FCC SAR TEST REPORT

FCC ID	:	**PY7-65375K**
Brand Name	:	**Sony**
Applicant	:	**Sony Mobile Communications Inc. 4-12-3 Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan**
Manufacturer	:	**Sony Mobile Communications Inc. 4-12-3 Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan**
Standard	:	**FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2013**

The product was received on Jan. 06, 2020 and testing was started from Feb. 15, 2020 and completed on Feb. 28, 2020. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

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Approved by: Cona Huang / Deputy Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA9O1534-03	01	Initial issue of report	Mar. 21, 2020
FA9O1534-03	02	Update Appendix D	Mar. 26, 2020
FA9O1534-03	03	Update the antenna name and section13, 14	Apr. 01, 2020
FA9O1534-03	04	Update section 14	Apr. 16, 2020

1. Statement of Compliance

Applicant Name	Sony Mobile Communications Inc.			
EUT Description	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPC and NFC			
Brand Name	Sony			
FCC ID	PY7-65375K			
HW Version	A			
SW Version	0.353			
RF Exposure Conditions	Equipment Class			
	Licensed	DTS	NII	DSS
Head (1g SAR W/kg)	0.21	0.41	0.34	0.22
Body-Worn (1g SAR W/kg)	0.48	0.08	0.04	0.04
Wireless Router (1g SAR W/kg)	0.77	0.70		0.13
Product Specific (10g SAR W/kg)	2.28		0.38	
Highest Simultaneous Transmission (1g SAR W/kg)	Head: 0.89 Body-worn: 0.59 Hotspot: 0.77	Head: 0.79 Body-worn: 0.57 Hotspot: 0.77	Head: 0.89 Body-worn: 0.59 Hotspot: N/A	Head: 0.89 Body-worn: 0.59 Hotspot: 0.77
Highest Simultaneous Transmission (10g SAR W/kg)	Product Specific: 2.83		Product Specific: 2.83	
Date Tested	2020/2/15 ~ 2020/2/28			
Test Result	Pass			

Remark:

1. This device 2.4GHz WLAN support Hotspot operation and Bluetooth support tethering applications.
2. When the device operate on the head that the WWAN ASDIV Sub antenna is non-active, detail descriptions included in the operational description
3. When the WWAN transmit with 2.4GHz and 5GHz WLAN at the same time, the device will limit different output power for 2.4GHz and 5GHz WLAN to show compliance.
4. When hotspot mode is active which the power will be reduced of GSM1900, UMTS B2/B4 and LTE B2/B4/B7/B25/B41/B66, detail descriptions of the power reduction mechanism are included in the operational description.
5. The device employs sensors to detect different usage conditions, when operating in near-body or handheld condition by end user, the device will limit different output powers on the GSM1900, UMTS B2/B4 and LTE B2/B4/B7/B25/B41/B66 and detail descriptions of the power reduction mechanism are included in the operational description.
6. This device implements antenna tuning techniques in the LTE 2, 4, 5, 13, 25, 26, 66. SAR test proposal was measured according to the normally required SAR configurations with the tuner active and worst tune state (auto tune) was used for SAR testing and this design will provide the highest power at different user scenarios and would not influence to the antenna characteristics other than impedance matching, The detail descriptions of the antenna tuner are included in the operational description and supplemental data for additional information on section14

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

Reviewed by: Jason Wang
Report Producer: Wan Liu

2. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01
- FCC KDB 941225 D07 UMPC Mini Tablet v01r02

3. Equipment Under Test (EUT) Information

3.1 General Information

Wireless Technologies	Frequency	Operating Mode	
GSM	850 1900	· GSM Voice · GPRS (GMSK) · EDGE (8PSK)	Multi-Slot Class: Class 33
	Does device support dual transfer mode? (Yes)		
W-CDMA (UMTS)	Band 2 Band 4 Band 5	· AMR / RMC 12.2Kbps · HSDPA (Rel.5) · HSUPA (Rel.6) · DC-HSDPA (Rel.8)	
LTE (FDD)	Band 2 Band 4 Band 5 Band 7 Band 12 Band 13 Band 17 Band 25 Band 26 Band 66	· QPSK · 16QAM · 64QAM	
LTE (TDD)	Band 41		
WiFi	2.4GHz: 2412 MHz ~ 2462 MHz	· 11b · 11g · 11n (HT20) · 11ax (HE20)	
	5GHz: 5.2GHz: 5180 MHz ~ 5240 MHz 5.3GHz: 5260 MHz ~ 5320 MHz 5.5GHz: 5500 MHz ~ 5720 MHz 5.8GHz: 5745 MHz ~ 5825 MHz	· 11a · 11n (HT20) · 11n (HT40) · 11ac (VHT20) · 11ac (VHT40) · 11ac (VHT80) · 11ax (HE20) · 11ax (HE40) · 11ax (HE80)	
Bluetooth	2.4GHz	· BR / EDR / LE	
NFC	13.56MHz	· ASK	

3.2 Device Serial Number

Band	SN
WWAN	QV7100VX2E QV7100ZQ2E QV7101342E QV7100X52E
WLAN	QV71013E2E QV71014Y2E QV7100WM2E QV7100W52E

Note: Several samples were used with identical hardware to support SAR testing. The manufacturer has confirmed that the device tested gave the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.

3.3 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	PY7-65375K
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz
Channel Bandwidth	LTE Band 02:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 04:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 05:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 07: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 25:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM / 64QAM
LTE Voice / Data requirements	Voice and Data
LTE MPR permanently built-in by design	**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3**

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	Yes, when operating in hotspot/body-worn/product specific mode power reduction applied to satisfy SAR compliance.

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 5

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 7

	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

LTE Band 12

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 13

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5	23230	782
M	23230	782		
H	23255	784.5		

LTE Band 17

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq. (MHz)
L	23755	706.5	23780	709
M	23790	710	23790	710
H	23825	713.5	23800	711

LTE Band 25												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905

LTE Band 26										
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5

LTE Band 41								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506
L M	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2593	40620	2593	40620	2593
H M	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680

LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

4. RF Exposure Limits

4.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

4.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

5. Specific Absorption Rate (SAR)

5.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

5.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$\mathbf{SAR} = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\mathbf{dm}}\right) = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\boldsymbol{\rho}\mathbf{dv}}\right)$$

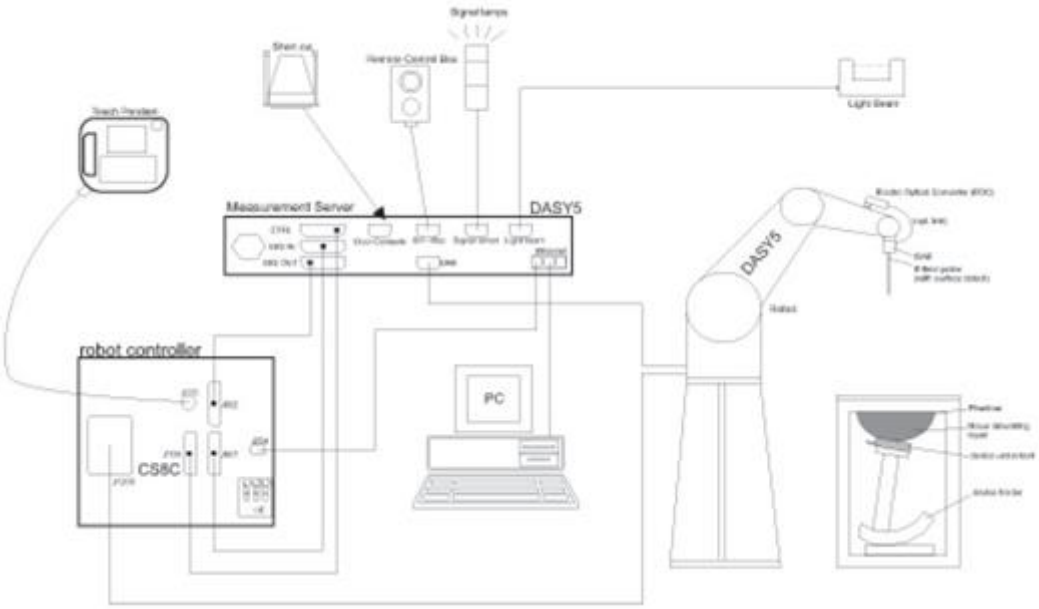
SAR is expressed in units of Watts per kilogram (W/kg)

$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}|\mathbf{E}|^{\mathbf{2}}}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

6. System Description and Setup

The DASY 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.

6.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – 4 GHz; Linearity: ±0.2 dB (30 MHz – 4 GHz)	
Directivity	±0.2 dB in TSL (rotation around probe axis) ±0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 µW/g – >100 mW/g; Linearity: ±0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)	
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

6.2 Data Acquisition Electronics (DAE)

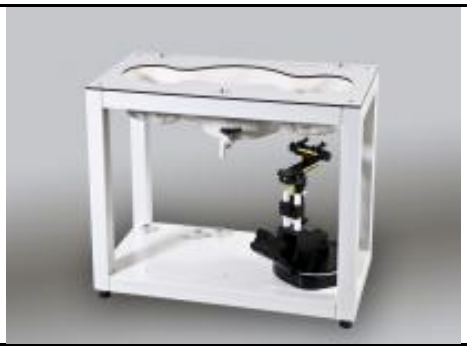
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

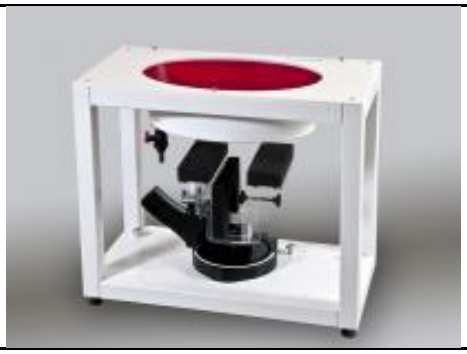
6.3 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

6.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Mounting Device for Laptops

7. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix E demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

7.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

7.2 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. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

7.3 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 found in the scanned area, within a range of the global maximum. The range (in dB0 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 FCC KDB 865664 D01v01r04 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.	

7.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes 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 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 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	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
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.

7.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

7.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1107	Mar. 08, 2019	Mar. 07, 2020
SPEAG	835MHz System Validation Kit	D835V2	4d167	Nov. 25, 2019	Nov. 24, 2020
SPEAG	1750MHz System Validation Kit	D1750V2	1112	Mar. 07, 2019	Mar. 06, 2020
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Sep. 11, 2018	Sep. 09, 2020
SPEAG	2450MHz System Validation Kit	D2450V2	736	Aug. 31, 2018	Aug. 29, 2020
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Aug. 31, 2018	Aug. 29, 2020
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Sep. 27, 2018	Sep. 25, 2020
SPEAG	Data Acquisition Electronics	DAE3	577	Sep. 17, 2019	Sep. 16, 2020
SPEAG	Data Acquisition Electronics	DAE4	854	May. 21, 2019	May. 20, 2020
SPEAG	Data Acquisition Electronics	DAE4	1305	Apr. 30, 2019	Apr. 29, 2020
SPEAG	Dosimetric E-Field Probe	ES3DV3	3184	Sep. 25, 2019	Sep. 24, 2020
SPEAG	Dosimetric E-Field Probe	EX3DV4	3642	Apr. 29, 2019	Apr. 28, 2020
SPEAG	Dosimetric E-Field Probe	EX3DV4	7306	Jul. 22, 2019	Jul. 21, 2020
RCPTWN	Thermometer	HTC-1	TM685-1	Nov. 12, 2019	Nov. 11, 2020
RCPTWN	Thermometer	HTC-1	TM560-2	Nov. 12, 2019	Nov. 11, 2020
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Oct. 31, 2019	Oct. 30, 2020
Agilent	Wireless Communication Test Set	E5515C	MY50267236	Apr. 01, 2019	Mar. 31, 2020
R&S	BT Base Station	CBT32	100522	Mar. 18, 2019	Mar. 17, 2020
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Nov. 20, 2019	Nov. 19, 2020
Agilent	ENA Network Analyzer	E5071C	MY46104758	Sep. 06, 2019	Sep. 05, 2020
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 18, 2019	Sep. 17, 2020
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3169	Sep. 10, 2019	Sep. 09, 2020
Anritsu	Power Meter	ML2495A	1036004	Aug. 08, 2019	Aug. 07, 2020
Anritsu	Power Sensor	MA2411B	1027253	Aug. 08, 2019	Aug. 07, 2020
Anritsu	Power Meter	ML2495A	1419002	May. 29, 2019	May. 28, 2020
Anritsu	Power Sensor	MA2411B	1339124	May. 29, 2019	May. 28, 2020
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 27, 2019	Aug. 26, 2020
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jun. 27, 2019	Jun. 26, 2020
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 16, 2019	Oct. 15, 2020
Mini-Circuits	Power Amplifier	ZVE-8G+	6382	Aug. 12, 2019	Aug. 11, 2020
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole D835V2, SN: 4d167, D1900V2, SN: 5d041, D2450V2, SN: 736, D2600V2, SN: 1008, D5GHzV2, SN: 1006 can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

9. System Verification

9.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.2.

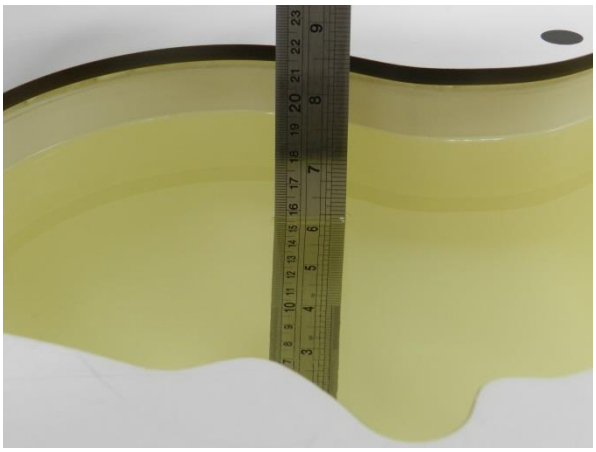


Fig 10.1Photo of Liquid Height for Head SAR

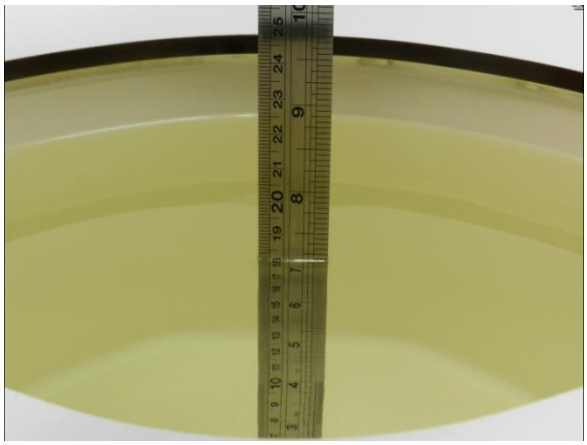


Fig 10.2 Photo of Liquid Height for Body SAR

9.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Tissue check appears that head liquid is also used for body SAR test

