

FCC SAR Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : LTE/WCDMA/GSM (GPRS) Multi-Mode
Digital Mobile Phone
BRAND NAME : ZTE
MODEL NAME : Z999
FCC ID : SRQ-Z999
STANDARD : FCC 47 CFR Part 2 (2.1093)
ANSI/IEEE C95.1-1992
IEEE 1528-2013

We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.



Approved by: Mark Qu / Manager



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1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **ZTE CORPORATION, LTE/WCDMA/GSM (GPRS) Multi-Mode Digital Mobile Phone, Z999**, are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 10mm)	Body-worn (Separation 10mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.44	1.07	0.93	1.48
		GSM1900	0.18	1.18	0.80	
	WCDMA	Band V	0.26	0.44	0.44	
		Band IV	0.21	1.15	0.64	
		Band II	0.21	1.20	0.80	
	LTE	Band 12	0.16	0.43	0.30	
		Band 5	0.22	0.36	0.36	
		Band 66/Band 4	0.26	1.18	0.96	
		Band 2	0.19	1.20	0.92	
		Band 30	1.05	1.04	0.35	
DTS	WLAN	2.4GHz WLAN	0.40	<0.10	<0.10	1.40
NII		5GHz WLAN	0.68		<0.10	1.48
Highest 10g SAR Summary						
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)			Highest Simultaneous Transmission 10g SAR (W/kg)
Licensed	GSM	GSM1900	3.72			3.84
	WCDMA	Band IV	3.50			
		Band II	3.64			
	LTE	Band 66/Band 4	3.51			
		Band 2	3.84			
NII	WLAN	5GHz WLAN	0.59			3.84
Date of Testing:			2017.7.20 ~ 2017.7.31			
Remark: This device supports both LTE B4 and B66. Since the supported frequency span for LTE B4 falls completely within the supports frequency span for LTE B66, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B66.						

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.



2. Administration Data

Testing Laboratory	
Test Site	Sporton International (Kunshan) Inc.
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958

Applicant	
Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

Manufacturer	
Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

3. 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 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01



4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	LTE/WCDMA/GSM (GPRS) Multi-Mode Digital Mobile Phone
Brand Name	ZTE
Model Name	Z999
FCC ID	SRQ-Z999
IMEI Code	WWAN SAR Test Sample: 865800030006586 WLAN SAR Test Sample: 865800030006362
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz 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 12: 699.7 MHz ~ 715.3 MHz LTE Band 30: 2307.5 MHz ~ 2312.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA HSPA+ (16QAM uplink is not supported) LTE: QPSK, 16QAM WLAN 2.4GHz : 802.11b/g/n HT20/HT40 WLAN 5GHz : 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth v3.0+EDR, Bluetooth v4.0 LE, Bluetooth v4.1 LE NFC
HW Version	Z999HWV1.0
SW Version	Z999V1.0.0B02
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Identical Prototype

Remark:

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. This device does not support DTM operation and supports GRPS/EGRPS mode up to multi-slot class 10.
3. This device WLAN 2.4GHz supports hotspot operation and Bluetooth support tethering applications.
4. This device 5.2GHz WLAN/5.8GHz WLAN does not support hotspot operation and supports WiFi Direct.
5. When hotspot mode is enabled, power reduction will be activated to limit the maximum power of GSM1900, WCDMA B2 / B4 and LTE B2 / B4 / B66.
6. This device has two WWAN antennas. WWAN antenna 1 is located at the bottom side of the device and WWAN antenna 2 is located at the right side of the device which can refer to antenna location chapter. WWAN antenna 1 frequency bands include GSM850/1900, WCDMA B2 / B4 / B5, LTE B2 / B4 / B5 / B12 / B66 and WWAN antenna 2 frequency bands only include LTE B30.
7. The device is capable of switching between antenna 1 and antenna 2 based on signal strength.
8. For WLAN two transmitters, WLAN antenna 1 can transmit standalone, WLAN antenna 2 can only transmit simultaneously with WLAN antenna 1.
9. This is a dual screens side flip smartphone. The device has two screens, mounted on the front and back face. When the device screen is closed, the back face screen can't work; when the device screen is open, these two screens can be used as one screen or as two screens separate.



4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05																																							
FCC ID	SRQ-Z999																																						
Equipment Name	LTE/WCDMA/GSM (GPRS) Multi-Mode Digital Mobile Phone																																						
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 12: 699.7 MHz ~ 715.3 MHz LTE Band 30: 2307.5 MHz ~ 2312.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz																																						
Channel Bandwidth	LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 12: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 30: 5MHz, 10MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz																																						
uplink modulations used	QPSK / 16QAM																																						
LTE Voice / Data requirements	Voice and Data																																						
LTE Release Version	R11, Cat11																																						
CA Support	Yes, Downlink Only																																						
LTE MPR permanently built-in by design	<p align="center">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>>5</td> <td>>4</td> <td>>8</td> <td>>12</td> <td>>16</td> <td>>18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>>5</td> <td>>4</td> <td>>8</td> <td>>12</td> <td>>16</td> <td>>18</td> <td>≤ 2</td> </tr> </tbody> </table>	Modulation	Channel bandwidth / Transmission bandwidth (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
Modulation	Channel bandwidth / Transmission bandwidth (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																																
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 mode that LTE B2 / B4 / B66 power reduction applied to satisfy SAR compliance.																																						
LTE Carrier Aggregation Combinations	Inter-Band possible combinations and the detail power verification please referred to section 12.																																						
LTE Carrier Aggregation Additional Information	This device supports maximum of 2 and 3 carriers in the downlink only. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. Due to carrier capability, only the combinations listed above are supported. The following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.																																						



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)	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 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)	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 30												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)					
L	27685		2307.5		27710		2310					
M	27710		2310									
H	27735		2312.5									
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

5. RF Exposure Limits

5.1 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.

5.2 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

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.

6. Specific Absorption Rate (SAR)

6.1 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.

6.2 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:

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

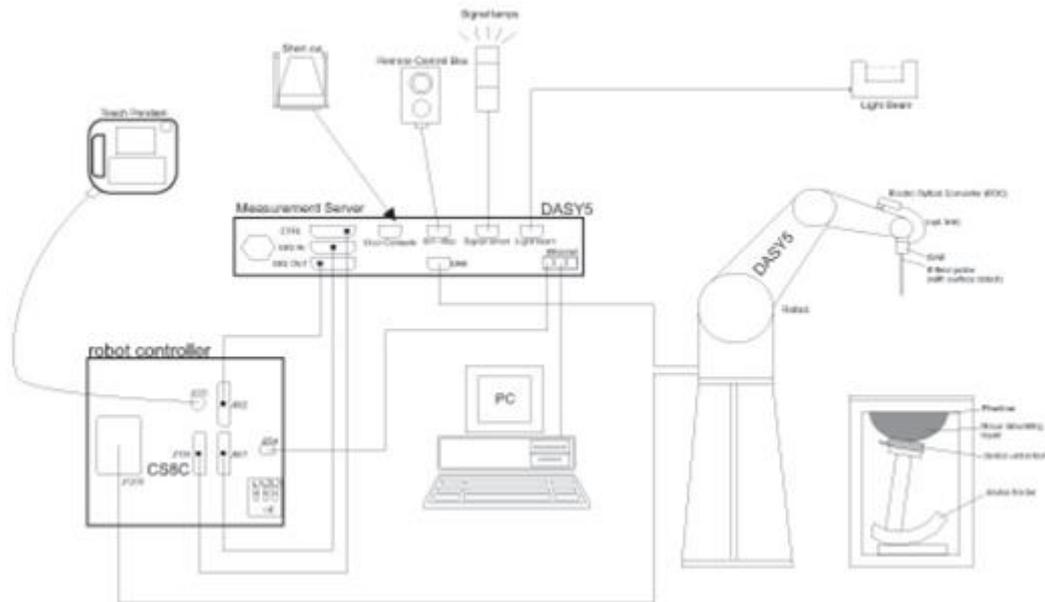
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. 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.

7.1 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.

<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	

7.2 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

7.3 Phantom

<SAM Twin Phantom>

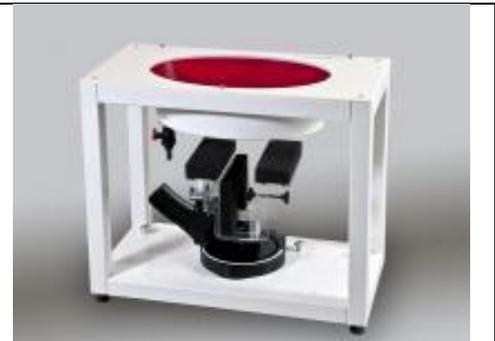
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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.

7.4 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

8. 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 D 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

8.1 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 from 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

8.2 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.

8.3 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	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: $\Delta x_{Area}, \Delta y_{Area}$	≤ 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.	

8.4 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: $\Delta x_{Zoom}, \Delta y_{Zoom}$		≤ 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 1 st 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 <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> 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.				

8.5 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.

8.6 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.



9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1065	2016/11/21	2017/11/20
SPEAG	835MHz System Validation Kit	D835V2	4d091	2016/11/22	2017/11/21
SPEAG	1750MHz System Validation Kit	D1750V2	1069	2016/11/23	2017/11/22
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	2016/11/24	2017/11/23
SPEAG	2300MHz System Validation Kit	D2300V2	1055	2016/8/31	2017/8/30
SPEAG	2450MHz System Validation Kit	D2450V2	840	2016/11/25	2017/11/24
SPEAG	5000MHz System Validation Kit	D5GHZV2	1113	2016/12/13	2017/12/12
SPEAG	Data Acquisition Electronics	DAE4	1279	2017/5/2	2018/5/1
SPEAG	Dosimetric E-Field Probe	EX3DV4	3954	2016/11/28	2017/11/27
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1839	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1842	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300654	2016/8/8	2017/8/7
Agilent	Wireless Communication Test Set	E5515C	MY52102706	2017/4/18	2018/4/17
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	2017/4/18	2018/4/17
SPEAG	DAK Kit	DAK3.5	1144	2016/11/23	2017/11/22
R&S	Signal Generator	SMR40	100455	2017/1/19	2018/1/18
Anritsu	Power Sensor	MA2411B	1644003	2016/12/23	2017/12/22
Anritsu	Power Meter	ML2495A	1531197	2016/12/23	2017/12/22
Anritsu	Power Sensor	MA2411B	1644004	2016/12/23	2017/12/22
Anritsu	Power Meter	ML2495A	1531198	2016/12/23	2017/12/22
R&S	CBT BLUETOOTH TESTER	CBT	101137	2016/8/9	2017/8/8
R&S	Spectrum Analyzer	FSV7	101631	2016/8/8	2017/8/7
WISEWIND	Hygrometer	WISEWIND 0905	905	2017/4/20	2018/4/19
JM	DIGITAC THERMOMETER	JM222	AA1207166	2017/4/19	2018/4/18
ARRA	Power Divider	A3200-2	N/A		Note
Agilent	Dual Directional Coupler	778D	50422		Note
PASTERNAK	Dual Directional Coupler	PE2214-10	N/A		Note
MCL	Attenuation1	BW-S10W5+	N/A		Note
MCL	Attenuation2	BW-S10W5+	N/A		Note
MCL	Attenuation3	BW-S10W5+	N/A		Note
AR	Amplifier	5S1G4	333096		Note
mini-circuits	Amplifier	ZVE-3W-83+	162601250		Note

Note:

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

10. System Verification

10.1 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 10.1 Photo of Liquid Height for Head SAR



Fig 10.2 Photo of Liquid Height for Body SAR



10.2 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.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ϵ_r)
For Head								
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
For Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
900	50.8	48.2	0	0.9	0.1	0	1.05	55.0
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7

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)	Tissue Type	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity Target (σ)	Permittivity Target (ϵ_r)	Delta (σ) (%)	Delta (ϵ_r) (%)	Limit (%)	Date
750	Head	22.8	0.894	41.276	0.89	41.90	0.45	-1.49	±5	2017.7.21
835	Head	22.8	0.911	42.211	0.90	41.50	1.22	1.71	±5	2017.7.21
1750	Head	22.7	1.368	40.802	1.37	40.10	-0.15	1.75	±5	2017.7.22
1900	Head	22.7	1.426	39.361	1.40	40.00	1.86	-1.60	±5	2017.7.22
2300	Head	22.9	1.701	38.840	1.67	39.50	1.86	-1.67	±5	2017.7.29
2450	Head	22.9	1.868	38.170	1.80	39.20	3.78	-2.63	±5	2017.7.29
5250	Head	22.8	4.882	37.304	4.71	35.90	3.65	3.91	±5	2017.7.28
5750	Head	22.8	5.415	36.543	5.22	35.40	3.74	3.23	±5	2017.7.28
750	Body	22.7	0.965	55.781	0.96	55.50	0.52	0.51	±5	2017.7.20
835	Body	22.7	0.955	54.096	0.97	55.20	-1.55	-2.00	±5	2017.7.20
1750	Body	22.9	1.475	54.567	1.49	53.40	-1.01	2.19	±5	2017.7.26
1900	Body	22.8	1.542	51.371	1.52	53.30	1.45	-3.62	±5	2017.7.24
2300	Body	22.6	1.786	52.172	1.81	52.90	-1.33	-1.38	±5	2017.7.31
2450	Body	22.6	1.978	51.988	1.95	52.70	1.44	-1.35	±5	2017.7.31
5250	Body	22.9	5.539	48.008	5.36	48.90	3.34	-1.82	±5	2017.7.30
5750	Body	22.7	6.215	47.167	5.94	48.30	4.63	-2.35	±5	2017.7.29

10.3 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.

<1g SAR>:

Date	Frequency (MHz)	Tissue Type	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 (%)
2017.7.21	750	Head	250	1065	3954	1279	1.99	8.32	7.96	-4.33
2017.7.21	835	Head	250	4d091	3954	1279	2.47	9.31	9.88	6.12
2017.7.22	1750	Head	250	1069	3954	1279	8.81	37.50	35.24	-6.03
2017.7.22	1900	Head	250	5d118	3954	1279	9.70	40.40	38.8	-3.96
2017.7.29	2300	Head	250	1055	3954	1279	12.40	48.60	49.6	2.06
2017.7.29	2450	Head	250	840	3954	1279	13.40	54.00	53.6	-0.74
2017.7.28	5250	Head	100	1113	3954	1279	8.18	76.40	81.8	7.07
2017.7.28	5750	Head	100	1113	3954	1279	7.40	80.30	74	-7.85
2017.7.20	750	Body	250	1065	3954	1279	2.22	8.71	8.88	1.95
2017.7.20	835	Body	250	4d091	3954	1279	2.33	9.68	9.32	-3.72
2017.7.26	1750	Body	250	1069	3954	1279	9.10	37.70	36.4	-3.45
2017.7.24	1900	Body	250	5d118	3954	1279	10.60	40.80	42.4	3.92
2017.7.31	2300	Body	250	1055	3954	1279	12.00	49.40	48	-2.83
2017.7.31	2450	Body	250	840	3954	1279	12.30	50.90	49.2	-3.34
2017.7.30	5250	Body	100	1113	3954	1279	7.48	76.10	74.8	-1.71
2017.7.29	5750	Body	100	1113	3954	1279	7.00	75.20	70	-6.91

<10g SAR>:

Date	Frequency (MHz)	Tissue Type	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 (%)
2017.7.26	1750	Body	250	1069	3954	1279	5.07	20.30	20.28	-0.10
2017.7.24	1900	Body	250	5d118	3954	1279	5.79	21.30	23.16	8.73
2017.7.30	5250	Body	100	1113	3954	1279	2.08	21.50	20.8	-3.26
2017.7.29	5750	Body	100	1113	3954	1279	1.95	21.10	19.5	-7.58

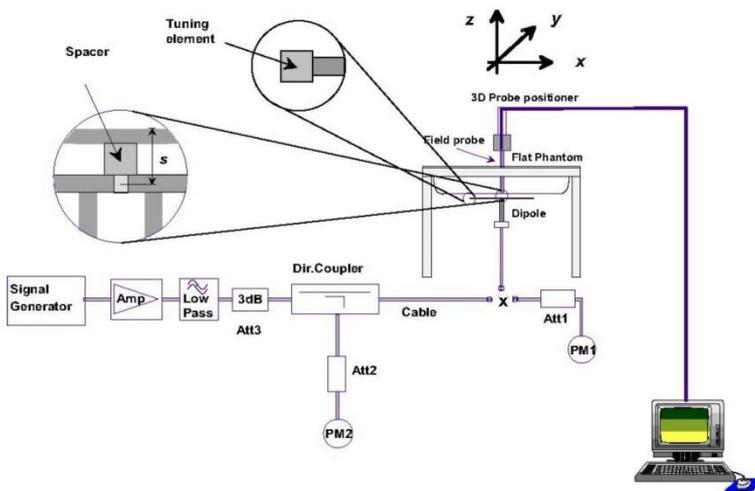


Fig 8.3.1 System Performance Check Setup



Fig 8.3.2 Setup Photo

11. RF Exposure Positions

11.1 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.

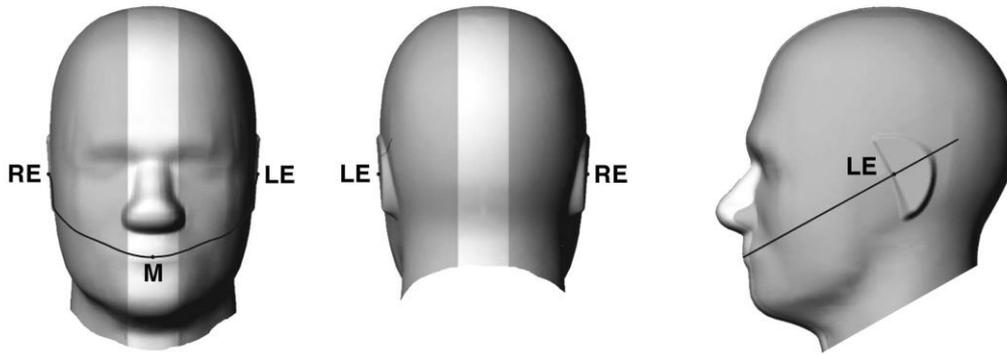


Fig 9.1.1 Front, back, and side views of SAM twin phantom

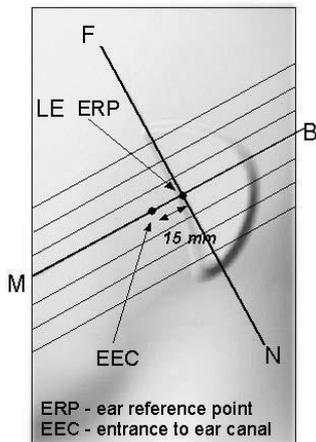


Fig 9.1.2 Close-up side view of phantom showing the ear region.

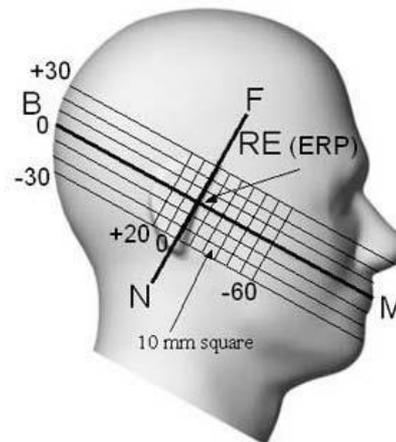


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.2 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 w_t 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 w_b 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.

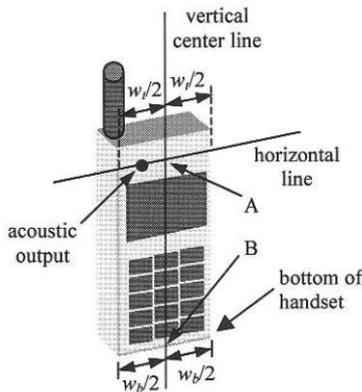


Fig 9.2.1 Handset vertical and horizontal reference lines—“fixed case”

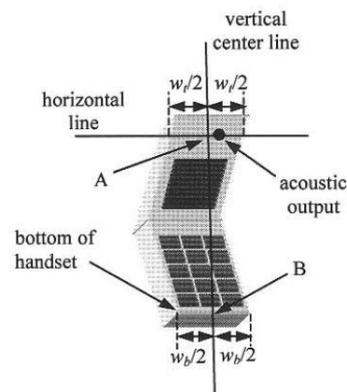


Fig 9.2.2 Handset vertical and horizontal reference lines—“clam-shell case”

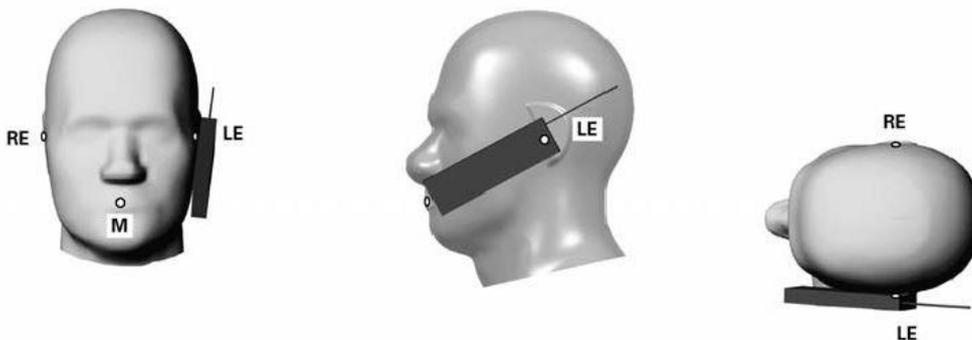


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3 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

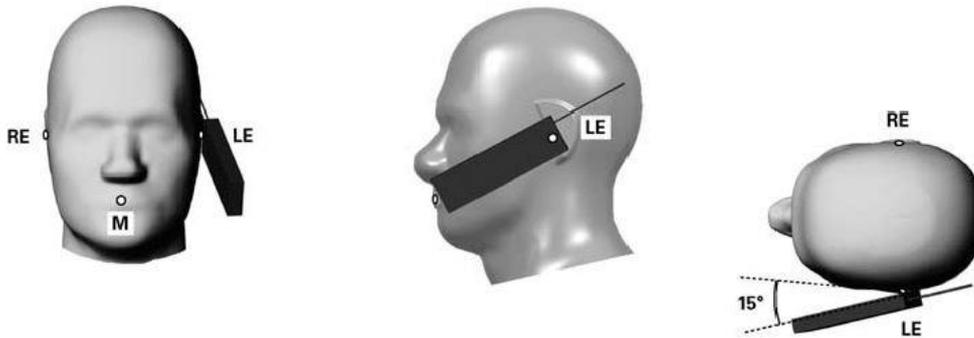


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.4 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 headset 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. 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 tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

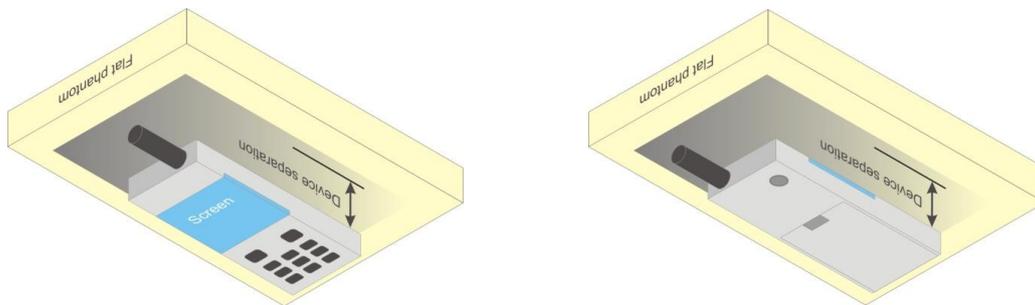


Fig 9.4 Body Worn Position

11.5 Extremity 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.



11.6 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 \geq 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 from 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.

12. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE 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 (2Tx slots) for GSM850/GSM1900 is considered as the primary mode.
3. Other configurations of GSM / GPRS / EDGE 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 $\leq \frac{1}{4}$ dB higher than the primary mode, SAR measurement is not required for the secondary mode
4. Power reduction which is triggered by hotspot mode is implemented in GSM1900 band, for hotspot mode SAR testing EUT was set in reduced power mode and GPRS (2Tx slots) due to its highest frame-average power.

<Full Power Mode>

GSM850 Tx Channel	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)	
	128	189	251		128	189	251		
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8		
GSM 1 Tx slot	33.40	33.52	33.55	34.00	24.40	24.52	24.55	25.00	
GPRS 1 Tx slot	33.39	33.50	33.53	34.00	24.39	24.50	24.53	25.00	
GPRS 2 Tx slots	33.22	33.36	33.34	33.50	27.22	27.36	27.34	27.50	
EDGE 1 Tx slot	26.89	26.98	27.00	27.50	17.89	17.98	18.00	18.50	
EDGE 2 Tx slots	26.74	26.85	26.95	27.50	20.74	20.85	20.95	21.50	
GSM1900		Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	512	661	810	512		661	810		
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8		
GSM 1 Tx slot	30.34	30.25	30.17	30.50	21.34	21.25	21.17	21.50	
GPRS 1 Tx slot	30.32	30.23	30.15	30.50	21.32	21.23	21.15	21.50	
GPRS 2 Tx slots	30.24	30.13	30.10	30.50	24.24	24.13	24.10	24.50	
EDGE 1 Tx slot	26.14	26.01	26.08	27.00	21.88	21.75	21.82	22.74	
EDGE 2 Tx slots	25.97	25.94	26.00	26.50	22.97	22.94	23.00	23.50	

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

<Reduced Power Mode for Hostpot On>

GSM1900 Tx Channel	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	27.88	27.62	27.77	28.00	18.88	18.62	18.77	19.00
GPRS 1 Tx slot	27.87	27.61	27.75	28.00	18.87	18.61	18.75	19.00
GPRS 2 Tx slots	27.77	27.53	27.67	28.00	21.77	21.53	21.67	22.00
EDGE 1 Tx slot	23.28	23.25	23.32	23.50	14.28	14.25	14.32	14.50
EDGE 2 Tx slots	23.19	23.15	23.24	23.50	17.19	17.15	17.24	17.50

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set Gain Factors (β_c and β_d) and parameters were set according to each
 - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - iii. Set RMC 12.2Kbps + HSDPA mode.
 - iv. Set Cell Power = -86 dBm
 - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
 - vi. Select HSDPA Uplink Parameters
 - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
 - viii. Set Ack-Nack Repetition Factor to 3
 - ix. Set CQI Feedback Cycle (k) to 4 ms
 - x. Set CQI Repetition Factor to 2
 - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPCCH, DPCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

Setup Configuration

HSUPA Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting * :
 - i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
 - ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
 - iii. Set Cell Power = -86 dBm
 - iv. Set Channel Type = 12.2k + HSPA
 - v. Set UE Target Power
 - vi. Power Ctrl Mode= Alternating bits
 - vii. Set and observe the E-TFCl
 - viii. Confirm that E-TFCl is equal to the target E-TFCl of 75 for sub-test 1, and other subtest's E-TFCl
- d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCl
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{hs} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Setup Configuration



<WCDMA Conducted Power>

General Note:

- Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
- 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 is $\leq \frac{1}{4}$ 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 to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA.

