FCC 47 CFR § 2.1093
IEEE Std 1528-2013

SAR EVALUATION REPORT
(Part 0 : SAR CHARACTERIZATION)

FOR

WCDMA/LTE/5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac

MODEL NUMBER: SM-T738U

FCC ID: A3LSMT738U

REPORT NUMBER: 4789867826-S1V2

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IAS ACCREDITED

Testing Laboratory

TL-637

Revision History

Rev.	Date	Revisions	Revised By
V1	5/26/2021	Initial Issue	--
V2	6/11/2021	Revised data in Section 6.3 & 7 related NR Band n66.	Sunghoon Kim

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1. Attestation of SAR Characterization

Applicant Name	SAMSUNG ELECTRONICS CO.,LTD.
FCC ID	A3LSMT738U
Model Number	SM-T738U
Applicable Standards	FCC 47 CFR § 2.1093 IEEE Std 1528-2013 Published RF exposure KDB procedures
Report type	Part.0 : SAR Characterization
Date Tested	4/6/2021 to 6/11/2021
Part 0 Purpose	Part 0 is the procedures for determining P_{Limit} for 3G/4G/5G NR sub6 to satisfy *SAR_design_target* in order to FCC limit's requirement.

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

This test report contains SAR measurements to support a Permissive Change application that only affect specific exposure conditions for the GSM 1900 cellular operations. The tables in sections 1 and 1.1 below, and data used for the simultaneous analysis in section 13, for the operating bands and modes not detailed in this report have been taken directly from the test report submitted to support the original filing for device certification.

Approved & Released By:	Prepared By:
	
Justin Park Operations Leader UL Korea, Ltd. Suwon Laboratory	Sunghoon Kim Engineer UL Korea, Ltd. Suwon Laboratory

2. Introduction

The equipment under test (EUT) is SAMSUNG Tablet (FCC ID : A3LSMT738U), it contains the Qualcomm modems supporting 3G/4G/5G NR technologies. These modems are enable with Qualcomm Smart Transmit feature to control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is in compliance with FCC requirement.

This purpose of the part 0 report is to determine SAR char is derived from SAR test measurements and conducted power measurements to determine P_{Limit} for each technology/band. The P_{Limit} represents the maximum time-averaged power level for the corresponding radio/antenna configuration.

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at

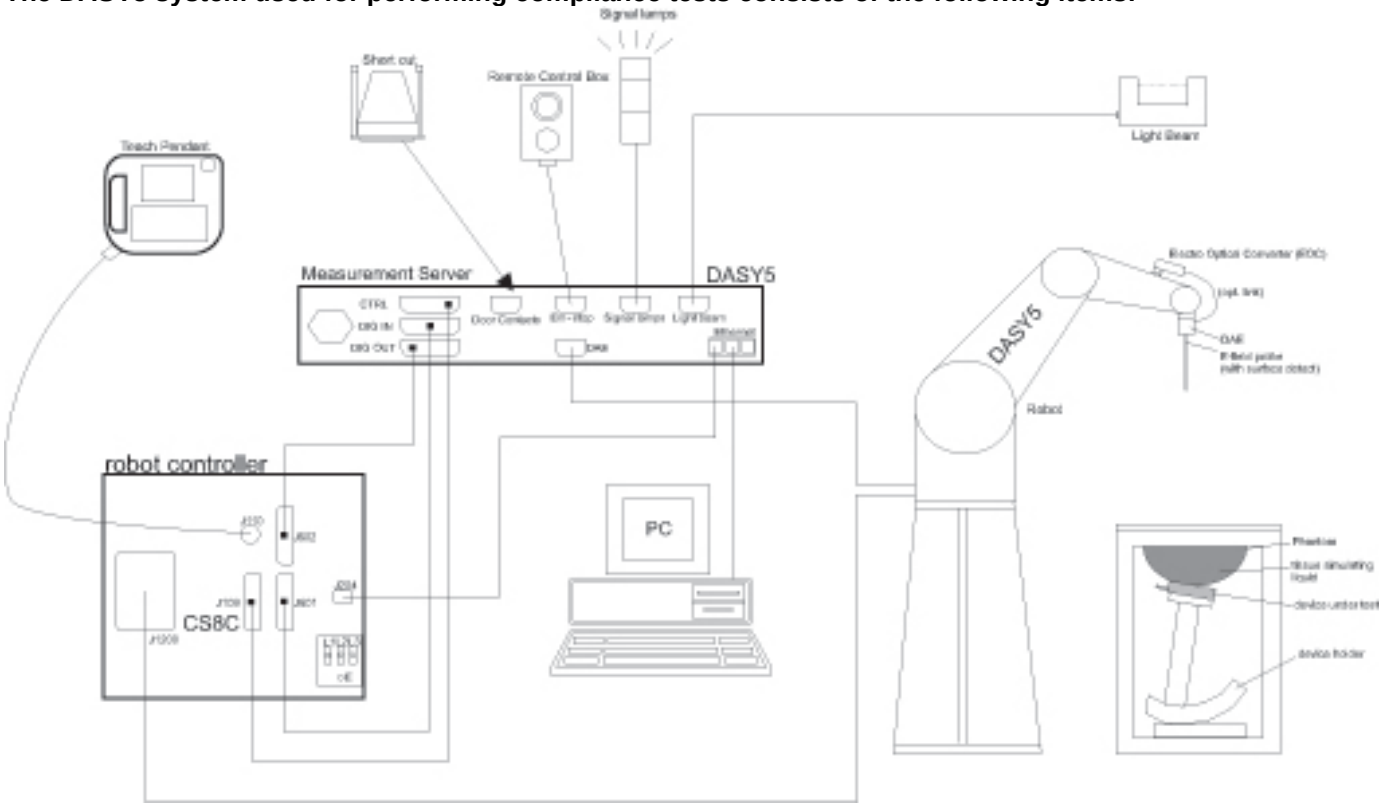
Suwon
SAR 1 Room
SAR 2 Room
SAR 3 Room
SAR 4 Room
SAR 5 Room