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
900	40.3	57.9	0.2	1.4	0.2	0	0.97	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	22.5	0.903	41.950	0.89	41.90	1.46	0.12	±5	2020/2/21
750	22.7	0.899	40.882	0.89	41.90	1.01	-2.43	±5	2020/2/22
750	22.5	0.894	40.782	0.89	41.90	0.45	-2.67	±5	2020/2/23
835	22.7	0.910	41.745	0.90	41.50	1.11	0.59	±5	2020/2/18
835	22.5	0.883	40.896	0.90	41.50	-1.89	-1.46	±5	2020/2/21
835	22.7	0.881	41.553	0.90	41.50	-2.11	0.13	±5	2020/2/22
835	22.5	0.876	41.453	0.90	41.50	-2.67	-0.11	±5	2020/2/23
1750	22.8	1.372	40.969	1.37	40.10	0.15	2.17	±5	2020/2/15
1750	22.5	1.369	40.623	1.37	40.10	-0.07	1.30	±5	2020/2/21
1750	22.4	1.389	39.447	1.37	40.10	1.39	-1.63	±5	2020/2/23
1900	22.8	1.457	39.164	1.40	40.00	4.07	-2.09	±5	2020/2/15
1900	22.5	1.345	39.899	1.40	40.00	-3.93	-0.25	±5	2020/2/16
1900	22.4	1.402	40.779	1.40	40.00	0.14	1.95	±5	2020/2/23
2450	22.5	1.854	38.376	1.80	39.20	3.00	-2.10	±5	2020/2/22
2450	22.3	1.790	39.216	1.80	39.20	-0.56	0.04	±5	2020/2/24
2600	22.6	1.941	38.719	1.96	39.00	-0.97	-0.72	±5	2020/2/20
2600	22.4	1.967	38.171	1.96	39.00	0.36	-2.13	±5	2020/2/24
5250	22.4	4.733	36.799	4.71	35.95	0.49	2.36	±5	2020/2/24
5250	22.4	4.695	35.897	4.71	35.95	-0.32	-0.15	±5	2020/2/25
5250	22.6	4.587	36.893	4.71	35.95	-2.61	2.62	±5	2020/2/27
5600	22.4	5.089	36.305	5.07	35.50	0.37	2.27	±5	2020/2/24
5600	22.4	5.044	35.347	5.07	35.50	-0.51	-0.43	±5	2020/2/25
5600	22.6	4.938	36.353	5.07	35.50	-2.60	2.40	±5	2020/2/27
5600	22.5	5.105	35.206	5.07	35.50	0.69	-0.83	±5	2020/2/28
5750	22.4	5.246	36.122	5.22	35.35	0.50	2.18	±5	2020/2/24
5750	22.4	5.189	35.205	5.22	35.35	-0.59	-0.41	±5	2020/2/25
5750	22.6	5.089	36.218	5.22	35.35	-2.51	2.46	±5	2020/2/27

9.3 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2020/2/21	750	250	D750V3-1107	EX3DV4 - SN7306	DAE3 Sn577	2.12	8.32	8.48	1.92
2020/2/22	750	250	D750V3-1107	EX3DV4 - SN7306	DAE3 Sn577	2.20	8.32	8.8	5.77
2020/2/23	750	250	D750V3-1107	EX3DV4 - SN7306	DAE3 Sn577	2.10	8.32	8.4	0.96
2020/2/18	835	250	D835V2-4d167	ES3DV3 - SN3184	DAE4 Sn1305	2.24	9.55	8.96	-6.18
2020/2/21	835	250	D835V2-4d167	EX3DV4 - SN7306	DAE3 Sn577	2.40	9.55	9.6	0.52
2020/2/22	835	250	D835V2-4d167	EX3DV4 - SN7306	DAE3 Sn577	2.25	9.55	9	-5.76
2020/2/23	835	250	D835V2-4d167	EX3DV4 - SN7306	DAE3 Sn577	2.38	9.55	9.52	-0.31
2020/2/15	1750	250	D1750V2-1112	EX3DV4 - SN3642	DAE4 Sn854	9.29	36.70	37.16	1.25
2020/2/21	1750	250	D1750V2-1112	EX3DV4 - SN7306	DAE3 Sn577	8.99	36.70	35.96	-2.02
2020/2/23	1750	250	D1750V2-1112	EX3DV4 - SN7306	DAE3 Sn577	9.20	36.70	36.8	0.27
2020/2/15	1900	250	D1900V2-5d041	EX3DV4 - SN3642	DAE4 Sn854	10.20	40.20	40.8	1.49
2020/2/16	1900	250	D1900V2-5d041	ES3DV3 - SN3184	DAE4 Sn1305	9.75	40.20	39	-2.99
2020/2/23	1900	250	D1900V2-5d041	EX3DV4 - SN7306	DAE3 Sn577	10.20	40.20	40.8	1.49
2020/2/22	2450	250	D2450V2-736	ES3DV3 - SN3184	DAE4 Sn1305	12.80	52.70	51.2	-2.85
2020/2/24	2450	250	D2450V2-736	ES3DV3 - SN3184	DAE4 Sn1305	12.30	52.70	49.2	-6.64
2020/2/20	2600	250	D2600V2-1008	EX3DV4 - SN7306	DAE3 Sn577	14.70	56.40	58.8	4.26
2020/2/24	2600	250	D2600V2-1008	EX3DV4 - SN7306	DAE3 Sn577	14.00	56.40	56	-0.71
2020/2/24	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN3642	DAE4 Sn854	8.66	80.70	86.6	7.31
2020/2/25	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN3642	DAE4 Sn854	8.59	80.70	85.9	6.44
2020/2/27	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN3642	DAE4 Sn854	8.39	80.70	83.9	3.97
2020/2/24	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3642	DAE4 Sn854	8.44	83.30	84.4	1.32
2020/2/25	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3642	DAE4 Sn854	8.92	83.30	89.2	7.08
2020/2/27	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3642	DAE4 Sn854	8.83	83.30	88.3	6.00
2020/2/28	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3642	DAE4 Sn854	8.47	83.30	84.7	1.68
2020/2/24	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN3642	DAE4 Sn854	8.55	80.40	85.5	6.34
2020/2/25	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN3642	DAE4 Sn854	8.34	80.40	83.4	3.73
2020/2/27	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN3642	DAE4 Sn854	8.30	80.40	83	3.23

Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2020/2/21	1750	250	D1750V2-1112	EX3DV4 - SN7306	DAE3 Sn577	4.62	19.40	18.48	-4.74
2020/2/23	1750	250	D1750V2-1112	EX3DV4 - SN7306	DAE3 Sn577	4.91	19.40	19.64	1.24
2020/2/16	1900	250	D1900V2-5d041	ES3DV3 - SN3184	DAE4 Sn1305	5.03	21.20	20.12	-5.09
2020/2/23	1900	250	D1900V2-5d041	EX3DV4 - SN7306	DAE3 Sn577	5.24	21.20	20.96	-1.13
2020/2/24	2600	250	D2600V2-1008	EX3DV4 - SN7306	DAE3 Sn577	6.18	25.30	24.72	-2.29
2020/2/24	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN3642	DAE4 Sn854	2.45	23.20	24.5	5.60
2020/2/25	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN3642	DAE4 Sn854	2.43	23.20	24.3	4.74
2020/2/27	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN3642	DAE4 Sn854	2.37	23.20	23.7	2.16
2020/2/24	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3642	DAE4 Sn854	2.29	23.80	22.9	-3.78
2020/2/25	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3642	DAE4 Sn854	2.39	23.80	23.9	0.42
2020/2/27	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3642	DAE4 Sn854	2.46	23.80	24.6	3.36
2020/2/28	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN3642	DAE4 Sn854	2.29	23.80	22.9	-3.78
2020/2/24	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN3642	DAE4 Sn854	2.38	22.90	23.8	3.93
2020/2/25	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN3642	DAE4 Sn854	2.34	22.90	23.4	2.18
2020/2/27	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN3642	DAE4 Sn854	2.31	22.90	23.1	0.87

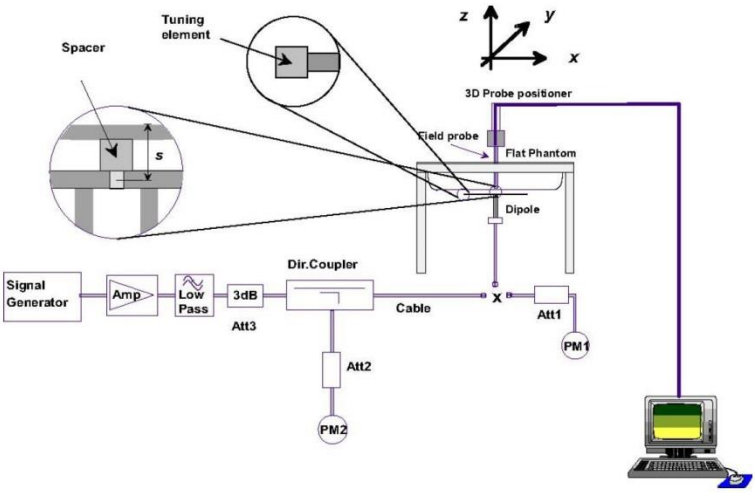


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

10. RF Exposure Positions

10.1 Ear and handset reference point

Figure 9.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M,” the left ear reference point (ERP) is marked “LE,” and the right ERP is marked “RE.” Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 9.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 9.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 9.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

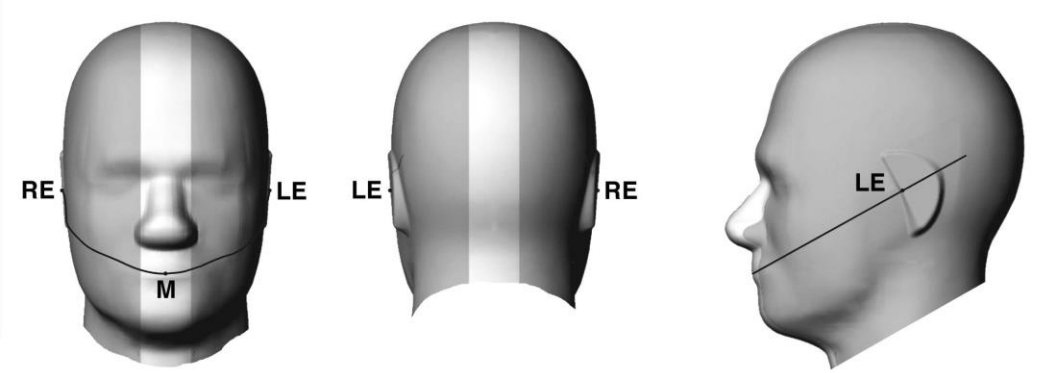


Fig 9.1.1 Front, back, and side views of SAM twin phantom

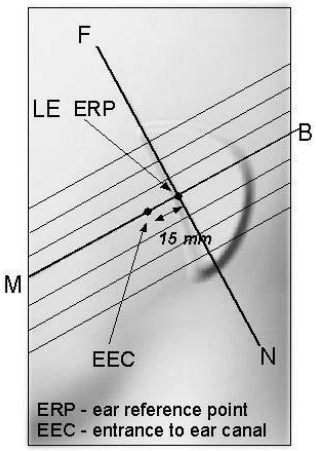


Fig 9.1.2 Close-up side view of phantom showing the ear region.

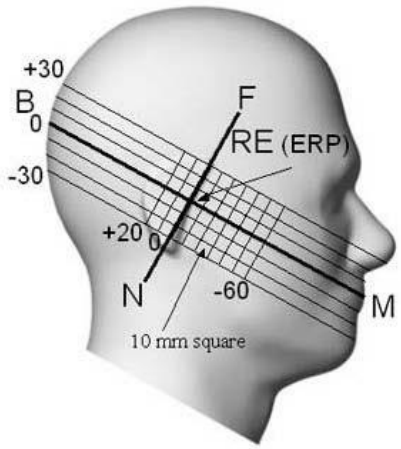


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

10.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Figure 9.2.1 and Figure 9.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 9.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 9.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 9.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 9.2.3. The actual rotation angles should be documented in the test report.

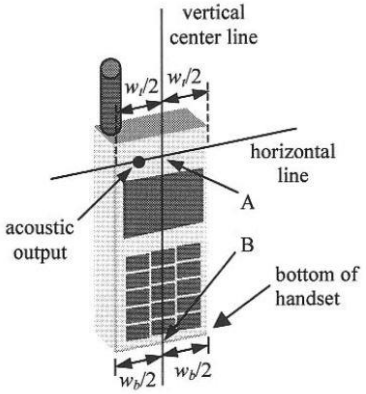


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

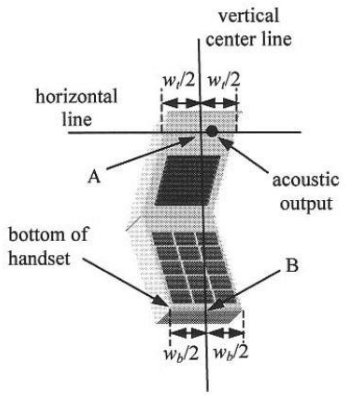


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

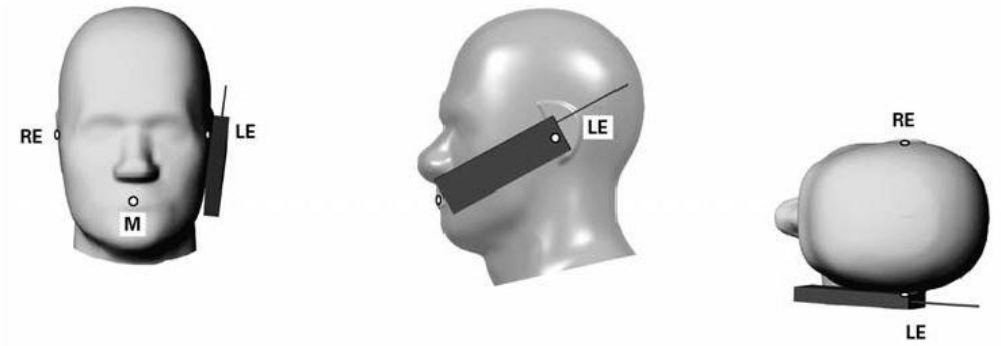


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

10.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 9.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

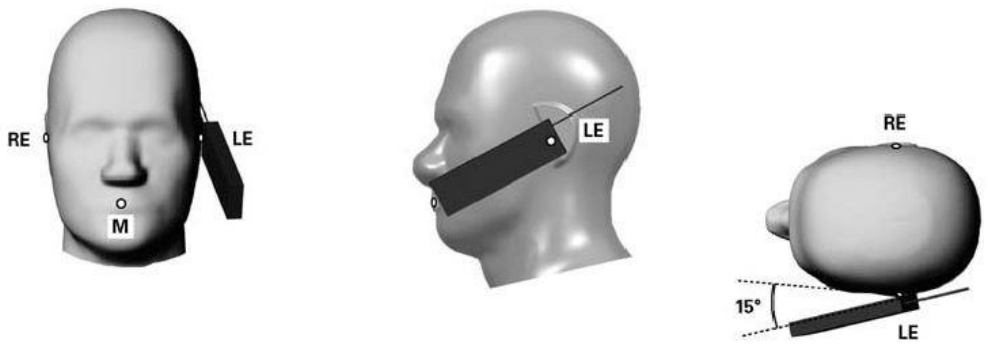


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

10.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

Accessories for body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

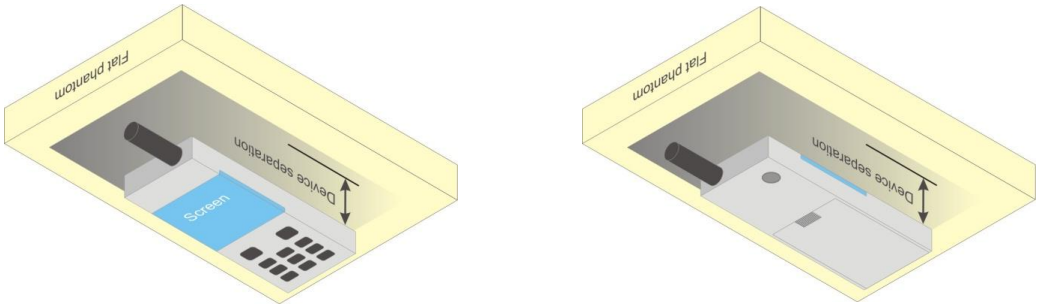


Fig 9.4 Body Worn Position

10.5 Product Specific Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

10.6 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

11. RF Exposure Conditions

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN_Main	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	≤ 25mm
WWAN_Sub	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm
BT&WLAN	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	>25mm	≤ 25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN_Main	Yes	Yes	No	Yes	Yes	Yes
WWAN_Sub	Yes	Yes	Yes	No	Yes	Yes
BT&WLAN	Yes	Yes	Yes	No	No	Yes

General Note:

Referring to KDB 941225 D06 v02r01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge, The detail antenna location please refers to Appendix E.

12. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN/BT: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
5. 5GHz WLAN product specific SAR is necessary too, due to an overall diagonal dimension is > 16cm.
6. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g product specific SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold, for this device only bottom side SAR for WWAN transmitter scaled to maximum output power is higher than 1.2W/kg of WCDMA B2 and LTE B7/25/66, therefore product specific SAR is necessary.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE / DTM modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (4Tx slots) for GSM850/GSM1900 is considered as the primary mode.
2. Other configurations of GSM / GPRS / EDGE / DTM are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the secondary mode.

UMTS Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B12/B26 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 2/4/5/17 SAR test was covered by Band 25/66/26/12; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. The maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion.
   b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

12.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (4 Tx slots)	Right Cheek	0mm	189	836.4	26.97	27.20	1.054	-0.12	0.140	0.148
	GSM850	GPRS (4 Tx slots)	Right Tilted	0mm	189	836.4	26.97	27.20	1.054	-0.01	0.032	0.034
01	GSM850	GPRS (4 Tx slots)	Left Cheek	0mm	189	836.4	26.97	27.20	1.054	-0.1	0.202	0.213
	GSM850	GPRS (4 Tx slots)	Left Tilted	0mm	189	836.4	26.97	27.20	1.054	0.16	0.067	0.071
02	GSM1900	GPRS (4 Tx slots)	Right Cheek	0mm	810	1909.8	24.55	24.70	1.035	0.16	0.023	0.024
	GSM1900	GPRS (4 Tx slots)	Right Tilted	0mm	810	1909.8	24.55	24.70	1.035	0.1	0.015	0.016
	GSM1900	GPRS (4 Tx slots)	Left Cheek	0mm	810	1909.8	24.55	24.70	1.035	-0.17	0.013	0.013
	GSM1900	GPRS (4 Tx slots)	Left Tilted	0mm	810	1909.8	24.55	24.70	1.035	0.1	0.009	0.010

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
03	WCDMA II	RMC 12.2Kbps	Right Cheek	0mm	9400	1880	23.47	23.70	1.054	0.15	0.064	0.067
	WCDMA II	RMC 12.2Kbps	Right Tilted	0mm	9400	1880	23.47	23.70	1.054	0.18	0.032	0.034
	WCDMA II	RMC 12.2Kbps	Left Cheek	0mm	9400	1880	23.47	23.70	1.054	-0.08	0.050	0.053
	WCDMA II	RMC 12.2Kbps	Left Tilted	0mm	9400	1880	23.47	23.70	1.054	-0.03	0.020	0.021
04	WCDMA IV	RMC 12.2Kbps	Right Cheek	0mm	1413	1732.6	23.35	23.70	1.084	0.13	0.041	0.044
	WCDMA IV	RMC 12.2Kbps	Right Tilted	0mm	1413	1732.6	23.35	23.70	1.084	0.18	0.008	0.009
	WCDMA IV	RMC 12.2Kbps	Left Cheek	0mm	1413	1732.6	23.35	23.70	1.084	0.17	0.001	0.001
	WCDMA IV	RMC 12.2Kbps	Left Tilted	0mm	1413	1732.6	23.35	23.70	1.084	0.17	0.017	0.018
	WCDMA V	RMC 12.2Kbps	Right Cheek	0mm	4233	846.6	24.66	24.70	1.009	-0.1	0.150	0.151
	WCDMA V	RMC 12.2Kbps	Right Tilted	0mm	4233	846.6	24.66	24.70	1.009	0.05	0.079	0.080
05	WCDMA V	RMC 12.2Kbps	Left Cheek	0mm	4233	846.6	24.66	24.70	1.009	-0.07	0.195	0.197
	WCDMA V	RMC 12.2Kbps	Left Tilted	0mm	4233	846.6	24.66	24.70	1.009	0.07	0.079	0.080

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 7	20M	QPSK	1	0	Right Cheek	0mm	21100	2535	24.63	25.00	1.089	-0.18	0.057	0.062
	LTE Band 7	20M	QPSK	50	50	Right Cheek	0mm	21100	2535	23.74	24.00	1.062	-0.17	0.048	0.051
	LTE Band 7	20M	QPSK	1	0	Right Tilted	0mm	21100	2535	24.63	25.00	1.089	-0.13	0.046	0.050
	LTE Band 7	20M	QPSK	50	50	Right Tilted	0mm	21100	2535	23.74	24.00	1.062	-0.14	0.037	0.039
06	LTE Band 7	20M	QPSK	1	0	Left Cheek	0mm	21100	2535	24.63	25.00	1.089	-0.06	0.089	0.097
	LTE Band 7	20M	QPSK	50	50	Left Cheek	0mm	21100	2535	23.74	24.00	1.062	-0.01	0.075	0.080
	LTE Band 7	20M	QPSK	1	0	Left Tilted	0mm	21100	2535	24.63	25.00	1.089	-0.18	0.030	0.033
	LTE Band 7	20M	QPSK	50	50	Left Tilted	0mm	21100	2535	23.74	24.00	1.062	0.14	0.021	0.022
	LTE Band 12	10M	QPSK	1	0	Right Cheek	0mm	23095	707.5	24.59	25.00	1.099	0.11	0.107	0.118
	LTE Band 12	10M	QPSK	25	0	Right Cheek	0mm	23095	707.5	23.70	24.00	1.072	0.02	0.083	0.089
	LTE Band 12	10M	QPSK	1	0	Right Tilted	0mm	23095	707.5	24.59	25.00	1.099	-0.08	0.037	0.041
	LTE Band 12	10M	QPSK	25	0	Right Tilted	0mm	23095	707.5	23.70	24.00	1.072	-0.04	0.029	0.031
07	LTE Band 12	10M	QPSK	1	0	Left Cheek	0mm	23095	707.5	24.59	25.00	1.099	0.15	0.140	0.154
	LTE Band 12	10M	QPSK	25	0	Left Cheek	0mm	23095	707.5	23.70	24.00	1.072	0.02	0.115	0.123
	LTE Band 12	10M	QPSK	1	0	Left Tilted	0mm	23095	707.5	24.59	25.00	1.099	0	0.050	0.055
	LTE Band 12	10M	QPSK	25	0	Left Tilted	0mm	23095	707.5	23.70	24.00	1.072	0.17	0.040	0.043

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 13	10M	QPSK	1	25	Right Cheek	0mm	23230	782	24.41	25.00	1.146	0.07	0.133	0.152
	LTE Band 13	10M	QPSK	25	25	Right Cheek	0mm	23230	782	23.55	24.00	1.109	-0.01	0.109	0.121
	LTE Band 13	10M	QPSK	1	25	Right Tilted	0mm	23230	782	24.41	25.00	1.146	-0.07	0.062	0.071
	LTE Band 13	10M	QPSK	25	25	Right Tilted	0mm	23230	782	23.55	24.00	1.109	-0.07	0.052	0.058
08	LTE Band 13	10M	QPSK	1	25	Left Cheek	0mm	23230	782	24.41	25.00	1.146	0.06	0.165	0.189
	LTE Band 13	10M	QPSK	25	25	Left Cheek	0mm	23230	782	23.55	24.00	1.109	-0.17	0.132	0.146
	LTE Band 13	10M	QPSK	1	25	Left Tilted	0mm	23230	782	24.41	25.00	1.146	-0.02	0.068	0.078
	LTE Band 13	10M	QPSK	25	25	Left Tilted	0mm	23230	782	23.55	24.00	1.109	0	0.057	0.063
09	LTE Band 25	20M	QPSK	1	0	Right Cheek	0mm	26590	1905	24.41	25.00	1.146	0.11	0.080	0.092
	LTE Band 25	20M	QPSK	50	24	Right Cheek	0mm	26590	1905	23.47	24.00	1.130	-0.13	0.067	0.076
	LTE Band 25	20M	QPSK	1	0	Right Tilted	0mm	26590	1905	24.41	25.00	1.146	0.05	0.065	0.074
	LTE Band 25	20M	QPSK	50	24	Right Tilted	0mm	26590	1905	23.47	24.00	1.130	0.15	0.049	0.055
	LTE Band 25	20M	QPSK	1	0	Left Cheek	0mm	26590	1905	24.41	25.00	1.146	0.06	0.047	0.054
	LTE Band 25	20M	QPSK	50	24	Left Cheek	0mm	26590	1905	23.47	24.00	1.130	0.1	0.037	0.042
	LTE Band 25	20M	QPSK	1	0	Left Tilted	0mm	26590	1905	24.41	25.00	1.146	0.14	0.066	0.076
	LTE Band 25	20M	QPSK	50	24	Left Tilted	0mm	26590	1905	23.47	24.00	1.130	-0.11	0.036	0.041
	LTE Band 26	15M	QPSK	1	0	Right Cheek	0mm	26865	831.5	24.35	25.00	1.161	0.03	0.128	0.149
	LTE Band 26	15M	QPSK	36	20	Right Cheek	0mm	26865	831.5	23.54	24.00	1.112	-0.01	0.112	0.125
	LTE Band 26	15M	QPSK	1	0	Right Tilted	0mm	26865	831.5	24.35	25.00	1.161	-0.06	0.040	0.046
	LTE Band 26	15M	QPSK	36	20	Right Tilted	0mm	26865	831.5	23.54	24.00	1.112	-0.07	0.036	0.040
10	LTE Band 26	15M	QPSK	1	0	Left Cheek	0mm	26865	831.5	24.35	25.00	1.161	-0.01	0.153	0.178
	LTE Band 26	15M	QPSK	36	20	Left Cheek	0mm	26865	831.5	23.54	24.00	1.112	-0.16	0.133	0.148
	LTE Band 26	15M	QPSK	1	0	Left Tilted	0mm	26865	831.5	24.35	25.00	1.161	0.03	0.023	0.027
	LTE Band 26	15M	QPSK	36	20	Left Tilted	0mm	26865	831.5	23.54	24.00	1.112	0.03	0.023	0.026
11	LTE Band 66	20M	QPSK	1	0	Right Cheek	0mm	132322	1745	24.57	25.00	1.104	-0.06	0.048	0.053
	LTE Band 66	20M	QPSK	50	0	Right Cheek	0mm	132072	1720	23.56	24.00	1.107	0.02	0.037	0.041
	LTE Band 66	20M	QPSK	1	0	Right Tilted	0mm	132322	1745	24.57	25.00	1.104	0.1	0.034	0.038
	LTE Band 66	20M	QPSK	50	0	Right Tilted	0mm	132072	1720	23.56	24.00	1.107	0.01	0.019	0.021
	LTE Band 66	20M	QPSK	1	0	Left Cheek	0mm	132322	1745	24.57	25.00	1.104	0.08	0.047	0.052
	LTE Band 66	20M	QPSK	50	0	Left Cheek	0mm	132072	1720	23.56	24.00	1.107	0.05	0.031	0.034
	LTE Band 66	20M	QPSK	1	0	Left Tilted	0mm	132322	1745	24.57	25.00	1.104	0.13	0.030	0.033
	LTE Band 66	20M	QPSK	50	0	Left Tilted	0mm	132072	1720	23.56	24.00	1.107	0.15	0.018	0.020

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	99	Right Cheek	0mm	41490	2680	24.74	25.00	1.062	62.9	1.006	-0.1	0.045	0.048
	LTE Band 41	20M	QPSK	50	50	Right Cheek	0mm	41490	2680	23.80	24.00	1.047	62.9	1.006	-0.1	0.036	0.038
	LTE Band 41	20M	QPSK	1	99	Right Tilted	0mm	41490	2680	24.74	25.00	1.062	62.9	1.006	0.1	0.031	0.033
	LTE Band 41	20M	QPSK	50	50	Right Tilted	0mm	41490	2680	23.80	24.00	1.047	62.9	1.006	0.01	0.027	0.028
12	LTE Band 41	20M	QPSK	1	99	Left Cheek	0mm	41490	2680	24.74	25.00	1.062	62.9	1.006	-0.06	0.080	0.085
	LTE Band 41	20M	QPSK	50	50	Left Cheek	0mm	41490	2680	23.80	24.00	1.047	62.9	1.006	-0.04	0.068	0.072
	LTE Band 41	20M	QPSK	1	99	Left Tilted	0mm	41490	2680	24.74	25.00	1.062	62.9	1.006	-0.11	0.020	0.021
	LTE Band 41	20M	QPSK	50	50	Left Tilted	0mm	41490	2680	23.80	24.00	1.047	62.9	1.006	-0.06	0.016	0.017

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
13	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Chain 0	OFF	6	2437	14.80	15.00	1.047	100	1.000	0.17	0.389	0.407
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Chain 0	OFF	6	2437	14.80	15.00	1.047	100	1.000	0.16	0.061	0.064
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Chain 0	OFF	6	2437	14.80	15.00	1.047	100	1.000	0.03	0.106	0.111
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Chain 0	OFF	6	2437	14.80	15.00	1.047	100	1.000	0.13	0.014	0.015
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Chain 1	OFF	1	2412	10.80	11.00	1.047	100	1.000	0.01	0.092	0.096
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Chain 1	OFF	1	2412	10.80	11.00	1.047	100	1.000	0.13	0.064	0.067
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Chain 1	OFF	1	2412	10.80	11.00	1.047	100	1.000	-0.07	0.025	0.026
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Chain 1	OFF	1	2412	10.80	11.00	1.047	100	1.000	0.05	0.019	0.020
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Chain 0	ON	6	2437	12.70	13.00	1.072	100	1.000	0.08	0.214	0.229
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Chain 0	ON	6	2437	12.70	13.00	1.072	100	1.000	0.11	0.030	0.032
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Chain 0	ON	6	2437	12.70	13.00	1.072	100	1.000	0.04	0.092	0.099
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Chain 0	ON	6	2437	12.70	13.00	1.072	100	1.000	0.07	0.013	0.014
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Chain 1	ON	1	2412	10.80	11.00	1.047	100	1.000	0.01	0.092	0.096
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Chain 1	ON	1	2412	10.80	11.00	1.047	100	1.000	0.13	0.064	0.067
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Chain 1	ON	1	2412	10.80	11.00	1.047	100	1.000	-0.07	0.025	0.026
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Chain 1	ON	1	2412	10.80	11.00	1.047	100	1.000	0.05	0.019	0.020
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 0	OFF	58	5290	10.80	11.50	1.175	98.58	1.014	-0.03	0.150	0.179
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 0	OFF	58	5290	10.80	11.50	1.175	98.58	1.014	-0.09	0.020	0.024
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 0	OFF	58	5290	10.80	11.50	1.175	98.58	1.014	0.12	0.010	0.012
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 0	OFF	58	5290	10.80	11.50	1.175	98.58	1.014	-0.1	0.001	0.001
14	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 1	OFF	58	5290	11.50	11.50	1.000	98.58	1.014	-0.18	0.338	0.343
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 1	OFF	58	5290	11.50	11.50	1.000	98.58	1.014	-0.12	0.244	0.247
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 1	OFF	58	5290	11.50	11.50	1.000	98.58	1.014	-0.08	0.169	0.171
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 1	OFF	58	5290	11.50	11.50	1.000	98.58	1.014	-0.05	0.133	0.135
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 0	ON	58	5290	9.30	9.50	1.047	98.58	1.014	0.14	0.085	0.090
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 0	ON	58	5290	9.30	9.50	1.047	98.58	1.014	-0.17	0.008	0.008
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 0	ON	58	5290	9.30	9.50	1.047	98.58	1.014	0.15	0.010	0.011
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 0	ON	58	5290	9.30	9.50	1.047	98.58	1.014	0.09	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 1	ON	58	5290	9.50	9.50	1.000	98.58	1.014	0.05	0.216	0.219
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 1	ON	58	5290	9.50	9.50	1.000	98.58	1.014	-0.13	0.152	0.154
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 1	ON	58	5290	9.50	9.50	1.000	98.58	1.014	-0.12	0.102	0.103
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 1	ON	58	5290	9.50	9.50	1.000	98.58	1.014	-0.18	0.069	0.070