<Full Power Mode>

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)	WCDMA Band V			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	23.59	23.60	23.61	24.00	23.65	23.64	23.51	24.00	24.75	24.70	24.66	25.00
3GPP Rel 99	RMC 12.2Kbps	23.60	23.61	23.62	24.00	23.68	23.67	23.54	24.00	24.76	24.71	24.68	25.00
3GPP Rel 6	HSDPA Subtest-1	22.28	22.42	22.44	23.00	22.53	22.60	22.47	23.00	23.54	23.60	23.47	24.00
3GPP Rel 6	HSDPA Subtest-2	22.31	22.44	22.43	23.00	22.51	22.58	22.46	23.00	23.51	23.59	23.46	24.00
3GPP Rel 6	HSDPA Subtest-3	21.81	21.97	21.95	22.50	22.06	22.11	21.97	22.50	23.01	23.11	22.92	23.50
3GPP Rel 6	HSDPA Subtest-4	21.82	21.99	21.99	22.50	22.07	22.06	21.96	22.50	23.07	23.06	22.96	23.50
3GPP Rel 6	HSUPA Subtest-1	22.29	22.48	22.44	23.00	22.55	22.54	22.44	23.00	23.51	23.52	23.43	24.00
3GPP Rel 6	HSUPA Subtest-2	20.33	20.47	20.45	21.00	20.56	20.58	20.46	21.00	21.56	21.58	21.46	22.00
3GPP Rel 6	HSUPA Subtest-3	21.31	21.47	21.41	22.00	21.53	21.54	21.44	22.00	22.53	22.54	22.41	23.00
3GPP Rel 6	HSUPA Subtest-4	20.28	20.50	20.45	21.00	20.51	20.59	20.44	21.00	21.51	21.58	21.44	22.00
3GPP Rel 6	HSUPA Subtest-5	23.59	23.60	23.61	24.00	23.65	23.64	23.51	24.00	24.75	24.70	24.66	25.00

<Reduced Power Mode for Hotspot On>

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		1312	1413	1513	
Rx Channel		9662	9800	9938		1537	1638	1738	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	AMR 12.2Kbps	21.47	21.52	21.56	22.00	21.58	21.55	21.45	22.00
3GPP Rel 99	RMC 12.2Kbps	21.48	21.53	21.59	22.00	21.64	21.63	21.53	22.00
3GPP Rel 6	HSDPA Subtest-1	21.33	21.49	21.58	22.00	21.63	21.59	21.45	22.00
3GPP Rel 6	HSDPA Subtest-2	21.40	21.56	21.55	22.00	21.61	21.57	21.55	22.00
3GPP Rel 6	HSDPA Subtest-3	21.37	21.55	21.57	22.00	21.60	21.55	21.45	22.00
3GPP Rel 6	HSDPA Subtest-4	21.36	21.47	21.56	22.00	21.62	21.55	21.44	22.00
3GPP Rel 6	HSUPA Subtest-1	20.28	20.50	20.48	21.00	20.56	20.54	20.46	21.00
3GPP Rel 6	HSUPA Subtest-2	18.29	18.51	18.52	19.00	18.55	18.54	18.49	19.00
3GPP Rel 6	HSUPA Subtest-3	19.28	19.50	19.46	20.00	19.50	19.50	19.43	20.00
3GPP Rel 6	HSUPA Subtest-4	18.27	18.48	18.51	19.00	18.52	18.56	18.46	19.00
3GPP Rel 6	HSUPA Subtest-5	20.30	20.50	20.50	21.00	20.60	20.60	20.50	21.00



<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. 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.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. 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.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ 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.
7. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is $>$ not $\frac{1}{2}$ 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.
8. For LTE B4 / B5 / B12 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.
9. LTE band 4 SAR test was covered by Band 66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
 - a. the maximum output power, including tolerance, for the smaller band is \leq 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



<Full Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	23.51	23.65	23.59	24.00	0
20	QPSK	1	49	22.72	22.85	22.86		
20	QPSK	1	99	23.50	23.54	23.51		
20	QPSK	50	0	21.98	22.18	22.17	23.00	1
20	QPSK	50	24	21.83	21.96	21.86		
20	QPSK	50	50	21.97	22.17	22.16		
20	QPSK	100	0	22.03	22.14	22.12	23.00	1
20	16QAM	1	0	22.71	22.89	22.67		
20	16QAM	1	49	21.93	22.05	22.01		
20	16QAM	1	99	22.72	22.82	22.85	22.00	2
20	16QAM	50	0	20.99	21.09	21.03		
20	16QAM	50	24	20.84	20.93	20.82		
20	16QAM	50	50	20.99	21.11	21.08	22.00	2
20	16QAM	100	0	21.00	21.08	21.09		
Channel				18675	18900	19125		
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	23.27	23.28	23.17	24.00	0
15	QPSK	1	37	22.82	22.67	23.09		
15	QPSK	1	74	23.23	23.20	23.24		
15	QPSK	36	0	22.10	22.05	22.08	23.00	1
15	QPSK	36	20	21.92	21.86	21.91		
15	QPSK	36	39	22.00	21.97	21.99		
15	QPSK	75	0	22.03	22.05	22.07	23.00	1
15	16QAM	1	0	22.55	22.50	22.69		
15	16QAM	1	37	21.75	22.15	22.32		
15	16QAM	1	74	22.17	22.50	22.17	22.00	2
15	16QAM	36	0	21.12	20.93	21.06		
15	16QAM	36	20	20.92	20.90	20.95		
15	16QAM	36	39	20.98	20.97	21.03	22.00	2
15	16QAM	75	0	21.08	21.00	21.03		



Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	23.10	23.04	23.13	24.00	0
10	QPSK	1	25	22.78	22.92	22.93		
10	QPSK	1	49	22.85	22.98	22.81		
10	QPSK	25	0	21.97	21.95	22.07	23.00	1
10	QPSK	25	12	21.89	21.88	21.94		
10	QPSK	25	25	21.88	21.87	21.98		
10	QPSK	50	0	22.03	21.91	21.97	23.00	1
10	16QAM	1	0	22.20	22.59	22.59		
10	16QAM	1	25	22.00	22.00	22.01		
10	16QAM	1	49	22.08	22.35	22.34	22.00	2
10	16QAM	25	0	21.02	20.99	21.03		
10	16QAM	25	12	20.95	20.95	20.90		
10	16QAM	25	25	20.86	20.91	20.82	22.00	2
10	16QAM	50	0	20.90	20.91	20.88		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.95	22.87	22.98	24.00	0
5	QPSK	1	12	22.73	22.84	22.89		
5	QPSK	1	24	22.77	22.88	22.85		
5	QPSK	12	0	21.94	21.85	21.96	23.00	1
5	QPSK	12	7	21.85	21.85	21.95		
5	QPSK	12	13	21.81	21.81	21.85		
5	QPSK	25	0	21.82	21.80	21.92	23.00	1
5	16QAM	1	0	22.43	21.87	22.39		
5	16QAM	1	12	21.82	21.78	22.40		
5	16QAM	1	24	22.01	21.75	22.00	22.00	2
5	16QAM	12	0	20.94	20.89	20.90		
5	16QAM	12	7	20.88	20.92	20.89		
5	16QAM	12	13	20.77	20.83	20.89	22.00	2
5	16QAM	25	0	20.88	20.84	20.87		



Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.83	22.80	22.93	24.00	0
3	QPSK	1	8	22.94	23.00	22.99		
3	QPSK	1	14	22.71	22.80	22.85		
3	QPSK	8	0	21.81	21.84	21.91	23.00	1
3	QPSK	8	4	21.87	21.85	22.00		
3	QPSK	8	7	21.82	21.79	21.89		
3	QPSK	15	0	21.86	21.82	21.89	23.00	1
3	16QAM	1	0	21.85	22.24	22.11		
3	16QAM	1	8	21.88	22.03	22.14		
3	16QAM	1	14	22.12	21.92	22.06	22.00	2
3	16QAM	8	0	20.90	20.79	20.89		
3	16QAM	8	4	20.93	20.95	20.98		
3	16QAM	8	7	20.83	20.77	20.90	22.00	2
3	16QAM	15	0	20.87	20.90	20.87		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.71	22.80	22.78	24.00	0
1.4	QPSK	1	3	22.82	22.78	23.15		
1.4	QPSK	1	5	22.74	22.72	22.90		
1.4	QPSK	3	0	22.84	22.89	22.78		
1.4	QPSK	3	1	22.87	22.95	22.94		
1.4	QPSK	3	3	22.86	22.90	22.92	23.00	1
1.4	QPSK	6	0	21.74	21.74	21.77		
1.4	16QAM	1	0	21.82	21.82	22.21	23.00	1
1.4	16QAM	1	3	21.88	21.99	21.78		
1.4	16QAM	1	5	21.91	22.25	21.74		
1.4	16QAM	3	0	21.85	21.73	21.69		
1.4	16QAM	3	1	21.96	21.71	22.03		
1.4	16QAM	3	3	21.88	21.94	21.86	22.00	2
1.4	16QAM	6	0	21.00	20.76	20.85		



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	23.69	23.80	23.67	24.50	0
20	QPSK	1	49	23.31	23.31	23.36		
20	QPSK	1	99	23.51	23.59	23.49		
20	QPSK	50	0	22.55	22.53	22.48	23.50	1
20	QPSK	50	24	22.51	22.44	22.46		
20	QPSK	50	50	22.54	22.48	22.33		
20	QPSK	100	0	22.50	22.52	22.41	23.50	1
20	16QAM	1	0	22.99	23.00	23.02		
20	16QAM	1	49	22.78	22.65	22.64		
20	16QAM	1	99	23.05	22.93	22.84	22.50	2
20	16QAM	50	0	21.54	21.50	21.44		
20	16QAM	50	24	21.53	21.42	21.43		
20	16QAM	50	50	21.56	21.45	21.34	22.50	2
20	16QAM	100	0	21.50	21.43	21.37		
Channel				20025	20175	20325		
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.50	23.48	23.51	24.50	0
15	QPSK	1	37	23.50	23.40	23.36		
15	QPSK	1	74	23.47	23.31	23.26		
15	QPSK	36	0	22.58	22.48	22.54	23.50	1
15	QPSK	36	20	22.52	22.43	22.40		
15	QPSK	36	39	22.46	22.44	22.36		
15	QPSK	75	0	22.50	22.44	22.47	23.50	1
15	16QAM	1	0	22.72	22.65	22.66		
15	16QAM	1	37	22.59	22.60	22.52		
15	16QAM	1	74	22.70	22.59	22.52	22.50	2
15	16QAM	36	0	21.54	21.43	21.47		
15	16QAM	36	20	21.50	21.41	21.35		
15	16QAM	36	39	21.46	21.40	21.33	22.50	2
15	16QAM	75	0	21.47	21.39	21.41		



Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.43	23.59	23.51	24.50	0
10	QPSK	1	25	23.33	23.45	23.38		
10	QPSK	1	49	23.52	23.65	23.43		
10	QPSK	25	0	22.60	22.58	22.54	23.50	1
10	QPSK	25	12	22.54	22.55	22.51		
10	QPSK	25	25	22.56	22.59	22.50		
10	QPSK	50	0	22.53	22.60	22.52	23.50	1
10	16QAM	1	0	22.85	22.94	22.81		
10	16QAM	1	25	22.69	22.76	22.66		
10	16QAM	1	49	22.92	22.96	22.82	22.50	2
10	16QAM	25	0	21.58	21.55	21.52		
10	16QAM	25	12	21.50	21.56	21.50		
10	16QAM	25	25	21.56	21.57	21.51	22.50	2
10	16QAM	50	0	21.52	21.56	21.49		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.46	23.57	23.47	24.50	0
5	QPSK	1	12	23.42	23.46	23.37		
5	QPSK	1	24	23.30	23.48	23.32		
5	QPSK	12	0	22.59	22.58	22.51	23.50	1
5	QPSK	12	7	22.61	22.56	22.51		
5	QPSK	12	13	22.57	22.54	22.47		
5	QPSK	25	0	22.56	22.50	22.45	23.50	1
5	16QAM	1	0	22.81	22.89	22.74		
5	16QAM	1	12	22.72	22.75	22.68		
5	16QAM	1	24	22.71	22.74	22.72	22.50	2
5	16QAM	12	0	21.57	21.58	21.50		
5	16QAM	12	7	21.57	21.54	21.48		
5	16QAM	12	13	21.55	21.52	21.44	22.50	2
5	16QAM	25	0	21.58	21.56	21.47		



Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.35	23.45	23.35	24.50	0
3	QPSK	1	8	23.48	23.53	23.42		
3	QPSK	1	14	23.35	23.43	23.25		
3	QPSK	8	0	22.51	22.55	22.46	23.50	1
3	QPSK	8	4	22.54	22.55	22.48		
3	QPSK	8	7	22.53	22.51	22.43		
3	QPSK	15	0	22.51	22.51	22.45	23.50	1
3	16QAM	1	0	22.75	22.79	22.71		
3	16QAM	1	8	22.78	22.81	22.72		
3	16QAM	1	14	22.68	22.70	22.54	22.50	2
3	16QAM	8	0	21.64	21.60	21.54		
3	16QAM	8	4	21.71	21.61	21.57		
3	16QAM	8	7	21.61	21.59	21.52	22.50	2
3	16QAM	15	0	21.54	21.52	21.45		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	23.33	23.39	23.31	24.50	0
1.4	QPSK	1	3	23.42	23.48	23.40		
1.4	QPSK	1	5	23.30	23.39	23.26		
1.4	QPSK	3	0	23.47	23.51	23.37		
1.4	QPSK	3	1	23.49	23.53	23.46		
1.4	QPSK	3	3	23.48	23.53	23.44	23.50	1
1.4	QPSK	6	0	22.44	22.45	22.40		
1.4	16QAM	1	0	22.60	22.69	22.66	23.50	1
1.4	16QAM	1	3	22.66	22.73	22.67		
1.4	16QAM	1	5	22.55	22.65	22.49		
1.4	16QAM	3	0	22.44	22.52	22.43		
1.4	16QAM	3	1	22.51	22.56	22.48		
1.4	16QAM	3	3	22.47	22.57	22.47	22.50	2
1.4	16QAM	6	0	21.48	21.52	21.47		



<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	23.60	23.55	23.61	24.00	0
10	QPSK	1	25	23.44	23.49	23.44		
10	QPSK	1	49	23.50	23.42	23.52		
10	QPSK	25	0	22.78	22.70	22.74	23.00	1
10	QPSK	25	12	22.75	22.69	22.71		
10	QPSK	25	25	22.62	22.68	22.69		
10	QPSK	50	0	22.72	22.67	22.68	23.00	1
10	16QAM	1	0	22.78	22.81	22.86		
10	16QAM	1	25	22.95	22.86	22.97		
10	16QAM	1	49	22.82	22.73	22.84	22.00	2
10	16QAM	25	0	21.77	21.64	21.71		
10	16QAM	25	12	21.73	21.69	21.74		
10	16QAM	25	25	21.59	21.65	21.65	22.00	2
10	16QAM	50	0	21.68	21.63	21.64		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.62	23.62	23.65	24.00	0
5	QPSK	1	12	23.57	23.54	23.62		
5	QPSK	1	24	23.64	23.59	23.72		
5	QPSK	12	0	22.75	22.63	22.77	23.00	1
5	QPSK	12	7	22.74	22.67	22.74		
5	QPSK	12	13	22.65	22.67	22.74		
5	QPSK	25	0	22.67	22.65	22.68	23.00	1
5	16QAM	1	0	22.91	22.94	22.91		
5	16QAM	1	12	22.95	22.87	22.91		
5	16QAM	1	24	22.96	22.87	22.96	22.00	2
5	16QAM	12	0	21.74	21.62	21.77		
5	16QAM	12	7	21.72	21.64	21.74		
5	16QAM	12	13	21.69	21.66	21.76	22.00	2
5	16QAM	25	0	21.70	21.64	21.70		



Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.61	23.55	23.61	24.00	0
3	QPSK	1	8	23.69	23.59	23.75		
3	QPSK	1	14	23.54	23.51	23.66		
3	QPSK	8	0	22.62	22.67	22.70	23.00	1
3	QPSK	8	4	22.71	22.63	22.78		
3	QPSK	8	7	22.69	22.68	22.78		
3	QPSK	15	0	22.69	22.60	22.75	23.00	1
3	16QAM	1	0	22.87	22.81	22.91		
3	16QAM	1	8	22.99	22.91	22.97		
3	16QAM	1	14	22.96	22.88	22.94	22.00	2
3	16QAM	8	0	21.66	21.71	21.74		
3	16QAM	8	4	21.78	21.68	21.81		
3	16QAM	8	7	21.74	21.69	21.80	22.00	2
3	16QAM	15	0	21.72	21.64	21.76		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	23.46	23.51	23.64	24.00	0
1.4	QPSK	1	3	23.54	23.58	23.71		
1.4	QPSK	1	5	23.44	23.52	23.62		
1.4	QPSK	3	0	23.51	23.52	23.65		
1.4	QPSK	3	1	23.52	23.57	23.67		
1.4	QPSK	3	3	23.53	23.53	23.67	23.00	1
1.4	QPSK	6	0	22.55	22.53	22.70		
1.4	16QAM	1	0	22.79	22.81	22.83	23.00	1
1.4	16QAM	1	3	22.86	22.83	22.98		
1.4	16QAM	1	5	22.73	22.81	22.95		
1.4	16QAM	3	0	22.56	22.55	22.68		
1.4	16QAM	3	1	22.62	22.60	22.74		
1.4	16QAM	3	3	22.58	22.56	22.65	22.00	2
1.4	16QAM	6	0	21.61	21.58	21.78		



<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	23.19	23.19	23.32	24.00	0
10	QPSK	1	25	23.08	23.17	23.20		
10	QPSK	1	49	23.15	23.15	23.19		
10	QPSK	25	0	22.27	22.32	22.34	23.00	1
10	QPSK	25	12	22.23	22.19	22.24		
10	QPSK	25	25	22.21	22.26	22.31		
10	QPSK	50	0	22.24	22.21	22.29	23.00	1
10	16QAM	1	0	22.52	22.30	22.31		
10	16QAM	1	25	22.37	22.50	22.58		
10	16QAM	1	49	22.48	22.54	22.73	22.00	2
10	16QAM	25	0	21.20	21.19	21.23		
10	16QAM	25	12	21.18	21.26	21.32		
10	16QAM	25	25	21.28	21.24	21.29	22.00	2
10	16QAM	25	25	21.28	21.24	21.29		
10	16QAM	50	0	21.21	21.19	21.27		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	23.31	23.07	23.17	24.00	0
5	QPSK	1	12	23.09	23.20	23.16		
5	QPSK	1	24	23.13	23.18	23.34		
5	QPSK	12	0	22.32	22.24	22.23	23.00	1
5	QPSK	12	7	22.21	22.32	22.31		
5	QPSK	12	13	22.17	22.26	22.37		
5	QPSK	25	0	22.19	22.27	22.38	23.00	1
5	16QAM	1	0	22.65	22.38	22.48		
5	16QAM	1	12	22.51	22.48	22.53		
5	16QAM	1	24	22.40	22.42	22.62	22.00	2
5	16QAM	12	0	21.34	21.23	21.27		
5	16QAM	12	7	21.23	21.30	21.33		
5	16QAM	12	13	21.15	21.26	21.41	22.00	2
5	16QAM	12	13	21.15	21.26	21.41		
5	16QAM	25	0	21.20	21.26	21.43		



Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	23.27	23.12	23.19	24.00	0
3	QPSK	1	8	23.29	23.27	23.36		
3	QPSK	1	14	23.14	23.14	23.39		
3	QPSK	8	0	22.43	22.20	22.29	23.00	1
3	QPSK	8	4	22.40	22.26	22.40		
3	QPSK	8	7	22.23	22.24	22.42		
3	QPSK	15	0	22.31	22.26	22.41	23.00	1
3	16QAM	1	0	22.57	22.45	22.54		
3	16QAM	1	8	22.66	22.56	22.64		
3	16QAM	1	14	22.43	22.41	22.69	22.00	2
3	16QAM	8	0	21.45	21.24	21.35		
3	16QAM	8	4	21.44	21.34	21.48		
3	16QAM	8	7	21.29	21.28	21.47	22.00	2
3	16QAM	15	0	21.35	21.29	21.45		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	23.25	23.02	23.27	24.00	0
1.4	QPSK	1	3	23.28	23.17	23.30		
1.4	QPSK	1	5	23.20	23.09	23.36		
1.4	QPSK	3	0	23.34	23.10	23.36		
1.4	QPSK	3	1	23.31	23.22	23.34		
1.4	QPSK	3	3	23.33	23.25	23.42	23.00	1
1.4	QPSK	6	0	22.32	22.20	22.44		
1.4	16QAM	1	0	22.55	22.33	22.58	23.00	1
1.4	16QAM	1	3	22.53	22.46	22.61		
1.4	16QAM	1	5	22.52	22.34	22.69		
1.4	16QAM	3	0	22.37	22.07	22.39		
1.4	16QAM	3	1	22.42	22.26	22.37		
1.4	16QAM	3	3	22.36	22.26	22.48	22.00	2
1.4	16QAM	6	0	21.39	21.25	21.52		



<LTE Band 30>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				27710				
Frequency (MHz)				2310				
10	QPSK	1	0		22.18		22.50	0
10	QPSK	1	25		21.99			
10	QPSK	1	49		22.01			
10	QPSK	25	0		21.19		21.50	1
10	QPSK	25	12		21.09			
10	QPSK	25	25		21.14			
10	QPSK	50	0		21.06		21.50	1
10	16QAM	1	0		21.48			
10	16QAM	1	25		21.32			
10	16QAM	1	49		21.31		20.50	2
10	16QAM	25	0		20.17			
10	16QAM	25	12		20.10			
10	16QAM	25	25		20.16		20.50	2
10	16QAM	25	0		20.08			
10	16QAM	50	0		20.08			
Channel				27685	27710	27735	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2307.5	2310	2312.5		
5	QPSK	1	0	22.03	22.13	22.11	22.50	0
5	QPSK	1	12	22.04	22.01	22.01		
5	QPSK	1	24	22.03	22.05	22.06		
5	QPSK	12	0	20.99	21.14	21.14	21.50	1
5	QPSK	12	7	21.05	21.06	21.04		
5	QPSK	12	13	20.96	21.08	21.08		
5	QPSK	25	0	21.08	21.04	21.00	21.50	1
5	16QAM	1	0	21.32	21.38	21.41		
5	16QAM	1	12	21.37	21.31	21.34		
5	16QAM	1	24	21.24	21.31	21.27	20.50	2
5	16QAM	12	0	20.08	20.16	20.18		
5	16QAM	12	7	20.08	20.08	20.09		
5	16QAM	12	13	19.98	20.10	20.10	20.50	2
5	16QAM	12	0	20.08	20.07	20.07		



<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	24.23	24.35	24.30		
20	QPSK	1	49	22.97	23.06	22.93	24.50	0
20	QPSK	1	99	23.95	23.89	23.85		
20	QPSK	50	0	22.75	22.76	22.72		
20	QPSK	50	24	22.28	22.29	22.33	23.50	1
20	QPSK	50	50	22.45	22.42	22.40		
20	QPSK	100	0	22.60	22.63	22.62		
20	16QAM	1	0	23.76	23.88	23.84	24.00	0.5
20	16QAM	1	49	22.31	22.32	22.26		
20	16QAM	1	99	23.23	23.23	23.17		
20	16QAM	50	0	21.78	21.75	21.74	22.50	2
20	16QAM	50	24	21.31	21.31	21.33		
20	16QAM	50	50	21.43	21.40	21.38		
20	16QAM	100	0	21.59	21.55	21.61		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	24.15	24.14	24.09	24.50	0
15	QPSK	1	37	23.13	23.18	23.02		
15	QPSK	1	74	23.67	23.69	23.59		
15	QPSK	36	0	22.55	22.55	22.49	23.50	1
15	QPSK	36	20	22.23	22.24	22.16		
15	QPSK	36	39	22.26	22.25	22.17		
15	QPSK	75	0	22.42	22.43	22.34	24.00	0.5
15	16QAM	1	0	23.07	23.28	23.17		
15	16QAM	1	37	22.08	22.18	22.03		
15	16QAM	1	74	22.77	22.77	22.72	22.50	2
15	16QAM	36	0	21.54	21.54	21.47		
15	16QAM	36	20	21.24	21.23	21.15		
15	16QAM	36	39	21.26	21.28	21.13		
15	16QAM	75	0	21.39	21.42	21.31		



Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	23.25	23.33	23.18	24.50	0
10	QPSK	1	25	22.97	23.03	22.93		
10	QPSK	1	49	22.98	22.94	22.93		
10	QPSK	25	0	22.25	22.23	22.17	23.50	1
10	QPSK	25	12	22.17	22.13	22.10		
10	QPSK	25	25	22.11	22.10	22.06		
10	QPSK	50	0	22.20	22.12	22.09	24.00	0.5
10	16QAM	1	0	22.57	22.58	22.41		
10	16QAM	1	25	22.31	22.31	22.20		
10	16QAM	1	49	22.28	22.21	22.16	22.50	2
10	16QAM	25	0	21.28	21.22	21.14		
10	16QAM	25	12	21.20	21.11	21.06		
10	16QAM	25	25	21.14	21.10	21.03	22.50	2
10	16QAM	50	0	21.20	21.14	21.10		
10	16QAM	50	0	21.20	21.14	21.10		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	23.11	23.16	23.03	24.50	0
5	QPSK	1	12	23.01	23.08	22.95		
5	QPSK	1	24	22.95	23.04	22.92		
5	QPSK	12	0	22.16	22.12	22.12	23.50	1
5	QPSK	12	7	22.15	22.11	22.07		
5	QPSK	12	13	22.12	22.02	22.02		
5	QPSK	25	0	22.12	22.06	22.04	24.00	0.5
5	16QAM	1	0	22.32	22.39	22.32		
5	16QAM	1	12	22.25	22.31	22.26		
5	16QAM	1	24	22.21	22.23	22.20	22.50	2
5	16QAM	12	0	21.19	21.15	21.12		
5	16QAM	12	7	21.12	21.12	21.04		
5	16QAM	12	13	21.13	21.05	21.03	22.50	2
5	16QAM	25	0	21.14	21.08	21.04		



Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	24.03	24.22	24.04	24.50	0
3	QPSK	1	8	24.14	24.22	24.10		
3	QPSK	1	14	23.94	24.08	23.95		
3	QPSK	8	0	23.22	23.24	23.16	23.50	1
3	QPSK	8	4	23.23	23.26	23.14		
3	QPSK	8	7	23.18	23.19	23.12		
3	QPSK	15	0	23.19	23.24	23.12		
3	16QAM	1	0	23.32	23.45	23.30	24.00	0.5
3	16QAM	1	8	23.40	23.60	23.41		
3	16QAM	1	14	23.27	23.37	23.27		
3	16QAM	8	0	22.36	22.32	22.25	22.50	2
3	16QAM	8	4	22.38	22.34	22.27		
3	16QAM	8	7	22.34	22.27	22.20		
3	16QAM	15	0	22.23	22.23	22.16		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	24.07	24.14	24.04	24.50	0
1.4	QPSK	1	3	24.15	24.22	24.08		
1.4	QPSK	1	5	24.03	24.07	23.94		
1.4	QPSK	3	0	24.16	24.23	24.12		
1.4	QPSK	3	1	24.17	24.28	24.15		
1.4	QPSK	3	3	24.15	24.25	24.11		
1.4	QPSK	6	0	23.20	23.17	23.07	23.50	1
1.4	16QAM	1	0	23.32	23.43	23.28	24.00	0.5
1.4	16QAM	1	3	23.39	23.47	23.31		
1.4	16QAM	1	5	23.22	23.35	23.21		
1.4	16QAM	3	0	23.14	23.28	23.15		
1.4	16QAM	3	1	23.22	23.29	23.25		
1.4	16QAM	3	3	23.24	23.32	23.18		
1.4	16QAM	6	0	22.28	22.25	22.18	22.50	2



<Reduced Power Mode for Hotspot On>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	21.50	21.62	21.51	22.00	0
20	QPSK	1	49	20.69	20.78	20.78		
20	QPSK	1	99	21.49	21.61	21.50		
20	QPSK	50	0	19.96	20.08	20.07	21.00	1
20	QPSK	50	24	19.86	19.95	19.86		
20	QPSK	50	50	19.90	20.07	20.05		
20	QPSK	100	0	20.05	20.17	20.14	21.00	1
20	16QAM	1	0	20.74	20.86	20.75		
20	16QAM	1	49	19.98	20.07	20.00		
20	16QAM	1	99	20.73	20.78	20.82	20.00	2
20	16QAM	50	0	19.02	19.10	19.08		
20	16QAM	50	24	18.87	18.94	18.83		
20	16QAM	50	50	19.02	19.14	19.11	20.00	2
20	16QAM	100	0	19.06	19.13	19.09		
Channel				18675	18900	19125		
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	21.24	21.18	21.12	22.00	0
15	QPSK	1	37	20.79	20.73	20.78		
15	QPSK	1	74	21.19	21.17	21.22		
15	QPSK	36	0	20.08	20.03	20.07	21.00	1
15	QPSK	36	20	19.93	19.89	19.92		
15	QPSK	36	39	19.97	20.01	19.99		
15	QPSK	75	0	20.06	20.03	20.03	21.00	1
15	16QAM	1	0	20.43	20.47	20.40		
15	16QAM	1	37	19.98	19.98	20.00		
15	16QAM	1	74	20.42	20.40	20.48	20.00	2
15	16QAM	36	0	19.07	19.02	19.04		
15	16QAM	36	20	18.94	18.89	18.92		
15	16QAM	36	39	18.99	19.03	19.01	20.00	2
15	16QAM	75	0	19.00	18.99	19.00		



Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	21.06	21.08	21.04	22.00	0
10	QPSK	1	25	20.78	20.78	20.82		
10	QPSK	1	49	20.80	20.84	20.88		
10	QPSK	25	0	19.95	20.02	20.00	21.00	1
10	QPSK	25	12	19.90	19.93	19.88		
10	QPSK	25	25	19.88	19.88	19.90		
10	QPSK	50	0	19.94	19.96	19.90	21.00	1
10	16QAM	1	0	20.35	20.36	20.29		
10	16QAM	1	25	20.08	20.11	20.00		
10	16QAM	1	49	20.15	20.11	20.11	20.00	2
10	16QAM	25	0	18.96	18.98	18.92		
10	16QAM	25	12	18.92	18.90	18.84		
10	16QAM	25	25	18.88	18.87	18.90	20.00	2
10	16QAM	50	0	18.91	18.93	18.85		
Channel				18625	18900	19175		
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	20.91	20.91	21.01	22.00	0
5	QPSK	1	12	20.78	20.82	20.86		
5	QPSK	1	24	20.77	20.80	20.88		
5	QPSK	12	0	19.85	19.89	19.85	21.00	1
5	QPSK	12	7	19.80	19.84	19.88		
5	QPSK	12	13	19.76	19.86	19.83		
5	QPSK	25	0	19.76	19.80	19.84	21.00	1
5	16QAM	1	0	20.14	20.19	20.22		
5	16QAM	1	12	20.03	20.10	20.11		
5	16QAM	1	24	20.04	20.03	20.10	20.00	2
5	16QAM	12	0	18.93	18.91	18.89		
5	16QAM	12	7	18.85	18.90	18.90		
5	16QAM	12	13	18.81	18.86	18.89	20.00	2
5	16QAM	25	0	18.86	18.87	18.88		



Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	20.84	20.83	20.92	22.00	0
3	QPSK	1	8	20.89	20.92	20.94		
3	QPSK	1	14	20.72	20.76	20.83		
3	QPSK	8	0	19.79	19.85	19.85	21.00	1
3	QPSK	8	4	19.82	19.87	19.87		
3	QPSK	8	7	19.81	19.82	19.86		
3	QPSK	15	0	19.79	19.83	19.84	21.00	1
3	16QAM	1	0	20.05	20.13	20.11		
3	16QAM	1	8	20.14	20.15	20.20		
3	16QAM	1	14	19.96	19.99	20.01	20.00	2
3	16QAM	8	0	18.94	18.92	18.91		
3	16QAM	8	4	18.98	18.94	18.93		
3	16QAM	8	7	18.92	18.91	18.87	20.00	2
3	16QAM	15	0	18.88	18.88	18.90		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	20.76	20.74	20.78	22.00	0
1.4	QPSK	1	3	20.83	20.84	20.88		
1.4	QPSK	1	5	20.73	20.73	20.77		
1.4	QPSK	3	0	20.84	20.81	20.84		
1.4	QPSK	3	1	20.85	20.85	20.89		
1.4	QPSK	3	3	20.86	20.85	20.85	21.00	1
1.4	QPSK	6	0	19.75	19.78	19.77		
1.4	16QAM	1	0	19.95	20.04	20.04	21.00	1
1.4	16QAM	1	3	19.99	20.06	20.11		
1.4	16QAM	1	5	19.94	19.98	19.98		
1.4	16QAM	3	0	19.80	19.84	19.85		
1.4	16QAM	3	1	19.84	19.87	19.90		
1.4	16QAM	3	3	19.86	19.87	19.89	20.00	2
1.4	16QAM	6	0	18.87	18.84	18.86		



<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	21.26	21.24	21.31	22.00	0
20	QPSK	1	49	20.87	20.81	20.84		
20	QPSK	1	99	21.25	21.13	21.08		
20	QPSK	50	0	20.05	20.02	20.06	21.00	1
20	QPSK	50	24	20.01	19.91	19.94		
20	QPSK	50	50	20.01	19.99	19.83		
20	QPSK	100	0	19.95	19.93	19.96	21.00	1
20	16QAM	1	0	20.50	20.46	20.52		
20	16QAM	1	49	20.20	20.13	20.11		
20	16QAM	1	99	20.54	20.41	20.35	20.00	2
20	16QAM	50	0	19.09	19.14	18.99		
20	16QAM	50	24	19.06	18.95	18.94		
20	16QAM	50	50	19.08	19.00	18.83	20.00	2
20	16QAM	100	0	19.01	18.98	18.87		
Channel				20025	20175	20325		
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	20.95	20.98	20.97	22.00	0
15	QPSK	1	37	20.93	20.84	20.82		
15	QPSK	1	74	20.92	20.80	20.76		
15	QPSK	36	0	20.05	19.96	20.02	21.00	1
15	QPSK	36	20	19.98	19.93	19.89		
15	QPSK	36	39	19.94	19.91	19.81		
15	QPSK	75	0	20.00	19.90	19.96	21.00	1
15	16QAM	1	0	20.24	20.11	20.11		
15	16QAM	1	37	20.10	20.06	20.04		
15	16QAM	1	74	20.18	20.04	20.08	20.00	2
15	16QAM	36	0	19.03	18.96	19.00		
15	16QAM	36	20	18.97	18.95	18.84		
15	16QAM	36	39	18.95	18.93	18.80	20.00	2
15	16QAM	75	0	18.94	18.90	18.90		



Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	21.03	21.09	21.01	22.00	0
10	QPSK	1	25	20.87	20.93	20.85		
10	QPSK	1	49	21.07	21.17	21.01		
10	QPSK	25	0	20.10	20.04	20.03	21.00	1
10	QPSK	25	12	20.00	20.05	19.99		
10	QPSK	25	25	20.06	20.09	20.01		
10	QPSK	50	0	20.04	20.06	20.00	21.00	1
10	16QAM	1	0	20.30	20.38	20.32		
10	16QAM	1	25	20.21	20.27	20.21		
10	16QAM	1	49	20.37	20.41	20.34	20.00	2
10	16QAM	25	0	19.08	19.06	18.98		
10	16QAM	25	12	19.03	19.08	18.95		
10	16QAM	25	25	19.07	19.09	18.96	20.00	2
10	16QAM	50	0	19.04	19.08	18.97		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	21.03	21.06	20.99	22.00	0
5	QPSK	1	12	20.96	20.96	20.85		
5	QPSK	1	24	20.86	20.95	20.86		
5	QPSK	12	0	20.05	20.04	19.98	21.00	1
5	QPSK	12	7	20.05	20.02	19.97		
5	QPSK	12	13	20.05	20.00	19.94		
5	QPSK	25	0	20.05	19.99	19.96	21.00	1
5	16QAM	1	0	20.34	20.36	20.28		
5	16QAM	1	12	20.33	20.29	20.24		
5	16QAM	1	24	20.14	20.25	20.09	20.00	2
5	16QAM	12	0	19.11	19.11	18.98		
5	16QAM	12	7	19.08	19.06	18.97		
5	16QAM	12	13	19.07	19.02	18.94	20.00	2
5	16QAM	25	0	19.05	19.04	18.94		



Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	21.10	21.12	21.10	22.00	0
3	QPSK	1	8	21.19	21.12	21.12		
3	QPSK	1	14	21.05	21.00	21.00		
3	QPSK	8	0	20.20	20.17	20.10	21.00	1
3	QPSK	8	4	20.17	20.19	20.13		
3	QPSK	8	7	20.14	20.06	20.07		
3	QPSK	15	0	20.17	20.16	20.08	21.00	1
3	16QAM	1	0	20.18	20.17	20.07		
3	16QAM	1	8	20.08	20.13	20.14		
3	16QAM	1	14	20.15	20.09	20.11	20.00	2
3	16QAM	8	0	19.05	19.11	19.19		
3	16QAM	8	4	19.05	19.16	19.19		
3	16QAM	8	7	19.19	19.10	19.18	20.00	2
3	16QAM	15	0	19.16	19.17	19.14		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	21.05	21.08	21.02	22.00	0
1.4	QPSK	1	3	21.14	21.14	21.10		
1.4	QPSK	1	5	21.03	21.03	20.98		
1.4	QPSK	3	0	21.14	21.15	21.12		
1.4	QPSK	3	1	21.18	21.20	21.16		
1.4	QPSK	3	3	21.17	21.19	21.14	21.00	1
1.4	QPSK	6	0	20.10	20.07	20.08		
1.4	16QAM	1	0	20.36	20.34	20.30	21.00	1
1.4	16QAM	1	3	20.38	20.35	20.34		
1.4	16QAM	1	5	20.27	20.36	20.25		
1.4	16QAM	3	0	20.15	20.13	20.08		
1.4	16QAM	3	1	20.24	20.18	20.13		
1.4	16QAM	3	3	20.19	20.20	20.12	20.00	2
1.4	16QAM	6	0	19.16	19.14	19.12		



<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	21.70	21.71	21.59	22.00	0
20	QPSK	1	49	20.11	20.08	20.06		
20	QPSK	1	99	21.09	21.07	20.92		
20	QPSK	50	0	19.78	19.85	19.75	21.00	1
20	QPSK	50	24	19.37	19.45	19.37		
20	QPSK	50	50	19.57	19.51	19.43		
20	QPSK	100	0	19.70	19.77	19.76	21.00	1
20	16QAM	1	0	20.77	20.91	20.94		
20	16QAM	1	49	19.63	19.21	19.20		
20	16QAM	1	99	20.57	20.47	20.07	20.00	2
20	16QAM	50	0	18.78	18.70	18.91		
20	16QAM	50	24	18.41	18.34	18.35		
20	16QAM	50	50	18.46	18.39	18.48	20.00	2
20	16QAM	100	0	18.61	18.57	18.58		
Channel				132047	132322	132597		
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	21.09	21.24	21.17	22.00	0
15	QPSK	1	37	20.01	20.50	20.44		
15	QPSK	1	74	20.71	20.67	20.66		
15	QPSK	36	0	19.62	19.62	19.52	21.00	1
15	QPSK	36	20	19.38	19.34	19.21		
15	QPSK	36	39	19.32	19.37	19.18		
15	QPSK	75	0	19.52	19.55	19.40	21.00	1
15	16QAM	1	0	20.10	20.17	20.15		
15	16QAM	1	37	19.58	19.26	19.21		
15	16QAM	1	74	19.83	20.21	19.58	20.00	2
15	16QAM	36	0	18.63	18.70	18.61		
15	16QAM	36	20	18.25	18.41	18.23		
15	16QAM	36	39	18.33	18.40	18.32	20.00	2
15	16QAM	75	0	18.43	18.50	18.46		



Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	20.37	20.35	20.31	22.00	0
10	QPSK	1	25	20.20	20.11	20.00		
10	QPSK	1	49	20.11	20.00	20.11		
10	QPSK	25	0	19.33	19.38	19.17	21.00	1
10	QPSK	25	12	19.28	19.21	19.02		
10	QPSK	25	25	19.24	19.18	19.09		
10	QPSK	50	0	19.33	19.22	19.12	21.00	1
10	16QAM	1	0	19.37	19.59	19.40		
10	16QAM	1	25	19.67	19.63	19.16		
10	16QAM	1	49	19.49	19.36	19.54	20.00	2
10	16QAM	25	0	18.37	18.29	18.19		
10	16QAM	25	12	18.28	18.22	18.21		
10	16QAM	25	25	18.09	18.21	18.05	20.00	2
10	16QAM	50	0	18.38	18.23	18.12		
Channel				131997	132322	132647		
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	20.30	20.20	20.17	22.00	0
5	QPSK	1	12	20.04	20.16	20.10		
5	QPSK	1	24	20.15	20.12	20.03		
5	QPSK	12	0	19.23	19.18	19.18	21.00	1
5	QPSK	12	7	19.18	19.20	19.13		
5	QPSK	12	13	19.21	19.08	19.13		
5	QPSK	25	0	19.18	19.21	19.09	21.00	1
5	16QAM	1	0	19.62	19.61	19.11		
5	16QAM	1	12	19.34	19.29	19.32		
5	16QAM	1	24	19.71	19.30	19.52	20.00	2
5	16QAM	12	0	18.27	18.17	18.25		
5	16QAM	12	7	18.29	18.22	18.18		
5	16QAM	12	13	18.25	18.07	18.11	20.00	2
5	16QAM	25	0	18.28	18.15	18.13		



Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	21.21	21.25	21.16	22.00	0
3	QPSK	1	8	21.24	21.31	21.22		
3	QPSK	1	14	21.10	21.14	21.07		
3	QPSK	8	0	20.23	20.29	20.17	21.00	1
3	QPSK	8	4	20.24	20.26	20.17		
3	QPSK	8	7	20.22	20.22	20.16		
3	QPSK	15	0	20.21	20.26	20.13	21.00	1
3	16QAM	1	0	20.49	20.53	20.42		
3	16QAM	1	8	20.61	20.62	20.50		
3	16QAM	1	14	20.41	20.39	20.34	20.00	2
3	16QAM	8	0	19.28	19.35	19.26		
3	16QAM	8	4	19.29	19.36	19.29		
3	16QAM	8	7	19.27	19.28	19.23	20.00	2
3	16QAM	15	0	19.23	19.31	19.19		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	21.13	21.18	21.09	22.00	0
1.4	QPSK	1	3	21.19	21.27	21.19		
1.4	QPSK	1	5	21.10	21.14	21.08		
1.4	QPSK	3	0	21.23	21.28	21.20		
1.4	QPSK	3	1	21.27	21.32	21.25		
1.4	QPSK	3	3	21.23	21.31	21.21	21.00	1
1.4	QPSK	6	0	20.15	20.18	20.10		
1.4	16QAM	1	0	20.38	20.50	20.30	21.00	1
1.4	16QAM	1	3	20.48	20.55	20.39		
1.4	16QAM	1	5	20.37	20.47	20.27		
1.4	16QAM	3	0	20.21	20.32	20.21		
1.4	16QAM	3	1	20.28	20.35	20.23		
1.4	16QAM	3	3	20.29	20.32	20.23	20.00	2
1.4	16QAM	6	0	19.23	19.29	19.18		



<LTE Carrier Aggregation>

General Note:

This device supports Carrier Aggregation on downlink for inter band, uplink CA is not supported. For the device supports bands and bandwidths and configurations are provided as follow table was according to 3GPP.

<Inter-Band for Two Carrier Combination>

E-UTRA CA configuration / Bandwidth combination set										
E-UTRA CA Configuration	Uplink CA configurations	E- UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_2A-5A	-	2			Yes	Yes	Yes	Yes	30	0
		5			Yes	Yes				
		2			Yes	Yes			20	1
		5			Yes	Yes				
CA_2A-12A	-	2			Yes	Yes	Yes	Yes	30	0
		12			Yes	Yes				
		2			Yes	Yes	Yes	Yes	30	1
		12		Yes	Yes	Yes				
		2			Yes	Yes			20	2
		12			Yes	Yes				
CA_2A-29A	-	2			Yes	Yes			20	0
		29		Yes	Yes	Yes				
		2			Yes	Yes			20	1
		29			Yes	Yes				
		2			Yes	Yes	Yes	Yes	30	2
29			Yes	Yes						
CA_2A-30A	-	2			Yes	Yes	Yes	Yes	30	0
		30			Yes	Yes				
CA_4A-5A	-	4			Yes	Yes			20	0
		5			Yes	Yes				
		4			Yes	Yes	Yes	Yes	30	0
5			Yes	Yes						
CA_4A-12A	-	4	Yes	Yes	Yes	Yes			20	0
		12			Yes	Yes				
		4	Yes	Yes	Yes	Yes	Yes	Yes	30	1
		12			Yes	Yes				
		4			Yes	Yes	Yes	Yes	30	2
		12		Yes	Yes	Yes				
		4			Yes	Yes			20	3
		12			Yes	Yes				
		4			Yes	Yes	Yes	Yes	30	4
		12			Yes	Yes				
4			Yes	Yes	Yes		20	5		
12			Yes							
CA_4A-29A	-	4			Yes	Yes			20	0
		29		Yes	Yes	Yes				
		4			Yes	Yes			20	1
		29			Yes	Yes				
		4			Yes	Yes	Yes	Yes	30	2
29			Yes	Yes						
CA_4A-30A	-	4			Yes	Yes	Yes	Yes	30	0
		30			Yes	Yes				



E-UTRA CA configuration / Bandwidth combination set										
E-UTRA CA Configuration	Uplink CA configurations	E- UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_5A-30A	-	5			Yes	Yes			20	0
		30			Yes	Yes				
CA_5A-66A	-	5			Yes	Yes			30	0
		66			Yes	Yes	Yes	Yes		
CA_12A-30A	-	12			Yes	Yes			20	0
		30			Yes	Yes				
CA_12A-66A	-	12			Yes	Yes			20	0
		66	Yes	Yes	Yes	Yes				
		12			Yes	Yes			30	1
		66	Yes	Yes	Yes	Yes	Yes	Yes		
		12		Yes	Yes	Yes			30	2
		66			Yes	Yes	Yes	Yes		
		12			Yes	Yes			20	3
		66			Yes	Yes				
		12			Yes	Yes			30	4
		66			Yes	Yes	Yes	Yes		
12			Yes				20	5		
66			Yes	Yes	Yes					
CA_30A-29A	-	30			Yes	Yes			20	0
		29			Yes	Yes				
CA_30A-66A	-	30			Yes	Yes			30	0
		66			Yes	Yes	Yes	Yes		
CA_66A-29A	-	66			Yes	Yes	Yes	Yes	30	0
		29			Yes	Yes				



<Inter-Band for Three Carrier Combination>

E-UTRA CA configuration / Bandwidth combination set										
E-UTRA CA Configuration	Uplink CA configurations	E- UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_2A-5A-30A	-	2			Yes	Yes	Yes	Yes	40	0
		5			Yes	Yes				
		30			Yes	Yes				
CA_4A-5A-30A	-	4			Yes	Yes	Yes	Yes	40	0
		5			Yes	Yes				
		30			Yes	Yes				
CA_2A-12A-30A	-	2			Yes	Yes	Yes	Yes	40	0
		12			Yes	Yes				
		30			Yes	Yes				
CA_4A-12A-30A	-	4			Yes	Yes	Yes	Yes	40	0
		12			Yes	Yes				
		30			Yes	Yes				
CA_2A-29A-30A	-	2			Yes	Yes	Yes	Yes	40	0
		29			Yes	Yes				
		30			Yes	Yes				
CA_4A-29A-30A	-	4			Yes	Yes	Yes	Yes	40	0
		29			Yes	Yes				
		30			Yes	Yes				



LTE Carrier Aggregation Conducted Power (Downlink)

General Note:

- i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.
- ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.
- iii. The device supports downlink carrier aggregation only. Uplink carrier aggregation is not supported. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
- iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.
- v. For inter-band CA, the SCC selected highest bandwidth and near the middle of its transmission band. For SCC DL RB size and offset will base on the PCC corresponding RB allocation.

<Full Power Mode for Two Carrier Power Verification>

Configure	PCC							SCC				Power	
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx. Power (dBm)	Without CA Tx. Power (dBm)
Inter-Band	Band 2	20M	1880	18900	QPSK	1	0	Band 5	10M	881.5	2525	23.61	23.65
	Band 5	10M	844	20600	QPSK	1	0	Band 2	20M	1960	900	23.60	23.61
	Band 2	20M	1880	18900	QPSK	1	0	Band 12	10M	737.5	5095	23.64	23.65
	Band 12	10M	711	23130	QPSK	1	0	Band 2	20M	1960	900	23.31	23.32
	Band 2	20M	1880	18900	QPSK	1	0	Band 29	10M	722.5	9715	23.63	23.65
	Band 2	20M	1880	18900	QPSK	1	0	Band 30	10M	2355	9820	23.61	23.65
	Band 30	10M	2310	27710	QPSK	1	0	Band 2	20M	1960	900	22.15	22.18
	Band 4	20M	1732.5	20175	QPSK	1	0	Band 5	10M	881.5	2525	23.78	23.80
	Band 5	10M	844	20600	QPSK	1	0	Band 4	20M	2132.5	2175	23.58	23.61
	Band 4	20M	1732.5	20175	QPSK	1	0	Band 12	10M	737.5	5095	23.76	23.80
	Band 4	20M	1732.5	20175	QPSK	1	0	Band 29	10M	722.5	9715	23.75	23.80
	Band 4	20M	1732.5	20175	QPSK	1	0	Band 30	10M	2355	9820	23.71	23.80
	Band 30	10M	2310	27710	QPSK	1	0	Band 4	20M	2132.5	2175	22.13	22.18
	Band 5	10M	844	20600	QPSK	1	0	Band 30	10M	2355	9820	23.60	23.61
	Band 30	10M	2310	27710	QPSK	1	0	Band 5	10M	881.5	2525	22.15	22.18
	Band 5	10M	844	20600	QPSK	1	0	Band 66	20M	2155	66886	23.58	23.61
	Band 66	20M	1745	132322	QPSK	1	0	Band 5	10M	881.5	2525	23.78	24.35
	Band 12	10M	711	23130	QPSK	1	0	Band 30	10M	2355	9820	23.28	23.32
	Band 30	10M	2310	27710	QPSK	1	0	Band 12	10M	737.5	5095	22.14	22.18
	Band 66	20M	1745	132322	QPSK	1	0	Band 12	10M	737.5	5095	23.76	24.35
Band 30	10M	2310	27710	QPSK	1	0	Band 29	10M	722.5	9715	22.13	22.18	
Band 30	10M	2310	27710	QPSK	1	0	Band 66	20M	2155	66886	22.16	22.18	
Band 66	20M	1745	132322	QPSK	1	0	Band 30	10M	2355	9820	23.71	24.35	
Band 66	20M	1745	132322	QPSK	1	0	Band 29	10M	722.5	9715	23.75	24.35	



<Full Power Mode for Three Carrier Power Verification>

Configure		PCC						SCC1				SCC2				Power		
		LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx. Power (dBm)	Without CA Tx. Power (dBm)
Inter-Band	CA_2A-5A-30A	Band 2	20M	1880	18900	QPSK	1	0	Band 30	10M	2355	9820	Band 5	10M	881.5	2525	23.61	23.65
		Band 5	10M	844	20600	QPSK	1	0	Band 30	10M	2355	9820	Band 2	20M	1960	900	23.60	23.61
		Band 30	10M	2310	27710	QPSK	1	0	Band 2	20M	1960	900	Band 5	10M	881.5	2525	22.12	22.18
	CA_4A-5A-30A	Band 4	20M	1732.5	20175	QPSK	1	0	Band 30	10M	2355	9820	Band 5	10M	881.5	2525	23.76	23.80
		Band 5	10M	844	20600	QPSK	1	0	Band 4	20M	2132.5	2175	Band 30	10M	2355	9820	23.58	23.61
		Band 30	10M	2310	27710	QPSK	1	0	Band 4	20M	2132.5	2175	Band 5	10M	881.5	2525	22.15	22.18
	CA_2A-12A-30A	Band 2	20M	1880	18900	QPSK	1	0	Band 30	10M	2355	9820	Band 12	10M	737.5	5095	23.61	23.65
		Band 12	10M	711	23130	QPSK	1	0	Band 2	20M	1960	900	Band 30	10M	2355	9820	23.31	23.32
		Band 30	10M	2310	27710	QPSK	1	0	Band 2	20M	1960	900	Band 12	10M	737.5	5095	22.15	22.18
	CA_4A-12A-30A	Band 4	20M	1732.5	20175	QPSK	1	0	Band 30	10M	2355	9820	Band 12	10M	737.5	5095	23.75	23.80
		Band 30	10M	2310	27710	QPSK	1	0	Band 4	20M	2132.5	2175	Band 12	10M	737.5	5095	22.17	22.18
	CA_2A-29A-30A	Band 2	20M	1880	18900	QPSK	1	0	Band 30	10M	2355	9820	Band 29	10M	722.5	9715	23.61	23.65
		Band 30	10M	2310	27710	QPSK	1	0	Band 2	20M	1960	900	Band 29	10M	722.5	9715	22.17	22.18
	CA_4A-29A-30A	Band 4	20M	1732.5	20175	QPSK	1	0	Band 30	10M	2355	9820	Band 29	10M	722.5	9715	23.74	23.80
		Band 30	10M	2310	27710	QPSK	1	0	Band 4	20M	2132.5	2175	Band 29	10M	722.5	9715	22.16	22.18

<WLAN Conducted Power>

General Note:

1. For WLAN two transmitters, WLAN antenna 1 can transmit standalone, WLAN antenna 2 can only transmit simultaneously with WLAN antenna 1.
2. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
3. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
4. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
5. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
 - a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
 - b. 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.
 - c. 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.

<2.4GHz WLAN Ant.1>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	14.66	15.50	98.96
		6	2437	14.97	15.50	
		11	2462	14.12	15.50	
	802.11g 6Mbps	1	2412	12.38	13.00	95.00
		6	2437	12.85	13.00	
		11	2462	11.47	13.00	
	802.11n-HT20 MCS0	1	2412	11.68	12.50	95.00
		6	2437	11.99	12.50	
		11	2462	10.92	12.50	
	802.11n-HT40 MCS0	3	2422	11.99	12.50	89.66
		6	2437	11.56	12.50	
		9	2452	10.95	12.50	

<2.4GHz WLAN Ant. 1+2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11n-HT20 MCS0	1	2412	14.56	15.50	94.33
		6	2437	14.92	15.50	
		11	2462	14.54	15.50	
	802.11n-HT40 MCS0	3	2422	14.94	15.50	89.12
		6	2437	14.68	15.50	
		9	2452	14.41	15.50	



<5GHz WLAN Ant.1>

5.2GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
	802.11a 6Mbps	36	5180	12.96	13.50	95.34
		40	5200	12.62	13.50	
		44	5220	12.79	13.50	
		48	5240	12.93	13.50	
	802.11n-HT20 MCS0	36	5180	12.86	13.00	94.32
		40	5200	12.56	13.00	
		44	5220	12.93	13.00	
		48	5240	12.95	13.00	
	802.11n-HT40 MCS0	38	5190	12.87	13.00	90.35
46		5230	12.95	13.00		
802.11ac-VHT20 MCS0	36	5180	9.86	11.00	94.31	
	40	5200	9.37	11.00		
	44	5220	9.63	11.00		
	48	5240	9.73	11.00		
802.11ac-VHT40 MCS0	38	5190	10.21	11.00	90.35	
	46	5230	10.25	11.00		
802.11ac-VHT80 MCS0	42	5210	9.99	11.00	82.43	

5.8GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
	802.11a 6Mbps	149	5745	12.40	13.50	95.34
		157	5785	13.23	13.50	
		165	5825	12.06	13.50	
	802.11n-HT20 MCS0	149	5745	12.57	13.50	94.32
		157	5785	13.04	13.50	
		165	5825	11.97	13.50	
	802.11n-HT40 MCS0	151	5755	13.14	13.50	90.35
		159	5795	12.46	13.50	
	802.11ac-VHT20 MCS0	149	5745	9.28	10.50	94.31
		157	5785	10.07	10.50	
		165	5825	8.95	10.50	
	802.11ac-VHT40 MCS0	151	5755	10.00	10.50	90.35
		159	5795	9.55	10.50	
802.11ac-VHT80 MCS0	155	5775	9.87	10.50	82.43	

<5GHz WLAN Ant.1+2>

5.2GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
	802.11n-HT20 MCS0	36	5180	16.13	16.50	95.12
		40	5200	15.92	16.50	
		44	5220	16.08	16.50	
		48	5240	16.19	16.50	
	802.11n-HT40 MCS0	38	5190	15.70	16.00	89.71
		46	5230	15.79	16.00	
	802.11ac-VHT20 MCS0	36	5180	12.78	14.00	94.80
		40	5200	12.45	14.00	
		44	5220	12.68	14.00	
48		5240	12.74	14.00		
802.11ac-VHT40 MCS0	38	5190	13.19	14.00	91.02	
	46	5230	13.30	14.00		
802.11ac-VHT80 MCS0	42	5210	13.14	14.00	80.05	

5.8GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
	802.11n-HT20 MCS0	149	5745	14.85	15.50	95.12
		157	5785	14.94	15.50	
		165	5825	14.79	15.50	
	802.11n-HT40 MCS0	151	5755	15.37	15.50	89.71
		159	5795	15.34	15.50	
	802.11ac-VHT20 MCS0	149	5745	11.47	13.00	94.80
		157	5785	11.42	13.00	
		165	5825	11.52	13.00	
	802.11ac-VHT40 MCS0	151	5755	11.94	13.00	91.02
159		5795	11.91	13.00		
802.11ac-VHT80 MCS0	155	5775	11.85	13.00	80.05	

13. Bluetooth Exclusions Applied

Mode Band	Average power(dBm)	
	Bluetooth v3.0+EDR	Bluetooth v4.0 LE / v4.1 LE
2.4GHz Bluetooth	8.5	0.5

Note:

Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR}$$

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

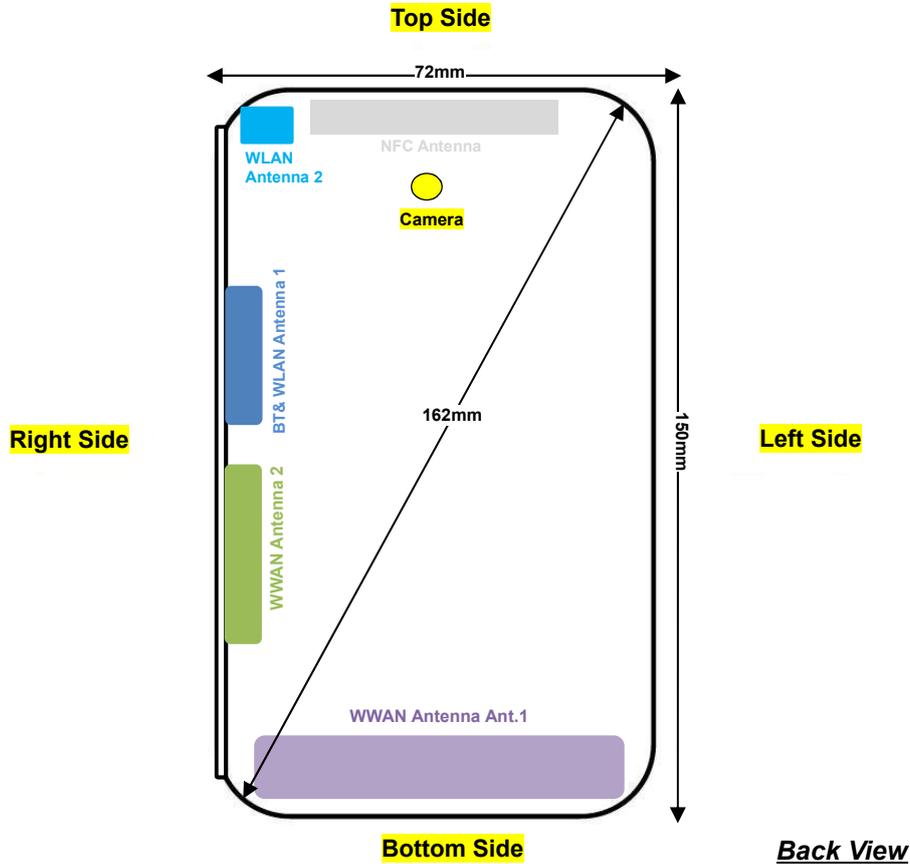
Bluetooth Max Power (dBm)	Frequency (GHz)	Separation Distance (mm)		Exclusion Thresholds	
		1-g SAR	10-g extremity SAR	1-g SAR	10-g extremity SAR
8.5	2.48	10	0	1.1	2.2

Note:

1. Per KDB 447498 D01v06, a distance of 10 mm is applied to determine 1g SAR test exclusion. The test exclusion threshold is 1.1 which is ≤ 3, SAR testing is not required.
2. Per KDB 447498 D01v06, when the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR 10g SAR test exclusion. The test exclusion threshold is 2.2 which is ≤ 7.5, SAR testing is not required.