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637.
The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2017/05/TL-637 -cert-New.pdf.

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

The DASY5 system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

4.2. SAR Scan Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ $1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

4.3. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	E5071C	MY46522054	8-4-2021
Dielectric Assessment Kit	SPEAG	DAK-3.5	1196	6-17-2021
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	LKM	DTM3000	3424	8-11-2021

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Agilent	N5181A	MY50145882	8-4-2021
Power Sensor	Agilent	U2000A	MY54260007	8-5-2021
Power Sensor	Agilent	U2000A	MY60180020	9-9-2021
Power Amplifier	EXODUS	1410025-AMP2027-10003	10003	8-4-2021
Directional Coupler	Agilent	772D	MY52180193	8-4-2021
Directional Coupler	Agilent	778D	MY52180432	8-4-2021
Low Pass Filter	MICROLAB	LA-15N	3943	8-4-2021
Low Pass Filter	FILTRON	L14012FL	1410003S	8-4-2021
Low Pass Filter	MICROLAB	LA-60N	3942	8-4-2021
Attenuator	Agilent	8491B/003	MY39271969	12-3-2021
Attenuator	MINI-CIRCUITS	BW-N3W5+	N/A	4-21-2022
Attenuator	Agilent	8491B/010	MY39271981	9-9-2021
Attenuator	Agilent	8491B/020	MY39271973	9-9-2021
E-Field Probe	SPEAG	EX3DV4	7330	1-26-2022
E-Field Probe	SPEAG	EX3DV4	7314	5-29-2021
E-Field Probe	SPEAG	EX3DV4	7376	7-31-2021
E-Field Probe	SPEAG	EX3DV4	7545	11-23-2021
E-Field Probe	SPEAG	EX3DV4	7313	2-23-2022
E-Field Probe	SPEAG	EX3DV4	7645	4-15-2022
E-Field Probe	SPEAG	EX3DV4	3871	8-28-2021
Data Acquisition Electronics (SAR2)	SPEAG	DAE4	1343	8-25-2021
Data Acquisition Electronics (SAR3)	SPEAG	DAE4	1494	7-31-2021
Data Acquisition Electronics (SAR4)	SPEAG	DAE4	1591	3-26-2022
Data Acquisition Electronics (SAR5)	SPEAG	DAE4	1447	3-23-2022
Data Acquisition Electronics (SAR5)	SPEAG	DAE4	479	10-21-2021
System Validation Dipole	SPEAG	D750V3	1122	2-24-2022
System Validation Dipole	SPEAG	D835V2	4d194	3-20-2022
System Validation Dipole	SPEAG	D835V2	4d174	3-17-2023
System Validation Dipole	SPEAG	D1750V2	1125	2-21-2022
System Validation Dipole	SPEAG	D1900V2	5d199	3-19-2022
System Validation Dipole	SPEAG	D2300V2	1090	11-18-2022
System Validation Dipole	SPEAG	D2450V2	939	7-25-2021
System Validation Dipole	SPEAG	D2600V2	1097	9-19-2021
System Validation Dipole	SPEAG	D3500V2	1121	4-21-2023
System Validation Dipole	SPEAG	D3700V2	1026	9-18-2022
System Validation Dipole	SPEAG	D3900V2	1069	4-21-2023
System Validation Dipole	SPEAG	D5GHzV2	1209	2-27-2022
Thermometer (SAR2)	Lutron	MHB-382SD	AH.50215	8-7-2021
Thermometer (SAR3)	Lutron	MHB-382SD	AH.50213	8-11-2021
Thermometer (SAR4),(SAR5)	Lutron	MHB-382SD	AH.91463	8-11-2021

Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	150313	8-4-2021
Base Station Simulator	R & S	CMW500	150314	8-4-2021
Base Station Simulator	R & S	CMW500	162790	8-4-2021
Wireless Connectivity Tester	R & S	CMW270	100982	8-3-2021
UXM 5G Wireless Test Platform	Keysight	E7515B	MY57510596	1-13-2022

5. Device Under Test (DUT) Information

5.1. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode	Duty Cycle used for SAR testing
W-CDMA (UMTS)	Band II Band IV Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Category 24) HSUPA (Category 6) DC-HSDPA (Category 24) HSPA+ (DL only)	100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 7 FDD Band 12 FDD Band 13 FDD Band 14 FDD Band 25 FDD Band 26 FDD Band 30 TDD Band 41 Power Class 3 TDD Band 41 Power Class 2 TDD Band 48 FDD Band 66 FDD Band 71	QPSK 16QAM 64QAM Rel. 15 Carrier Aggregation (2 Uplink and 4 Downlinks)	100% (FDD) 63.3% (TDD) Power Class 3 43.3% (TDD) Power Class 2
	FDD Band 5 (2CC) FDD Band 66 (2CC) TDD Band 41 (2CC)		
	Does this device support SV-LTE (1xRTT-LTE)? ☐ Yes ☒ No		
5G NR (Sub 6)	NR Band n2 NR Band n5 NR Band n25 NR Band n41 NR Band n66 NR Band n71 NR Band n77	DFT-s-ODFM: ■ π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-ODFM: ■QPSK, 16QAM, 64QAM, 256QAM Support to SA and NSA mode.	100%
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)	SISO mode : 98.8% (802.11b) MIMO mode : 98.7% (802.11g)
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80)	SISO mode: 98.7% (802.11a) 98.6% (802.11ac VHT80) MIMO mode: 98.7% (802.11a) 97.3% (802.11ac VHT80
	Does this device support bands 5.60 ~ 5.65 GHz? ☒ Yes ☐ No		
	Does this device support Band gap channel(s)? ☒ Yes ☐ No		
Bluetooth	2.4 GHz	Version 5.0 LE	77.1% (DH5)

Notes:

1. The Bluetooth protocol is considered source-based averaging. Bluetooth GFSK (DH5) was verified to have the highest duty cycle of 77.1% and was considered and used for SAR Testing.
2. Duty cycle for Wi-Fi is referenced from the DTS and UNII report.
3. This device supports Power Class 2(HPUE) and Power Class 3 for LTE Band 41. And LTE Band 41-2CC is only support Power Class 3.
4. NR Band SAR test were evaluated using 100% duty cycle.
5. This device supports Smart transmit feature for 3G/4G/5G NR operations.

5.2. Time-Averaging for SAR

This device is enabled with Qualcomm Smart Transmit algorithm to control and manage transmitting power in real time and to ensure that the time-averaged RF exposure from 3G/4G/5G NR Sub6 WWAN is compliance with FCC requirement. This part.0 report shows SAR characterization of WWAN radios for 3G/4G/5G NR Sub6. Characterization is achieved by determining P_{Limit} for 3G/4G/5G NR Sub6 that correspond to the *SAR_design_target*s after accounting for all device design related uncertainty. The SAR Characterization is denoted as SAR Char in this report.