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 0	OFF	138	5690	11.20	11.50	1.072	98.58	1.014	-0.08	0.033	0.036
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 0	OFF	138	5690	11.20	11.50	1.072	98.58	1.014	0.14	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 0	OFF	138	5690	11.20	11.50	1.072	98.58	1.014	0.02	0.028	0.030
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 0	OFF	138	5690	11.20	11.50	1.072	98.58	1.014	0	0.001	0.001
15	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 1	OFF	122	5610	11.30	11.50	1.047	98.58	1.014	0.14	0.287	0.305
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 1	OFF	122	5610	11.30	11.50	1.047	98.58	1.014	0.05	0.192	0.204
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 1	OFF	122	5610	11.30	11.50	1.047	98.58	1.014	-0.17	0.086	0.091
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 1	OFF	122	5610	11.30	11.50	1.047	98.58	1.014	-0.08	0.071	0.075
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 0	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.14	0.063	0.067
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 0	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.16	0.005	0.005
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 0	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.06	0.031	0.033
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 0	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.09	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 1	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.13	0.173	0.184
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 1	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.13	0.137	0.145
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 1	ON	106	5530	9.30	9.50	1.047	98.58	1.014	-0.18	0.110	0.117
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 1	ON	106	5530	9.30	9.50	1.047	98.58	1.014	-0.19	0.078	0.083
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 0	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.17	0.022	0.024
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 0	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 0	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.11	0.016	0.017
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 0	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0	0.001	0.001
16	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 1	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.11	0.143	0.155
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 1	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.11	0.094	0.102
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 1	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.02	0.004	0.004
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 1	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.19	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 0	ON	155	5775	9.20	9.50	1.072	98.58	1.014	0.05	0.028	0.030
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 0	ON	155	5775	9.20	9.50	1.072	98.58	1.014	-0.01	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 0	ON	155	5775	9.20	9.50	1.072	98.58	1.014	-0.01	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 0	ON	155	5775	9.20	9.50	1.072	98.58	1.014	-0.01	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	0mm	Chain 1	ON	155	5775	9.30	9.50	1.047	98.58	1.014	-0.04	0.082	0.087
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	0mm	Chain 1	ON	155	5775	9.30	9.50	1.047	98.58	1.014	0.16	0.054	0.057
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	0mm	Chain 1	ON	155	5775	9.30	9.50	1.047	98.58	1.014	0.07	0.024	0.025
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	0mm	Chain 1	ON	155	5775	9.30	9.50	1.047	98.58	1.014	0.1	0.020	0.021

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
17	Bluetooth	1Mbps	Right Cheek	0mm	Chain 0	OFF	39	2441	13.91	14.00	1.022	0.05	0.211	0.216
	Bluetooth	1Mbps	Right Tilted	0mm	Chain 0	OFF	39	2441	13.91	14.00	1.022	0.08	0.026	0.027
	Bluetooth	1Mbps	Left Cheek	0mm	Chain 0	OFF	39	2441	13.91	14.00	1.022	-0.09	0.091	0.093
	Bluetooth	1Mbps	Left Tilted	0mm	Chain 0	OFF	39	2441	13.91	14.00	1.022	0.01	0.012	0.012

12.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (4 Tx slots)	Front	10mm	OFF	189	836.4	26.97	27.20	1.054	-0.09	0.171	0.180
18	GSM850	GPRS (4 Tx slots)	Back	10mm	OFF	189	836.4	26.97	27.20	1.054	-0.14	0.214	0.226
	GSM850	GPRS (4 Tx slots)	Left Side	10mm	OFF	189	836.4	26.97	27.20	1.054	-0.03	0.175	0.185
	GSM850	GPRS (4 Tx slots)	Right Side	10mm	OFF	189	836.4	26.97	27.20	1.054	-0.07	0.084	0.089
	GSM850	GPRS (4 Tx slots)	Bottom Side	10mm	OFF	189	836.4	26.97	27.20	1.054	-0.07	0.181	0.191
	GSM1900	EDGE (4 Tx slots)	Front	10mm	ON	661	1880	21.30	22.50	1.318	-0.07	0.150	0.198
	GSM1900	EDGE (4 Tx slots)	Back	10mm	ON	661	1880	21.30	22.50	1.318	-0.03	0.193	0.254
	GSM1900	EDGE (4 Tx slots)	Left Side	10mm	ON	661	1880	21.30	22.50	1.318	-0.04	0.019	0.025
	GSM1900	EDGE (4 Tx slots)	Right Side	10mm	ON	661	1880	21.30	22.50	1.318	-0.07	0.018	0.024
19	GSM1900	EDGE (4 Tx slots)	Bottom Side	10mm	ON	661	1880	21.30	22.50	1.318	-0.07	0.284	0.374

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	10mm	ON	9538	1907.6	18.67	18.70	1.007	0.09	0.219	0.221
	WCDMA II	RMC 12.2Kbps	Back	10mm	ON	9538	1907.6	18.67	18.70	1.007	-0.19	0.254	0.256
	WCDMA II	RMC 12.2Kbps	Left Side	10mm	ON	9538	1907.6	18.67	18.70	1.007	-0.13	0.018	0.018
	WCDMA II	RMC 12.2Kbps	Right Side	10mm	ON	9538	1907.6	18.67	18.70	1.007	-0.12	0.028	0.028
20	WCDMA II	RMC 12.2Kbps	Bottom Side	10mm	ON	9538	1907.6	18.67	18.70	1.007	-0.18	0.417	0.420
	WCDMA IV	RMC 12.2Kbps	Front	10mm	ON	1312	1712.4	18.54	18.70	1.038	0.01	0.231	0.240
	WCDMA IV	RMC 12.2Kbps	Back	10mm	ON	1312	1712.4	18.54	18.70	1.038	-0.11	0.300	0.311
	WCDMA IV	RMC 12.2Kbps	Left Side	10mm	ON	1312	1712.4	18.54	18.70	1.038	-0.13	0.017	0.018
	WCDMA IV	RMC 12.2Kbps	Right Side	10mm	ON	1312	1712.4	18.54	18.70	1.038	-0.09	0.036	0.037
21	WCDMA IV	RMC 12.2Kbps	Bottom Side	10mm	ON	1312	1712.4	18.54	18.70	1.038	-0.16	0.397	0.412
	WCDMA V	RMC 12.2Kbps	Front	10mm	OFF	4233	846.6	24.66	24.70	1.009	-0.16	0.191	0.193
	WCDMA V	RMC 12.2Kbps	Back	10mm	OFF	4233	846.6	24.66	24.70	1.009	0.01	0.230	0.232
22	WCDMA V	RMC 12.2Kbps	Left Side	10mm	OFF	4233	846.6	24.66	24.70	1.009	-0.08	0.321	0.324
	WCDMA V	RMC 12.2Kbps	Right Side	10mm	OFF	4233	846.6	24.66	24.70	1.009	-0.13	0.110	0.111
	WCDMA V	RMC 12.2Kbps	Bottom Side	10mm	OFF	4233	846.6	24.66	24.70	1.009	-0.15	0.190	0.192

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 7	20M	QPSK	1	99	Front	10mm	ON	20850	2510	19.54	20.00	1.112	0.14	0.205	0.228
	LTE Band 7	20M	QPSK	50	50	Front	10mm	ON	21100	2535	19.65	20.00	1.084	-0.12	0.200	0.217
	LTE Band 7	20M	QPSK	1	99	Back	10mm	ON	20850	2510	19.54	20.00	1.112	-0.14	0.216	0.240
	LTE Band 7	20M	QPSK	50	50	Back	10mm	ON	21100	2535	19.65	20.00	1.084	-0.12	0.229	0.248
	LTE Band 7	20M	QPSK	1	99	Left Side	10mm	ON	20850	2510	19.54	20.00	1.112	-0.17	0.071	0.079
	LTE Band 7	20M	QPSK	50	50	Left Side	10mm	ON	21100	2535	19.65	20.00	1.084	0.11	0.077	0.083
	LTE Band 7	20M	QPSK	1	99	Right Side	10mm	ON	20850	2510	19.54	20.00	1.112	-0.19	0.030	0.033
	LTE Band 7	20M	QPSK	50	50	Right Side	10mm	ON	21100	2535	19.65	20.00	1.084	-0.08	0.026	0.028
23	LTE Band 7	20M	QPSK	1	99	Bottom Side	10mm	ON	20850	2510	19.54	20.00	1.112	-0.05	0.455	0.506
	LTE Band 7	20M	QPSK	50	50	Bottom Side	10mm	ON	21100	2535	19.65	20.00	1.084	-0.12	0.456	0.494

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 12	10M	QPSK	1	0	Front	10mm	OFF	23095	707.5	24.59	25.00	1.099	0.1	0.184	0.202
	LTE Band 12	10M	QPSK	25	0	Front	10mm	OFF	23095	707.5	23.70	24.00	1.072	-0.16	0.149	0.160
24	LTE Band 12	10M	QPSK	1	0	Back	10mm	OFF	23095	707.5	24.59	25.00	1.099	-0.07	0.231	0.254
	LTE Band 12	10M	QPSK	25	0	Back	10mm	OFF	23095	707.5	23.70	24.00	1.072	-0.02	0.187	0.200
	LTE Band 12	10M	QPSK	1	0	Left Side	10mm	OFF	23095	707.5	24.59	25.00	1.099	-0.1	0.178	0.196
	LTE Band 12	10M	QPSK	25	0	Left Side	10mm	OFF	23095	707.5	23.70	24.00	1.072	0	0.138	0.148
	LTE Band 12	10M	QPSK	1	0	Right Side	10mm	OFF	23095	707.5	24.59	25.00	1.099	-0.12	0.107	0.118
	LTE Band 12	10M	QPSK	25	0	Right Side	10mm	OFF	23095	707.5	23.70	24.00	1.072	-0.14	0.084	0.090
	LTE Band 12	10M	QPSK	1	0	Bottom Side	10mm	OFF	23095	707.5	24.59	25.00	1.099	-0.1	0.181	0.199
	LTE Band 12	10M	QPSK	25	0	Bottom Side	10mm	OFF	23095	707.5	23.70	24.00	1.072	-0.12	0.150	0.161
	LTE Band 13_Sub	10M	QPSK	1	49	Front	10mm	OFF	23230	782	24.02	24.50	1.117	-0.13	0.102	0.114
	LTE Band 13_Sub	10M	QPSK	25	0	Front	10mm	OFF	23230	782	22.23	23.50	1.340	-0.05	0.109	0.146
	LTE Band 13_Sub	10M	QPSK	1	49	Back	10mm	OFF	23230	782	24.02	24.50	1.117	-0.16	0.144	0.161
	LTE Band 13_Sub	10M	QPSK	25	0	Back	10mm	OFF	23230	782	22.23	23.50	1.340	-0.15	0.119	0.159
	LTE Band 13_Sub	10M	QPSK	1	49	Left Side	10mm	OFF	23230	782	24.02	24.50	1.117	-0.05	0.140	0.156
	LTE Band 13_Sub	10M	QPSK	25	0	Left Side	10mm	OFF	23230	782	22.23	23.50	1.340	-0.14	0.147	0.197
	LTE Band 13_Sub	10M	QPSK	1	49	Right Side	10mm	OFF	23230	782	24.02	24.50	1.117	-0.11	0.056	0.063
	LTE Band 13_Sub	10M	QPSK	25	0	Right Side	10mm	OFF	23230	782	22.23	23.50	1.340	-0.07	0.063	0.084
	LTE Band 13_Sub	10M	QPSK	1	49	Top Side	10mm	OFF	23230	782	24.02	24.50	1.117	-0.03	0.097	0.108
	LTE Band 13_Sub	10M	QPSK	25	0	Top Side	10mm	OFF	23230	782	22.23	23.50	1.340	-0.02	0.084	0.113
	LTE Band 13	10M	QPSK	1	25	Front	10mm	OFF	23230	782	24.41	25.00	1.146	-0.12	0.125	0.143
	LTE Band 13	10M	QPSK	25	25	Front	10mm	OFF	23230	782	23.55	24.00	1.109	-0.04	0.095	0.105
	LTE Band 13	10M	QPSK	1	25	Back	10mm	OFF	23230	782	24.41	25.00	1.146	0.09	0.154	0.176
	LTE Band 13	10M	QPSK	25	25	Back	10mm	OFF	23230	782	23.55	24.00	1.109	0.01	0.095	0.105
25	LTE Band 13	10M	QPSK	1	25	Left Side	10mm	OFF	23230	782	24.41	25.00	1.146	-0.1	0.305	0.349
	LTE Band 13	10M	QPSK	25	25	Left Side	10mm	OFF	23230	782	23.55	24.00	1.109	-0.07	0.256	0.284
	LTE Band 13	10M	QPSK	1	25	Right Side	10mm	OFF	23230	782	24.41	25.00	1.146	-0.07	0.220	0.252
	LTE Band 13	10M	QPSK	25	25	Right Side	10mm	OFF	23230	782	23.55	24.00	1.109	-0.06	0.087	0.096
	LTE Band 13	10M	QPSK	1	25	Bottom Side	10mm	OFF	23230	782	24.41	25.00	1.146	-0.1	0.171	0.196
	LTE Band 13	10M	QPSK	25	25	Bottom Side	10mm	OFF	23230	782	23.55	24.00	1.109	-0.15	0.141	0.156
	LTE Band 25	20M	QPSK	1	0	Front	10mm	ON	26590	1905	20.72	21.00	1.067	0.16	0.340	0.363
	LTE Band 25	20M	QPSK	50	0	Front	10mm	ON	26590	1905	20.73	21.00	1.064	-0.17	0.357	0.380
	LTE Band 25	20M	QPSK	1	0	Back	10mm	ON	26590	1905	20.72	21.00	1.067	-0.05	0.418	0.446
	LTE Band 25	20M	QPSK	50	0	Back	10mm	ON	26590	1905	20.73	21.00	1.064	-0.05	0.438	0.466
	LTE Band 25	20M	QPSK	1	0	Left Side	10mm	ON	26590	1905	20.72	21.00	1.067	-0.1	0.040	0.043
	LTE Band 25	20M	QPSK	50	0	Left Side	10mm	ON	26590	1905	20.73	21.00	1.064	-0.05	0.042	0.045
	LTE Band 25	20M	QPSK	1	0	Right Side	10mm	ON	26590	1905	20.72	21.00	1.067	-0.1	0.054	0.058
	LTE Band 25	20M	QPSK	50	0	Right Side	10mm	ON	26590	1905	20.73	21.00	1.064	-0.14	0.056	0.060
	LTE Band 25	20M	QPSK	1	0	Bottom Side	10mm	ON	26590	1905	20.72	21.00	1.067	-0.18	0.683	0.728
26	LTE Band 25	20M	QPSK	50	0	Bottom Side	10mm	ON	26590	1905	20.73	21.00	1.064	-0.18	0.724	0.770