14. Antenna Location

<Flip Close Mode>



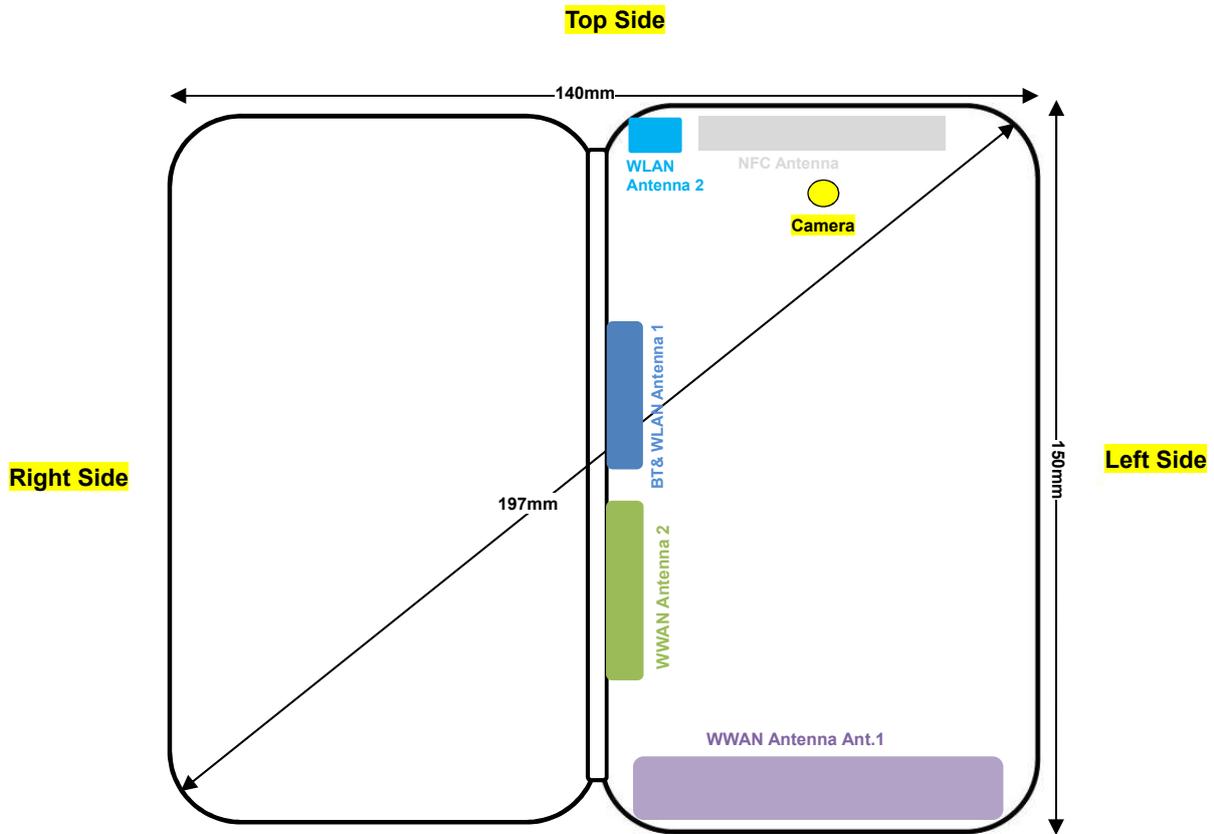
Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Antenna 1	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	≤ 25mm
WWAN Antenna 2	≤ 25mm	≤ 25mm	>25mm	>25mm	≤ 25mm	>25mm
BT&WLAN Antenna 1	≤ 25mm	≤ 25mm	>25mm	>25mm	≤ 25mm	>25mm
WLAN Antenna 2	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Antenna 1	Yes	Yes	No	Yes	Yes	Yes
WWAN Antenna 2	Yes	Yes	No	No	Yes	No
BT&WLAN Antenna 1	Yes	Yes	No	No	Yes	No
WLAN Antenna 2	Yes	Yes	Yes	No	Yes	No

General Note:

1. WWAN antenna 1 frequency bands include GSM850/1900, WCDMA B2 / B4 / B5, LTE B2 / B4 / B5 / B12 / B66 and WWAN antenna 2 frequency band only includes LTE B30.
2. For WLAN two transmitters, WLAN antenna 1 can transmit standalone, WLAN antenna 2 can only transmit simultaneously with WLAN antenna 1.
3. 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.

<Flip Open Mode>



Bottom Side

Back View

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Antenna 1	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm	≤ 25mm
WWAN Antenna 2	≤ 25mm	≤ 25mm	>25mm	>25mm	>25mm	>25mm
BT&WLAN Antenna 1	≤ 25mm	≤ 25mm	>25mm	>25mm	>25mm	>25mm
WLAN Antenna 2	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	>25mm	>25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Antenna 1	Yes	Yes	No	Yes	No	Yes
WWAN Antenna 2	Yes	Yes	No	No	No	No
BT&WLAN Antenna 1	Yes	Yes	No	No	No	No
WLAN Antenna 2	Yes	Yes	Yes	No	No	No

General Note:

1. WWAN antenna 1 frequency bands include GSM850/1900, WCDMA B2 / B4 / B5, LTE B2 / B4 / B5 / B12 / B66 and WWAN antenna 2 frequency band only includes LTE B30.
2. For WLAN two transmitters, WLAN antenna 1 can transmit standalone, WLAN antenna 2 can only transmit simultaneously with WLAN antenna 1.
3. 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.



15. 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: 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
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 ≥ 0.8 W/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. When hotspot mode is enabled, power reduction will be activated to limit the maximum power of GSM1900, WCDMA B2 / B4 and LTE B2 / B4 / B66.
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 GSM1900, WCDMA B2 / B4 and LTE B2 / B66, therefore product specific SAR is necessary.
7. For 5.2GHz / 5.8GHz WLAN product specific SAR is necessary too, due to an overall diagonal dimension is > 16cm and it does not support hotspot operation.
8. This device has two WWAN antennas. WWAN antenna 1 is located at the bottom side of the device and WWAN antenna 2 is located at the right side of the device which can refer to antenna location chapter. WWAN antenna 1 frequency bands include GSM850/1900, WCDMA B2 / B4 / B5, LTE B2 / B4 / B5 / B12 / B66 and WWAN antenna 2 frequency bands only include LTE B30.
9. The device is capable of switching between antenna 1 and antenna 2 based on signal strength.
10. For WLAN two transmitters, WLAN antenna 1 can transmit standalone, WLAN antenna 2 can only transmit simultaneously with WLAN antenna 1.
11. This is a dual screens side flip smartphone. The device has two screens, mounted on the front and back face. When the device screen is closed, the back face screen can't work; when the device screen is open, these two screens can be used as one screen or as two screens separate.
12. In the following tables of the SAR test values, "FC" = Flip Close mode, "FO" = Flip Open mode.

**GSM Note:**

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE 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 (2Tx slots) for GSM850/GSM1900 is considered as the primary mode.
2. Other configurations of GSM / GPRS / EDGE 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 $\leq \frac{1}{4}$ dB higher than the primary mode, SAR measurement is not required for the secondary mode.
3. Power reduction which is triggered by hotspot mode is implemented in GSM1900 band, for hotspot mode SAR testing EUT was set in reduced power mode and GPRS (2Tx slots) due to its highest frame-average power.

WCDMA 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 is $\leq \frac{1}{4}$ 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 to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA) are less than $\frac{1}{4}$ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA.

LTE Note:

3. 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.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. 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.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is $> \frac{1}{2}$ 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.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is $> \frac{1}{2}$ 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.
8. For LTE B4 / B5 / B12 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.
9. LTE band 4 SAR test was covered by Band 66; 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 \leq 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. 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.
3. 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.
4. During SAR testing the WLAN transmission was verified using a spectrum analyzer.



15.1 Head SAR

<GSM SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	Test Position	Power Mode	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)
	FC	1	GSM850	GPRS 2 Tx slots	Right Cheek	Full	189	836.4	33.36	33.50	1.033	0.13	0.263	0.272
	FC	1	GSM850	GPRS 2 Tx slots	Right Tilted	Full	189	836.4	33.36	33.50	1.033	-0.11	0.254	0.262
01	FC	1	GSM850	GPRS 2 Tx slots	Left Cheek	Full	189	836.4	33.36	33.50	1.033	0.09	0.427	0.441
	FC	1	GSM850	GPRS 2 Tx slots	Left Tilted	Full	189	836.4	33.36	33.50	1.033	-0.04	0.241	0.249
	FO	1	GSM850	GPRS 2 Tx slots	Right Cheek	Full	189	836.4	33.36	33.50	1.033	0.12	0.153	0.158
	FO	1	GSM850	GPRS 2 Tx slots	Right Tilted	Full	189	836.4	33.36	33.50	1.033	-0.04	0.157	0.162
	FO	1	GSM850	GPRS 2 Tx slots	Left Cheek	Full	189	836.4	33.36	33.50	1.033	0.05	0.237	0.245
	FO	1	GSM850	GPRS 2 Tx slots	Left Tilted	Full	189	836.4	33.36	33.50	1.033	0.11	0.136	0.140
02	FC	1	GSM1900	GPRS 2 Tx slots	Right Cheek	Full	512	1850.2	30.24	30.50	1.062	0.02	0.170	0.180
	FC	1	GSM1900	GPRS 2 Tx slots	Right Tilted	Full	512	1850.2	30.24	30.50	1.062	0.05	0.060	0.064
	FC	1	GSM1900	GPRS 2 Tx slots	Left Cheek	Full	512	1850.2	30.24	30.50	1.062	0.08	0.103	0.109
	FC	1	GSM1900	GPRS 2 Tx slots	Left Tilted	Full	512	1850.2	30.24	30.50	1.062	0.11	0.122	0.130
	FO	1	GSM1900	GPRS 2 Tx slots	Right Cheek	Full	512	1850.2	30.24	30.50	1.062	0.07	0.124	0.132
	FO	1	GSM1900	GPRS 2 Tx slots	Right Tilted	Full	512	1850.2	30.24	30.50	1.062	-0.1	0.046	0.049
	FO	1	GSM1900	GPRS 2 Tx slots	Left Cheek	Full	512	1850.2	30.24	30.50	1.062	0.07	0.092	0.098
	FO	1	GSM1900	GPRS 2 Tx slots	Left Tilted	Full	512	1850.2	30.24	30.50	1.062	0.02	0.072	0.076

<WCDMA SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	Test Position	Power Mode	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)
	FC	1	WCDMA Band V	RMC 12.2Kbps	Right Cheek	Full	4132	826.4	24.76	25.00	1.057	0.03	0.169	0.179
	FC	1	WCDMA Band V	RMC 12.2Kbps	Right Tilted	Full	4132	826.4	24.76	25.00	1.057	-0.01	0.136	0.144
03	FC	1	WCDMA Band V	RMC 12.2Kbps	Left Cheek	Full	4132	826.4	24.76	25.00	1.057	0.07	0.241	0.255
	FC	1	WCDMA Band V	RMC 12.2Kbps	Left Tilted	Full	4132	826.4	24.76	25.00	1.057	0.07	0.132	0.139
	FO	1	WCDMA Band V	RMC 12.2Kbps	Right Cheek	Full	4132	826.4	24.76	25.00	1.057	0.09	0.050	0.053
	FO	1	WCDMA Band V	RMC 12.2Kbps	Right Tilted	Full	4132	826.4	24.76	25.00	1.057	-0.08	0.035	0.037
	FO	1	WCDMA Band V	RMC 12.2Kbps	Left Cheek	Full	4132	826.4	24.76	25.00	1.057	0.09	0.056	0.059
	FO	1	WCDMA Band V	RMC 12.2Kbps	Left Tilted	Full	4132	826.4	24.76	25.00	1.057	0.03	0.034	0.036
04	FC	1	WCDMA Band IV	RMC 12.2Kbps	Right Cheek	Full	1312	1712.4	23.68	24.00	1.076	0.06	0.198	0.213
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Right Tilted	Full	1312	1712.4	23.68	24.00	1.076	0.01	0.056	0.060
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Left Cheek	Full	1312	1712.4	23.68	24.00	1.076	0.1	0.132	0.142
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Left Tilted	Full	1312	1712.4	23.68	24.00	1.076	0.02	0.094	0.101
	FO	1	WCDMA Band IV	RMC 12.2Kbps	Right Cheek	Full	1312	1712.4	23.68	24.00	1.076	0.03	0.098	0.105
	FO	1	WCDMA Band IV	RMC 12.2Kbps	Right Tilted	Full	1312	1712.4	23.68	24.00	1.076	-0.01	0.030	0.032
	FO	1	WCDMA Band IV	RMC 12.2Kbps	Left Cheek	Full	1312	1712.4	23.68	24.00	1.076	0.07	0.069	0.074
	FO	1	WCDMA Band IV	RMC 12.2Kbps	Left Tilted	Full	1312	1712.4	23.68	24.00	1.076	0.01	0.033	0.036
05	FC	1	WCDMA Band II	RMC 12.2Kbps	Right Cheek	Full	9538	1907.6	23.62	24.00	1.091	0.02	0.195	0.213
	FC	1	WCDMA Band II	RMC 12.2Kbps	Right Tilted	Full	9538	1907.6	23.62	24.00	1.091	0.02	0.042	0.046
	FC	1	WCDMA Band II	RMC 12.2Kbps	Left Cheek	Full	9538	1907.6	23.62	24.00	1.091	0.03	0.134	0.146
	FC	1	WCDMA Band II	RMC 12.2Kbps	Left Tilted	Full	9538	1907.6	23.62	24.00	1.091	0.11	0.110	0.120
	FO	1	WCDMA Band II	RMC 12.2Kbps	Right Cheek	Full	9538	1907.6	23.62	24.00	1.091	0.04	0.161	0.176
	FO	1	WCDMA Band II	RMC 12.2Kbps	Right Tilted	Full	9538	1907.6	23.62	24.00	1.091	-0.06	0.052	0.057
	FO	1	WCDMA Band II	RMC 12.2Kbps	Left Cheek	Full	9538	1907.6	23.62	24.00	1.091	0.09	0.133	0.145
	FO	1	WCDMA Band II	RMC 12.2Kbps	Left Tilted	Full	9538	1907.6	23.62	24.00	1.091	-0.15	0.072	0.079



<LTE SAR>

Plot No.	EUT Type	Ant. Port	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Power Mode	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)
	FC	1	LTE Band 12	10M	QPSK	1	0	Right Cheek	Full	23095	707.5	23.19	24.00	1.205	0.03	0.105	0.127
	FC	1	LTE Band 12	10M	QPSK	25	0	Right Cheek	Full	23095	707.5	22.32	23.00	1.169	0.01	0.087	0.102
	FC	1	LTE Band 12	10M	QPSK	1	0	Right Tilted	Full	23095	707.5	23.19	24.00	1.205	0.02	0.087	0.105
	FC	1	LTE Band 12	10M	QPSK	25	0	Right Tilted	Full	23095	707.5	22.32	23.00	1.169	0.05	0.074	0.087
06	FC	1	LTE Band 12	10M	QPSK	1	0	Left Cheek	Full	23095	707.5	23.19	24.00	1.205	0.05	0.131	0.158
	FC	1	LTE Band 12	10M	QPSK	25	0	Left Cheek	Full	23095	707.5	22.32	23.00	1.169	0.05	0.109	0.127
	FC	1	LTE Band 12	10M	QPSK	1	0	Left Tilted	Full	23095	707.5	23.19	24.00	1.205	0.01	0.087	0.105
	FC	1	LTE Band 12	10M	QPSK	25	0	Left Tilted	Full	23095	707.5	22.32	23.00	1.169	-0.08	0.076	0.089
	FO	1	LTE Band 12	10M	QPSK	1	0	Right Cheek	Full	23095	707.5	23.19	24.00	1.205	0.08	0.052	0.063
	FO	1	LTE Band 12	10M	QPSK	25	0	Right Cheek	Full	23095	707.5	22.32	23.00	1.169	0.06	0.045	0.053
	FO	1	LTE Band 12	10M	QPSK	1	0	Right Tilted	Full	23095	707.5	23.19	24.00	1.205	0.07	0.024	0.029
	FO	1	LTE Band 12	10M	QPSK	25	0	Right Tilted	Full	23095	707.5	22.32	23.00	1.169	-0.02	0.020	0.023
	FO	1	LTE Band 12	10M	QPSK	1	0	Left Cheek	Full	23095	707.5	23.19	24.00	1.205	0.03	0.059	0.071
	FO	1	LTE Band 12	10M	QPSK	25	0	Left Cheek	Full	23095	707.5	22.32	23.00	1.169	0.04	0.051	0.060
	FO	1	LTE Band 12	10M	QPSK	1	0	Left Tilted	Full	23095	707.5	23.19	24.00	1.205	0.08	0.027	0.033
	FO	1	LTE Band 12	10M	QPSK	25	0	Left Tilted	Full	23095	707.5	22.32	23.00	1.169	-0.04	0.023	0.027
	FC	1	LTE Band 5	10M	QPSK	1	0	Right Cheek	Full	20525	836.5	23.55	24.00	1.109	0.06	0.141	0.156
	FC	1	LTE Band 5	10M	QPSK	25	0	Right Cheek	Full	20525	836.5	22.70	23.00	1.072	-0.17	0.119	0.128
	FC	1	LTE Band 5	10M	QPSK	1	0	Right Tilted	Full	20525	836.5	23.55	24.00	1.109	0.02	0.148	0.164
	FC	1	LTE Band 5	10M	QPSK	25	0	Right Tilted	Full	20525	836.5	22.70	23.00	1.072	0.05	0.122	0.131
07	FC	1	LTE Band 5	10M	QPSK	1	0	Left Cheek	Full	20525	836.5	23.55	24.00	1.109	0.01	0.196	0.217
	FC	1	LTE Band 5	10M	QPSK	25	0	Left Cheek	Full	20525	836.5	22.70	23.00	1.072	0.08	0.164	0.176
	FC	1	LTE Band 5	10M	QPSK	1	0	Left Tilted	Full	20525	836.5	23.55	24.00	1.109	0.11	0.128	0.142
	FC	1	LTE Band 5	10M	QPSK	25	0	Left Tilted	Full	20525	836.5	22.70	23.00	1.072	0.06	0.106	0.114
	FO	1	LTE Band 5	10M	QPSK	1	0	Right Cheek	Full	20525	836.5	23.55	24.00	1.109	0.08	0.051	0.057
	FO	1	LTE Band 5	10M	QPSK	25	0	Right Cheek	Full	20525	836.5	22.70	23.00	1.072	0.11	0.043	0.046
	FO	1	LTE Band 5	10M	QPSK	1	0	Right Tilted	Full	20525	836.5	23.55	24.00	1.109	0.07	0.019	0.021
	FO	1	LTE Band 5	10M	QPSK	25	0	Right Tilted	Full	20525	836.5	22.70	23.00	1.072	0.06	0.016	0.017
	FO	1	LTE Band 5	10M	QPSK	1	0	Left Cheek	Full	20525	836.5	23.55	24.00	1.109	0.11	0.053	0.059
	FO	1	LTE Band 5	10M	QPSK	25	0	Left Cheek	Full	20525	836.5	22.70	23.00	1.072	0.06	0.045	0.048
	FO	1	LTE Band 5	10M	QPSK	1	0	Left Tilted	Full	20525	836.5	23.55	24.00	1.109	0.08	0.025	0.028
	FO	1	LTE Band 5	10M	QPSK	25	0	Left Tilted	Full	20525	836.5	22.70	23.00	1.072	-0.19	0.021	0.023
08	FC	1	LTE Band 66	20M	QPSK	1	0	Right Cheek	Full	132322	1745	24.35	24.50	1.035	0.01	0.254	0.263
	FC	1	LTE Band 66	20M	QPSK	50	0	Right Cheek	Full	132322	1745	22.76	23.50	1.186	0.04	0.157	0.186
	FC	1	LTE Band 66	20M	QPSK	1	0	Right Tilted	Full	132322	1745	24.35	24.50	1.035	0.04	0.077	0.080
	FC	1	LTE Band 66	20M	QPSK	50	0	Right Tilted	Full	132322	1745	22.76	23.50	1.186	0.07	0.076	0.090
	FC	1	LTE Band 66	20M	QPSK	1	0	Left Cheek	Full	132322	1745	24.35	24.50	1.035	0.06	0.153	0.158
	FC	1	LTE Band 66	20M	QPSK	50	0	Left Cheek	Full	132322	1745	22.76	23.50	1.186	0.05	0.094	0.111
	FC	1	LTE Band 66	20M	QPSK	1	0	Left Tilted	Full	132322	1745	24.35	24.50	1.035	0.01	0.126	0.130
	FC	1	LTE Band 66	20M	QPSK	50	0	Left Tilted	Full	132322	1745	22.76	23.50	1.186	0.17	0.077	0.091
	FO	1	LTE Band 66	20M	QPSK	1	0	Right Cheek	Full	132322	1745	24.35	24.50	1.035	0.01	0.141	0.146
	FO	1	LTE Band 66	20M	QPSK	50	0	Right Cheek	Full	132322	1745	22.76	23.50	1.186	0.04	0.089	0.106
	FO	1	LTE Band 66	20M	QPSK	1	0	Right Tilted	Full	132322	1745	24.35	24.50	1.035	-0.11	0.040	0.041
	FO	1	LTE Band 66	20M	QPSK	50	0	Right Tilted	Full	132322	1745	22.76	23.50	1.186	-0.01	0.025	0.030
	FO	1	LTE Band 66	20M	QPSK	1	0	Left Cheek	Full	132322	1745	24.35	24.50	1.035	0.06	0.073	0.076
	FO	1	LTE Band 66	20M	QPSK	50	0	Left Cheek	Full	132322	1745	22.76	23.50	1.186	0.04	0.047	0.056
	FO	1	LTE Band 66	20M	QPSK	1	0	Left Tilted	Full	132322	1745	24.35	24.50	1.035	0.16	0.038	0.039
	FO	1	LTE Band 66	20M	QPSK	50	0	Left Tilted	Full	132322	1745	22.76	23.50	1.186	0.11	0.023	0.027



Plot No.	EUT Type	Ant. Port	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Power Mode	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)
09	FC	1	LTE Band 2	20M	QPSK	1	0	Right Cheek	Full	18900	1880	23.65	24.00	1.084	0.01	0.172	0.186
	FC	1	LTE Band 2	20M	QPSK	50	0	Right Cheek	Full	18900	1880	22.18	23.00	1.208	0.13	0.128	0.155
	FC	1	LTE Band 2	20M	QPSK	1	0	Right Tilted	Full	18900	1880	23.65	24.00	1.084	0.047	0.053	0.057
	FC	1	LTE Band 2	20M	QPSK	50	0	Right Tilted	Full	18900	1880	22.18	23.00	1.208	0.05	0.040	0.048
	FC	1	LTE Band 2	20M	QPSK	1	0	Left Cheek	Full	18900	1880	23.65	24.00	1.084	-0.08	0.109	0.118
	FC	1	LTE Band 2	20M	QPSK	50	0	Left Cheek	Full	18900	1880	22.18	23.00	1.208	0.04	0.082	0.099
	FC	1	LTE Band 2	20M	QPSK	1	0	Left Tilted	Full	18900	1880	23.65	24.00	1.084	0.07	0.126	0.137
	FC	1	LTE Band 2	20M	QPSK	50	0	Left Tilted	Full	18900	1880	22.18	23.00	1.208	0.05	0.093	0.112
	FO	1	LTE Band 2	20M	QPSK	1	0	Right Cheek	Full	18900	1880	23.65	24.00	1.084	0.03	0.143	0.155
	FO	1	LTE Band 2	20M	QPSK	50	0	Right Cheek	Full	18900	1880	22.18	23.00	1.208	-0.08	0.105	0.127
	FO	1	LTE Band 2	20M	QPSK	1	0	Right Tilted	Full	18900	1880	23.65	24.00	1.084	-0.04	0.067	0.073
	FO	1	LTE Band 2	20M	QPSK	50	0	Right Tilted	Full	18900	1880	22.18	23.00	1.208	0.04	0.045	0.054
	FO	1	LTE Band 2	20M	QPSK	1	0	Left Cheek	Full	18900	1880	23.65	24.00	1.084	0.15	0.114	0.124
	FO	1	LTE Band 2	20M	QPSK	50	0	Left Cheek	Full	18900	1880	22.18	23.00	1.208	-0.11	0.084	0.101
	FO	1	LTE Band 2	20M	QPSK	1	0	Left Tilted	Full	18900	1880	23.65	24.00	1.084	0.09	0.101	0.109
	FO	1	LTE Band 2	20M	QPSK	50	0	Left Tilted	Full	18900	1880	22.18	23.00	1.208	-0.03	0.073	0.088
10	FC	2	LTE Band 30	10M	QPSK	1	0	Right Cheek	Full	27710	2310	22.18	22.50	1.076	0.05	0.973	1.047
	FC	2	LTE Band 30	10M	QPSK	25	0	Right Cheek	Full	27710	2310	21.19	21.50	1.074	0.04	0.783	0.841
	FC	2	LTE Band 30	10M	QPSK	50	0	Right Cheek	Full	27710	2310	21.06	21.50	1.107	0.05	0.766	0.848
	FC	2	LTE Band 30	10M	QPSK	1	0	Right Tilted	Full	27710	2310	22.18	22.50	1.076	-0.05	0.133	0.143
	FC	2	LTE Band 30	10M	QPSK	25	0	Right Tilted	Full	27710	2310	21.19	21.50	1.074	-0.19	0.105	0.113
	FC	2	LTE Band 30	10M	QPSK	1	0	Left Cheek	Full	27710	2310	22.18	22.50	1.076	0.02	0.299	0.322
	FC	2	LTE Band 30	10M	QPSK	25	0	Left Cheek	Full	27710	2310	21.19	21.50	1.074	0.03	0.217	0.233
	FC	2	LTE Band 30	10M	QPSK	1	0	Left Tilted	Full	27710	2310	22.18	22.50	1.076	-0.09	0.170	0.183
	FC	2	LTE Band 30	10M	QPSK	25	0	Left Tilted	Full	27710	2310	21.19	21.50	1.074	-0.04	0.133	0.143
	FO	2	LTE Band 30	10M	QPSK	1	0	Right Cheek	Full	27710	2310	22.18	22.50	1.076	0.04	0.258	0.278
	FO	2	LTE Band 30	10M	QPSK	25	0	Right Cheek	Full	27710	2310	21.19	21.50	1.074	0.05	0.204	0.219
	FO	2	LTE Band 30	10M	QPSK	1	0	Right Tilted	Full	27710	2310	22.18	22.50	1.076	0.01	0.104	0.112
	FO	2	LTE Band 30	10M	QPSK	25	0	Right Tilted	Full	27710	2310	21.19	21.50	1.074	0.05	0.082	0.088
	FO	2	LTE Band 30	10M	QPSK	1	0	Left Cheek	Full	27710	2310	22.18	22.50	1.076	0.02	0.567	0.610
	FO	2	LTE Band 30	10M	QPSK	25	0	Left Cheek	Full	27710	2310	21.19	21.50	1.074	-0.04	0.450	0.483
	FO	2	LTE Band 30	10M	QPSK	1	0	Left Tilted	Full	27710	2310	22.18	22.50	1.076	-0.05	0.370	0.398
	FO	2	LTE Band 30	10M	QPSK	25	0	Left Tilted	Full	27710	2310	21.19	21.50	1.074	-0.15	0.293	0.315



<WLAN 2.4GHz SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Max Area Scan SAR	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FC	1	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	6	2437	14.97	15.50	1.130	98.96	1.011	0.14	0.108	0.068	0.078
	FC	1	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	6	2437	14.97	15.50	1.130	98.96	1.011		0.011		
	FC	1	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	6	2437	14.97	15.50	1.130	98.96	1.011		0.083		
	FC	1	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	6	2437	14.97	15.50	1.130	98.96	1.011		0.023		
	FC	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Right Cheek	3	2422	14.94	15.50	1.138	89.12	1.122		0.156		
	FC	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Right Tilted	3	2422	14.94	15.50	1.138	89.12	1.122		0.156		
	FC	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Left Cheek	3	2422	14.94	15.50	1.138	89.12	1.122	0.17	0.559	0.276	0.352
	FC	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Left Tilted	3	2422	14.94	15.50	1.138	89.12	1.122		0.520		
	FO	1	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	6	2437	14.97	15.50	1.130	98.96	1.011	0.02	0.055	0.024	0.027
	FO	1	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	6	2437	14.97	15.50	1.130	98.96	1.011		0.016		
	FO	1	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	6	2437	14.97	15.50	1.130	98.96	1.011		0.031		
	FO	1	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	6	2437	14.97	15.50	1.130	98.96	1.011		0.026		
	FO	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Right Cheek	3	2422	14.94	15.50	1.138	89.12	1.122		0.15		
	FO	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Right Tilted	3	2422	14.94	15.50	1.138	89.12	1.122		0.166		
11	FO	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Left Cheek	3	2422	14.94	15.50	1.138	89.12	1.122	0.05	0.523	0.313	0.400
	FO	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Left Tilted	3	2422	14.94	15.50	1.138	89.12	1.122	0.03	0.425	0.256	0.327