5.3. Nomenclature for Part 0 Report

Technology	Term	Description
3G/4G/ 5G NR Sub6	P_{limit}	Power level that corresponds to the exposure design target (*SAR_design_target*) after accounting for all device design related uncertainties
	P_{max}	Maximum tune up output power
	SAR_design_target	Target SAR level < FCC SAR limit after accounting for all device design related uncertainties
	SAR Char	Table containing P_{limit} for all technologies and bands

6. SAR Characterizations

6.1. SAR Design Target

SAR_Design_target is determined by ensuring that it is less than FCC SAR limit after accounting for total device designed related uncertainties specified by the manufacturer.

SAR_design_target	
$SAR\_design\_target < SAR\_regulatory\_limit \times 10^{\frac{-Total\ Uncertainty}{10}}$	
1g SAR (W/kg)	
Total Uncertainty	**1.0 dB**
SAR_regulatory_limit	**1.6 W/kg**
SAR_design_target	**1.0 W/kg**

6.2. DSI and SAR Determination

This device uses different Device State Index (DSI) to configure different time averaged power levels based on certain exposure scenarios. Depending on the detection scheme implemented in the Tablet, the worst-case SAR was determined by measurements for the relevant exposure conditions for that DSI. Detailed descriptions of the detection mechanisms are included in the operational description.

The device state index (DSI) conditions used in below table represent different exposure scenarios.

DSI and Corresponding Exposure Scenarios

Exposure Scenario (DSI = No.)	Description	KDB guide for SAR test
Standalone exposure Without triggering sensor (DSI = 0)	■ Proximity sensor is not triggered even if Device was touched to user's body or hands. ■ Proximity sensor is not triggered due to triggering distance.	KDB 616217 D04
Standalone exposure With triggering sensor (DSI = 1)	■ Proximity sensor is triggered, when Device was touched to user's body or hands.	KDB 616217 D04

6.3. SAR Char

SAR results corresponding to P_{max} for each antenna/technology/band/DSI can be found in Section.7. P_{limit} is calculated by linearly scaling with the measured SAR at the P_{max} to correspond to *the SAR_ design_target*. P_{limit} determination for each exposure scenario corresponding to *SAR_design_target* are shown in table.

P_{Limit} Determination

Device State Index (DSI)	P_{Limit} Determination Scenarios
DSI = 0	The worst-case SAR exposure is determined as maximum SAR normalized To the limit among; 1. Standalone SAR measured at 19, 9, and 23 mm spacing for Rear, Edge1 and Edge4 Standalone SAR measured at 0 mm for Edge2 and Edge3 (Main Ant.1) 2. Standalone SAR measured at 17, 9, and 20 mm spacing for Rear, Edge1 and Edge4 Standalone SAR measured at 0 mm for Edge2 and Edge3 (Main Ant.2) 3. Standalone SAR measured at 8 and 10 mm spacing for Rear and Edge 4. Standalone SAR measured at 0 mm for Edge1, Edge 2 and Edge 3 (Main Ant.3)
DSI = 1	1. P_{limit} is calculated based on Standalone SAR (1-g SAR) at 0 mm for Rear, Edge1 and Edge4 (Main Ant 1) 2. P_{limit} is calculated based on Standalone SAR (1-g SAR) at 0 mm for Rear, Edge1 and Edge4 (Main Ant 2) 3. P_{limit} is calculated based on Standalone SAR (1-g SAR) at 0 mm for Rear, Edge4 (Main Ant 3)

Notes:

For DSI = 0, P_{limit} is calculated by:

Main Ant.1)

P_{limit} = min{ P_{limit} corresponding to 1g Standalone SAR evaluation at 19 (Rear), 9(Edge1) and 23(Edge4) mm spacing, P_{limit} corresponding to 1g Standalone SAR evaluation at 0 mm for Edge2 and Edge3 surfaces}

Main Ant.2)

P_{limit} = min{ P_{limit} corresponding to 1g Standalone SAR evaluation at 17 (Rear), 9(Edge1) and 20(Edge4) mm spacing, P_{limit} corresponding to 1g Standalone SAR evaluation at 0 mm for Edge2 and Edge3 surfaces}