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 26_Sub	15M	QPSK	1	0	Front	10mm	OFF	26865	831.5	23.81	24.50	1.172	-0.02	0.172	0.202
	LTE Band 26_Sub	15M	QPSK	36	0	Front	10mm	OFF	26865	831.5	22.95	23.50	1.135	-0.02	0.169	0.192
	LTE Band 26_Sub	15M	QPSK	1	0	Back	10mm	OFF	26865	831.5	23.81	24.50	1.172	0.1	0.216	0.253
	LTE Band 26_Sub	15M	QPSK	36	0	Back	10mm	OFF	26865	831.5	22.95	23.50	1.135	-0.09	0.188	0.213
	LTE Band 26_Sub	15M	QPSK	1	0	Left Side	10mm	OFF	26865	831.5	23.81	24.50	1.172	-0.03	0.150	0.176
	LTE Band 26_Sub	15M	QPSK	36	0	Left Side	10mm	OFF	26865	831.5	22.95	23.50	1.135	-0.06	0.140	0.159
	LTE Band 26_Sub	15M	QPSK	1	0	Right Side	10mm	OFF	26865	831.5	23.81	24.50	1.172	-0.09	0.108	0.127
	LTE Band 26_Sub	15M	QPSK	36	0	Right Side	10mm	OFF	26865	831.5	22.95	23.50	1.135	-0.04	0.095	0.108
	LTE Band 26_Sub	10M	QPSK	1	0	Top Side	10mm	OFF	26865	831.5	23.81	24.50	1.172	-0.1	0.064	0.075
	LTE Band 26_Sub	10M	QPSK	36	0	Top Side	10mm	OFF	26865	831.5	22.95	23.50	1.135	-0.03	0.057	0.065
	LTE Band 26	15M	QPSK	1	0	Front	10mm	OFF	26865	831.5	24.35	25.00	1.161	-0.1	0.206	0.239
	LTE Band 26	15M	QPSK	36	20	Front	10mm	OFF	26865	831.5	23.54	24.00	1.112	-0.13	0.170	0.189
27	LTE Band 26	15M	QPSK	1	0	Back	10mm	OFF	26865	831.5	24.35	25.00	1.161	-0.03	0.243	0.282
	LTE Band 26	15M	QPSK	36	20	Back	10mm	OFF	26865	831.5	23.54	24.00	1.112	-0.02	0.202	0.225
	LTE Band 26	15M	QPSK	1	0	Left Side	10mm	OFF	26865	831.5	24.35	25.00	1.161	-0.04	0.162	0.188
	LTE Band 26	15M	QPSK	36	20	Left Side	10mm	OFF	26865	831.5	23.54	24.00	1.112	-0.03	0.132	0.147
	LTE Band 26	15M	QPSK	1	0	Right Side	10mm	OFF	26865	831.5	24.35	25.00	1.161	-0.09	0.089	0.103
	LTE Band 26	15M	QPSK	36	20	Right Side	10mm	OFF	26865	831.5	23.54	24.00	1.112	-0.12	0.072	0.080
	LTE Band 26	15M	QPSK	1	0	Bottom Side	10mm	OFF	26865	831.5	24.35	25.00	1.161	-0.19	0.222	0.258
	LTE Band 26	15M	QPSK	36	20	Bottom Side	10mm	OFF	26865	831.5	23.54	24.00	1.112	-0.18	0.180	0.200
	LTE Band 66	20M	QPSK	1	0	Front	10mm	ON	132572	1770	20.68	21.00	1.076	0.09	0.400	0.431
	LTE Band 66	20M	QPSK	50	24	Front	10mm	ON	132572	1770	20.74	21.00	1.062	0.13	0.419	0.445
	LTE Band 66	20M	QPSK	1	0	Back	10mm	ON	132572	1770	20.68	21.00	1.076	0.09	0.444	0.478
	LTE Band 66	20M	QPSK	50	24	Back	10mm	ON	132572	1770	20.74	21.00	1.062	0.06	0.459	0.487
	LTE Band 66	20M	QPSK	1	0	Left Side	10mm	ON	132572	1770	20.68	21.00	1.076	-0.09	0.047	0.051
	LTE Band 66	20M	QPSK	50	24	Left Side	10mm	ON	132572	1770	20.74	21.00	1.062	-0.02	0.053	0.056
	LTE Band 66	20M	QPSK	1	0	Right Side	10mm	ON	132572	1770	20.68	21.00	1.076	0.14	0.051	0.055
	LTE Band 66	20M	QPSK	50	24	Right Side	10mm	ON	132572	1770	20.74	21.00	1.062	0.11	0.060	0.064
	LTE Band 66	20M	QPSK	1	0	Bottom Side	10mm	ON	132572	1770	20.68	21.00	1.076	0	0.612	0.659
28	LTE Band 66	20M	QPSK	50	24	Bottom Side	10mm	ON	132572	1770	20.74	21.00	1.062	0.01	0.659	0.700

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	99	Front	10mm	ON	40185	2549.5	19.50	20.20	1.175	62.9	1.006	-0.14	0.111	0.131
	LTE Band 41	20M	QPSK	50	24	Front	10mm	ON	40185	2549.5	19.61	20.20	1.146	62.9	1.006	-0.18	0.115	0.133
	LTE Band 41	20M	QPSK	1	99	Back	10mm	ON	40185	2549.5	19.50	20.20	1.175	62.9	1.006	-0.12	0.126	0.149
	LTE Band 41	20M	QPSK	50	24	Back	10mm	ON	40185	2549.5	19.61	20.20	1.146	62.9	1.006	-0.04	0.134	0.154
	LTE Band 41	20M	QPSK	1	99	Left Side	10mm	ON	40185	2549.5	19.50	20.20	1.175	62.9	1.006	-0.18	0.046	0.054
	LTE Band 41	20M	QPSK	50	24	Left Side	10mm	ON	40185	2549.5	19.61	20.20	1.146	62.9	1.006	-0.13	0.060	0.069
	LTE Band 41	20M	QPSK	1	99	Right Side	10mm	ON	40185	2549.5	19.50	20.20	1.175	62.9	1.006	0.04	0.051	0.060
	LTE Band 41	20M	QPSK	50	24	Right Side	10mm	ON	40185	2549.5	19.61	20.20	1.146	62.9	1.006	-0.01	0.052	0.060
	LTE Band 41	20M	QPSK	1	99	Bottom Side	10mm	ON	40185	2549.5	19.50	20.20	1.175	62.9	1.006	-0.04	0.271	0.320
29	LTE Band 41	20M	QPSK	50	24	Bottom Side	10mm	ON	40185	2549.5	19.61	20.20	1.146	62.9	1.006	-0.1	0.282	0.325

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Chain 0	OFF	6	2437	14.80	15.00	1.047	100	1.000	-0.05	0.077	0.081
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Chain 0	OFF	6	2437	14.80	15.00	1.047	100	1.000	-0.02	0.172	0.180
30	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Chain 0	OFF	6	2437	14.80	15.00	1.047	100	1.000	-0.1	0.233	0.244
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Chain 0	OFF	6	2437	14.80	15.00	1.047	100	1.000	0	0.006	0.006
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Chain 1	OFF	1	2412	10.80	11.00	1.047	100	1.000	0	0.003	0.004
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Chain 1	OFF	1	2412	10.80	11.00	1.047	100	1.000	0.13	0.034	0.036
	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Chain 1	OFF	1	2412	10.80	11.00	1.047	100	1.000	0.1	0.001	0.001
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Chain 1	OFF	1	2412	10.80	11.00	1.047	100	1.000	0.1	0.001	0.001

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Front	10mm	Chain 0	OFF	39	2441	13.91	14.00	1.022	0.04	0.038	0.039
	Bluetooth	1Mbps	Back	10mm	Chain 0	OFF	39	2441	13.91	14.00	1.022	0.07	0.097	0.099
31	Bluetooth	1Mbps	Left Side	10mm	Chain 0	OFF	39	2441	13.91	14.00	1.022	-0.04	0.128	0.131
	Bluetooth	1Mbps	Top Side	10mm	Chain 0	OFF	39	2441	13.91	14.00	1.022	0	0.004	0.004

12.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
32	GSM850	GPRS (4 Tx slots)	Front	15mm	OFF	189	836.4	26.97	27.20	1.054	0	0.113	0.119
	GSM850	GPRS (4 Tx slots)	Back	15mm	OFF	189	836.4	26.97	27.20	1.054	-0.12	0.111	0.117
	GSM1900	EDGE (4 Tx slots)	Front	15mm	ON	661	1880	21.30	22.50	1.318	-0.06	0.073	0.096
33	GSM1900	EDGE (4 Tx slots)	Back	15mm	ON	661	1880	21.30	22.50	1.318	-0.05	0.095	0.125

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II	RMC 12.2Kbps	Front	15mm	ON	9538	1907.6	18.67	18.70	1.007	0.09	0.103	0.104
34	WCDMA II	RMC 12.2Kbps	Back	15mm	ON	9538	1907.6	18.67	18.70	1.007	-0.17	0.138	0.139
	WCDMA IV	RMC 12.2Kbps	Front	15mm	ON	1312	1712.4	18.54	18.70	1.038	0.01	0.100	0.104
35	WCDMA IV	RMC 12.2Kbps	Back	15mm	ON	1312	1712.4	18.54	18.70	1.038	0.03	0.170	0.176
	WCDMA V	RMC 12.2Kbps	Front	15mm	OFF	4233	846.6	24.66	24.70	1.009	-0.17	0.184	0.186
36	WCDMA V	RMC 12.2Kbps	Back	15mm	OFF	4233	846.6	24.66	24.70	1.009	-0.07	0.186	0.188

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 7	20M	QPSK	1	99	Front	15mm	ON	20850	2510	19.54	20.00	1.112	-0.14	0.096	0.107
	LTE Band 7	20M	QPSK	50	50	Front	15mm	ON	21100	2535	19.65	20.00	1.084	-0.07	0.100	0.108
	LTE Band 7	20M	QPSK	1	99	Back	15mm	ON	20850	2510	19.54	20.00	1.112	-0.02	0.103	0.115
37	LTE Band 7	20M	QPSK	50	50	Back	15mm	ON	21100	2535	19.65	20.00	1.084	-0.07	0.108	0.117
38	LTE Band 12	10M	QPSK	1	0	Front	15mm	OFF	23095	707.5	24.59	25.00	1.099	-0.04	0.178	0.196
	LTE Band 12	10M	QPSK	25	0	Front	15mm	OFF	23095	707.5	23.70	24.00	1.072	-0.06	0.142	0.152
	LTE Band 12	10M	QPSK	1	0	Back	15mm	OFF	23095	707.5	24.59	25.00	1.099	-0.08	0.160	0.176
	LTE Band 12	10M	QPSK	25	0	Back	15mm	OFF	23095	707.5	23.70	24.00	1.072	0.1	0.127	0.136
	LTE Band 13_Sub	10M	QPSK	1	49	Front	15mm	OFF	23230	782	24.02	24.50	1.117	-0.05	0.100	0.112
	LTE Band 13_Sub	10M	QPSK	25	0	Front	15mm	OFF	23230	782	22.23	23.50	1.340	-0.03	0.099	0.133
	LTE Band 13_Sub	10M	QPSK	1	49	Back	15mm	OFF	23230	782	24.02	24.50	1.117	-0.04	0.083	0.093
	LTE Band 13_Sub	10M	QPSK	25	0	Back	15mm	OFF	23230	782	22.23	23.50	1.340	-0.04	0.083	0.111
39	LTE Band 13	10M	QPSK	1	25	Front	15mm	OFF	23230	782	24.41	25.00	1.146	-0.01	0.194	0.222
	LTE Band 13	10M	QPSK	25	25	Front	15mm	OFF	23230	782	23.55	24.00	1.109	-0.06	0.162	0.180
	LTE Band 13	10M	QPSK	1	25	Back	15mm	OFF	23230	782	24.41	25.00	1.146	0.17	0.145	0.166
	LTE Band 13	10M	QPSK	25	25	Back	15mm	OFF	23230	782	23.55	24.00	1.109	0.11	0.118	0.131
	LTE Band 25	20M	QPSK	1	0	Front	15mm	ON	26140	1860	22.91	23.50	1.146	-0.13	0.237	0.271
	LTE Band 25	20M	QPSK	50	24	Front	15mm	ON	26140	1860	23.01	23.50	1.119	-0.09	0.253	0.283
	LTE Band 25	20M	QPSK	1	0	Back	15mm	ON	26140	1860	22.91	23.50	1.146	-0.07	0.339	0.388
40	LTE Band 25	20M	QPSK	50	24	Back	15mm	ON	26140	1860	23.01	23.50	1.119	-0.05	0.357	0.400
41	LTE Band 26_Sub	15M	QPSK	1	0	Front	15mm	OFF	26865	831.5	23.81	24.50	1.172	-0.05	0.166	0.195
	LTE Band 26_Sub	15M	QPSK	36	0	Front	15mm	OFF	26865	831.5	22.95	23.50	1.135	-0.1	0.140	0.159
	LTE Band 26_Sub	15M	QPSK	1	0	Back	15mm	OFF	26865	831.5	23.81	24.50	1.172	-0.14	0.144	0.169
	LTE Band 26_Sub	15M	QPSK	36	0	Back	15mm	OFF	26865	831.5	22.95	23.50	1.135	0	0.125	0.142
	LTE Band 26	15M	QPSK	1	0	Front	15mm	OFF	26865	831.5	24.35	25.00	1.161	-0.06	0.107	0.124
	LTE Band 26	15M	QPSK	36	20	Front	15mm	OFF	26865	831.5	23.54	24.00	1.112	-0.11	0.090	0.100
	LTE Band 26	15M	QPSK	1	0	Back	15mm	OFF	26865	831.5	24.35	25.00	1.161	-0.09	0.128	0.149
	LTE Band 26	15M	QPSK	36	20	Back	15mm	OFF	26865	831.5	23.54	24.00	1.112	-0.06	0.106	0.118
	LTE Band 66	20M	QPSK	1	0	Front	15mm	ON	132322	1745	22.62	23.00	1.091	-0.09	0.338	0.369
	LTE Band 66	20M	QPSK	50	24	Front	15mm	ON	132072	1720	22.63	23.00	1.089	0.03	0.326	0.355
42	LTE Band 66	20M	QPSK	1	0	Back	15mm	ON	132322	1745	22.62	23.00	1.091	0	0.442	0.482
	LTE Band 66	20M	QPSK	50	24	Back	15mm	ON	132072	1720	22.63	23.00	1.089	0.06	0.428	0.466

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41	20M	QPSK	1	99	Front	15mm	ON	40185	2549.5	19.50	20.20	1.175	62.9	1.006	-0.11	0.062	0.073
43	LTE Band 41	20M	QPSK	50	24	Front	15mm	ON	40185	2549.5	19.61	20.20	1.146	62.9	1.006	-0.08	0.066	0.076
	LTE Band 41	20M	QPSK	1	99	Back	15mm	ON	40185	2549.5	19.50	20.20	1.175	62.9	1.006	-0.06	0.061	0.072
	LTE Band 41	20M	QPSK	50	24	Back	15mm	ON	40185	2549.5	19.61	20.20	1.146	62.9	1.006	-0.05	0.063	0.073