<WLAN 5GHz SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Max Area Scan SAR	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FC	1	WLAN5.2GHz	802.11a 6Mbps	Right Cheek	36	5180	12.96	13.50	1.132	95.34	1.049		0.110		
	FC	1	WLAN5.2GHz	802.11a 6Mbps	Right Tilted	36	5180	12.96	13.50	1.132	95.34	1.049		0.033		
	FC	1	WLAN5.2GHz	802.11a 6Mbps	Left Cheek	36	5180	12.96	13.50	1.132	95.34	1.049		0.068		
	FC	1	WLAN5.2GHz	802.11a 6Mbps	Left Tilted	36	5180	12.96	13.50	1.132	95.34	1.049	0.01	0.165	0.003	0.004
	FC	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Right Cheek	48	5240	16.19	16.50	1.073	95.12	1.051		0.545		
	FC	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Right Tilted	48	5240	16.19	16.50	1.073	95.12	1.051		0.669		
	FC	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Left Cheek	48	5240	16.19	16.50	1.073	95.12	1.051		0.820		
	FC	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Left Tilted	48	5240	16.19	16.50	1.073	95.12	1.051	0.1	1.074	0.348	0.392
	FO	1	WLAN5.2GHz	802.11a 6Mbps	Right Cheek	36	5180	12.96	13.50	1.132	95.34	1.049	0.01	0.00101	<0.001	<0.001
	FO	1	WLAN5.2GHz	802.11a 6Mbps	Right Tilted	36	5180	12.96	13.50	1.132	95.34	1.049		0.000871		
	FO	1	WLAN5.2GHz	802.11a 6Mbps	Left Cheek	36	5180	12.96	13.50	1.132	95.34	1.049		0.000589		
	FO	1	WLAN5.2GHz	802.11a 6Mbps	Left Tilted	36	5180	12.96	13.50	1.132	95.34	1.049		0.000947		
	FO	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Right Cheek	48	5240	16.19	16.50	1.073	95.12	1.051		0.736		
	FO	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Right Tilted	48	5240	16.19	16.50	1.073	95.12	1.051		0.744		
	FO	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Left Cheek	48	5240	16.19	16.50	1.073	95.12	1.051	-0.17	1.078	0.497	0.560
12	FO	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Left Tilted	48	5240	16.19	16.50	1.073	95.12	1.051	0.01	1.317	0.599	0.675
	FC	1	WLAN5.8GHz	802.11n-HT40 MCS0	Right Cheek	151	5755	13.14	13.50	1.086	90.35	1.107		0.024		
	FC	1	WLAN5.8GHz	802.11n-HT40 MCS0	Right Tilted	151	5755	13.14	13.50	1.086	90.35	1.107	0.01	0.130	0.018	0.022
	FC	1	WLAN5.8GHz	802.11n-HT40 MCS0	Left Cheek	151	5755	13.14	13.50	1.086	90.35	1.107		0.023		
	FC	1	WLAN5.8GHz	802.11n-HT40 MCS0	Left Tilted	151	5755	13.14	13.50	1.086	90.35	1.107		0.047		
	FC	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Right Cheek	151	5755	15.37	15.50	1.031	89.71	1.115		0.508		
	FC	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Right Tilted	151	5755	15.37	15.50	1.031	89.71	1.115		0.500		
	FC	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Left Cheek	151	5755	15.37	15.50	1.031	89.71	1.115	0.15	0.631	0.332	0.381
13	FC	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Left Tilted	151	5755	15.37	15.50	1.031	89.71	1.115	-0.03	0.727	0.373	0.429
	FO	1	WLAN5.8GHz	802.11n-HT40 MCS0	Right Cheek	151	5755	13.14	13.50	1.086	90.35	1.107	0.03	0.051	0.003	0.004
	FO	1	WLAN5.8GHz	802.11n-HT40 MCS0	Right Tilted	151	5755	13.14	13.50	1.086	90.35	1.107		0.047		
	FO	1	WLAN5.8GHz	802.11n-HT40 MCS0	Left Cheek	151	5755	13.14	13.50	1.086	90.35	1.107		0		
	FO	1	WLAN5.8GHz	802.11n-HT40 MCS0	Left Tilted	151	5755	13.14	13.50	1.086	90.35	1.107		0.011		
	FO	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Right Cheek	151	5755	15.37	15.50	1.031	89.71	1.115		0.598		
	FO	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Right Tilted	151	5755	15.37	15.50	1.031	89.71	1.115		0.625		
	FO	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Left Cheek	151	5755	15.37	15.50	1.031	89.71	1.115	-0.14	0.740	0.337	0.387
	FO	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Left Tilted	151	5755	15.37	15.50	1.031	89.71	1.115	-0.15	0.812	0.370	0.425



15.2 Hotspot SAR

<GSM SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
	FC	1	GSM850	GPRS 2 Tx slots	Front	10	Full	189	836.4	33.36	33.50	1.033	-0.06	0.904	0.934
	FC	1	GSM850	GPRS 2 Tx slots	Front	10	Full	128	824.2	33.22	33.50	1.067	0.01	0.597	0.637
	FC	1	GSM850	GPRS 2 Tx slots	Front	10	Full	251	848.8	33.34	33.50	1.038	-0.17	0.745	0.773
	FC	1	GSM850	GPRS 2 Tx slots	Back	10	Full	189	836.4	33.36	33.50	1.033	0.1	0.620	0.640
	FC	1	GSM850	GPRS 2 Tx slots	Left Side	10	Full	189	836.4	33.36	33.50	1.033	0.03	0.593	0.612
	FC	1	GSM850	GPRS 2 Tx slots	Right Side	10	Full	189	836.4	33.36	33.50	1.033	-0.01	0.179	0.185
	FC	1	GSM850	GPRS 2 Tx slots	Bottom Side	10	Full	189	836.4	33.36	33.50	1.033	0.08	0.539	0.557
	FO	1	GSM850	GPRS 2 Tx slots	Front	10	Full	189	836.4	33.36	33.50	1.033	0.003	0.906	0.936
	FO	1	GSM850	GPRS 2 Tx slots	Front	10	Full	128	824.2	33.22	33.50	1.067	-0.13	0.685	0.731
14	FO	1	GSM850	GPRS 2 Tx slots	Front	10	Full	251	848.8	33.34	33.50	1.038	0.05	1.030	1.069
	FO	1	GSM850	GPRS 2 Tx slots	Back	10	Full	189	836.4	33.36	33.50	1.033	0.07	1.020	1.053
	FO	1	GSM850	GPRS 2 Tx slots	Back	10	Full	128	824.2	33.22	33.50	1.067	0.17	0.705	0.752
	FO	1	GSM850	GPRS 2 Tx slots	Back	10	Full	251	848.8	33.34	33.50	1.038	0.03	1.010	1.048
	FO	1	GSM850	GPRS 2 Tx slots	Left Side	10	Full	189	836.4	33.36	33.50	1.033	0.03	0.287	0.296
	FO	1	GSM850	GPRS 2 Tx slots	Bottom Side	10	Full	189	836.4	33.36	33.50	1.033	0.03	0.609	0.629
	FC	1	GSM1900	GPRS 2 Tx slots	Front	10	Reduced	512	1850.2	27.77	28.00	1.054	-0.02	0.465	0.490
	FC	1	GSM1900	GPRS 2 Tx slots	Back	10	Reduced	512	1850.2	27.77	28.00	1.054	0.03	0.253	0.267
	FC	1	GSM1900	GPRS 2 Tx slots	Left Side	10	Reduced	512	1850.2	27.77	28.00	1.054	-0.16	0.153	0.161
	FC	1	GSM1900	GPRS 2 Tx slots	Right Side	10	Reduced	512	1850.2	27.77	28.00	1.054	0.03	0.033	0.035
	FC	1	GSM1900	GPRS 2 Tx slots	Bottom Side	10	Reduced	512	1850.2	27.77	28.00	1.054	-0.1	0.968	1.021
	FC	1	GSM1900	GPRS 2 Tx slots	Bottom Side	10	Reduced	661	1880	27.53	28.00	1.114	-0.08	1.000	1.114
	FC	1	GSM1900	GPRS 2 Tx slots	Bottom Side	10	Reduced	810	1909.8	27.67	28.00	1.079	-0.1	1.010	1.090
	FO	1	GSM1900	GPRS 2 Tx slots	Front	10	Reduced	512	1850.2	27.77	28.00	1.054	-0.06	0.460	0.485
	FO	1	GSM1900	GPRS 2 Tx slots	Back	10	Reduced	512	1850.2	27.77	28.00	1.054	-0.14	0.420	0.443
	FO	1	GSM1900	GPRS 2 Tx slots	Left Side	10	Reduced	512	1850.2	27.77	28.00	1.054	-0.12	0.114	0.120
	FO	1	GSM1900	GPRS 2 Tx slots	Bottom Side	10	Reduced	512	1850.2	27.77	28.00	1.054	-0.11	1.010	1.065
15	FO	1	GSM1900	GPRS 2 Tx slots	Bottom Side	10	Reduced	661	1880	27.53	28.00	1.114	-0.08	1.060	1.181
	FO	1	GSM1900	GPRS 2 Tx slots	Bottom Side	10	Reduced	810	1909.8	27.67	28.00	1.079	-0.04	1.070	1.154



<WCDMA SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
16	FC	1	WCDMA Band V	RMC 12.2Kbps	Front	10	Full	4132	826.4	24.76	25.00	1.057	-0.01	0.419	0.443
	FC	1	WCDMA Band V	RMC 12.2Kbps	Back	10	Full	4132	826.4	24.76	25.00	1.057	0.02	0.304	0.321
	FC	1	WCDMA Band V	RMC 12.2Kbps	Left Side	10	Full	4132	826.4	24.76	25.00	1.057	0.08	0.394	0.416
	FC	1	WCDMA Band V	RMC 12.2Kbps	Right Side	10	Full	4132	826.4	24.76	25.00	1.057	0.02	0.139	0.147
	FC	1	WCDMA Band V	RMC 12.2Kbps	Bottom Side	10	Full	4132	826.4	24.76	25.00	1.057	0.1	0.257	0.272
	FO	1	WCDMA Band V	RMC 12.2Kbps	Front	10	Full	4132	826.4	24.76	25.00	1.057	0.01	0.314	0.332
	FO	1	WCDMA Band V	RMC 12.2Kbps	Back	10	Full	4132	826.4	24.76	25.00	1.057	0.08	0.363	0.384
	FO	1	WCDMA Band V	RMC 12.2Kbps	Left Side	10	Full	4132	826.4	24.76	25.00	1.057	0.03	0.120	0.127
	FO	1	WCDMA Band V	RMC 12.2Kbps	Bottom Side	10	Full	4132	826.4	24.76	25.00	1.057	0.03	0.305	0.322
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Front	10	Reduced	1312	1712.4	21.64	22.00	1.086	0.04	0.445	0.483
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Back	10	Reduced	1312	1712.4	21.64	22.00	1.086	0.06	0.348	0.378
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Left Side	10	Reduced	1312	1712.4	21.64	22.00	1.086	-0.02	0.109	0.118
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Right Side	10	Reduced	1312	1712.4	21.64	22.00	1.086	-0.08	0.078	0.085
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	10	Reduced	1312	1712.4	21.64	22.00	1.086	-0.15	1.050	1.141
17	FC	1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	10	Reduced	1413	1732.6	21.63	22.00	1.089	-0.12	1.060	1.154
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	10	Reduced	1513	1752.6	21.53	22.00	1.114	-0.14	1.010	1.125
	FO	1	WCDMA Band IV	RMC 12.2Kbps	Front	10	Reduced	1312	1712.4	21.64	22.00	1.086	-0.08	0.337	0.366
	FO	1	WCDMA Band IV	RMC 12.2Kbps	Back	10	Reduced	1312	1712.4	21.64	22.00	1.086	-0.18	0.300	0.326
	FO	1	WCDMA Band IV	RMC 12.2Kbps	Left Side	10	Reduced	1312	1712.4	21.64	22.00	1.086	-0.16	0.106	0.115
	FO	1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	10	Reduced	1312	1712.4	21.64	22.00	1.086	-0.03	0.712	0.774
	FC	1	WCDMA Band II	RMC 12.2Kbps	Front	10	Reduced	9538	1907.6	21.59	22.00	1.099	-0.04	0.471	0.518
	FC	1	WCDMA Band II	RMC 12.2Kbps	Back	10	Reduced	9538	1907.6	21.59	22.00	1.099	0.02	0.283	0.311
	FC	1	WCDMA Band II	RMC 12.2Kbps	Left Side	10	Reduced	9538	1907.6	21.59	22.00	1.099	0.03	0.163	0.179
	FC	1	WCDMA Band II	RMC 12.2Kbps	Right Side	10	Reduced	9538	1907.6	21.59	22.00	1.099	-0.06	0.029	0.032
	FC	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	10	Reduced	9538	1907.6	21.59	22.00	1.099	-0.16	1.080	1.187
	FC	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	10	Reduced	9262	1852.4	21.48	22.00	1.127	-0.14	1.020	1.150
	FC	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	10	Reduced	9400	1880	21.53	22.00	1.114	-0.16	1.040	1.159
	FO	1	WCDMA Band II	RMC 12.2Kbps	Front	10	Reduced	9538	1907.6	21.59	22.00	1.099	-0.17	0.499	0.548
	FO	1	WCDMA Band II	RMC 12.2Kbps	Back	10	Reduced	9538	1907.6	21.59	22.00	1.099	-0.14	0.496	0.545
	FO	1	WCDMA Band II	RMC 12.2Kbps	Left Side	10	Reduced	9538	1907.6	21.59	22.00	1.099	-0.02	0.132	0.145
18	FO	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	10	Reduced	9538	1907.6	21.59	22.00	1.099	-0.08	1.090	1.198
	FO	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	10	Reduced	9262	1852.4	21.48	22.00	1.127	-0.18	0.996	1.123
	FO	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	10	Reduced	9400	1880	21.53	22.00	1.114	-0.02	1.040	1.159



<LTE SAR>

Plot No.	EUT Type	Ant. Port	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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)
	FC	1	LTE Band 12	10M	QPSK	1	0	Front	10	Full	23095	707.5	23.19	24.00	1.205	-0.13	0.249	0.300
	FC	1	LTE Band 12	10M	QPSK	25	0	Front	10	Full	23095	707.5	22.32	23.00	1.169	-0.14	0.228	0.267
	FC	1	LTE Band 12	10M	QPSK	1	0	Back	10	Full	23095	707.5	23.19	24.00	1.205	0.02	0.190	0.229
	FC	1	LTE Band 12	10M	QPSK	25	0	Back	10	Full	23095	707.5	22.32	23.00	1.169	0.07	0.175	0.205
	FC	1	LTE Band 12	10M	QPSK	1	0	Left Side	10	Full	23095	707.5	23.19	24.00	1.205	-0.04	0.222	0.268
	FC	1	LTE Band 12	10M	QPSK	25	0	Left Side	10	Full	23095	707.5	22.32	23.00	1.169	-0.03	0.210	0.246
	FC	1	LTE Band 12	10M	QPSK	1	0	Right Side	10	Full	23095	707.5	23.19	24.00	1.205	-0.08	0.108	0.130
	FC	1	LTE Band 12	10M	QPSK	25	0	Right Side	10	Full	23095	707.5	22.32	23.00	1.169	0.01	0.092	0.108
	FC	1	LTE Band 12	10M	QPSK	1	0	Bottom Side	10	Full	23095	707.5	23.19	24.00	1.205	0.02	0.122	0.147
	FC	1	LTE Band 12	10M	QPSK	25	0	Bottom Side	10	Full	23095	707.5	22.32	23.00	1.169	0.02	0.115	0.134
	FO	1	LTE Band 12	10M	QPSK	1	0	Front	10	Full	23095	707.5	23.19	24.00	1.205	-0.09	0.270	0.325
	FO	1	LTE Band 12	10M	QPSK	25	0	Front	10	Full	23095	707.5	22.32	23.00	1.169	-0.03	0.236	0.276
19	FO	1	LTE Band 12	10M	QPSK	1	0	Back	10	Full	23095	707.5	23.19	24.00	1.205	0.17	0.358	0.431
	FO	1	LTE Band 12	10M	QPSK	25	0	Back	10	Full	23095	707.5	22.32	23.00	1.169	0.17	0.290	0.339
	FO	1	LTE Band 12	10M	QPSK	1	0	Left Side	10	Full	23095	707.5	23.19	24.00	1.205	-0.07	0.118	0.142
	FO	1	LTE Band 12	10M	QPSK	25	0	Left Side	10	Full	23095	707.5	22.32	23.00	1.169	-0.14	0.094	0.110
	FO	1	LTE Band 12	10M	QPSK	1	0	Bottom Side	10	Full	23095	707.5	23.19	24.00	1.205	-0.12	0.168	0.202
	FO	1	LTE Band 12	10M	QPSK	25	0	Bottom Side	10	Full	23095	707.5	22.32	23.00	1.169	-0.07	0.170	0.199
20	FC	1	LTE Band 5	10M	QPSK	1	0	Front	10	Full	20525	836.5	23.55	24.00	1.109	-0.16	0.326	0.362
	FC	1	LTE Band 5	10M	QPSK	25	0	Front	10	Full	20525	836.5	22.70	23.00	1.072	0.03	0.301	0.323
	FC	1	LTE Band 5	10M	QPSK	1	0	Back	10	Full	20525	836.5	23.55	24.00	1.109	0.01	0.281	0.312
	FC	1	LTE Band 5	10M	QPSK	25	0	Back	10	Full	20525	836.5	22.70	23.00	1.072	0.03	0.239	0.256
	FC	1	LTE Band 5	10M	QPSK	1	0	Left Side	10	Full	20525	836.5	23.55	24.00	1.109	-0.12	0.325	0.360
	FC	1	LTE Band 5	10M	QPSK	25	0	Left Side	10	Full	20525	836.5	22.70	23.00	1.072	0.01	0.272	0.291
	FC	1	LTE Band 5	10M	QPSK	1	0	Right Side	10	Full	20525	836.5	23.55	24.00	1.109	-0.09	0.075	0.083
	FC	1	LTE Band 5	10M	QPSK	25	0	Right Side	10	Full	20525	836.5	22.70	23.00	1.072	-0.02	0.058	0.062
	FC	1	LTE Band 5	10M	QPSK	1	0	Bottom Side	10	Full	20525	836.5	23.55	24.00	1.109	0.1	0.238	0.264
	FC	1	LTE Band 5	10M	QPSK	25	0	Bottom Side	10	Full	20525	836.5	22.70	23.00	1.072	0.14	0.201	0.215
	FO	1	LTE Band 5	10M	QPSK	1	0	Front	10	Full	20525	836.5	23.55	24.00	1.109	-0.17	0.293	0.325
	FO	1	LTE Band 5	10M	QPSK	25	0	Front	10	Full	20525	836.5	22.70	23.00	1.072	0.02	0.252	0.270
	FO	1	LTE Band 5	10M	QPSK	1	0	Back	10	Full	20525	836.5	23.55	24.00	1.109	0.03	0.325	0.360
	FO	1	LTE Band 5	10M	QPSK	25	0	Back	10	Full	20525	836.5	22.70	23.00	1.072	0.03	0.267	0.286
	FO	1	LTE Band 5	10M	QPSK	1	0	Left Side	10	Full	20525	836.5	23.55	24.00	1.109	-0.19	0.065	0.072
	FO	1	LTE Band 5	10M	QPSK	25	0	Left Side	10	Full	20525	836.5	22.70	23.00	1.072	0.03	0.057	0.061
	FO	1	LTE Band 5	10M	QPSK	1	0	Bottom Side	10	Full	20525	836.5	23.55	24.00	1.109	0.1	0.220	0.244
	FO	1	LTE Band 5	10M	QPSK	25	0	Bottom Side	10	Full	20525	836.5	22.70	23.00	1.072	0.06	0.191	0.205



Plot No.	EUT Type	Ant. Port	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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)
	FC	1	LTE Band 66	20M	QPSK	1	0	Front	10	Reduced	132322	1745	21.71	22.00	1.069	0.05	0.585	0.625
	FC	1	LTE Band 66	20M	QPSK	50	0	Front	10	Reduced	132322	1745	19.85	21.00	1.303	0.03	0.369	0.481
	FC	1	LTE Band 66	20M	QPSK	1	0	Back	10	Reduced	132322	1745	21.71	22.00	1.069	0.02	0.339	0.362
	FC	1	LTE Band 66	20M	QPSK	50	0	Back	10	Reduced	132322	1745	19.85	21.00	1.303	0.16	0.213	0.278
	FC	1	LTE Band 66	20M	QPSK	1	0	Left Side	10	Reduced	132322	1745	21.71	22.00	1.069	0.03	0.133	0.142
	FC	1	LTE Band 66	20M	QPSK	50	0	Left Side	10	Reduced	132322	1745	19.85	21.00	1.303	0.03	0.085	0.111
	FC	1	LTE Band 66	20M	QPSK	1	0	Right Side	10	Reduced	132322	1745	21.71	22.00	1.069	-0.15	0.091	0.097
	FC	1	LTE Band 66	20M	QPSK	50	0	Right Side	10	Reduced	132322	1745	19.85	21.00	1.303	-0.13	0.057	0.074
	FC	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	10	Reduced	132322	1745	21.71	22.00	1.069	-0.15	1.090	1.165
21	FC	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	10	Reduced	132072	1720	21.70	22.00	1.072	-0.01	1.100	1.179
	FC	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	10	Reduced	132572	1770	21.59	22.00	1.099	-0.13	1.020	1.121
	FC	1	LTE Band 66	20M	QPSK	50	0	Bottom Side	10	Reduced	132322	1745	19.85	21.00	1.303	-0.16	0.684	0.891
	FC	1	LTE Band 66	20M	QPSK	50	0	Bottom Side	10	Reduced	132072	1720	19.78	21.00	1.324	0.03	0.675	0.894
	FC	1	LTE Band 66	20M	QPSK	50	0	Bottom Side	10	Reduced	132572	1770	19.75	21.00	1.334	0.01	0.679	0.905
	FC	1	LTE Band 66	20M	QPSK	100	0	Bottom Side	10	Reduced	132322	1745	19.77	21.00	1.327	0.03	0.659	0.875
	FO	1	LTE Band 66	20M	QPSK	1	0	Front	10	Reduced	132322	1745	21.71	22.00	1.069	-0.09	0.423	0.452
	FO	1	LTE Band 66	20M	QPSK	50	0	Front	10	Reduced	132322	1745	19.85	21.00	1.303	0.06	0.271	0.353
	FO	1	LTE Band 66	20M	QPSK	1	0	Back	10	Reduced	132322	1745	21.71	22.00	1.069	0.01	0.355	0.380
	FO	1	LTE Band 66	20M	QPSK	50	0	Back	10	Reduced	132322	1745	19.85	21.00	1.303	-0.18	0.229	0.298
	FO	1	LTE Band 66	20M	QPSK	1	0	Left Side	10	Reduced	132322	1745	21.71	22.00	1.069	0.05	0.121	0.129
	FO	1	LTE Band 66	20M	QPSK	50	0	Left Side	10	Reduced	132322	1745	19.85	21.00	1.303	0.01	0.076	0.099
	FO	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	10	Reduced	132322	1745	21.71	22.00	1.069	-0.19	0.919	0.982
	FO	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	10	Reduced	132072	1720	21.70	22.00	1.072	0.03	0.890	0.954
	FO	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	10	Reduced	132572	1770	21.59	22.00	1.099	-0.08	0.975	1.072
	FO	1	LTE Band 66	20M	QPSK	50	0	Bottom Side	10	Reduced	132322	1745	19.85	21.00	1.303	0.01	0.596	0.777
	FO	1	LTE Band 66	20M	QPSK	100	0	Bottom Side	10	Reduced	132322	1745	19.77	21.00	1.327	0.03	0.589	0.782



Plot No.	EUT Type	Ant. Port	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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)
	FC	1	LTE Band 2	20M	QPSK	1	0	Front	10	Reduced	18900	1880	21.62	22.00	1.091	-0.11	0.499	0.545
	FC	1	LTE Band 2	20M	QPSK	50	0	Front	10	Reduced	18900	1880	20.08	21.00	1.236	0	0.366	0.452
	FC	1	LTE Band 2	20M	QPSK	1	0	Back	10	Reduced	18900	1880	21.62	22.00	1.091	0.07	0.266	0.290
	FC	1	LTE Band 2	20M	QPSK	50	0	Back	10	Reduced	18900	1880	20.08	21.00	1.236	0.01	0.199	0.246
	FC	1	LTE Band 2	20M	QPSK	1	0	Left Side	10	Reduced	18900	1880	21.62	22.00	1.091	-0.04	0.040	0.044
	FC	1	LTE Band 2	20M	QPSK	50	0	Left Side	10	Reduced	18900	1880	20.08	21.00	1.236	0.16	0.027	0.033
	FC	1	LTE Band 2	20M	QPSK	1	0	Right Side	10	Reduced	18900	1880	21.62	22.00	1.091	0.03	0.170	0.186
	FC	1	LTE Band 2	20M	QPSK	50	0	Right Side	10	Reduced	18900	1880	20.08	21.00	1.236	0.03	0.125	0.154
	FC	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	10	Reduced	18900	1880	21.62	22.00	1.091	-0.15	1.070	1.168
	FC	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	10	Reduced	18700	1860	21.50	22.00	1.122	-0.13	1.040	1.167
22	FC	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	10	Reduced	19100	1900	21.51	22.00	1.119	-0.15	1.070	1.198
	FC	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	10	Reduced	18900	1880	20.08	21.00	1.236	-0.14	0.810	1.001
	FC	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	10	Reduced	18700	1860	19.96	21.00	1.271	-0.13	0.784	0.996
	FC	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	10	Reduced	19100	1900	20.07	21.00	1.239	0.01	0.832	1.031
	FC	1	LTE Band 2	20M	QPSK	100	0	Bottom Side	10	Reduced	18900	1880	20.17	21.00	1.211	0.03	0.846	1.024
	FO	1	LTE Band 2	20M	QPSK	1	0	Front	10	Reduced	18900	1880	21.62	22.00	1.091	-0.16	0.493	0.538
	FO	1	LTE Band 2	20M	QPSK	50	0	Front	10	Reduced	18900	1880	20.08	21.00	1.236	-0.09	0.369	0.456
	FO	1	LTE Band 2	20M	QPSK	1	0	Back	10	Reduced	18900	1880	21.62	22.00	1.091	-0.01	0.466	0.509
	FO	1	LTE Band 2	20M	QPSK	50	0	Back	10	Reduced	18900	1880	20.08	21.00	1.236	-0.03	0.352	0.435
	FO	1	LTE Band 2	20M	QPSK	1	0	Left Side	10	Reduced	18900	1880	21.62	22.00	1.091	-0.02	0.116	0.127
	FO	1	LTE Band 2	20M	QPSK	50	0	Left Side	10	Reduced	18900	1880	20.08	21.00	1.236	-0.05	0.087	0.108
	FO	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	10	Reduced	18900	1880	21.62	22.00	1.091	-0.04	0.982	1.072
	FO	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	10	Reduced	18700	1860	21.50	22.00	1.122	-0.04	0.932	1.046
	FO	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	10	Reduced	19100	1900	21.51	22.00	1.119	-0.02	0.988	1.106
	FO	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	10	Reduced	18900	1880	20.08	21.00	1.236	-0.15	0.734	0.907
	FO	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	10	Reduced	18700	1860	19.96	21.00	1.271	-0.12	0.695	0.883
	FO	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	10	Reduced	19100	1900	20.07	21.00	1.239	0.01	0.736	0.912
	FO	1	LTE Band 2	20M	QPSK	100	0	Bottom Side	10	Reduced	18900	1880	20.17	21.00	1.211	-0.1	0.739	0.895
	FC	2	LTE Band 30	10M	QPSK	1	0	Front	10	Full	27710	2310	22.18	22.50	1.076	-0.11	0.323	0.348
	FC	2	LTE Band 30	10M	QPSK	25	0	Front	10	Full	27710	2310	21.19	21.50	1.074	-0.09	0.245	0.263
	FC	2	LTE Band 30	10M	QPSK	1	0	Back	10	Full	27710	2310	22.18	22.50	1.076	0.03	0.287	0.309
	FC	2	LTE Band 30	10M	QPSK	25	0	Back	10	Full	27710	2310	21.19	21.50	1.074	0.01	0.230	0.247
23	FC	2	LTE Band 30	10M	QPSK	1	0	Right Side	10	Full	27710	2310	22.18	22.50	1.076	-0.02	0.969	1.043
	FC	2	LTE Band 30	10M	QPSK	25	0	Right Side	10	Full	27710	2310	21.19	21.50	1.074	0.04	0.774	0.831
	FC	2	LTE Band 30	10M	QPSK	50	0	Right Side	10	Full	27710	2310	21.06	21.50	1.107	0.03	0.734	0.812
	FO	2	LTE Band 30	10M	QPSK	1	0	Front	10	Full	27710	2310	22.18	22.50	1.076	0.08	0.072	0.078
	FO	2	LTE Band 30	10M	QPSK	25	0	Front	10	Full	27710	2310	21.19	21.50	1.074	-0.02	0.058	0.062
	FO	2	LTE Band 30	10M	QPSK	1	0	Back	10	Full	27710	2310	22.18	22.50	1.076	-0.17	0.260	0.280
	FO	2	LTE Band 30	10M	QPSK	25	0	Back	10	Full	27710	2310	21.19	21.50	1.074	-0.05	0.212	0.228