Main Ant.3)

P_{limit} = min{ P_{limit} corresponding to 1g Standalone SAR evaluation at 8 (Rear) and 10(Edge4) mm spacing, P_{limit} corresponding to 1g Standalone SAR evaluation at 0 mm for Edge1, Edge2 and Edge3 surfaces}

SAR Characterizations

Device State Index (DSI)		0	1	Pmax (Maximum tune-up Power) (dBm)
Exposure scenario		Standalone SAR without triggering sensor	Standalone SAR with triggering sensor	
Test Distance (mm)		Refer to Section 6.3.		
Spatial-average		1g	1g	
WWAN Bands	Antenna	PLimit (dBm)		
WCDMA Band II	Main.1	27.6	12.5	**22.5**
WCDMA Band IV	Main.1	28.2	12.5	**22.5**
WCDMA Band V	Main.1	27.6	14.0	**24.0**
LTE Band 7	Main.1	27.5	13.0	**24.0**
LTE Band 12	Main.1	29.2	14.0	**24.5**
LTE Band 13	Main.1	27.7	14.0	**24.0**
LTE Band 14	Main.1	28.2	16.0	**24.0**
LTE Band 25/2	Main.1	29.5	14.0	**24.0**
LTE Band 26/5	Main.1	29.6	16.5	**24.5**
LTE Band 30	Main.1	25.6	13.0	**22.0**
LTE Band 41-PC3	Main.1	29.8	11.0	**22.0**
LTE Band 41-PC2	Main.1	29.7	10.4	**22.9**
LTE Band 66/4	Main.1	28.9	13.0	**24.0**
LTE Band 71	Main.1	31.5	16.0	**24.5**
NR Band n5	Main.1	28.2	18.0	**24.0**
NR Band n25/n2	Main.1	30.6	14.0	**24.0**
NR Band n66	Main.1	29.3	13.5	**24.0**
NR Band n71	Main.1	30.5	20.0	**24.5**
NR Band n41	Main.2	29.4	14.0	**25.5**
LTE Band 48	Main.3	20.6	11.0	**20.5**
NR Band n77	Main.3	20.5	11.0	**24.5**

Notes:

1. If P_{limit} is higher than P_{max} for some modes / bands, The modes/bands will operate at a power level up to P_{max}.
2. P_{max} (Maximum tune-up power) is specified in tune-up document. The maximum allowed power is equal to maximum tune up power + 1 dB device design uncertainty.
3. All PLimit EFS and maximum tune up output Pmax levels entered in above Table correspond to average power levels after accounting for duty cycle in the case of LTE TDD modulation schemes.

7. SAR Test results for P_{limit} calculations

Standalone exposure without triggering proximity sensor (DSI = 0)

