool 2	Instructions for collecting diagnostic logs	09/10/19	Mandatory
Dev Fcc	OEM Deliverable - Device FCC		
Dev 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) n2 (BW 5, 10, 15, 20 MHz) B4 (BW 5, 10, 15, 20 MHz) B5 / n5 (BW 1.4, 3, 5, 10 MHz) B12 / n12 (BW 5, 10 MHz) B66 / n66 (BW 5, 10, 15, 20 MHz) B71 / n71 (BW 5, 10, 15 MHz) B13 (BW 10 MHz) B25 (BW 5 MHz) B41 (BW 5, 10, 15, 20 MHz) B48 (BW 5, 10, 15, 20 MHz) n25 (BW 5, 10, 15, 20 MHz) n41 (BW 40, 60, 80, 100 MHz) n77 (BW 20, 40, 60, 80, 100 MHz) n258 (BW 50, 100, 400 MHz) n260 (BW 50, 100, 400 MHz) n261 (BW 50, 100, 400 MHz)</p>	09/10/19	Mandatory
Dev Cbr	OEM Deliverable - CTIA Cybersecurity Certification		
Dev Cbr 1	<p>CTIA IoT Cybersecurity Certification from CTIA Authorized Testing Laboratory (CATL) based on "CTIA Cybersecurity Certification Test Plan For IoT Devices V1.2.3 " document.</p> <p>*** Only Level 1 certification is required *** *** Not applicable to laptops or tablets ***</p>	06/26/20	Mandatory
Dev Test	OEM Deliverable - Conformance Test		
Dev 3GPP	GCF Certification from Certified Lab		
Dev Comply 1	<p>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))</p> <p>LTE: TS 36.521-1, TS 36.521-3, TS 36.523-1</p> <p>USIM / USAT : 3GPP TS 31.121, TS 31.124, ETSI 102 230</p> <p>OTA (TIS/TRP) based on latest "CTIA Test Plan for Wireless Device Over-the-Air Performance"</p> <p>*** NOTE *** OTA results are required only for devices with integrated antennas</p> <p>*** NOTE *** When leveraging test results for GCF certification, please provide the test results for the Parent device</p>	06/26/20	Mandatory
Dev Comply 2	<p>*** Only for 5G devices ***</p> <p>Result of the RF requirements and conformance test cases defined in</p> <p>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_n[25, DC_12_n[2, 66], DC_5_n[2, 66]</p> <p>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_n[25, DC_12_n[2, 66], DC_5_n[2, 66]</p>	08/27/21	Mandatory
Dev Comply 3	<p>*** Only for 5G devices ***</p> <p>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_n[25, DC_12_n[2, 66], DC_5_n[2, 66]</p>	08/27/21	Mandatory
Dev VnV	Device V&V Testing		
Dev VnV 1	<p>Results for "USCC M2M Verification & Validation Test Plan for Integrated Devices" (See attachment for latest version).</p> <p>US Cellular will provide one standard and one QPP SIM card for testing if QPP is in scope for this device.</p>	10/18/19	Mandatory
Dev GSMA	Device GSMA Compliance		

Identifier	Description	Updates	Requirement Type
Dev GSMA 1	<p>*** Only for devices that support LTE Band 13 ***</p> <p>Results for the following test cases from GSMA TS.35 "Application Device Connection Efficiency Tests"</p> <ul style="list-style-type: none"> - TS35_5.1_TC_001 - Basic RCC and data connection establishment / release, ensuring connection request are not excessive - TS35_5.1_TC_008d - failure scenario (Test for wrong APN) - TS35_5.1_TC_008g - failure scenario (Test for IoT server not reachable) - TS35_5.1_TC_008h - failure scenario (Test for SMSC not reachable) 	10/14/21	Mandatory
Dev SW	OEM Deliverable - Device Software		
Dev SW 1	Submit device software/firmware binary file	09/10/19	Mandatory
	Revisions Since Previous Release		
	Remvoed "non-stocked" criteria from applicability section		
	Removed PTCRB as option for 3GPP compliance. Only GCF allowed now.		
	APN requirement changed to allow only blank default APN		
	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		
	Added GSMA TS.35 for band 13 devices		
	Added Dev Ret section for Business in Retail devices		