<WLAN 2.4GHz SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	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)	Max Area Scan SAR	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FC	1	WLAN2.4GHz	802.11b 1Mbps	Front	10	6	2437	14.97	15.50	1.130	98.96	1.011	-0.04	0.010	0.001	0.001
	FC	1	WLAN2.4GHz	802.11b 1Mbps	Back	10	6	2437	14.97	15.50	1.130	98.96	1.011		0.008		
	FC	1	WLAN2.4GHz	802.11b 1Mbps	Right Side	10	6	2437	14.97	15.50	1.130	98.96	1.011	0.02	0.044	0.010	0.011
	FC	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Front	10	3	2422	14.94	15.50	1.138	89.12	1.122	0.12	0.079	0.008	0.010
	FC	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Back	10	3	2422	14.94	15.50	1.138	89.12	1.122		0.076		
	FC	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Right Side	10	3	2422	14.94	15.50	1.138	89.12	1.122	0.05	0.081	0.023	0.029
	FC	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Top Side	10	3	2422	14.94	15.50	1.138	89.12	1.122		0.079		
	FO	1	WLAN2.4GHz	802.11b 1Mbps	Front	10	6	2437	14.97	15.50	1.130	98.96	1.011		0.00428		
	FO	1	WLAN2.4GHz	802.11b 1Mbps	Back	10	6	2437	14.97	15.50	1.130	98.96	1.011	0.13	0.038	0.014	0.016
	FO	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Front	10	3	2422	14.94	15.50	1.138	89.12	1.122	0.11	0.077	0.031	0.040
	FO	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Back	10	3	2422	14.94	15.50	1.138	89.12	1.122		0.062		
24	FO	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Top Side	10	3	2422	14.94	15.50	1.138	89.12	1.122	-0.06	0.082	0.058	0.074



15.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
25	FC	1	GSM850	GPRS 2 Tx slots	Front	10	Full	189	836.4	33.36	33.50	1.033	-0.06	0.904	0.934
	FC	1	GSM850	GPRS 2 Tx slots	Front	10	Full	128	824.2	33.22	33.50	1.067	0.01	0.597	0.637
	FC	1	GSM850	GPRS 2 Tx slots	Front	10	Full	251	848.8	33.34	33.50	1.038	-0.17	0.745	0.773
	FC	1	GSM850	GPRS 2 Tx slots	Back	10	Full	189	836.4	33.36	33.50	1.033	0.1	0.620	0.640
26	FC	1	GSM1900	GPRS 2 Tx slots	Front	10	Full	512	1850.2	30.24	30.50	1.062	-0.04	0.750	0.796
	FC	1	GSM1900	GPRS 2 Tx slots	Back	10	Full	512	1850.2	30.24	30.50	1.062	0.03	0.442	0.469

<WCDMA SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
27	FC	1	WCDMA Band V	RMC 12.2Kbps	Front	10	Full	4132	826.4	24.76	25.00	1.057	-0.01	0.419	0.443
	FC	1	WCDMA Band V	RMC 12.2Kbps	Back	10	Full	4132	826.4	24.76	25.00	1.057	0.02	0.304	0.321
28	FC	1	WCDMA Band IV	RMC 12.2Kbps	Front	10	Full	1312	1712.4	23.68	24.00	1.076	-0.05	0.591	0.636
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Back	10	Full	1312	1712.4	23.68	24.00	1.076	0.16	0.430	0.463
29	FC	1	WCDMA Band II	RMC 12.2Kbps	Front	10	Full	9538	1907.6	23.62	24.00	1.091	-0.1	0.734	0.801
	FC	1	WCDMA Band II	RMC 12.2Kbps	Front	10	Full	9262	1852.4	23.60	24.00	1.096	0.01	0.668	0.732
	FC	1	WCDMA Band II	RMC 12.2Kbps	Front	10	Full	9400	1880	23.61	24.00	1.094	0.06	0.691	0.756
	FC	1	WCDMA Band II	RMC 12.2Kbps	Back	10	Full	9538	1907.6	23.62	24.00	1.091	0.06	0.449	0.490



<LTE SAR>

Plot No.	EUT Type	Ant. Port	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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)
30	FC	1	LTE Band 12	10M	QPSK	1	0	Front	10	Full	23095	707.5	23.19	24.00	1.205	-0.13	0.249	0.300
	FC	1	LTE Band 12	10M	QPSK	25	0	Front	10	Full	23095	707.5	22.32	23.00	1.169	-0.14	0.228	0.267
	FC	1	LTE Band 12	10M	QPSK	1	0	Back	10	Full	23095	707.5	23.19	24.00	1.205	0.02	0.190	0.229
	FC	1	LTE Band 12	10M	QPSK	25	0	Back	10	Full	23095	707.5	22.32	23.00	1.169	0.07	0.175	0.205
31	FC	1	LTE Band 5	10M	QPSK	1	0	Front	10	Full	20525	836.5	23.55	24.00	1.109	-0.16	0.326	0.362
	FC	1	LTE Band 5	10M	QPSK	25	0	Front	10	Full	20525	836.5	22.70	23.00	1.072	0.03	0.301	0.323
	FC	1	LTE Band 5	10M	QPSK	1	0	Back	10	Full	20525	836.5	23.55	24.00	1.109	0.01	0.281	0.312
	FC	1	LTE Band 5	10M	QPSK	25	0	Back	10	Full	20525	836.5	22.70	23.00	1.072	0.03	0.239	0.256
	FC	1	LTE Band 66	20M	QPSK	1	0	Front	10	Full	132322	1745	24.35	24.50	1.035	0.03	0.810	0.838
32	FC	1	LTE Band 66	20M	QPSK	1	0	Front	10	Full	132072	1720	24.23	24.50	1.064	-0.02	0.900	0.958
	FC	1	LTE Band 66	20M	QPSK	1	0	Front	10	Full	132572	1770	24.30	24.50	1.047	-0.08	0.734	0.769
	FC	1	LTE Band 66	20M	QPSK	50	0	Front	10	Full	132322	1745	22.76	23.50	1.186	0.02	0.621	0.736
	FC	1	LTE Band 66	20M	QPSK	100	0	Front	10	Full	132322	1745	22.63	23.50	1.222	-0.18	0.597	0.729
	FC	1	LTE Band 66	20M	QPSK	1	0	Back	10	Full	132322	1745	24.35	24.50	1.035	0.09	0.575	0.595
	FC	1	LTE Band 66	20M	QPSK	50	0	Back	10	Full	132322	1745	22.76	23.50	1.186	0.15	0.374	0.443
33	FC	1	LTE Band 2	20M	QPSK	1	0	Front	10	Full	18900	1880	23.65	24.00	1.084	-0.07	0.847	0.918
	FC	1	LTE Band 2	20M	QPSK	1	0	Front	10	Full	18700	1860	23.51	24.00	1.119	0.02	0.783	0.877
	FC	1	LTE Band 2	20M	QPSK	1	0	Front	10	Full	19100	1900	23.59	24.00	1.099	0.08	0.816	0.897
	FC	1	LTE Band 2	20M	QPSK	50	0	Front	10	Full	18900	1880	22.18	23.00	1.208	0.06	0.623	0.752
	FC	1	LTE Band 2	20M	QPSK	100	0	Front	10	Full	18900	1880	22.14	23.00	1.219	-0.11	0.636	0.775
	FC	1	LTE Band 2	20M	QPSK	1	0	Back	10	Full	18900	1880	23.65	24.00	1.084	0.12	0.453	0.491
	FC	1	LTE Band 2	20M	QPSK	50	0	Back	10	Full	18900	1880	22.18	23.00	1.208	0.01	0.339	0.409
34	FC	2	LTE Band 30	10M	QPSK	1	0	Front	10	Full	27710	2310	22.18	22.50	1.076	-0.11	0.323	0.348
	FC	2	LTE Band 30	10M	QPSK	25	0	Front	10	Full	27710	2310	21.19	21.50	1.074	-0.09	0.245	0.263
	FC	2	LTE Band 30	10M	QPSK	1	0	Back	10	Full	27710	2310	22.18	22.50	1.076	0.03	0.287	0.309
	FC	2	LTE Band 30	10M	QPSK	25	0	Back	10	Full	27710	2310	21.19	21.50	1.074	0.01	0.23	0.247



<WLAN 2.4GHz SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	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)	Max Area Scan SAR	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FC	1	WLAN2.4GHz	802.11b 1Mbps	Front	10	6	2437	14.97	15.50	1.130	98.96	1.011	-0.04	0.010	0.001	0.001
	FC	1	WLAN2.4GHz	802.11b 1Mbps	Back	10	6	2437	14.97	15.50	1.130	98.96	1.011		0.008		
35	FC	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Front	10	3	2422	14.94	15.50	1.138	89.12	1.122	0.12	0.079	0.008	0.010
	FC	1+2	WLAN2.4GHz	802.11n-HT40 MCS0	Back	10	3	2422	14.94	15.50	1.138	89.12	1.122		0.076		

<WLAN 5GHz SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	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)	Max Area Scan SAR	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FC	1	WLAN5.2GHz	802.11a 6Mbps	Front	10	36	5180	12.96	13.50	1.132	95.34	1.049	0.07	0.00658	<0.001	<0.001
	FC	1	WLAN5.2GHz	802.11a 6Mbps	Back	10	36	5180	12.96	13.50	1.132	95.34	1.049		0.00276		
36	FC	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Front	10	48	5240	16.19	16.50	1.073	95.12	1.051	0.03	0.114	0.025	0.028
	FC	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Back	10	48	5240	16.19	16.50	1.073	95.12	1.051		0.076		
	FC	1	WLAN5.8GHz	802.11n-HT40 MCS0	Front	10	151	5755	13.14	13.50	1.086	90.35	1.107	0.08	0.00559	<0.001	<0.001
	FC	1	WLAN5.8GHz	802.11n-HT40 MCS0	Back	10	151	5755	13.14	13.50	1.086	90.35	1.107		0.00166		
37	FC	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Front	10	151	5755	15.37	15.50	1.031	89.71	1.115	0.09	0.185	0.011	0.013
	FC	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Back	10	151	5755	15.37	15.50	1.031	89.71	1.115		0.00469		



15.4 Product specific 10g SAR

<GSM SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
	FC	1	GSM1900	GPRS 2 Tx slots	Bottom Side	0	Full	512	1850.2	30.24	30.50	1.062	0.03	2.980	3.164
	FC	1	GSM1900	GPRS 2 Tx slots	Bottom Side	0	Full	661	1880	30.13	30.50	1.089	0.02	3.220	3.506
38	FC	1	GSM1900	GPRS 2 Tx slots	Bottom Side	0	Full	810	1909.8	30.10	30.50	1.096	0.07	3.390	3.717
	FO	1	GSM1900	GPRS 2 Tx slots	Bottom Side	0	Full	512	1850.2	30.24	30.50	1.062	0.04	2.580	2.739
	FO	1	GSM1900	GPRS 2 Tx slots	Bottom Side	0	Full	661	1880	30.13	30.50	1.089	-0.07	3.090	3.365
	FO	1	GSM1900	GPRS 2 Tx slots	Bottom Side	0	Full	810	1909.8	30.10	30.50	1.096	-0.02	3.140	3.443

<WCDMA SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	Test Position	Gap (mm)	Power Mode	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)
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	0	Full	1312	1712.4	23.68	24.00	1.076	0.02	2.540	2.734
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	0	Full	1413	1732.6	23.67	24.00	1.079	0.01	2.520	2.719
	FC	1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	0	Full	1513	1752.6	23.54	24.00	1.112	0.04	2.490	2.768
	FO	1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	0	Full	1312	1712.4	23.68	24.00	1.076	-0.12	2.480	2.670
	FO	1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	0	Full	1413	1732.6	23.67	24.00	1.079	-0.19	3.100	3.345
39	FO	1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	0	Full	1513	1752.6	23.54	24.00	1.112	-0.02	3.150	3.502
	FC	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Full	9538	1907.6	23.62	24.00	1.091	0.18	3.040	3.318
	FC	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Full	9262	1852.4	23.60	24.00	1.096	0.08	3.110	3.410
	FC	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Full	9400	1880	23.61	24.00	1.094	0.07	2.930	3.205
	FO	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Full	9538	1907.6	23.62	24.00	1.091	-0.05	2.990	3.263
	FO	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Full	9262	1852.4	23.60	24.00	1.096	-0.01	3.190	3.498
40	FO	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Full	9400	1880	23.61	24.00	1.094	-0.02	3.330	3.643



<LTE SAR>

Plot No.	EUT Type	Ant. Port	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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)
	FC	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	0	Full	132322	1745	24.35	24.50	1.035	-0.12	3.310	3.426
41	FC	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	0	Full	132072	1720	24.23	24.50	1.064	0.01	3.300	3.512
	FC	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	0	Full	132572	1770	24.30	24.50	1.047	0.03	3.340	3.497
	FC	1	LTE Band 66	20M	QPSK	50	0	Bottom Side	0	Full	132322	1745	22.76	23.50	1.186	0.07	2.240	2.656
	FC	1	LTE Band 66	20M	QPSK	50	0	Bottom Side	0	Full	132072	1720	22.75	23.50	1.189	0.01	2.220	2.638
	FC	1	LTE Band 66	20M	QPSK	50	0	Bottom Side	0	Full	132572	1770	22.72	23.50	1.197	-0.04	2.280	2.729
	FC	1	LTE Band 66	20M	QPSK	100	0	Bottom Side	0	Full	132322	1745	22.63	23.50	1.222	0.03	2.150	2.627
	FO	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	0	Full	132322	1745	24.35	24.50	1.035	0.03	3.260	3.375
	FO	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	0	Full	132072	1720	24.23	24.50	1.064	-0.03	3.220	3.427
	FO	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	0	Full	132572	1770	24.30	24.50	1.047	-0.14	3.300	3.456
	FO	1	LTE Band 66	20M	QPSK	50	0	Bottom Side	0	Full	132322	1745	22.76	23.50	1.186	-0.11	2.220	2.632
	FO	1	LTE Band 66	20M	QPSK	50	0	Bottom Side	0	Full	132072	1720	22.75	23.50	1.189	-0.02	2.190	2.603
	FO	1	LTE Band 66	20M	QPSK	50	0	Bottom Side	0	Full	132572	1770	22.72	23.50	1.197	-0.12	2.300	2.753
	FO	1	LTE Band 66	20M	QPSK	100	0	Bottom Side	0	Full	132322	1745	22.63	23.50	1.222	-0.17	2.140	2.615
	FC	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Full	18900	1880	23.65	24.00	1.084	0.05	3.330	3.609
42	FC	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Full	18700	1860	23.51	24.00	1.119	0.07	3.430	3.840
	FC	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Full	19100	1900	23.59	24.00	1.099	-0.09	3.190	3.506
	FC	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	0	Full	18900	1880	22.18	23.00	1.208	-0.03	2.620	3.164
	FC	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	0	Full	18700	1860	21.98	23.00	1.265	0	2.480	3.137
	FC	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	0	Full	19100	1900	22.17	23.00	1.211	-0.16	2.020	2.445
	FC	1	LTE Band 2	20M	QPSK	100	0	Bottom Side	0	Full	18900	1880	22.14	23.00	1.219	-0.18	2.450	2.987
	FO	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Full	18900	1880	23.65	24.00	1.084	-0.08	3.260	3.534
	FO	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Full	18700	1860	23.51	24.00	1.119	-0.04	3.160	3.537
	FO	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Full	19100	1900	23.59	24.00	1.099	-0.09	3.180	3.495
	FO	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	0	Full	18900	1880	22.18	23.00	1.208	-0.05	2.470	2.983
	FO	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	0	Full	18700	1860	21.98	23.00	1.265	-0.04	2.430	3.073
	FO	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	0	Full	19100	1900	22.17	23.00	1.211	-0.13	2.460	2.978
	FO	1	LTE Band 2	20M	QPSK	100	0	Bottom Side	0	Full	18900	1880	22.14	23.00	1.219	-0.16	2.510	3.060



<WLAN 5GHz SAR>

Plot No.	EUT Type	Ant. Port	Band	Mode	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)	Max Area Scan SAR	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	FC	1	WLAN5.2GHz	802.11a 6Mbps	Front	0	36	5180	12.96	13.50	1.132	95.34	1.049		0.00108		
	FC	1	WLAN5.2GHz	802.11a 6Mbps	Back	0	36	5180	12.96	13.50	1.132	95.34	1.049		0.145		
	FC	1	WLAN5.2GHz	802.11a 6Mbps	Right Side	0	36	5180	12.96	13.50	1.132	95.34	1.049	0.06	1.247	0.108	0.128
	FC	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Front	0	48	5240	16.19	16.50	1.073	95.12	1.051	0.09	2.244	0.263	0.297
	FC	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Back	0	48	5240	16.19	16.50	1.073	95.12	1.051		0.441		
	FC	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Right Side	0	48	5240	16.19	16.50	1.073	95.12	1.051		0.056		
	FC	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Top Side	0	48	5240	16.19	16.50	1.073	95.12	1.051		1.064		
	FO	1	WLAN5.2GHz	802.11a 6Mbps	Front	0	36	5180	12.96	13.50	1.132	95.34	1.049	0.02	0	0.100	0.119
	FO	1	WLAN5.2GHz	802.11a 6Mbps	Back	0	36	5180	12.96	13.50	1.132	95.34	1.049		0.691		
	FO	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Front	0	48	5240	16.19	16.50	1.073	95.12	1.051		3.291		
43	FO	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Back	0	48	5240	16.19	16.50	1.073	95.12	1.051	0.12	4.546	0.522	0.589
	FO	1+2	WLAN5.2GHz	802.11n-HT20 MCS0	Top Side	0	48	5240	16.19	16.50	1.073	95.12	1.051		2.727		
	FC	1	WLAN5.8GHz	802.11n-HT40 MCS0	Front	0	151	5755	13.14	13.50	1.086	90.35	1.107		0.085		
	FC	1	WLAN5.8GHz	802.11n-HT40 MCS0	Back	0	151	5755	13.14	13.50	1.086	90.35	1.107		0.097		
	FC	1	WLAN5.8GHz	802.11n-HT40 MCS0	Right Side	0	151	5755	13.14	13.50	1.086	90.35	1.107	-0.08	0.749	0.049	0.059
	FC	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Front	0	151	5755	15.37	15.50	1.031	89.71	1.115		1.838		
	FC	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Back	0	151	5755	15.37	15.50	1.031	89.71	1.115		0.255		
	FC	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Right Side	0	151	5755	15.37	15.50	1.031	89.71	1.115		1.539		
	FC	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Top Side	0	151	5755	15.37	15.50	1.031	89.71	1.115	0.06	2.024	0.229	0.263
	FO	1	WLAN5.8GHz	802.11n-HT40 MCS0	Front	0	151	5755	13.14	13.50	1.086	90.35	1.107		0		
	FO	1	WLAN5.8GHz	802.11n-HT40 MCS0	Back	0	151	5755	13.14	13.50	1.086	90.35	1.107	0.09	0.677	0.076	0.091
	FO	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Front	0	151	5755	15.37	15.50	1.031	89.71	1.115		2.569		
	FO	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Back	0	151	5755	15.37	15.50	1.031	89.71	1.115		2.634		
44	FO	1+2	WLAN5.8GHz	802.11n-HT40 MCS0	Top Side	0	151	5755	15.37	15.50	1.031	89.71	1.115	0.03	2.653	0.300	0.345

15.5 Repeated SAR Measurement

<1g SAR>

No.	EUT Type	Ant. Port	Band	Mode	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	FO	1	GSM850	GPRS 2 Tx slots	-	-	-	-	Front	10	Full	251	848.8	33.34	33.50	1.038	0.05	1.030	1	1.069
2nd	FO	1	GSM850	GPRS 2 Tx slots	-	-	-	-	Front	10	Full	251	848.8	33.34	33.50	1.038	0.03	1.020	1.010	1.058
1st	FO	1	WCDMA Band II	RMC 12.2Kbps	-	-	-	-	Bottom Side	10	Reduced	9538	1907.6	21.59	22.00	1.099	-0.08	1.090	1	1.198
2nd	FO	1	WCDMA Band II	RMC 12.2Kbps	-	-	-	-	Bottom Side	10	Reduced	9538	1907.6	21.59	22.00	1.099	-0.06	1.070	1.019	1.176
1st	FC	2	LTE Band 30	-	10M	QPSK	1	0	Right Cheek	-	Full	27710	2310	22.18	22.50	1.076	0.05	0.973	1	1.047
2nd	FC	2	LTE Band 30	-	10M	QPSK	1	0	Right Cheek	-	Full	27710	2310	22.18	22.50	1.076	0.12	0.954	1.020	1.027
1st	FC	1	LTE Band 66	-	20M	QPSK	1	0	Bottom Side	10	Reduced	132072	1720	21.70	22.00	1.072	-0.01	1.100	1	1.179
2nd	FC	1	LTE Band 66	-	20M	QPSK	1	0	Bottom Side	10	Reduced	132072	1720	21.70	22.00	1.072	-0.11	1.050	1.048	1.125

<10g SAR>

No.	EUT Type	Ant. Port	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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	FC	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Full	18700	1860	23.51	24.00	1.119	0.07	3.430	1	3.840
2nd	FC	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Full	18700	1860	23.51	24.00	1.119	0.01	3.290	1.043	3.683
1st	FC	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	0	Full	132572	1770	24.30	24.50	1.047	0.03	3.340	1	3.497
2nd	FC	1	LTE Band 66	20M	QPSK	1	0	Bottom Side	0	Full	132572	1770	24.30	24.50	1.047	0.05	3.290	1.015	3.445

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is $\geq 0.8W/kg$.
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.

16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset			Note
		Head	Body-worn	Hotspot	
1.	GSM Voice + WLAN2.4GHz SISO	Yes	Yes		
2.	GPRS/EDGE + WLAN2.4GHz SISO	Yes	Yes	Yes	WLAN Hotspot
3.	WCDMA + WLAN2.4GHz SISO	Yes	Yes	Yes	WLAN Hotspot
4.	LTE + WLAN2.4GHz SISO	Yes	Yes	Yes	WLAN Hotspot
5.	GSM Voice + WLAN2.4GHz MIMO	Yes	Yes		
6.	GPRS/EDGE + WLAN2.4GHz MIMO	Yes	Yes	Yes	WLAN Hotspot
7.	WCDMA + WLAN2.4GHz MIMO	Yes	Yes	Yes	WLAN Hotspot
8.	LTE + WLAN2.4GHz MIMO	Yes	Yes	Yes	WLAN Hotspot
9.	GSM Voice + WLAN5.2/5.8GHz SISO	Yes	Yes		
10.	GPRS/EDGE + WLAN5.2/5.8GHz SISO	Yes	Yes		WLAN Direct
11.	WCDMA + WLAN5.2/5.8GHz SISO	Yes	Yes		WLAN Direct
12.	LTE + WLAN5.2/5.8GHz SISO	Yes	Yes		WLAN Direct
13.	GSM Voice + WLAN5.2/5.8GHz MIMO	Yes	Yes		
14.	GPRS/EDGE + WLAN5.2/5.8GHz MIMO	Yes	Yes		WLAN Direct
15.	WCDMA + WLAN5.2/5.8GHz MIMO	Yes	Yes		WLAN Direct
16.	LTE + WLAN5.2/5.8GHz MIMO	Yes	Yes		WLAN Direct
17.	GSM Voice + Bluetooth		Yes		
18.	GPRS/EDGE + Bluetooth		Yes	Yes	BT Tethering
19.	WCDMA + Bluetooth		Yes	Yes	BT Tethering
20.	LTE + Bluetooth		Yes	Yes	BT Tethering

General Note:

- This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
- EUT will choose each GSM, WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
- This device WLAN 2.4GHz supports hotspot operation and Bluetooth support tethering applications.
- This device 5.2GHz WLAN/5.8GHz WLAN does not support hotspot operation and supports WiFi Direct.
- Bluetooth share the same antenna with WLAN antenna 1 so can't transmit simultaneously.
- EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment though they have independent antenna.
- According to the EUT character, WLAN antenna 2 and Bluetooth can't transmit simultaneously.
- Chose the worst zoom scan SAR for each EUT type of WLAN correspondingly for co-located with WWAN analysis.
- The worst case 5 GHz WLAN reported SAR for each configuration was used for SAR summation.
- For WLAN two transmitters, WLAN antenna 1 can transmit standalone, WLAN antenna 2 can only transmit simultaneously with WLAN antenna 1.
- The reported SAR summation is calculated based on the same configuration and test position.
- This device has two WWAN antennas. WWAN antenna 1 is located at the bottom side of the device and WWAN antenna 2 is located at the right side of the device which can refer to antenna location chapter. WWAN antenna 1 frequency bands include GSM850/1900, WCDMA B2 / B4 / B5, LTE B2 / B4 / B5 / B12 / B66 and WWAN antenna 2 frequency bands only include LTE B30.
- The device is capable of switching between antenna 1 and antenna 2 based on signal strength.
- For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v06 based on the formula below.
 - (max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)²·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm; where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
 - When the minimum separation distance is < 5mm, the distance is used 5mm to determine SAR test exclusion.
 - 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.

<1g SAR>

Bluetooth Max Power (dBm)	Exposure Position	Hotspot & Body worn
	Test separation	10 mm
8.5	Estimated 1g SAR (W/kg)	0.147

<10g SAR>

Bluetooth Max Power (dBm)	Exposure Position	Product specific 10g SAR
	Test separation	0 mm
8.5	Estimated 10g SAR (W/kg)	0.118



16.1 Head Exposure Conditions

WWAN Band		Exposure Position		1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
				WWAN	2.4GHz WLAN	5GHz WLAN		
				1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
GSM	GSM850	Flip Close	Right Cheek	0.272	0.352	0.429	0.62	0.70
			Right Tilted	0.262	0.352	0.429	0.61	0.69
			Left Cheek	0.441	0.352	0.429	0.79	0.87
			Left Tilted	0.249	0.352	0.429	0.60	0.68
		Flip Open	Right Cheek	0.158	0.400	0.675	0.56	0.83
			Right Tilted	0.162	0.400	0.675	0.56	0.84
			Left Cheek	0.245	0.400	0.675	0.65	0.92
			Left Tilted	0.140	0.400	0.675	0.54	0.82
	GSM1900	Flip Close	Right Cheek	0.180	0.352	0.429	0.53	0.61
			Right Tilted	0.064	0.352	0.429	0.42	0.49
			Left Cheek	0.109	0.352	0.429	0.46	0.54
			Left Tilted	0.130	0.352	0.429	0.48	0.56
		Flip Open	Right Cheek	0.132	0.400	0.675	0.53	0.81
			Right Tilted	0.049	0.400	0.675	0.45	0.72
			Left Cheek	0.098	0.400	0.675	0.50	0.77
			Left Tilted	0.076	0.400	0.675	0.48	0.75
WCDMA	Band V	Flip Close	Right Cheek	0.179	0.352	0.429	0.53	0.61
			Right Tilted	0.144	0.352	0.429	0.50	0.57
			Left Cheek	0.255	0.352	0.429	0.61	0.68
			Left Tilted	0.139	0.352	0.429	0.49	0.57
		Flip Open	Right Cheek	0.053	0.400	0.675	0.45	0.73
			Right Tilted	0.037	0.400	0.675	0.44	0.71
			Left Cheek	0.059	0.400	0.675	0.46	0.73
			Left Tilted	0.036	0.400	0.675	0.44	0.71
	Band IV	Flip Close	Right Cheek	0.213	0.352	0.429	0.57	0.64
			Right Tilted	0.060	0.352	0.429	0.41	0.49
			Left Cheek	0.142	0.352	0.429	0.49	0.57
			Left Tilted	0.101	0.352	0.429	0.45	0.53
		Flip Open	Right Cheek	0.105	0.400	0.675	0.51	0.78
			Right Tilted	0.032	0.400	0.675	0.43	0.71
			Left Cheek	0.074	0.400	0.675	0.47	0.75
			Left Tilted	0.036	0.400	0.675	0.44	0.71
	Band II	Flip Close	Right Cheek	0.213	0.352	0.429	0.57	0.64
			Right Tilted	0.046	0.352	0.429	0.40	0.48
			Left Cheek	0.146	0.352	0.429	0.50	0.58
			Left Tilted	0.120	0.352	0.429	0.47	0.55
		Flip Open	Right Cheek	0.176	0.400	0.675	0.58	0.85
			Right Tilted	0.057	0.400	0.675	0.46	0.73
			Left Cheek	0.145	0.400	0.675	0.55	0.82
			Left Tilted	0.079	0.400	0.675	0.48	0.75



WWAN Band		Exposure Position		1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
				WWAN	2.4GHz WLAN	5GHz WLAN		
				1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
LTE	Band 12	Flip Close	Right Cheek	0.127	0.352	0.429	0.48	0.56
			Right Tilted	0.105	0.352	0.429	0.46	0.53
			Left Cheek	0.158	0.352	0.429	0.51	0.59
			Left Tilted	0.105	0.352	0.429	0.46	0.53
		Flip Open	Right Cheek	0.063	0.400	0.675	0.46	0.74
			Right Tilted	0.029	0.400	0.675	0.43	0.70
			Left Cheek	0.071	0.400	0.675	0.47	0.75
			Left Tilted	0.033	0.400	0.675	0.43	0.71
	Band 5	Flip Close	Right Cheek	0.156	0.352	0.429	0.51	0.59
			Right Tilted	0.164	0.352	0.429	0.52	0.59
			Left Cheek	0.217	0.352	0.429	0.57	0.65
			Left Tilted	0.142	0.352	0.429	0.49	0.57
		Flip Open	Right Cheek	0.057	0.400	0.675	0.46	0.73
			Right Tilted	0.021	0.400	0.675	0.42	0.70
			Left Cheek	0.059	0.400	0.675	0.46	0.73
			Left Tilted	0.028	0.400	0.675	0.43	0.70
	Band 66	Flip Close	Right Cheek	0.263	0.352	0.429	0.62	0.69
			Right Tilted	0.090	0.352	0.429	0.44	0.52
			Left Cheek	0.158	0.352	0.429	0.51	0.59
			Left Tilted	0.130	0.352	0.429	0.48	0.56
		Flip Open	Right Cheek	0.146	0.400	0.675	0.55	0.82
			Right Tilted	0.041	0.400	0.675	0.44	0.72
			Left Cheek	0.076	0.400	0.675	0.48	0.75
			Left Tilted	0.039	0.400	0.675	0.44	0.71
	Band 2	Flip Close	Right Cheek	0.186	0.352	0.429	0.54	0.62
			Right Tilted	0.057	0.352	0.429	0.41	0.49
			Left Cheek	0.118	0.352	0.429	0.47	0.55
			Left Tilted	0.137	0.352	0.429	0.49	0.57
		Flip Open	Right Cheek	0.155	0.400	0.675	0.56	0.83
			Right Tilted	0.073	0.400	0.675	0.47	0.75
			Left Cheek	0.124	0.400	0.675	0.52	0.80
			Left Tilted	0.109	0.400	0.675	0.51	0.78
	Band 30	Flip Close	Right Cheek	1.047	0.352	0.429	1.40	1.48
			Right Tilted	0.143	0.352	0.429	0.50	0.57
			Left Cheek	0.322	0.352	0.429	0.67	0.75
			Left Tilted	0.183	0.352	0.429	0.54	0.61
		Flip Open	Right Cheek	0.278	0.400	0.675	0.68	0.95
			Right Tilted	0.112	0.400	0.675	0.51	0.79
			Left Cheek	0.610	0.400	0.675	1.01	1.29
			Left Tilted	0.398	0.400	0.675	0.80	1.07