RF Exposure Conditions	Antenna	band	mode	DSI	Test position	Test distance (mm)	Channel	Measured Output power (dbm)	measured SAR 1g (W/kg)	Plimit (dBm)	Minimim Plimit (dBm)
Standalone	Main Ant.1	WCDMA Band II	Rel.99	0	Rear	19	4183	22.6	0.313	27.6	27.6
					Edge 1	9	4183	22.6	0.106	32.3	
					Edge 4	23	4183	22.6	0.211	29.3	
Standalone	Main Ant.1	WCDMA Band IV	Rel.99	0	Rear	19	1513	22.6	0.274	28.2	28.2
					Edge 1	9	1513	22.6	0.131	31.4	
					Edge 4	23	1513	22.6	0.191	29.8	
Standalone	Main Ant.1	WCDMA Band V	Rel.99	0	Rear	19	4183	24.1	0.433	27.7	27.7
					Edge 1	9	4183	24.1	0.102	34.0	
					Edge 3	0	4183	24.1	0.144	32.5	
					Edge 4	23	4183	24.1	0.290	29.4	
Standalone	Main Ant.1	LTE Band 7	QPSK BW=20MHz	0	Rear	19	21350	23.6	0.304	28.8	27.5
					Edge 1	9	21350	23.6	0.165	31.4	
					Edge 3	0	21350	23.6	0.409	27.5	
					Edge 4	23	21350	23.6	0.284	29.0	
Standalone	Main Ant.1	LTE Band 12	QPSK BW=10MHz	0	Rear	19	23095	24.4	0.334	29.2	29.2
					Edge 1	9	23095	24.4	0.078	35.5	
					Edge 3	0	23095	24.4	0.064	36.3	
					Edge 4	23	23095	24.4	0.308	29.5	
Standalone	Main Ant.1	LTE Band 13	QPSK BW=10MHz	0	Rear	19	23230	24.2	0.447	27.7	27.7
					Edge 1	9	23230	24.2	0.094	34.5	
					Edge 3	0	23230	24.2	0.092	34.6	
					Edge 4	23	23230	24.2	0.309	29.3	
Standalone	Main Ant.1	LTE Band 14	QPSK BW=10MHz	0	Rear	19	23330	24.1	0.389	28.2	28.2
					Edge 1	9	23330	24.1	0.094	34.3	
					Edge 3	0	23330	24.1	0.086	34.7	
					Edge 4	23	23330	24.1	0.293	29.4	
Standalone	Main Ant.1	LTE Band 25(2)	QPSK BW=20MHz	0	Rear	19	26140	24.3	0.302	29.5	29.5
					Edge 1	9	26140	24.3	0.134	33.0	
					Edge 4	23	26140	24.3	0.277	29.9	
Standalone	Main Ant.1	LTE Band 26(5)	QPSK BW=15MHz	0	Rear	19	26865	24.7	0.288	30.1	29.6
					Edge 1	9	26865	24.7	0.101	34.6	
					Edge 3	0	26865	24.7	0.102	34.6	
					Edge 4	23	26865	24.7	0.323	29.6	
Standalone	Main Ant.1	LTE Band 30	QPSK BW=10MHz	0	Rear	19	27710	21.8	0.421	25.6	25.6
					Edge 1	9	27710	21.8	0.128	30.7	
					Edge 4	23	27710	21.8	0.363	26.2	
Standalone	Main Ant.1	LTE Band 41 (Power Class 3)	QPSK BW=20MHz	0	Rear	19	40620	21.9	0.097	32.0	29.8
					Edge 1	9	40620	21.9	0.120	31.1	
					Edge 3	0	40620	21.9	0.102	31.8	
					Edge 4	23	40620	21.9	0.162	29.8	
Standalone	Main Ant.1	LTE Band 41 (Power Class 2)	QPSK BW=20MHz	0	Edge 4	23	39750	23.3	0.229	29.7	29.7

Notes:

1. The maximum allowed power is equal to maximum tune up power + 1 dB device design uncertainty
2. Measured Output power refer to Sec.9 in SAR part.1 report.

Standalone exposure without triggering proximity sensor (DSI = 0) (Continued)

RF Exposure Conditions	Antenna	band	mode	DSI	Test position	Test distance (mm)	Channel	Measured Output power (dbm)	measured SAR 1g (W/kg)	Plimit (dBm)	Minimim Plimit (dBm)
Standalone	Main Ant.1	LTE Band 66(4)	QPSK BW=20MHz	0	Rear	19	132572	24.7	0.386	28.9	28.9
					Edge 1	9	132572	24.7	0.195	31.8	
					Edge 4	23	132572	24.7	0.352	29.3	
Standalone	Main Ant.1	LTE Band 71	QPSK BW=20MHz	0	Rear	19	133297	24.8	0.187	32.0	31.5
					Edge 1	9	133297	24.8	0.036	39.2	
					Edge 3	0	133297	24.8	0.065	36.6	
					Edge 4	23	133297	24.8	0.212	31.5	
Standalone	Main Ant.1	NR Band n5	DFT-s-OFDM QPSK BW=20MHz	0	Rear	19	167300	24.5	0.430	28.2	28.2
					Edge 1	9	167300	24.5	0.110	34.1	
					Edge 3	0	167300	24.5	0.070	36.1	
					Edge 4	23	167300	24.5	0.216	31.2	
Standalone	Main Ant.1	NR Band n25(n2)	DFT-s-OFDM QPSK BW=20MHz	0	Rear	19	372000	24.5	0.245	30.6	30.6
					Edge 1	9	372000	24.5	0.129	33.4	
					Edge 4	23	372000	24.5	0.233	30.8	
Standalone	Main Ant.1	NR Band n66	DFT-s-OFDM QPSK BW=40MHz	0	Rear	19	349000	24.1	0.225	30.6	29.3
					Edge 1	9	349000	24.1	0.140	32.6	
					Edge 4	23	349000	24.1	0.300	29.3	
Standalone	Main Ant.1	NR Band 71	DFT-s-OFDM QPSK BW=20MHz	0	Rear	19	136100	24.6	0.254	30.5	30.5
					Edge 1	9	136100	24.6	0.047	37.8	
					Edge 3	0	136100	24.6	0.072	36.0	
					Edge 4	23	136100	24.6	0.213	31.3	
Standalone	Main Ant.2	NR Band n41	DFT-s-OFDM QPSK BW=100MH	0	Rear	17	518598	25.0	0.364	29.4	29.4
					Edge 1	9	518598	25.0	0.184	32.3	
					Edge 4	20	518598	25.0	0.291	30.4	
Standalone	Main Ant.3	LTE Band 48	QPSK BW=20MHz	0	Rear	8	56640	20.3	0.810	21.3	20.6
					Edge 3	0	56640	20.3	0.095	30.6	
					Edge 4	10	56640	20.3	0.944	20.6	
Standalone	Main Ant.3	NR Band n77	DFT-s-OFDM QPSK BW=100MH	0	Rear	8	650000	20.5	0.440	24.1	24.0
					Edge 3	0	650000	20.5	0.119	29.8	
					Edge 4	10	650000	20.5	0.453	24.0	