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Chain 0	OFF	6	2437	14.80	15.00	1.047	100	1.000	0.14	0.027	0.028
44	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Chain 0	OFF	6	2437	14.80	15.00	1.047	100	1.000	0.04	0.073	0.076
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Chain 1	OFF	1	2412	10.80	11.00	1.047	100	1.000	0.1	0.001	0.001
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Chain 1	OFF	1	2412	10.80	11.00	1.047	100	1.000	0.1	0.008	0.008
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Chain 0	ON	6	2437	12.70	13.00	1.072	100	1.000	0.12	0.009	0.010
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Chain 0	ON	6	2437	12.70	13.00	1.072	100	1.000	0.11	0.033	0.035
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Chain 1	ON	1	2412	10.80	11.00	1.047	100	1.000	0.1	0.001	0.001
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Chain 1	ON	1	2412	10.80	11.00	1.047	100	1.000	0.1	0.008	0.008
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 0	OFF	58	5290	10.80	11.50	1.175	98.58	1.014	0.13	0.005	0.006
45	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 0	OFF	58	5290	10.80	11.50	1.175	98.58	1.014	0.05	0.031	0.037
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 1	OFF	58	5290	11.50	11.50	1.000	98.58	1.014	0.01	0.018	0.018
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 1	OFF	58	5290	11.50	11.50	1.000	98.58	1.014	0	0.014	0.014
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 0	ON	58	5290	9.30	9.50	1.047	98.58	1.014	-0.07	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 0	ON	58	5290	9.30	9.50	1.047	98.58	1.014	0.01	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 1	ON	58	5290	9.50	9.50	1.000	98.58	1.014	0.13	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 1	ON	58	5290	9.50	9.50	1.000	98.58	1.014	0.03	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 0	OFF	138	5690	11.20	11.50	1.072	98.58	1.014	0.12	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 0	OFF	138	5690	11.20	11.50	1.072	98.58	1.014	0.16	0.019	0.021
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 1	OFF	122	5610	11.30	11.50	1.047	98.58	1.014	0.12	0.001	0.001
46	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 1	OFF	122	5610	11.30	11.50	1.047	98.58	1.014	-0.09	0.025	0.027
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 0	ON	106	5530	9.30	9.50	1.047	98.58	1.014	-0.01	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 0	ON	106	5530	9.30	9.50	1.047	98.58	1.014	-0.16	0.006	0.006
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 1	ON	106	5530	9.30	9.50	1.047	98.58	1.014	-0.01	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 1	ON	106	5530	9.30	9.50	1.047	98.58	1.014	-0.17	0.024	0.025
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 0	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0	0.002	0.002
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 0	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	-0.17	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 1	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.06	0.016	0.017
47	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 1	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.03	0.029	0.032
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 0	ON	155	5775	9.20	9.50	1.072	98.58	1.014	0.18	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 0	ON	155	5775	9.20	9.50	1.072	98.58	1.014	0.01	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Chain 1	ON	155	5775	9.30	9.50	1.047	98.58	1.014	0	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Chain 1	ON	155	5775	9.30	9.50	1.047	98.58	1.014	0.04	0.016	0.017

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Front	15mm	Chain 0	OFF	39	2441	13.91	14.00	1.022	0.18	0.014	0.014
48	Bluetooth	1Mbps	Back	15mm	Chain 0	OFF	39	2441	13.91	14.00	1.022	0.12	0.039	0.040

12.4 Product Specific SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
49	WCDMA II	RMC 12.2Kbps	Bottom Side	0mm	ON	9538	1907.6	18.67	18.70	1.007	-0.01	0.512	0.516
50	WCDMA IV	RMC 12.2Kbps	Bottom Side	0mm	ON	1312	1712.4	18.54	18.70	1.038	-0.1	0.816	0.847

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
51	LTE Band 7	20M	QPSK	1	99	Bottom Side	0mm	ON	20850	2510	19.54	20.00	1.112	0.18	1.070	1.190
52	LTE Band 25	20M	QPSK	1	0	Bottom Side	0mm	ON	26140	1860	22.91	23.50	1.146	-0.16	1.980	2.268
	LTE Band 25	20M	QPSK	1	0	Bottom Side	0mm	ON	26340	1880	22.89	23.50	1.151	-0.16	1.970	2.267
	LTE Band 25	20M	QPSK	1	0	Bottom Side	0mm	ON	26590	1905	22.79	23.50	1.178	-0.14	1.710	2.014
	LTE Band 66	20M	QPSK	1	0	Back	0mm	ON	132322	1745	22.62	23.00	1.091	0.12	2.000	2.183
	LTE Band 66	20M	QPSK	1	0	Back	0mm	ON	132072	1720	22.56	23.00	1.107	0.17	1.490	1.649
53	LTE Band 66	20M	QPSK	1	0	Back	0mm	ON	132572	1770	22.50	23.00	1.122	0.11	2.030	2.278
	LTE Band 66	20M	QPSK	1	0	Bottom Side	0mm	ON	132322	1745	22.62	23.00	1.091	-0.14	1.680	1.834

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Chain 0	OFF	58	5290	10.80	11.50	1.175	98.58	1.014	-0.11	0.121	0.144
54	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Chain 0	OFF	58	5290	10.80	11.50	1.175	98.58	1.014	0.14	0.315	0.375
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 0	OFF	58	5290	10.80	11.50	1.175	98.58	1.014	0.18	0.147	0.175
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 0	OFF	58	5290	10.80	11.50	1.175	98.58	1.014	0.04	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Chain 1	OFF	58	5290	11.50	11.50	1.000	98.58	1.014	-0.13	0.222	0.225
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Chain 1	OFF	58	5290	11.50	11.50	1.000	98.58	1.014	-0.12	0.142	0.144
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 1	OFF	58	5290	11.50	11.50	1.000	98.58	1.014	0.12	0.016	0.016
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 1	OFF	58	5290	11.50	11.50	1.000	98.58	1.014	0.1	0.054	0.055
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Chain 0	ON	58	5290	9.30	9.50	1.047	98.58	1.014	0.1	0.060	0.064
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Chain 0	ON	58	5290	9.30	9.50	1.047	98.58	1.014	0	0.151	0.160
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 0	ON	58	5290	9.30	9.50	1.047	98.58	1.014	0.15	0.074	0.079
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 0	ON	58	5290	9.30	9.50	1.047	98.58	1.014	0.13	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Chain 1	ON	58	5290	9.50	9.50	1.000	98.58	1.014	0.19	0.104	0.105
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Chain 1	ON	58	5290	9.50	9.50	1.000	98.58	1.014	-0.17	0.067	0.068
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 1	ON	58	5290	9.50	9.50	1.000	98.58	1.014	0.01	0.008	0.008
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 1	ON	58	5290	9.50	9.50	1.000	98.58	1.014	-0.18	0.031	0.031

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Chain 0	OFF	138	5690	11.20	11.50	1.072	98.58	1.014	-0.07	0.067	0.073
55	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Chain 0	OFF	138	5690	11.20	11.50	1.072	98.58	1.014	0.15	0.188	0.204
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 0	OFF	138	5690	11.20	11.50	1.072	98.58	1.014	-0.1	0.085	0.092
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 0	OFF	138	5690	11.20	11.50	1.072	98.58	1.014	0.11	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Chain 1	OFF	122	5610	11.30	11.50	1.047	98.58	1.014	0.07	0.172	0.183
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Chain 1	OFF	122	5610	11.30	11.50	1.047	98.58	1.014	-0.12	0.166	0.176
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 1	OFF	122	5610	11.30	11.50	1.047	98.58	1.014	-0.1	0.039	0.041
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 1	OFF	122	5610	11.30	11.50	1.047	98.58	1.014	-0.15	0.035	0.037
	WLAN5GHz-	802.11ac-VHT80 MCS0	Front	0mm	Chain 0	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.16	0.052	0.055
	WLAN5GHz-	802.11ac-VHT80 MCS0	Back	0mm	Chain 0	ON	106	5530	9.30	9.50	1.047	98.58	1.014	-0.01	0.145	0.154
	WLAN5GHz-	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 0	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.03	0.064	0.068
	WLAN5GHz-	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 0	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.001	0.001	0.001
	WLAN5GHz-	802.11ac-VHT80 MCS0	Front	0mm	Chain 1	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.15	0.105	0.111
	WLAN5GHz-	802.11ac-VHT80 MCS0	Back	0mm	Chain 1	ON	106	5530	9.30	9.50	1.047	98.58	1.014	-0.13	0.120	0.127
	WLAN5GHz-	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 1	ON	106	5530	9.30	9.50	1.047	98.58	1.014	0.01	0.001	0.001
	WLAN5GHz-	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 1	ON	106	5530	9.30	9.50	1.047	98.58	1.014	-0.15	0.026	0.028
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Chain 0	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	-0.06	0.049	0.053
56	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Chain 0	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	-0.19	0.178	0.193
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 0	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	-0.14	0.067	0.073
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 0	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0	0.001	0.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Chain 1	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.07	0.104	0.113
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Chain 1	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.11	0.105	0.114
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 1	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.15	0.086	0.093
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 1	OFF	155	5775	11.20	11.50	1.072	98.58	1.014	0.18	0.003	0.004
	WLAN5GHz-	802.11ac-VHT80 MCS0	Front	0mm	Chain 0	ON	155	5775	9.20	9.50	1.072	98.58	1.014	0.1	0.045	0.049
	WLAN5GHz-	802.11ac-VHT80 MCS0	Back	0mm	Chain 0	ON	155	5775	9.20	9.50	1.072	98.58	1.014	-0.17	0.122	0.133
	WLAN5GHz-	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 0	ON	155	5775	9.20	9.50	1.072	98.58	1.014	0.11	0.051	0.055
	WLAN5GHz-	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 0	ON	155	5775	9.20	9.50	1.072	98.58	1.014	0	0.001	0.001
	WLAN5GHz-	802.11ac-VHT80 MCS0	Front	0mm	Chain 1	ON	155	5775	9.30	9.50	1.047	98.58	1.014	0.05	0.040	0.042
	WLAN5GHz-	802.11ac-VHT80 MCS0	Back	0mm	Chain 1	ON	155	5775	9.30	9.50	1.047	98.58	1.014	-0.15	0.071	0.075
	WLAN5GHz-	802.11ac-VHT80 MCS0	Left Side	0mm	Chain 1	ON	155	5775	9.30	9.50	1.047	98.58	1.014	0.12	0.072	0.076
	WLAN5GHz-	802.11ac-VHT80 MCS0	Top Side	0mm	Chain 1	ON	155	5775	9.30	9.50	1.047	98.58	1.014	-0.02	0.013	0.014

12.5 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	LTE Band 66	20M	QPSK	1	0	Back	0mm	ON	132572	1770	22.50	23.00	1.122	0.11	2.030	-	2.278
2nd	LTE Band 66	20M	QPSK	1	0	Back	0mm	ON	132572	1770	22.50	23.00	1.122	0.06	1.960	1.04	2.199

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The ratio is the difference in percentage between original and repeated *measured SAR*.
5. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

13. Simultaneous Transmission Analysis

Case	Cellular	WLAN Chain0 / BT	WLAN Chain1
1	GSM/GPRS/EDGE	BT/BLE	(None)
2	GSM/GPRS/EDGE	WLAN 2.4G	WLAN 2.4G
3	GSM/GPRS/EDGE	WLAN 5G	WLAN 5G
4	GSM/GPRS/EDGE	WLAN 2.4G / 5G	WLAN 2.4G / 5G
5	UMTS/HSPA	BT/BLE	(None)
6	UMTS/HSPA	WLAN 2.4G	WLAN 2.4G
7	UMTS/HSPA	WLAN 5G	WLAN 5G
8	UMTS/HSPA	WLAN 2.4G / 5G	WLAN 2.4G / 5G
9	LTE	BT/BLE	(None)
10	LTE	WLAN 2.4G	WLAN 2.4G
11	LTE	WLAN 5G	WLAN 5G
12	LTE	WLAN 2.4G / 5G	WLAN 2.4G / 5G
13	None	BT/BLE WLAN 5G	WLAN 5G
14	GSM/GPRS/EDGE	BT/BLE WLAN 5G	WLAN 5G
15	UMTS/HSPA	BT/BLE WLAN 5G	WLAN 5G
16	LTE	BT/BLE WLAN 5G	WLAN 5G

General Note:

1. This device WLAN 2.4GHz supports Hotspot operation and Bluetooth support tethering applications.
2. 2.4GHz WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. All licensed modes share the same antenna part and cannot transmit simultaneously
4. The Scaled SAR summation is calculated based on the same configuration and test position.
5. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

13.1 Head Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN Chain 0 1g SAR (W/kg)	3 2.4GHz WLAN Chain 1 1g SAR (W/kg)	4 5GHz WLAN Chain 0 1g SAR (W/kg)	5 5GHz WLAN Chain 1 1g SAR (W/kg)	6 Bluetooth Chain 0 1g SAR (W/kg)	1+2+3 Summed 1g SAR (W/kg)	1+4+5 Summed 1g SAR (W/kg)	1+4+5+6 Summed 1g SAR (W/kg)
GSM	GSM850	Right Cheek	0.148	0.407	0.096	0.179	0.343	0.216	**0.651**	**0.670**	**0.886**
		Right Tilted	0.034	0.064	0.067	0.024	0.247	0.027	**0.165**	**0.305**	**0.332**
		Left Cheek	0.213	0.111	0.026	0.030	0.171	0.093	**0.350**	**0.414**	**0.507**
		Left Tilted	0.071	0.015	0.020	0.001	0.135	0.012	**0.106**	**0.207**	**0.219**
	GSM1900	Right Cheek	0.024	0.407	0.096	0.179	0.343	0.216	**0.527**	**0.546**	**0.762**
		Right Tilted	0.016	0.064	0.067	0.024	0.247	0.027	**0.147**	**0.287**	**0.314**
		Left Cheek	0.013	0.111	0.026	0.030	0.171	0.093	**0.150**	**0.214**	**0.307**
		Left Tilted	0.010	0.015	0.020	0.001	0.135	0.012	**0.045**	**0.146**	**0.158**
WCDMA	WCDMA II	Right Cheek	0.067	0.407	0.096	0.179	0.343	0.216	**0.570**	**0.589**	**0.805**
		Right Tilted	0.034	0.064	0.067	0.024	0.247	0.027	**0.165**	**0.305**	**0.332**
		Left Cheek	0.053	0.111	0.026	0.030	0.171	0.093	**0.190**	**0.254**	**0.347**
		Left Tilted	0.021	0.015	0.020	0.001	0.135	0.012	**0.056**	**0.157**	**0.169**
	WCDMA IV	Right Cheek	0.044	0.407	0.096	0.179	0.343	0.216	**0.547**	**0.566**	**0.782**
		Right Tilted	0.009	0.064	0.067	0.024	0.247	0.027	**0.140**	**0.280**	**0.307**
		Left Cheek	0.001	0.111	0.026	0.030	0.171	0.093	**0.138**	**0.202**	**0.295**
		Left Tilted	0.018	0.015	0.020	0.001	0.135	0.012	**0.053**	**0.154**	**0.166**
	WCDMA V	Right Cheek	0.151	0.407	0.096	0.179	0.343	0.216	**0.654**	**0.673**	**0.889**
		Right Tilted	0.080	0.064	0.067	0.024	0.247	0.027	**0.211**	**0.351**	**0.378**
		Left Cheek	0.197	0.111	0.026	0.030	0.171	0.093	**0.334**	**0.398**	**0.491**
		Left Tilted	0.080	0.015	0.020	0.001	0.135	0.012	**0.115**	**0.216**	**0.228**
LTE	LTE Band 7	Right Cheek	0.062	0.407	0.096	0.179	0.343	0.216	**0.565**	**0.584**	**0.800**
		Right Tilted	0.050	0.064	0.067	0.024	0.247	0.027	**0.181**	**0.321**	**0.348**
		Left Cheek	0.097	0.111	0.026	0.030	0.171	0.093	**0.234**	**0.298**	**0.391**
		Left Tilted	0.033	0.015	0.020	0.001	0.135	0.012	**0.068**	**0.169**	**0.181**
	LTE Band 12	Right Cheek	0.118	0.407	0.096	0.179	0.343	0.216	**0.621**	**0.640**	**0.856**
		Right Tilted	0.041	0.064	0.067	0.024	0.247	0.027	**0.172**	**0.312**	**0.339**
		Left Cheek	0.154	0.111	0.026	0.030	0.171	0.093	**0.291**	**0.355**	**0.448**
		Left Tilted	0.055	0.015	0.020	0.001	0.135	0.012	**0.090**	**0.191**	**0.203**
	LTE Band 13	Right Cheek	0.152	0.407	0.096	0.179	0.343	0.216	**0.655**	**0.674**	**0.890**
		Right Tilted	0.071	0.064	0.067	0.024	0.247	0.027	**0.202**	**0.342**	**0.369**
		Left Cheek	0.189	0.111	0.026	0.030	0.171	0.093	**0.326**	**0.390**	**0.483**
		Left Tilted	0.078	0.015	0.020	0.001	0.135	0.012	**0.113**	**0.214**	**0.226**
	LTE Band 25	Right Cheek	0.092	0.407	0.096	0.179	0.343	0.216	**0.595**	**0.614**	**0.830**
		Right Tilted	0.074	0.064	0.067	0.024	0.247	0.027	**0.205**	**0.345**	**0.372**
		Left Cheek	0.054	0.111	0.026	0.030	0.171	0.093	**0.191**	**0.255**	**0.348**
		Left Tilted	0.076	0.015	0.020	0.001	0.135	0.012	**0.111**	**0.212**	**0.224**
	LTE Band 26	Right Cheek	0.149	0.407	0.096	0.179	0.343	0.216	**0.652**	**0.671**	**0.887**
		Right Tilted	0.046	0.064	0.067	0.024	0.247	0.027	**0.177**	**0.317**	**0.344**
		Left Cheek	0.178	0.111	0.026	0.030	0.171	0.093	**0.315**	**0.379**	**0.472**
		Left Tilted	0.027	0.015	0.020	0.001	0.135	0.012	**0.062**	**0.163**	**0.175**
	LTE Band 41	Right Cheek	0.048	0.407	0.096	0.179	0.343	0.216	**0.551**	**0.570**	**0.786**
		Right Tilted	0.033	0.064	0.067	0.024	0.247	0.027	**0.164**	**0.304**	**0.331**
		Left Cheek	0.085	0.111	0.026	0.030	0.171	0.093	**0.222**	**0.286**	**0.379**
		Left Tilted	0.021	0.015	0.020	0.001	0.135	0.012	**0.056**	**0.157**	**0.169**
	LTE Band 66	Right Cheek	0.053	0.407	0.096	0.179	0.343	0.216	**0.556**	**0.575**	**0.791**
		Right Tilted	0.038	0.064	0.067	0.024	0.247	0.027	**0.169**	**0.309**	**0.336**
		Left Cheek	0.052	0.111	0.026	0.030	0.171	0.093	**0.189**	**0.253**	**0.346**
		Left Tilted	0.033	0.015	0.020	0.001	0.135	0.012	**0.068**	**0.169**	**0.181**