16.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position		1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
				WWAN	2.4GHz WLAN	Bluetooth		
				1g SAR (W/kg)	1g SAR (W/kg)	Estimated 1g SAR (W/kg)		
GSM	GSM850	Flip Close	Front	0.934	0.029	0.147	0.96	1.08
			Back	0.640	0.029	0.147	0.67	0.79
			Left side	0.612			0.61	0.61
			Right side	0.185	0.029	0.147	0.21	0.33
			Top side		0.029		0.03	
		Bottom side	0.557			0.56	0.56	
		Flip Open	Front	1.069	0.074	0.147	1.14	1.22
			Back	1.053	0.074	0.147	1.13	1.20
			Left side	0.296			0.30	0.30
			Top side		0.074		0.07	
	Bottom side		0.629			0.63	0.63	
	GSM1900	Flip Close	Front	0.490	0.029	0.147	0.52	0.64
			Back	0.267	0.029	0.147	0.30	0.41
			Left side	0.161			0.16	0.16
			Right side	0.035	0.029	0.147	0.06	0.18
			Top side		0.029		0.03	
		Bottom side	1.114			1.11	1.11	
		Flip Open	Front	0.485	0.074	0.147	0.56	0.63
			Back	0.443	0.074	0.147	0.52	0.59
			Left side	0.120			0.12	0.12
Top side				0.074		0.07		
Bottom side	1.181				1.18	1.18		
WCDMA	Band V	Flip Close	Front	0.443	0.029	0.147	0.47	0.59
			Back	0.321	0.029	0.147	0.35	0.47
			Left side	0.416			0.42	0.42
			Right side	0.147	0.029	0.147	0.18	0.29
			Top side		0.029		0.03	
		Bottom side	0.272			0.27	0.27	
		Flip Open	Front	0.332	0.074	0.147	0.41	0.48
			Back	0.384	0.074	0.147	0.46	0.53
			Left side	0.127			0.13	0.13
			Top side		0.074		0.07	
	Bottom side		0.322			0.32	0.32	
	Band IV	Flip Close	Front	0.483	0.029	0.147	0.51	0.63
			Back	0.378	0.029	0.147	0.41	0.53
			Left side	0.118			0.12	0.12
			Right side	0.085	0.029	0.147	0.11	0.23
			Top side		0.029		0.03	
		Bottom side	1.154			1.15	1.15	
		Flip Open	Front	0.366	0.074	0.147	0.44	0.51
			Back	0.326	0.074	0.147	0.40	0.47
			Left side	0.115			0.12	0.12
Top side				0.074		0.07		
Bottom side	0.774				0.77	0.77		
Band II	Flip Close	Front	0.518	0.029	0.147	0.55	0.67	
		Back	0.311	0.029	0.147	0.34	0.46	
		Left side	0.179			0.18	0.18	
		Right side	0.032	0.029	0.147	0.06	0.18	
		Top side		0.029		0.03		
	Bottom side	1.187			1.19	1.19		
	Flip Open	Front	0.548	0.074	0.147	0.62	0.70	
		Back	0.545	0.074	0.147	0.62	0.69	
		Left side	0.145			0.15	0.15	
		Top side		0.074		0.07		
Bottom side		1.198			1.20	1.20		



WWAN Band		Exposure Position		1	2	3	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)
				WWAN	2.4GHz WLAN	Bluetooth		
				1g SAR (W/kg)	1g SAR (W/kg)	Estimated 1g SAR (W/kg)		
LTE	Band 12	Flip Close	Front	0.300	0.029	0.147	0.33	0.45
			Back	0.229	0.029	0.147	0.26	0.38
			Left side	0.268			0.27	0.27
			Right side	0.130	0.029	0.147	0.16	0.28
			Top side		0.029		0.03	
		Bottom side	0.147			0.15	0.15	
		Flip Open	Front	0.325	0.074	0.147	0.40	0.47
			Back	0.431	0.074	0.147	0.51	0.58
			Left side	0.142			0.14	0.14
			Top side		0.074		0.07	
	Bottom side		0.202			0.20	0.20	
	Band 5	Flip Close	Front	0.362	0.029	0.147	0.39	0.51
			Back	0.312	0.029	0.147	0.34	0.46
			Left side	0.360			0.36	0.36
			Right side	0.083	0.029	0.147	0.11	0.23
			Top side		0.029		0.03	
		Bottom side	0.264			0.26	0.26	
		Flip Open	Front	0.325	0.074	0.147	0.40	0.47
			Back	0.360	0.074	0.147	0.43	0.51
			Left side	0.072			0.07	0.07
			Top side		0.074		0.07	
	Bottom side		0.244			0.24	0.24	
	Band 66	Flip Close	Front	0.625	0.029	0.147	0.65	0.77
			Back	0.362	0.029	0.147	0.39	0.51
			Left side	0.142			0.14	0.14
			Right side	0.097	0.029	0.147	0.13	0.24
			Top side		0.029		0.03	
		Bottom side	1.179			1.18	1.18	
		Flip Open	Front	0.452	0.074	0.147	0.53	0.60
			Back	0.380	0.074	0.147	0.45	0.53
			Left side	0.129			0.13	0.13
			Top side		0.074		0.07	
	Bottom side		1.072			1.07	1.07	
	Band 2	Flip Close	Front	0.545	0.029	0.147	0.57	0.69
			Back	0.290	0.029	0.147	0.32	0.44
			Left side	0.044			0.04	0.04
			Right side	0.186	0.029	0.147	0.22	0.33
			Top side		0.029		0.03	
		Bottom side	1.198			1.20	1.20	
		Flip Open	Front	0.538	0.074	0.147	0.61	0.69
			Back	0.509	0.074	0.147	0.58	0.66
			Left side	0.127			0.13	0.13
			Top side		0.074		0.07	
	Bottom side		1.106			1.11	1.11	
	Band 30	Flip Close	Front	0.348	0.029	0.147	0.38	0.50
Back			0.309	0.029	0.147	0.34	0.46	
Right side			1.043	0.029	0.147	1.07	1.19	
Top side				0.029		0.03		
Flip Open		Front	0.078	0.074	0.147	0.15	0.23	
		Back	0.280	0.074	0.147	0.35	0.43	
		Top side		0.074		0.07	0.00	
		Bottom side						

16.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position		1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
				WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth			
				1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	Estimated 1g SAR (W/kg)			
GSM	GSM850	Flip Close	Front	0.934	0.010	0.028	0.147	0.94	0.96	1.08
			Back	0.640	0.010	0.028	0.147	0.65	0.67	0.79
	GSM1900	Flip Close	Front	0.796	0.010	0.028	0.147	0.81	0.82	0.94
			Back	0.469	0.010	0.028	0.147	0.48	0.50	0.62
WCDMA	Band V	Flip Close	Front	0.443	0.010	0.028	0.147	0.45	0.47	0.59
			Back	0.321	0.010	0.028	0.147	0.33	0.35	0.47
	Band IV	Flip Close	Front	0.636	0.010	0.028	0.147	0.65	0.66	0.78
			Back	0.463	0.010	0.028	0.147	0.47	0.49	0.61
	Band II	Flip Close	Front	0.801	0.010	0.028	0.147	0.81	0.83	0.95
			Back	0.490	0.010	0.028	0.147	0.50	0.52	0.64
LTE	Band 12	Flip Close	Front	0.300	0.010	0.028	0.147	0.31	0.33	0.45
			Back	0.229	0.010	0.028	0.147	0.24	0.26	0.38
	Band 5	Flip Close	Front	0.362	0.010	0.028	0.147	0.37	0.39	0.51
			Back	0.312	0.010	0.028	0.147	0.32	0.34	0.46
	Band 66	Flip Close	Front	0.958	0.010	0.028	0.147	0.97	0.99	1.11
			Back	0.595	0.010	0.028	0.147	0.61	0.62	0.74
	Band 2	Flip Close	Front	0.918	0.010	0.028	0.147	0.93	0.95	1.07
			Back	0.491	0.010	0.028	0.147	0.50	0.52	0.64
	Band 230	Flip Close	Front	0.348	0.010	0.028	0.147	0.36	0.38	0.50
			Back	0.309	0.010	0.028	0.147	0.32	0.34	0.46



16.4 Product Specific 10g SAR Exposure Conditions

WWAN Band		Exposure Position		1	2	3	1+2 Summed 10g SAR (W/kg)	1+3 Summed 10g SAR (W/kg)
				WWAN 10g SAR (W/kg)	5GHz WLAN 10g SAR (W/kg)	Bluetooth Estimated 10g SAR (W/kg)		
GSM	GSM1900	Flip Close	Front		0.297	0.118	0.30	0.12
			Back		0.297	0.118	0.30	0.12
			Right side		0.297	0.118	0.30	0.12
			Top side		0.297		0.30	
			Bottom side	3.717			3.72	3.72
		Flip Open	Front		0.589	0.118	0.59	0.12
			Back		0.589	0.118	0.59	0.12
			Top side		0.589		0.59	
		Bottom side	3.443			3.44	3.44	
WCDMA	Band IV	Flip Close	Front		0.297	0.118	0.30	0.12
			Back		0.297	0.118	0.30	0.12
			Right side		0.297	0.118	0.30	0.12
			Top side		0.297		0.30	
			Bottom side	2.768			2.77	2.77
		Flip Open	Front		0.589	0.118	0.59	0.12
			Back		0.589	0.118	0.59	0.12
			Top side		0.589		0.59	
			Bottom side	3.502			3.50	3.50
	Band II	Flip Close	Front		0.297	0.118	0.30	0.12
			Back		0.297	0.118	0.30	0.12
			Right side		0.297	0.118	0.30	0.12
			Top side		0.297		0.30	
			Bottom side	3.410			3.41	3.41
		Flip Open	Front		0.589	0.118	0.59	0.12
			Back		0.589	0.118	0.59	0.12
Top side				0.589		0.59		
		Bottom side	3.643			3.64	3.64	
LTE	Band 66	Flip Close	Front		0.297	0.118	0.30	0.12
			Back		0.297	0.118	0.30	0.12
			Right side		0.297	0.118	0.30	0.12
			Top side		0.297		0.30	
			Bottom side	3.512			3.51	3.51
		Flip Open	Front		0.589	0.118	0.59	0.12
			Back		0.589	0.118	0.59	0.12
			Top side		0.589		0.59	
			Bottom side	3.456			3.46	3.46
	Band 2	Flip Close	Front		0.297	0.118	0.30	0.12
			Back		0.297	0.118	0.30	0.12
			Right side		0.297	0.118	0.30	0.12
			Top side		0.297		0.30	
			Bottom side	3.840			3.84	3.84
		Flip Open	Front		0.589	0.118	0.59	0.12
			Back		0.589	0.118	0.59	0.12
Top side				0.589		0.59		
		Bottom side	3.537			3.54	3.54	

Test Engineer : Nick Hu

17. Uncertainty Assessment

The component of uncertainty may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainty by the statistical analysis of a series of observations is termed a Type A evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture’s specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor ^(a)	1/k ^(b)	1/√3	1/√6	1/√2

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 17.1. Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual “root-sum-squares” (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.0	N	1	1	1	6.0	6.0
Axial Isotropy	4.7	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.6	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	1.0	R	1.732	1	1	0.6	0.6
Linearity	4.7	R	1.732	1	1	2.7	2.7
System Detection Limits	1.0	R	1.732	1	1	0.6	0.6
Modulation Response	3.2	R	1.732	1	1	1.8	1.8
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.0	R	1.732	1	1	0.0	0.0
Integration Time	2.6	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.0	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	1.732	1	1	1.7	1.7
Probe Positioner	0.4	R	1.732	1	1	0.2	0.2
Probe Positioning	2.9	R	1.732	1	1	1.7	1.7
Max. SAR Eval.	2.0	R	1.732	1	1	1.2	1.2
Test Sample Related							
Device Positioning	3.0	N	1	1	1	3.0	3.0
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	1.732	1	1	2.9	2.9
Power Scaling	0.0	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.1	R	1.732	1	1	3.5	3.5
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.2	N	1	0.78	0.71	0.1	0.1
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						11.4%	11.4%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						22.9%	22.7%

Table 17.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.55	N	1	1	1	6.6	6.6
Axial Isotropy	4.7	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.6	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	2.0	R	1.732	1	1	1.2	1.2
Linearity	4.7	R	1.732	1	1	2.7	2.7
System Detection Limits	1.0	R	1.732	1	1	0.6	0.6
Modulation Response	3.2	R	1.732	1	1	1.8	1.8
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.0	R	1.732	1	1	0.0	0.0
Integration Time	2.6	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.0	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	1.732	1	1	1.7	1.7
Probe Positioner	0.4	R	1.732	1	1	0.2	0.2
Probe Positioning	6.7	R	1.732	1	1	3.9	3.9
Max. SAR Eval.	4.0	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Positioning	3.0	N	1	1	1	3.0	3.0
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	1.732	1	1	2.9	2.9
Power Scaling	0.0	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.6	R	1.732	1	1	3.8	3.8
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.2	N	1	0.78	0.71	0.1	0.1
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						12.5%	12.5%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						25.1%	25.0%

Table 17.3. Uncertainty Budget for frequency range 3 GHz to 6 GHz



18. 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 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [6] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.
- [7] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [8] FCC KDB 648474 D04 v01r03, "SAR Evaluation Considerations for Wireless Handsets", Oct 2015.
- [9] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [10] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [11] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [12] FCC KDB 941225 D05A v01r02, "Rel. 10 LTE SAR Test Guidance and KDB Inquiries", Oct 2015
- [13] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.



Appendix A. Plots of System Performance Check

The plots are shown as follows.

System Check_Head_750MHz

DUT: D750V3 - SN:1065

Communication System: UID 0, CW (0); Frequency: 750 MHz; Duty Cycle: 1:1

Medium: HSL_750 Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.894 \text{ S/m}$; $\epsilon_r = 41.276$; $\rho = 1000 \text{ kg/m}^3$

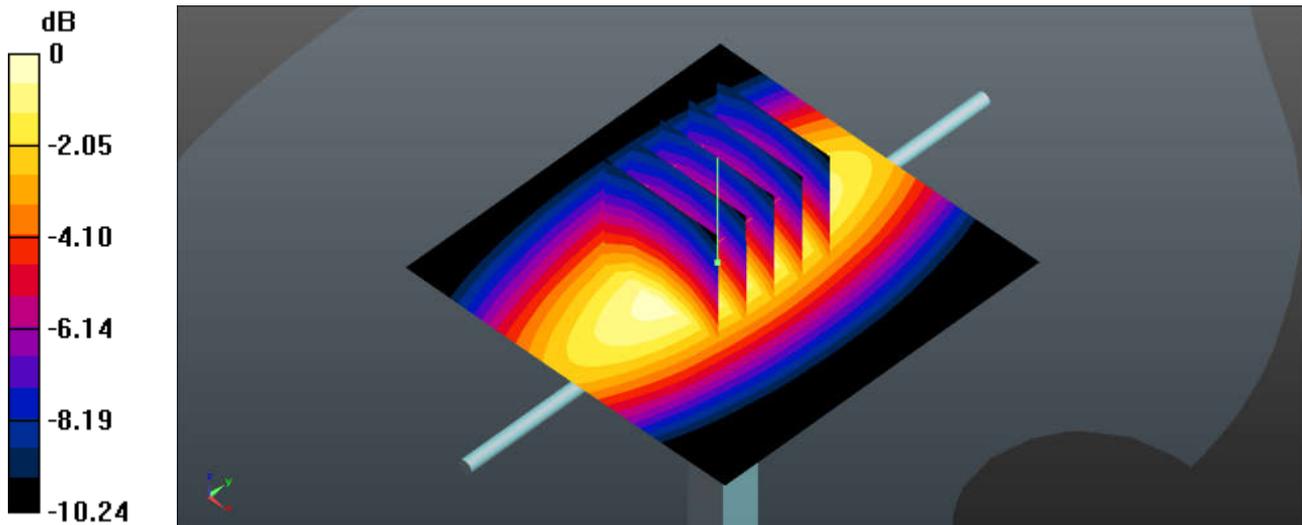
Ambient Temperature : $23.5 \text{ }^\circ\text{C}$; Liquid Temperature : $22.8 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(10.98, 10.98, 10.98); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
Maximum value of SAR (interpolated) = 2.52 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 47.93 V/m ; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 2.95 W/kg
SAR(1 g) = 1.99 W/kg ; SAR(10 g) = 1.33 W/kg
Maximum value of SAR (measured) = 2.51 W/kg



0 dB = $2.51 \text{ W/kg} = 4.00 \text{ dBW/kg}$

System Check_Head_835MHz

DUT: D835V2 - SN:4d091

Communication System: UID 0, CW (0); Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL_850 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.911 \text{ S/m}$; $\epsilon_r = 42.211$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : $23.5 \text{ }^\circ\text{C}$; Liquid Temperature : $22.8 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(10.52, 10.52, 10.52); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 3.07 W/kg

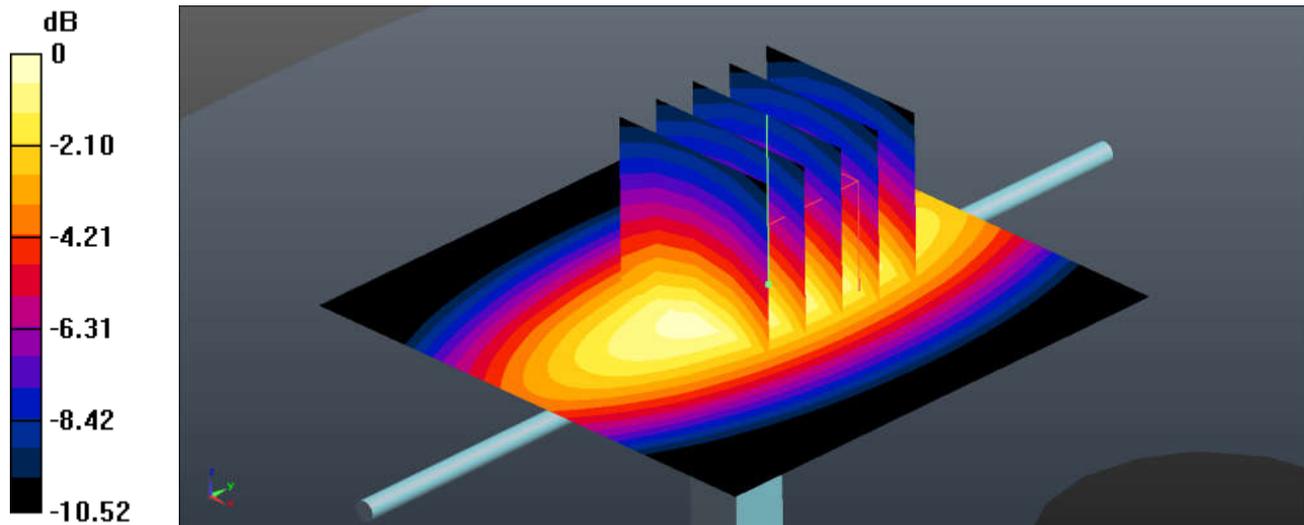
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 53.28 V/m ; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.64 W/kg

SAR(1 g) = 2.47 W/kg ; SAR(10 g) = 1.63 W/kg

Maximum value of SAR (measured) = 3.12 W/kg



0 dB = 3.12 W/kg = 4.94 dBW/kg

System Check_Head_1750MHz

DUT: D1750V2 - SN:1069

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: HSL_1750 Medium parameters used: $f = 1750$ MHz; $\sigma = 1.368$ S/m; $\epsilon_r = 40.802$; $\rho = 1000$ kg/m³

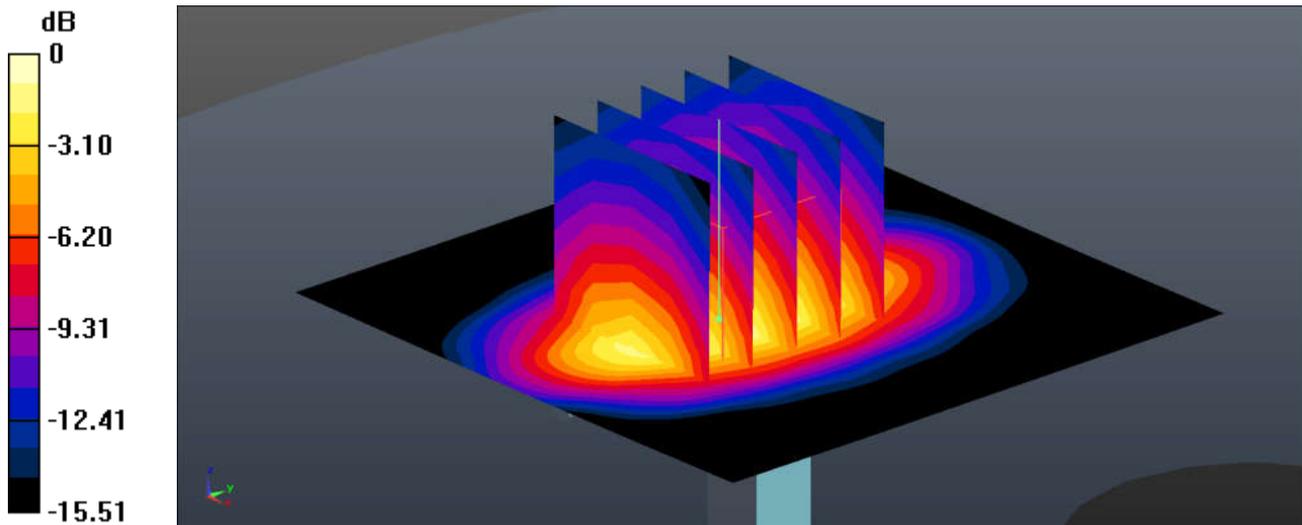
Ambient Temperature : 23.4 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(8.58, 8.58, 8.58); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 13.2 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 84.20 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 14.8 W/kg
SAR(1 g) = 8.81 W/kg; SAR(10 g) = 4.89 W/kg
Maximum value of SAR (measured) = 12.1 W/kg



0 dB = 12.1 W/kg = 10.83 dBW/kg

System Check_Head_1900MHz

DUT: D1900V2 - SN:5d118

Communication System: UID 0, CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL_1900 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.426$ S/m; $\epsilon_r = 39.361$; $\rho = 1000$ kg/m³

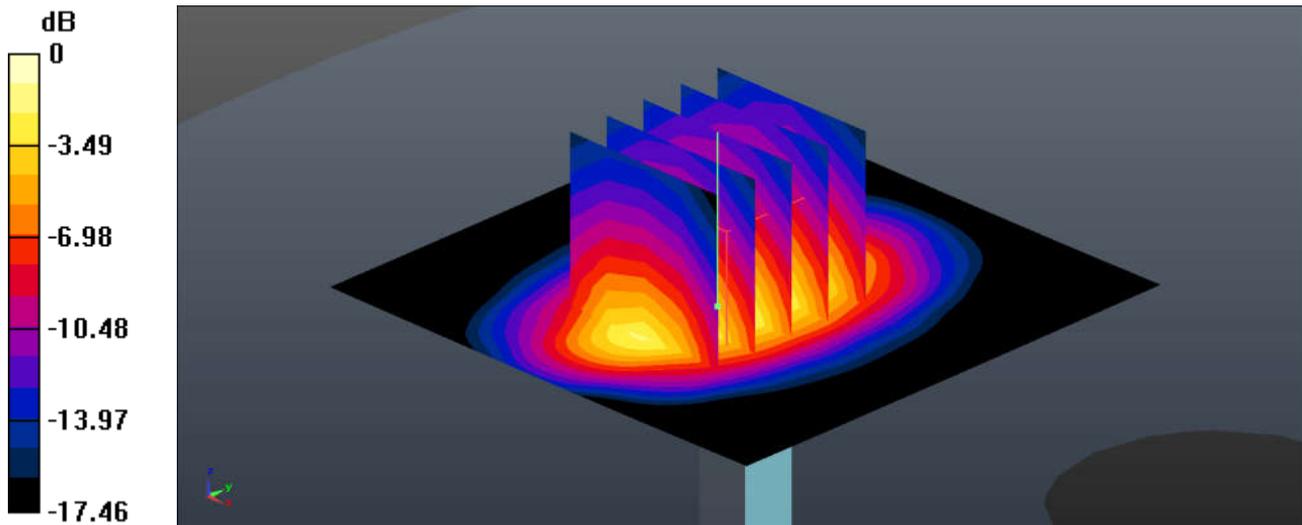
Ambient Temperature : 23.4 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(8.32, 8.32, 8.32); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 14.3 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.731 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 16.8 W/kg
SAR(1 g) = 9.7 W/kg; SAR(10 g) = 5.19 W/kg
Maximum value of SAR (measured) = 13.6 W/kg



0 dB = 13.6 W/kg = 11.34 dBW/kg

System Check_Head_2300MHz

DUT: D2300V2 - SN:1055

Communication System: UID 0, CW (0); Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: HSL_2300 Medium parameters used: $f = 2300$ MHz; $\sigma = 1.701$ S/m; $\epsilon_r = 38.84$; $\rho = 1000$ kg/m³

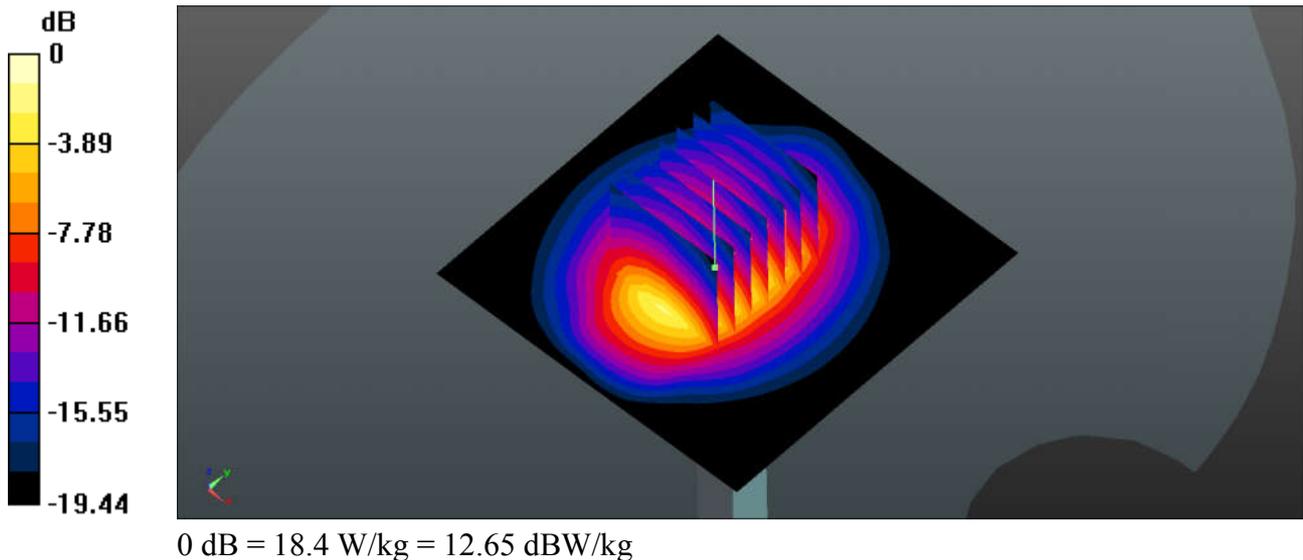
Ambient Temperature : 23.3 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(7.88, 7.88, 7.88); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 19.0 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.17 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 24.0 W/kg
SAR(1 g) = 12.4 W/kg; SAR(10 g) = 6.06 W/kg
Maximum value of SAR (measured) = 18.4 W/kg



System Check_Head_2450MHz

DUT: D2450V2 - SN:840

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL_2450 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.868$ S/m; $\epsilon_r = 38.17$; $\rho = 1000$ kg/m³