Notes:

1. The maximum allowed power is equal to maximum tune up power + 1 dB device design uncertainty
2. Measured Output power refer to Sec.9 in SAR part.1 report.

Standalone exposure with triggering proximity sensor (DSI = 1)

RF Exposure Conditions	Antenna	band	mode	DSI	Test position	Test distance (mm)	Channel	Measured Output power (dbm)	measured SAR 1g (W/kg)	Plimit (dBm)	Minimim Plimit (dBm)
Standalone	Main Ant.1	WCDMA Band II	Rel.99	1	Rear	0	9400	12.5	0.465	15.8	13.0
					Edge 1	0	9400	12.5	0.030	27.7	
					Edge 4	0	9400	12.5	0.894	13.0	
Standalone	Main Ant.1	WCDMA Band IV	Rel.99	1	Rear	0	1513	12.6	0.409	16.4	13.2
					Edge 1	0	1513	12.6	0.044	26.1	
					Edge 4	0	1513	12.6	0.857	13.2	
Standalone	Main Ant.1	WCDMA Band V	Rel.99	1	Rear	0	4183	14.5	0.374	18.8	16.9
					Edge 1	0	4183	14.5	0.028	30.1	
					Edge 4	0	4183	14.5	0.581	16.9	
Standalone	Main Ant.1	LTE Band 7	QPSK BW=20MHz	1	Rear	0	21350	13.1	0.604	15.3	13.5
					Edge 1	0	21350	13.1	0.065	25.0	
					Edge 4	0	21350	13.1	0.928	13.5	
Standalone	Main Ant.1	LTE Band 12	QPSK BW=10MHz	1	Rear	0	23095	14.2	0.270	19.9	17.6
					Edge 1	0	23095	14.2	0.015	32.5	
					Edge 4	0	23095	14.2	0.456	17.6	
Standalone	Main Ant.1	LTE Band 13	QPSK BW=10MHz	1	Rear	0	23230	14.2	0.337	18.9	18.1
					Edge 1	0	23230	14.2	0.022	30.7	
					Edge 4	0	23230	14.2	0.407	18.1	
Standalone	Main Ant.1	LTE Band 14	QPSK BW=10MHz	1	Rear	0	23330	16.2	0.493	19.3	17.2
					Edge 1	0	23330	16.2	0.024	32.4	
					Edge 4	0	23330	16.2	0.791	17.2	
Standalone	Main Ant.1	LTE Band 25(2)	QPSK BW=20MHz	1	Rear	0	26140	13.9	0.468	17.2	14.6
					Edge 1	0	26140	13.9	0.042	27.7	
					Edge 4	0	26140	13.9	0.845	14.6	
Standalone	Main Ant.1	LTE Band 26	QPSK BW=15MHz	1	Rear	0	26865	16.3	0.410	20.1	17.9
					Edge 1	0	26865	16.3	0.041	30.1	
					Edge 4	0	26865	16.3	0.682	17.9	
Standalone	Main Ant.1	LTE Band 30	QPSK BW=10MHz	1	Rear	0	27710	12.7	0.660	14.5	13.7
					Edge 1	0	27710	12.7	0.102	22.7	
					Edge 4	0	27710	12.7	0.797	13.7	
Standalone	Main Ant.1	LTE Band 41 (Power Class 3)	QPSK BW=20MHz	1	Rear	0	40620	11.0	0.306	16.1	14.8
					Edge 1	0	40620	11.0	0.030	26.2	
					Edge 4	0	40620	11.0	0.421	14.8	
Standalone	Main Ant.1	LTE Band 41 (Power Class 2)	QPSK BW=20MHz	1	Edge 4	0	39750	10.9	0.406	14.8	14.8