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN Chain 0 1g SAR (W/kg)	3 2.4GHz WLAN Chain 1 1g SAR (W/kg)	4 5GHz WLAN Chain 0 1g SAR (W/kg)	5 5GHz WLAN Chain 1 1g SAR (W/kg)	1+2+3+4+5 Summed 1g SAR (W/kg)
GSM	GSM850	Right Cheek	0.148	0.229	0.096	0.090	0.219	**0.782**
		Right Tilted	0.034	0.032	0.067	0.008	0.154	**0.295**
		Left Cheek	0.213	0.099	0.026	0.033	0.117	**0.488**
		Left Tilted	0.071	0.014	0.020	0.001	0.083	**0.189**
	GSM1900	Right Cheek	0.024	0.229	0.096	0.090	0.219	**0.658**
		Right Tilted	0.016	0.032	0.067	0.008	0.154	**0.277**
		Left Cheek	0.013	0.099	0.026	0.033	0.117	**0.288**
		Left Tilted	0.010	0.014	0.020	0.001	0.083	**0.128**
WCDMA	WCDMA II	Right Cheek	0.067	0.229	0.096	0.090	0.219	**0.701**
		Right Tilted	0.034	0.032	0.067	0.008	0.154	**0.295**
		Left Cheek	0.053	0.099	0.026	0.033	0.117	**0.328**
		Left Tilted	0.021	0.014	0.020	0.001	0.083	**0.139**
	WCDMA IV	Right Cheek	0.044	0.229	0.096	0.090	0.219	**0.678**
		Right Tilted	0.009	0.032	0.067	0.008	0.154	**0.270**
		Left Cheek	0.001	0.099	0.026	0.033	0.117	**0.276**
		Left Tilted	0.018	0.014	0.020	0.001	0.083	**0.136**
	WCDMA V	Right Cheek	0.151	0.229	0.096	0.090	0.219	**0.785**
		Right Tilted	0.080	0.032	0.067	0.008	0.154	**0.341**
		Left Cheek	0.197	0.099	0.026	0.033	0.117	**0.472**
		Left Tilted	0.080	0.014	0.020	0.001	0.083	**0.198**
LTE	LTE Band 7	Right Cheek	0.062	0.229	0.096	0.090	0.219	**0.696**
		Right Tilted	0.050	0.032	0.067	0.008	0.154	**0.311**
		Left Cheek	0.097	0.099	0.026	0.033	0.117	**0.372**
		Left Tilted	0.033	0.014	0.020	0.001	0.083	**0.151**
	LTE Band 12	Right Cheek	0.118	0.229	0.096	0.090	0.219	**0.752**
		Right Tilted	0.041	0.032	0.067	0.008	0.154	**0.302**
		Left Cheek	0.154	0.099	0.026	0.033	0.117	**0.429**
		Left Tilted	0.055	0.014	0.020	0.001	0.083	**0.173**
	LTE Band 13	Right Cheek	0.152	0.229	0.096	0.090	0.219	**0.786**
		Right Tilted	0.071	0.032	0.067	0.008	0.154	**0.332**
		Left Cheek	0.189	0.099	0.026	0.033	0.117	**0.464**
		Left Tilted	0.078	0.014	0.020	0.001	0.083	**0.196**
	LTE Band 25	Right Cheek	0.092	0.229	0.096	0.090	0.219	**0.726**
		Right Tilted	0.074	0.032	0.067	0.008	0.154	**0.335**
		Left Cheek	0.054	0.099	0.026	0.033	0.117	**0.329**
		Left Tilted	0.076	0.014	0.020	0.001	0.083	**0.194**
	LTE Band 26	Right Cheek	0.149	0.229	0.096	0.090	0.219	**0.783**
		Right Tilted	0.046	0.032	0.067	0.008	0.154	**0.307**
		Left Cheek	0.178	0.099	0.026	0.033	0.117	**0.453**
		Left Tilted	0.027	0.014	0.020	0.001	0.083	**0.145**
	LTE Band 41	Right Cheek	0.048	0.229	0.096	0.090	0.219	**0.682**
		Right Tilted	0.033	0.032	0.067	0.008	0.154	**0.294**
		Left Cheek	0.085	0.099	0.026	0.033	0.117	**0.360**
		Left Tilted	0.021	0.014	0.020	0.001	0.083	**0.139**
	LTE Band 66	Right Cheek	0.053	0.229	0.096	0.090	0.219	**0.687**
		Right Tilted	0.038	0.032	0.067	0.008	0.154	**0.299**
		Left Cheek	0.052	0.099	0.026	0.033	0.117	**0.327**
		Left Tilted	0.033	0.014	0.020	0.001	0.083	**0.151**

13.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN Chain 0 1g SAR (W/kg)	3 2.4GHz WLAN Chain 1 1g SAR (W/kg)	6 Bluetooth Chain 0 1g SAR (W/kg)	1+2+3 Summed 1g SAR (W/kg)	1+6 Summed 1g SAR (W/kg)
GSM	GSM850	Front	0.180	0.081	0.004	0.039	**0.265**	**0.219**
		Back	0.226	0.180	0.036	0.099	**0.442**	**0.325**
		Left side	0.185	0.244	0.001	0.131	**0.430**	**0.316**
		Right side	0.089				**0.089**	**0.089**
		Top side		0.006	0.001	0.004	**0.007**	**0.004**
		Bottom side	0.191				**0.191**	**0.191**
	GSM1900	Front	0.198	0.081	0.004	0.039	**0.283**	**0.237**
		Back	0.254	0.180	0.036	0.099	**0.470**	**0.353**
		Left side	0.025	0.244	0.001	0.131	**0.270**	**0.156**
		Right side	0.024				**0.024**	**0.024**
		Top side		0.006	0.001	0.004	**0.007**	**0.004**
		Bottom side	0.374				**0.374**	**0.374**
WCDMA	WCDMA II	Front	0.221	0.081	0.004	0.039	**0.306**	**0.260**
		Back	0.256	0.180	0.036	0.099	**0.472**	**0.355**
		Left side	0.018	0.244	0.001	0.131	**0.263**	**0.149**
		Right side	0.028				**0.028**	**0.028**
		Top side		0.006	0.001	0.004	**0.007**	**0.004**
		Bottom side	0.420				**0.420**	**0.420**
	WCDMA IV	Front	0.240	0.081	0.004	0.039	**0.325**	**0.279**
		Back	0.311	0.180	0.036	0.099	**0.527**	**0.410**
		Left side	0.018	0.244	0.001	0.131	**0.263**	**0.149**
		Right side	0.037				**0.037**	**0.037**
		Top side		0.006	0.001	0.004	**0.007**	**0.004**
		Bottom side	0.412				**0.412**	**0.412**
	WCDMA V	Front	0.193	0.081	0.004	0.039	**0.278**	**0.232**
		Back	0.232	0.180	0.036	0.099	**0.448**	**0.331**
		Left side	0.324	0.244	0.001	0.131	**0.569**	**0.455**
		Right side	0.111				**0.111**	**0.111**
		Top side		0.006	0.001	0.004	**0.007**	**0.004**
		Bottom side	0.192				**0.192**	**0.192**

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN Chain 0 1g SAR (W/kg)	3 2.4GHz WLAN Chain 1 1g SAR (W/kg)	6 Bluetooth Chain 0 1g SAR (W/kg)	1+2+3 Summed 1g SAR (W/kg)	1+6 Summed 1g SAR (W/kg)
LTE	LTE Band 7	Front	0.228	0.081	0.004	0.039	**0.313**	**0.267**
		Back	0.248	0.180	0.036	0.099	**0.464**	**0.347**
		Left side	0.083	0.244	0.001	0.131	**0.328**	**0.214**
		Right side	0.033				**0.033**	**0.033**
		Top side		0.006	0.001	0.004	**0.007**	**0.004**
		Bottom side	0.506				**0.506**	**0.506**
	LTE Band 12	Front	0.202	0.081	0.004	0.039	**0.287**	**0.241**
		Back	0.254	0.180	0.036	0.099	**0.470**	**0.353**
		Left side	0.196	0.244	0.001	0.131	**0.441**	**0.327**
		Right side	0.118				**0.118**	**0.118**
		Top side		0.006	0.001	0.004	**0.007**	**0.004**
		Bottom side	0.199				**0.199**	**0.199**
	LTE Band 13	Front	0.146	0.081	0.004	0.039	**0.231**	**0.185**
		Back	0.176	0.180	0.036	0.099	**0.392**	**0.275**
		Left side	0.349	0.244	0.001	0.131	**0.594**	**0.480**
		Right side	0.252				**0.252**	**0.252**
		Top side	0.113	0.006	0.001	0.004	**0.120**	**0.117**
		Bottom side	0.196				**0.196**	**0.196**
	LTE Band 25	Front	0.380	0.081	0.004	0.039	**0.465**	**0.419**
		Back	0.466	0.180	0.036	0.099	**0.682**	**0.565**
		Left side	0.045	0.244	0.001	0.131	**0.290**	**0.176**
		Right side	0.060				**0.060**	**0.060**
		Top side		0.006	0.001	0.004	**0.007**	**0.004**
		Bottom side	0.770				**0.770**	**0.770**
	LTE Band 26	Front	0.239	0.081	0.004	0.039	**0.324**	**0.278**
		Back	0.282	0.180	0.036	0.099	**0.498**	**0.381**
		Left side	0.188	0.244	0.001	0.131	**0.433**	**0.319**
		Right side	0.127				**0.127**	**0.127**
		Top side	0.075	0.006	0.001	0.004	**0.082**	**0.079**
		Bottom side	0.258				**0.258**	**0.258**
	LTE Band 41	Front	0.133	0.081	0.004	0.039	**0.218**	**0.172**
		Back	0.154	0.180	0.036	0.099	**0.370**	**0.253**
		Left side	0.069	0.244	0.001	0.131	**0.314**	**0.200**
		Right side	0.060				**0.060**	**0.060**
		Top side		0.006	0.001	0.004	**0.007**	**0.004**
		Bottom side	0.325				**0.325**	**0.325**
	LTE Band 66	Front	0.445	0.081	0.004	0.039	**0.530**	**0.484**
		Back	0.487	0.180	0.036	0.099	**0.703**	**0.586**
		Left side	0.056	0.244	0.001	0.131	**0.301**	**0.187**
		Right side	0.064				**0.064**	**0.064**
		Top side		0.006	0.001	0.004	**0.007**	**0.004**
		Bottom side	0.700				**0.700**	**0.700**

13.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN Chain 0 1g SAR (W/kg)	3 2.4GHz WLAN Chain 1 1g SAR (W/kg)	4 5GHz WLAN Chain 0 1g SAR (W/kg)	5 5GHz WLAN Chain 1 1g SAR (W/kg)	6 Bluetooth Chain 0 1g SAR (W/kg)	1+2+3 Summed 1g SAR (W/kg)	1+4+5 Summed 1g SAR (W/kg)	1+4+5+6 Summed 1g SAR (W/kg)
GSM	GSM850	Front	0.119	0.028	0.001	0.006	0.018	0.014	**0.148**	**0.143**	**0.157**
		Back	0.117	0.076	0.008	0.037	0.032	0.040	**0.201**	**0.186**	**0.226**
	GSM1900	Front	0.096	0.028	0.001	0.006	0.018	0.014	**0.125**	**0.120**	**0.134**
		Back	0.125	0.076	0.008	0.037	0.032	0.040	**0.209**	**0.194**	**0.234**
WCDMA	WCDMA II	Front	0.104	0.028	0.001	0.006	0.018	0.014	**0.133**	**0.128**	**0.142**
		Back	0.139	0.076	0.008	0.037	0.032	0.040	**0.223**	**0.208**	**0.248**
	WCDMA IV	Front	0.104	0.028	0.001	0.006	0.018	0.014	**0.133**	**0.128**	**0.142**
		Back	0.176	0.076	0.008	0.037	0.032	0.040	**0.260**	**0.245**	**0.285**
	WCDMA V	Front	0.186	0.028	0.001	0.006	0.018	0.014	**0.215**	**0.210**	**0.224**
		Back	0.188	0.076	0.008	0.037	0.032	0.040	**0.272**	**0.257**	**0.297**
LTE	LTE Band 7	Front	0.108	0.028	0.001	0.006	0.018	0.014	**0.137**	**0.132**	**0.146**
		Back	0.117	0.076	0.008	0.037	0.032	0.040	**0.201**	**0.186**	**0.226**
	LTE Band 12	Front	0.196	0.028	0.001	0.006	0.018	0.014	**0.225**	**0.220**	**0.234**
		Back	0.176	0.076	0.008	0.037	0.032	0.040	**0.260**	**0.245**	**0.285**
	LTE Band 13	Front	0.222	0.028	0.001	0.006	0.018	0.014	**0.251**	**0.246**	**0.260**
		Back	0.166	0.076	0.008	0.037	0.032	0.040	**0.250**	**0.235**	**0.275**
	LTE Band 25	Front	0.283	0.028	0.001	0.006	0.018	0.014	**0.312**	**0.307**	**0.321**
		Back	0.400	0.076	0.008	0.037	0.032	0.040	**0.484**	**0.469**	**0.509**
	LTE Band 26	Front	0.195	0.028	0.001	0.006	0.018	0.014	**0.224**	**0.219**	**0.233**
		Back	0.169	0.076	0.008	0.037	0.032	0.040	**0.253**	**0.238**	**0.278**
	LTE Band 41	Front	0.076	0.028	0.001	0.006	0.018	0.014	**0.105**	**0.100**	**0.114**
		Back	0.073	0.076	0.008	0.037	0.032	0.040	**0.157**	**0.142**	**0.182**
	LTE Band 66	Front	0.369	0.028	0.001	0.006	0.018	0.014	**0.398**	**0.393**	**0.407**
		Back	0.482	0.076	0.008	0.037	0.032	0.040	**0.566**	**0.551**	**0.591**