Notes:

1. The maximum allowed power is equal to maximum tune up power + 1 dB device design uncertainty
2. Measured Output power refer to Sec.9 in SAR part.1 report.
3. Some bands were determined more conservative P_{limit} instead of calculation P_{limit}.

Standalone exposure with triggering proximity sensor (DSI = 1) (Continued)

RF Exposure Conditions	Antenna	band	mode	DSI	Test position	Test distance (mm)	Channel	Measured Output power (dbm)	measured SAR 1g (W/kg)	Plimit (dBm)	Minimim Plimit (dBm)
Standalone	Main Ant.1	LTE Band 66	QPSK BW=20MHz	1	Rear	0	132572	13.3	0.488	16.5	14.1
					Edge 1	0	132572	13.3	0.046	26.7	
					Edge 4	0	132572	13.3	0.834	14.1	
Standalone	Main Ant.1	LTE Band 71	QPSK BW=20MHz	1	Rear	0	133297	16.3	0.276	21.9	18.6
					Edge 1	0	133297	16.3	0.014	34.8	
					Edge 4	0	133297	16.3	0.587	18.6	
Standalone	Main Ant.1	NR Band n5	DFT-s-OFDM QPSK BW=20MHz	1	Rear	0	167300	18.2	0.731	19.5	18.9
					Edge 1	0	167300	18.2	0.046	31.6	
					Edge 4	0	167300	18.2	0.840	18.9	
Standalone	Main Ant.1	NR Band n25(n2)	DFT-s-OFDM QPSK BW=20MHz	1	Rear	0	372000	14.4	0.503	17.4	15.5
					Edge 1	0	372000	14.4	0.043	28.1	
					Edge 4	0	372000	14.4	0.791	15.5	
Standalone	Main Ant.1	NR Band n66	DFT-s-OFDM QPSK BW=40MHz	1	Rear	0	349000	14.0	0.763	15.2	14.4
					Edge 1	0	349000	14.0	0.058	26.4	
					Edge 4	0	349000	14.0	0.916	14.4	
Standalone	Main Ant.1	NR Band n71	DFT-s-OFDM QPSK BW=20MHz	1	Rear	0	136100	20.6	0.785	21.7	21.0
					Edge 1	0	136100	20.6	0.062	32.7	
					Edge 4	0	136100	20.6	0.917	21.0	
Standalone	Main Ant.2	NR Band n41	DFT-s-OFDM QPSK BW=100MHz	1	Rear	0	518598	13.9	0.436	17.5	14.5
					Edge 1	0	518598	13.9	0.066	25.7	
					Edge 4	0	518598	13.9	0.878	14.5	
Standalone	Main Ant.3	LTE Band 48	QPSK BW=20MHz	1	Rear	0	55340	11.0	0.345	15.6	15.1
					Edge 4	0	55340	11.0	0.391	15.1	
Standalone	Main Ant.3	NR Band n71	DFT-s-OFDM QPSK BW=100MHz	1	Rear	0	662000	11.5	0.263	17.3	15.2
					Edge 4	0	662000	11.5	0.427	15.2	

Notes:

1. The maximum allowed power is equal to maximum tune up power + 1 dB device design uncertainty
2. Measured Output power refer to Sec.9 in SAR part.1 report.
3. Some bands were determined more conservative P_{limit} instead of calculation P_{limit}.

END OF REPORT