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN Chain 0 1g SAR (W/kg)	3 2.4GHz WLAN Chain 1 1g SAR (W/kg)	4 5GHz WLAN Chain 0 1g SAR (W/kg)	5 5GHz WLAN Chain 1 1g SAR (W/kg)	**1+2+3+4+5 Summed 1g SAR (W/kg)**
GSM	GSM850	Front	0.119	0.010	0.001	0.001	0.001	**0.132**
		Back	0.117	0.035	0.008	0.006	0.025	**0.191**
	GSM1900	Front	0.096	0.010	0.001	0.001	0.001	**0.109**
		Back	0.125	0.035	0.008	0.006	0.025	**0.199**
WCDMA	WCDMA II	Front	0.104	0.010	0.001	0.001	0.001	**0.117**
		Back	0.139	0.035	0.008	0.006	0.025	**0.213**
	WCDMA IV	Front	0.104	0.010	0.001	0.001	0.001	**0.117**
		Back	0.176	0.035	0.008	0.006	0.025	**0.250**
	WCDMA V	Front	0.186	0.010	0.001	0.001	0.001	**0.199**
		Back	0.188	0.035	0.008	0.006	0.025	**0.262**
LTE	LTE Band 7	Front	0.108	0.010	0.001	0.001	0.001	**0.121**
		Back	0.117	0.035	0.008	0.006	0.025	**0.191**
	LTE Band 12	Front	0.196	0.010	0.001	0.001	0.001	**0.209**
		Back	0.176	0.035	0.008	0.006	0.025	**0.250**
	LTE Band 13	Front	0.222	0.010	0.001	0.001	0.001	**0.235**
		Back	0.166	0.035	0.008	0.006	0.025	**0.240**
	LTE Band 25	Front	0.283	0.010	0.001	0.001	0.001	**0.296**
		Back	0.400	0.035	0.008	0.006	0.025	**0.474**
	LTE Band 26	Front	0.195	0.010	0.001	0.001	0.001	**0.208**
		Back	0.169	0.035	0.008	0.006	0.025	**0.243**
	LTE Band 41	Front	0.076	0.010	0.001	0.001	0.001	**0.089**
		Back	0.073	0.035	0.008	0.006	0.025	**0.147**
	LTE Band 66	Front	0.369	0.010	0.001	0.001	0.001	**0.382**
		Back	0.482	0.035	0.008	0.006	0.025	**0.556**

13.4 Product Specific Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 10g SAR (W/kg)	2 2.4GHz WLAN Chain 0 10g SAR (W/kg)	3 2.4GHz WLAN Chain 1 10g SAR (W/kg)	4 5GHz WLAN Chain 0 10g SAR (W/kg)	5 5GHz WLAN Chain 1 10g SAR (W/kg)	6 Bluetooth Chain 0 10g SAR (W/kg)	1+2+3 Summed 10g SAR (W/kg)	1+4+5 Summed 10g SAR (W/kg)	1+4+5+6 Summed 10g SAR (W/kg)
WCDMA	WCDMA II	Front				0.144	0.225		**0.000**	**0.369**	**0.369**
		Back				0.375	0.176		**0.000**	**0.551**	**0.551**
		Left side				0.175	0.093		**0.000**	**0.268**	**0.268**
		Right side							**0.000**	**0.000**	**0.000**
		Top side				0.001	0.055		**0.000**	**0.056**	**0.056**
		Bottom side	0.516						**0.516**	**0.516**	**0.516**
	WCDMA IV	Front				0.144	0.225		**0.000**	**0.369**	**0.369**
		Back				0.375	0.176		**0.000**	**0.551**	**0.551**
		Left side				0.175	0.093		**0.000**	**0.268**	**0.268**
		Right side							**0.000**	**0.000**	**0.000**
		Top side				0.001	0.055		**0.000**	**0.056**	**0.056**
		Bottom side	0.847						**0.847**	**0.847**	**0.847**
LTE	LTE Band 7	Front				0.144	0.225		**0.000**	**0.369**	**0.369**
		Back				0.375	0.176		**0.000**	**0.551**	**0.551**
		Left side				0.175	0.093		**0.000**	**0.268**	**0.268**
		Right side							**0.000**	**0.000**	**0.000**
		Top side				0.001	0.055		**0.000**	**0.056**	**0.056**
		Bottom side	1.190						**1.190**	**1.190**	**1.190**
	LTE Band 25	Front				0.144	0.225		**0.000**	**0.369**	**0.369**
		Back				0.375	0.176		**0.000**	**0.551**	**0.551**
		Left side				0.175	0.093		**0.000**	**0.268**	**0.268**
		Right side							**0.000**	**0.000**	**0.000**
		Top side				0.001	0.055		**0.000**	**0.056**	**0.056**
		Bottom side	2.268						**2.268**	**2.268**	**2.268**
	LTE Band 66	Front				0.144	0.225		**0.000**	**0.369**	**0.369**
		Back	2.278			0.375	0.176		**2.278**	**2.829**	**2.829**
		Left side				0.175	0.093		**0.000**	**0.268**	**0.268**
		Right side							**0.000**	**0.000**	**0.000**
		Top side				0.001	0.055		**0.000**	**0.056**	**0.056**
		Bottom side	1.834						**1.834**	**1.834**	**1.834**

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN Chain 0 1g SAR (W/kg)	3 2.4GHz WLAN Chain 1 1g SAR (W/kg)	4 5GHz WLAN Chain 0 1g SAR (W/kg)	5 5GHz WLAN Chain 1 1g SAR (W/kg)	1+2+3+4+5 Summed 1g SAR (W/kg)
WCDMA	WCDMA II	Front				0.064	0.111	**0.175**
		Back				0.160	0.127	**0.287**
		Left side				0.079	0.076	**0.155**
		Right side						**0.000**
		Top side				0.001	0.031	**0.032**
		Bottom side	0.516					**0.516**
	WCDMA IV	Front				0.064	0.111	**0.175**
		Back				0.160	0.127	**0.287**
		Left side				0.079	0.076	**0.155**
		Right side						**0.000**
		Top side				0.001	0.031	**0.032**
		Bottom side	0.847					**0.847**
LTE	LTE Band 7	Front				0.064	0.111	**0.175**
		Back				0.160	0.127	**0.287**
		Left side				0.079	0.076	**0.155**
		Right side						**0.000**
		Top side				0.001	0.031	**0.032**
		Bottom side	1.190					**1.190**
	LTE Band 25	Front				0.064	0.111	**0.175**
		Back				0.160	0.127	**0.287**
		Left side				0.079	0.076	**0.155**
		Right side						**0.000**
		Top side				0.001	0.031	**0.032**
		Bottom side	2.268					**2.268**
	LTE Band 66	Front				0.064	0.111	**0.175**
		Back	2.278			0.160	0.127	**2.565**
		Left side				0.079	0.076	**0.155**
		Right side						**0.000**
		Top side				0.001	0.031	**0.032**
		Bottom side	1.834					**1.834**

14. Supplemental Antenna tuner tests results

General Note:

1. This device implements antenna tuning techniques in the LTE 2, 4, 5, 13, 25, 26, 66. SAR test proposal was measured according to the normally required SAR configurations with the tuner active and worst tune state (auto tune) was used for SAR testing and this design will provide the highest power at different user scenarios and would not influence to the antenna characteristics other than impedance matching.
2. The following test procedure was followed to demonstrate that the SAR results in this report represent the appropriate SAR test conditions. For bands with dynamic tuning implemented, SAR will be measured according to the required FCC SAR test procedures with the dynamic tuner active to allow the device to automatically tune to the antenna state for the respective RF exposure test configurations. Additional single point SAR time-sweep measurements will be evaluated for other tuner states to determine that the other tuner configurations would result in equivalent or lower SAR values.
3. To evaluate all of the tuner states, the 144 tuner states are divided evenly among band, mode and exposure combinations so that at least one single point SAR measurement is measured in each configuration. Single point time-sweep measurements will be performed at the peak SAR location determined by the zoom scan of the configuration with the highest reported SAR for each combination. The tuner state will be established remotely so that the device is not moved for the entire series of single point SAR for the tuner states in each combination. The SAR probe will remain stationary at the same position throughout the entire series of single point measurements for each combination.
4. The device supports LTE B5/B26, B2/B25 and B4/B66. Since the supported frequency span for LTE B5/B2/B4 falls completely within the supported frequency span for LTE B26/B25/B66, and both bands have the same target power and both LTE bands share the same transmission path, therefore standalone SAR was only assessed for LTE B26/B25/B66. The single point SAR time-sweep measurements were treated independently for each supported ACL frequency band. For the LTE B5/B2/B4 single point SAR measurement selected the highest measured SAR configuration and exposure condition of LTE B26/B25/B66. And the number of required single point measurements at least 24 applies to the band.
5. The tuner state was established remotely through Wi-Fi so that the device is not moved for the entire series of single point SAR for the tuner states in each combination (band, mode, exposure conditions).
6. This report is submitted to leverage PAG Reuse from previous FCC ID: PY7-77587Q as the tuning is identical to the previous filing and testing has been done, as was the case for the original filing, following the guidance provided by FCC in the April 2019 TCBC workshop. As with the previous model, this model only supports antenna tuning for the main antenna and dynamic tuning is not supported on the diversity / secondary antenna. The two devices are slightly different. This device has 144 different tuning states in 4 super-set LTE bands while the original model only had 96 states for the same 4 LTE bands. (Note - although there are seven LTE bands supporting antenna tuning, three of those bands are fully contained within another band). To verify the worst case SAR was with the default tuning state (the state used for full SAR evaluation) the original filing distributed the 96 different tuning states across the four bands to perform the single point SAR measurements (i.e. 24 single point SAR measurements per band for the head and body exposure conditions). In this report, as there are a total of 144 states, there are 36 spot checks per band per exposure condition to ensure all states were checked.
7. The original filing distributed the 96 different tuning states across the four bands to perform the single point SAR measurements, so first band state 0, 4, 8, 12, 16 ... 92, for second band state 1, 5, 9, … 93, third band 2, 6, 10 … 94 and fourth band 3, 7 … 95 versus , and in this filing distributed the 144 different tuning states across the four bands to perform the single point SAR measurements, so first band state 0, 4, 8, 12, 16 ... 140, for second band state 1, 5, 9, … 141, third band 2, 6, 10 … 142 and fourth band 3, 7 … 143, both compliance with April 2019 TCBC workshop guidance of antenna tuner.

14.1 Supplemental Head SAR results

Average Value of Time Sweep (W/kg)

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune 47	0	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136	140
LTE Band 13	QPSK	782	23230	1	25	Left Cheek	0mm	0.165	0.211	0.152	0.209	0.085	0.152	0.199	0.104	0.047	0.142	0.19	0.019	0.038	0.133	0.133	0.133	0.161	0.199	0.038	0.123	0.085	0.095	0.076	0.038	0.038	0.171	0.205	0.133	0.161	0.047	0.142	0.152	0.18	0.076	0.114	0.114	0.066	0.085

Average Value of Time Sweep (W/kg)

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune 131	1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69	73	77	81	85	89	93	97	101	105	109	113	117	121	125	129	133	137	141
LTE Band 25	QPSK	1905	26590	1	0	Right Cheek	0mm	0.08	0.102	0.014	0.062	0.071	0.09	0.081	0.062	0.024	0.071	0.071	0.014	0.005	0.062	0.043	0.052	0.043	0.024	0.101	0.043	0.014	0.005	0.052	0.1	0.052	0.09	0.062	0.09	0.043	0.1	0.024	0.052	0.09	0.09	0.071	0.043	0.081	0.071

Average Value of Time Sweep (W/kg)

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune 131	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	62	66	70	74	78	82	86	90	94	98	102	106	110	114	118	122	126	130	134	138	142
LTE Band 26	QPSK	831.5	26865	1	0	Left Cheek	0mm	0.153	0.203	0.03	0.153	0.068	0.191	0.163	0.172	0.195	0.087	0.077	0.058	0.125	0.011	0.134	0.049	0.182	0.077	0.068	0.153	0.106	0.03	0.039	0.058	0.087	0.03	0.058	0.049	0.039	0.125	0.039	0.144	0.068	0.049	0.087	0.153	0.201	0.144

Average Value of Time Sweep (W/kg)

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune 124	3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71	75	79	83	87	91	95	99	103	107	111	115	119	123	127	131	135	139	143
LTE Band 66	QPSK	1745	132322	1	0	Right Cheek	0mm	0.048	0.086	0.084	0.017	0.036	0.055	0.027	0.017	0.084	0.055	0.036	0.036	0.074	0.046	0.081	0.074	0.055	0.027	0.036	0.017	0.075	0.074	0.017	0.055	0.074	0.055	0.008	0.074	0.055	0.074	0.046	0.027	0.046	0.055	0.065	0.055	0.074	0.065

14.2 Supplemental Body SAR results

Average Value of Time Sweep (W/kg)

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune 47	0	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136	140
LTE Band 13	QPSK	782	23230	1	25	Left Side	10mm	0.305	0.398	0.082	0.31	0.31	0.32	0.244	0.282	0.053	0.186	0.072	0.072	0.025	0.282	0.301	0.044	0.272	0.282	0.158	0.386	0.11	0.091	0.158	0.11	0.282	0.044	0.263	0.358	0.253	0.167	0.158	0.12	0.101	0.196	0.082	0.167	0.272	0.225

Average Value of Time Sweep (W/kg)

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune 131	1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69	73	77	81	85	89	93	97	101	105	109	113	117	121	125	129	133	137	141
LTE Band 25	QPSK	1905	26590	50	0	Bottom Side	10mm	0.724	0.876	0.741	0.569	0.103	0.503	0.664	0.636	0.541	0.541	0.859	0.76	0.064	0.131	0.379	0.845	0.845	0.855	0.826	0.264	0.569	0.75	0.844	0.693	0.084	0.141	0.179	0.474	0.169	0.045	0.16	0.55	0.464	0.141	0.331	0.626	0.16	0.626

Average Value of Time Sweep (W/kg)

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune 131	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	62	66	70	74	78	82	86	90	94	98	102	106	110	114	118	122	126	130	134	138	142
LTE Band 26	QPSK	831.5	26865	1	0	Back	10mm	0.243	0.332	0.178	0.244	0.016	0.168	0.216	0.311	0.12	0.016	0.159	0.016	0.159	0.216	0.073	0.292	0.206	0.168	0.035	0.101	0.155	0.159	0.054	0.035	0.292	0.187	0.291	0.111	0.216	0.044	0.073	0.12	0.111	0.063	0.225	0.054	0.044	0.073

Average Value of Time Sweep (W/kg)

Mode	Service/ Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune 124	3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71	75	79	83	87	91	95	99	103	107	111	115	119	123	127	131	135	139	143
LTE Band 66	QPSK	1770	132572	50	24	Bottom Side	10mm	0.659	1.01	0.598	0.646	0.522	0.998	0.532	0.379	0.589	0.284	0.522	0.465	0.76	0.789	0.903	0.456	0.16	0.808	0.503	0.379	0.075	0.837	0.722	0.484	0.637	0.865	0.627	0.598	0.722	0.351	0.246	0.208	0.294	0.113	0.789	0.57	0.179	0.76

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15. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.

16. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[6] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[7] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.

[8] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

[9] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[10] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

[11] FCC KDB 941225 D07 v01r02, " SAR Evaluation Procedures for UMPC Mini-Tablet Devices", Oct 2015.

[12] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[13] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.