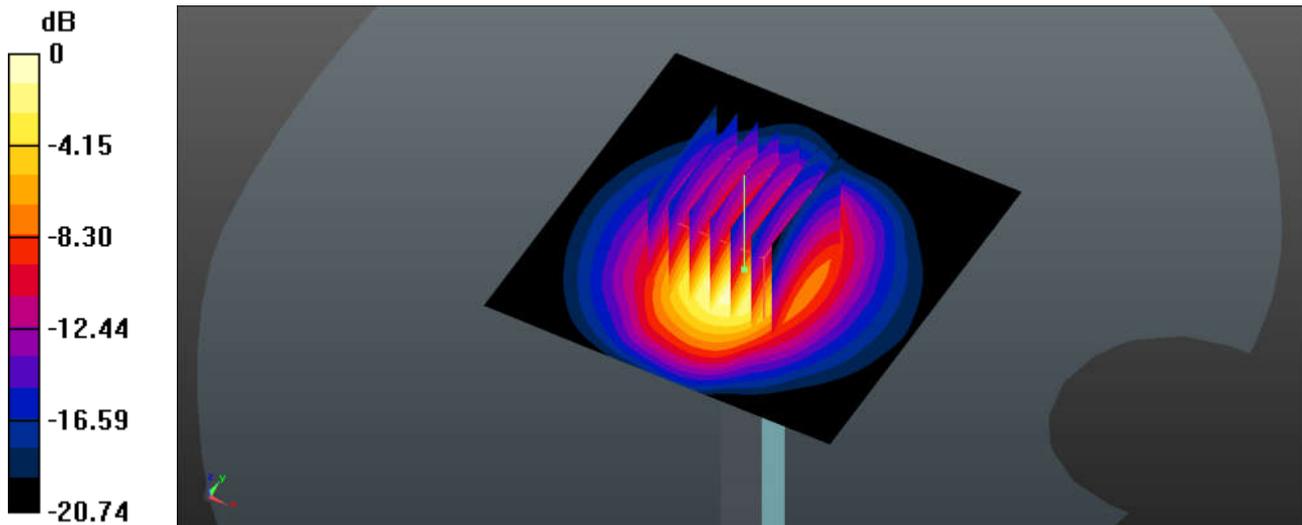
Ambient Temperature : 23.3 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(7.44, 7.44, 7.44); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 20.2 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.01 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 26.4 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.43 W/kg
Maximum value of SAR (measured) = 20.1 W/kg



0 dB = 20.1 W/kg = 13.03 dBW/kg

System Check_Head_5250MHz

DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: HSL_5000 Medium parameters used: $f = 5250$ MHz; $\sigma = 4.882$ S/m; $\epsilon_r = 37.304$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(5.08, 5.08, 5.08); Calibrated: 2016.11.28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 17.6 W/kg

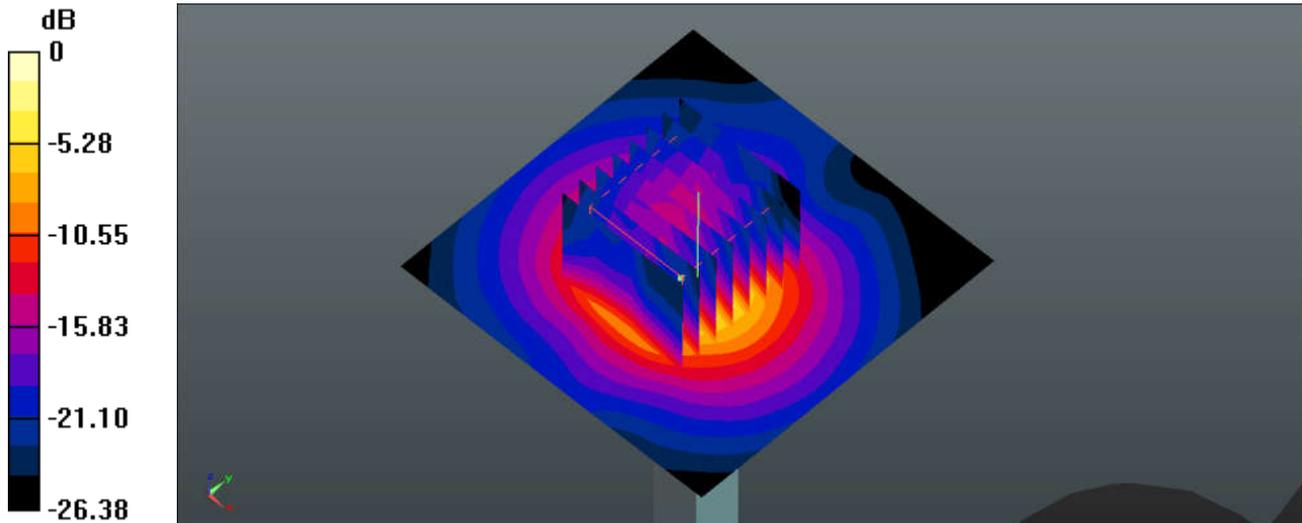
Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 40.51 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 30.3 W/kg

SAR(1 g) = 8.18 W/kg; SAR(10 g) = 2.43 W/kg

Maximum value of SAR (measured) = 18.4 W/kg



0 dB = 18.4 W/kg = 12.65 dBW/kg

System Check_Head_5750MHz

DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: HSL_5000 Medium parameters used: $f = 5750$ MHz; $\sigma = 5.415$ S/m; $\epsilon_r = 36.543$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(4.69, 4.69, 4.69); Calibrated: 2016.11.28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 17.3 W/kg

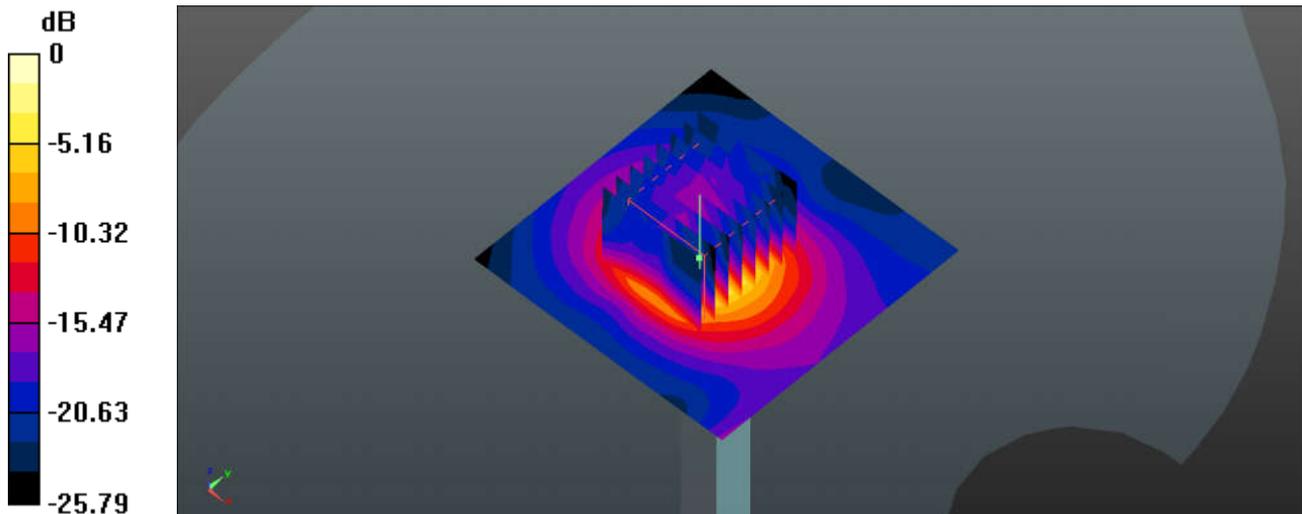
Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 36.67 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 30.1 W/kg

SAR(1 g) = 7.4 W/kg; SAR(10 g) = 2.25 W/kg

Maximum value of SAR (measured) = 17.6 W/kg



0 dB = 17.6 W/kg = 12.46 dBW/kg

System Check_Body_750MHz

DUT: D750V3 - SN:1065

Communication System: UID 0, CW (0); Frequency: 750 MHz; Duty Cycle: 1:1

Medium: MSL_750 Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.965 \text{ S/m}$; $\epsilon_r = 55.781$; $\rho = 1000 \text{ kg/m}^3$

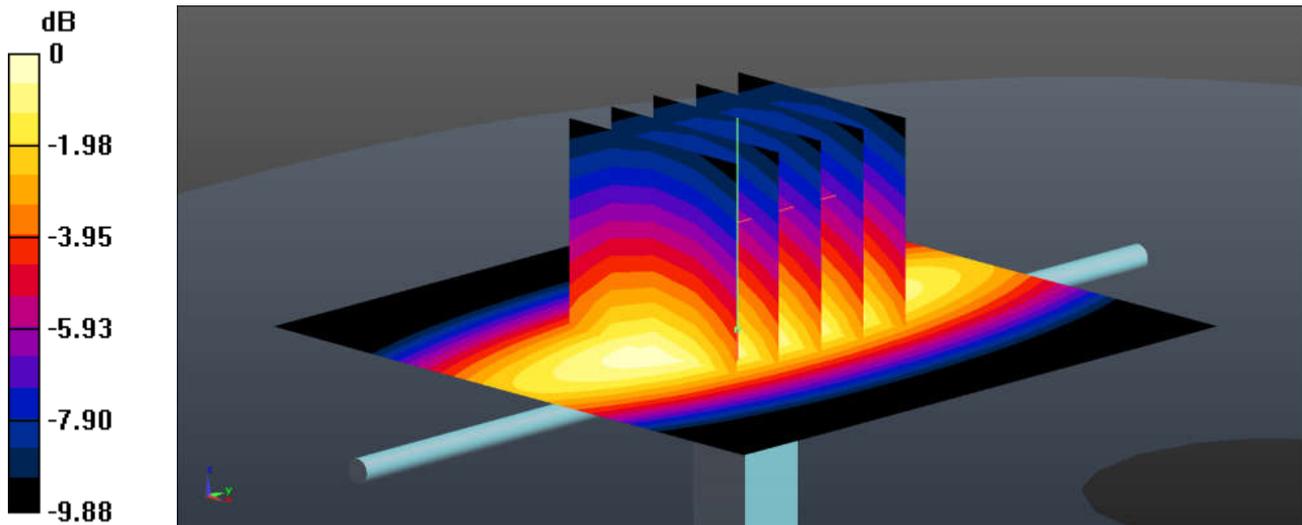
Ambient Temperature : $23.3 \text{ }^\circ\text{C}$; Liquid Temperature : $22.7 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(10.54, 10.54, 10.54); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
Maximum value of SAR (interpolated) = 2.83 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 49.85 V/m ; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 3.29 W/kg
SAR(1 g) = 2.22 W/kg ; SAR(10 g) = 1.48 W/kg
Maximum value of SAR (measured) = 2.80 W/kg



0 dB = 2.80 W/kg = 4.47 dBW/kg

System Check_Body_835MHz

DUT: D835V2 - SN:4d091

Communication System: UID 0, CW (0); Frequency: 835 MHz; Duty Cycle: 1:1

Medium: MSL_850 Medium parameters used: $f = 835$ MHz; $\sigma = 0.955$ S/m; $\epsilon_r = 54.096$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(10.32, 10.32, 10.32); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.89 W/kg

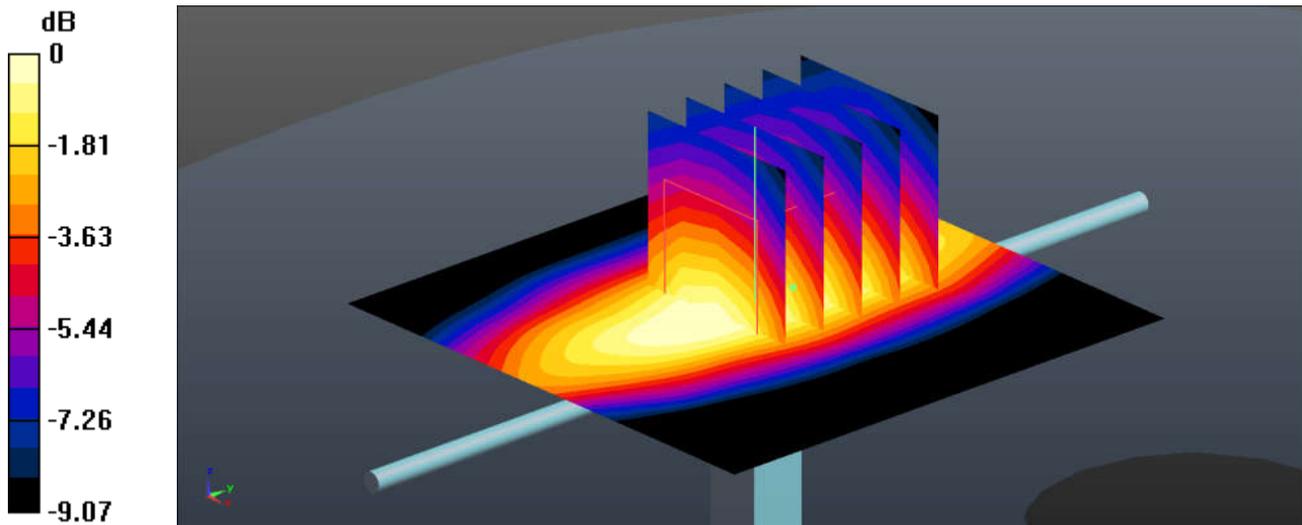
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 47.52 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 2.96 W/kg

SAR(1 g) = 2.33 W/kg; SAR(10 g) = 1.64 W/kg

Maximum value of SAR (measured) = 2.73 W/kg



System Check_Body_1750MHz

DUT: D1750V2 - SN:1069

Communication System: UID 0, CW (0); Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: MSL_1750 Medium parameters used: $f = 1750$ MHz; $\sigma = 1.475$ S/m; $\epsilon_r = 54.567$; $\rho = 1000$ kg/m³

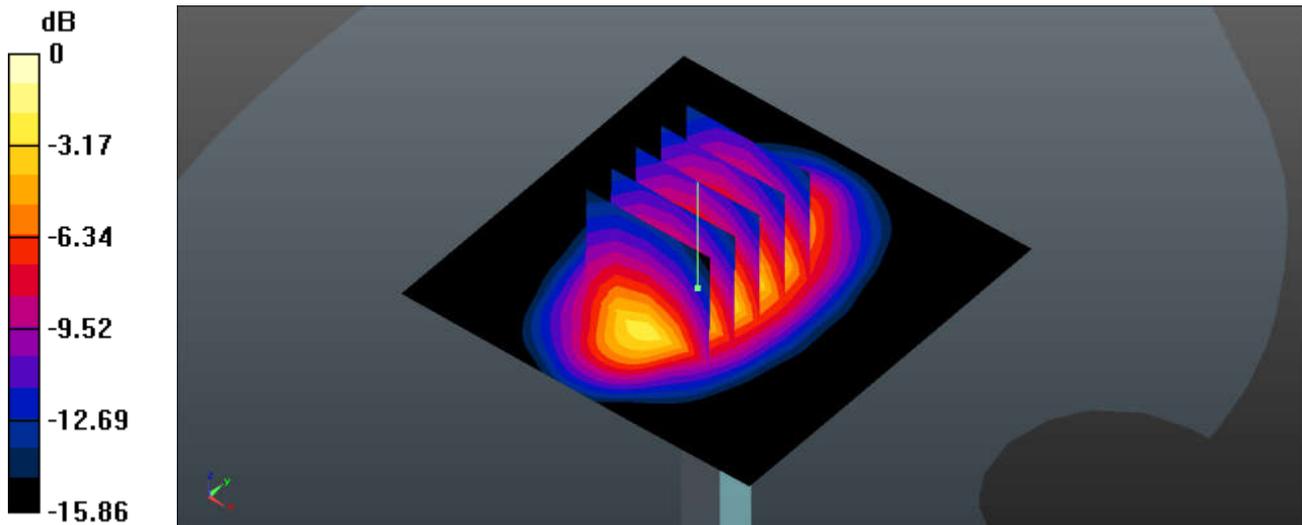
Ambient Temperature : 23.3 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(8.32, 8.32, 8.32); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.7 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 81.83 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 15.0 W/kg
SAR(1 g) = 9.1 W/kg; SAR(10 g) = 5.07 W/kg
Maximum value of SAR (measured) = 12.2 W/kg



0 dB = 12.2 W/kg = 10.86 dBW/kg

System Check_Body_1900MHz

DUT: D1900V2 - SN:5d118

Communication System: UID 0, CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: MSL_1900 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.542$ S/m; $\epsilon_r = 51.371$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(8.01, 8.01, 8.01); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 14.6 W/kg

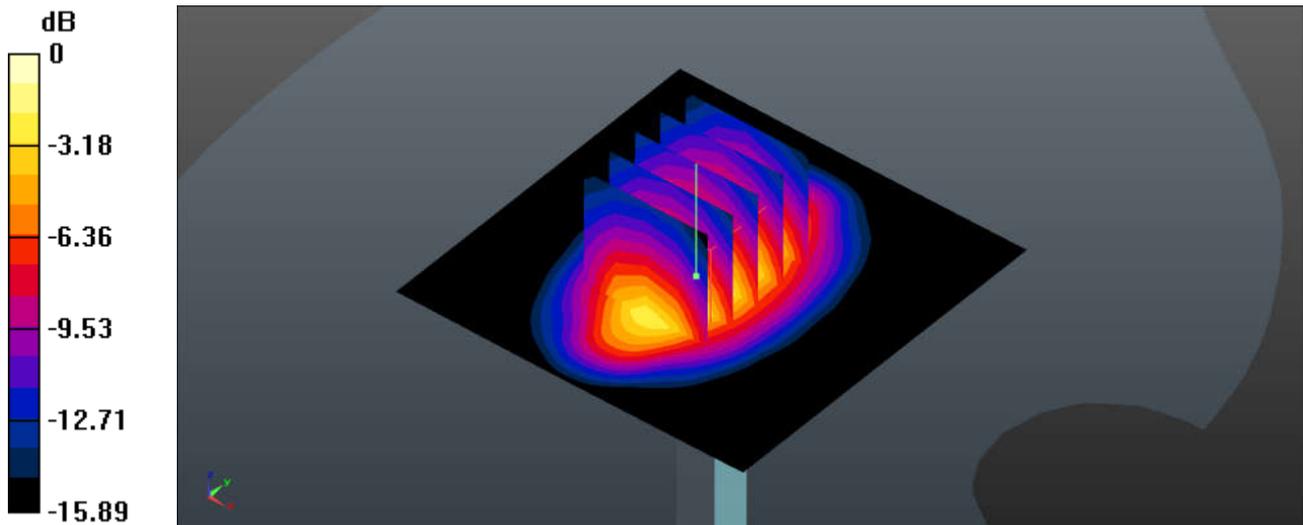
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 86.41 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 17.6 W/kg

SAR(1 g) = 10.6 W/kg; SAR(10 g) = 5.79 W/kg

Maximum value of SAR (measured) = 14.5 W/kg



0 dB = 14.5 W/kg = 11.61 dBW/kg

System Check_Body_2300MHz

DUT: D2300V2 - SN:1055

Communication System: UID 0, CW (0); Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: MSL_2300 Medium parameters used: $f = 2300$ MHz; $\sigma = 1.786$ S/m; $\epsilon_r = 52.172$; $\rho = 1000$ kg/m³

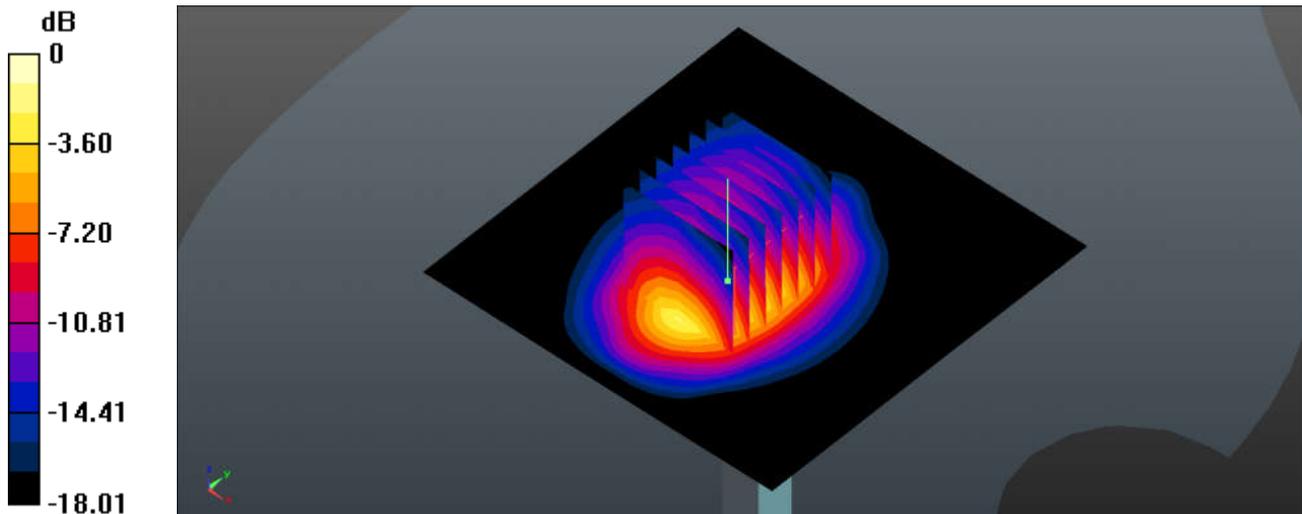
Ambient Temperature : 23.4 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(7.8, 7.8, 7.8); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 17.6 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 81.45 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 21.7 W/kg
SAR(1 g) = 12 W/kg; SAR(10 g) = 6.03 W/kg
Maximum value of SAR (measured) = 17.3 W/kg



0 dB = 17.3 W/kg = 12.38 dBW/kg

System Check_Body_2450MHz

DUT: D2450V2 - SN:840

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: MSL_2450 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.978$ S/m; $\epsilon_r = 51.988$; $\rho = 1000$ kg/m³

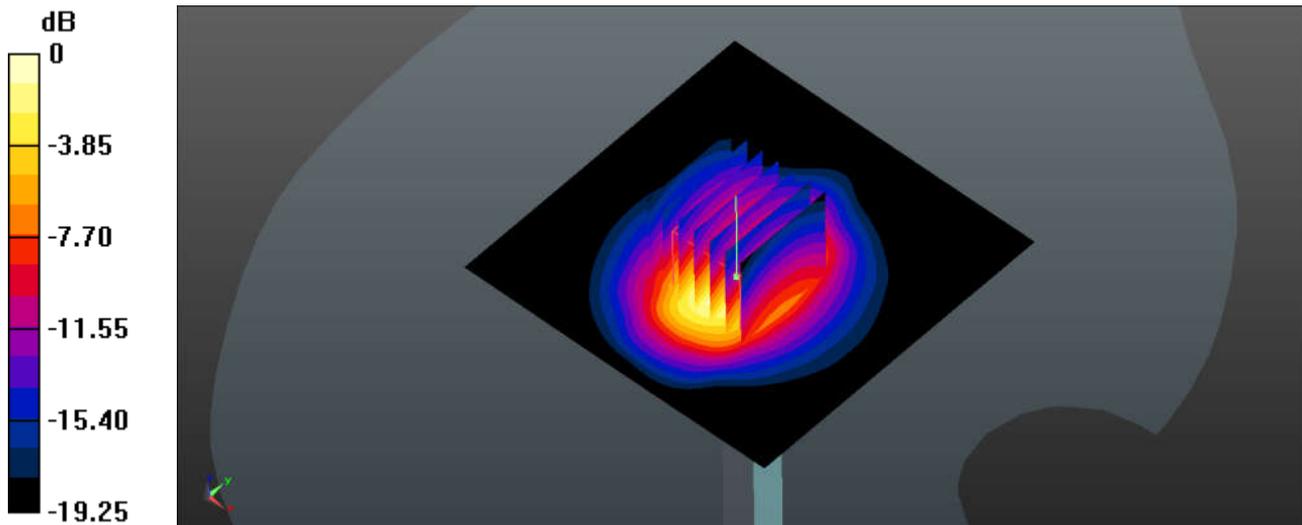
Ambient Temperature : 23.4 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(7.55, 7.55, 7.55); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 18.6 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 81.89 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 23.5 W/kg
SAR(1 g) = 12.3 W/kg; SAR(10 g) = 5.97 W/kg
Maximum value of SAR (measured) = 18.2 W/kg



0 dB = 18.2 W/kg = 12.60 dBW/kg

System Check_Body_5250MHz

DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: MSL_5000 Medium parameters used: $f = 5250$ MHz; $\sigma = 5.539$ S/m; $\epsilon_r = 48.008$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(4.5, 4.5, 4.5); Calibrated: 2016.11.28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 18.0 W/kg

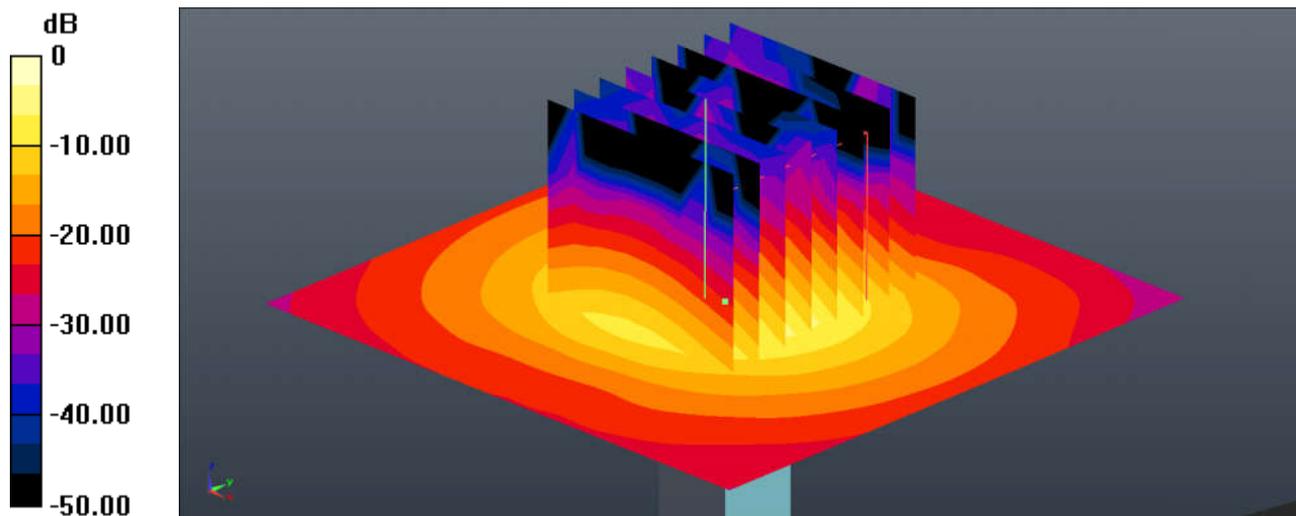
Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 41.08 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 30.3 W/kg

SAR(1 g) = 7.48 W/kg; SAR(10 g) = 2.08 W/kg

Maximum value of SAR (measured) = 17.5 W/kg



0 dB = 17.5 W/kg = 12.43 dBW/kg

System Check_Body_5750MHz

DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: MSL_5000 Medium parameters used: $f = 5750$ MHz; $\sigma = 6.215$ S/m; $\epsilon_r = 47.167$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(4.05, 4.05, 4.05); Calibrated: 2016.11.28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 17.2 W/kg

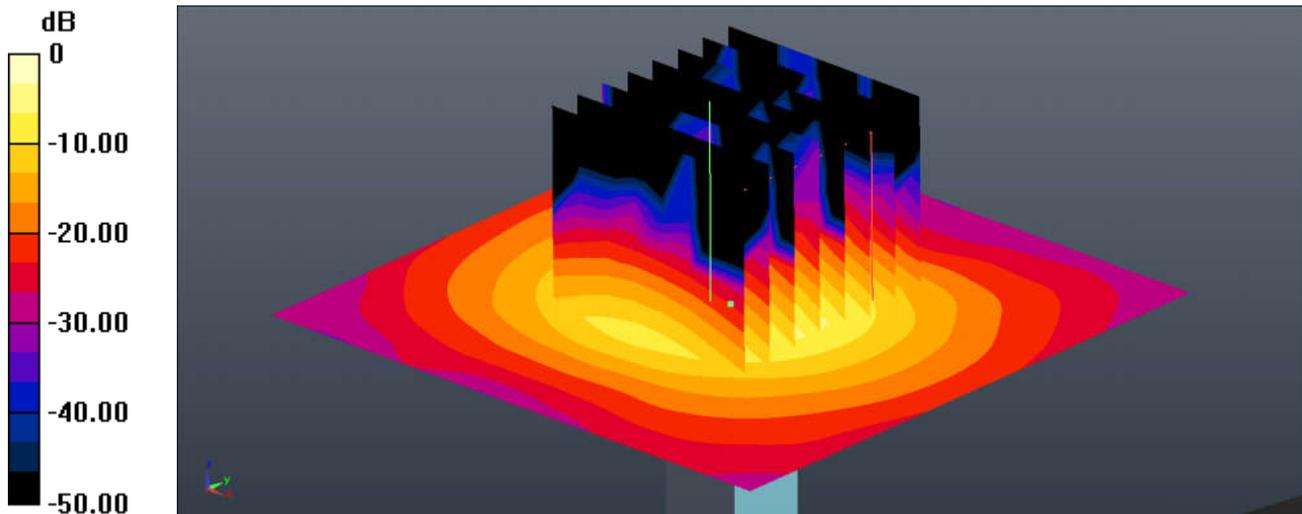
Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 37.52 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 29.0 W/kg

SAR(1 g) = 7 W/kg; SAR(10 g) = 1.95 W/kg

Maximum value of SAR (measured) = 16.7 W/kg



0 dB = 16.7 W/kg = 12.23 dBW/kg



Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

01_GSM850_GPRS 2 Tx slots_Left Cheek_0mm_Ch189

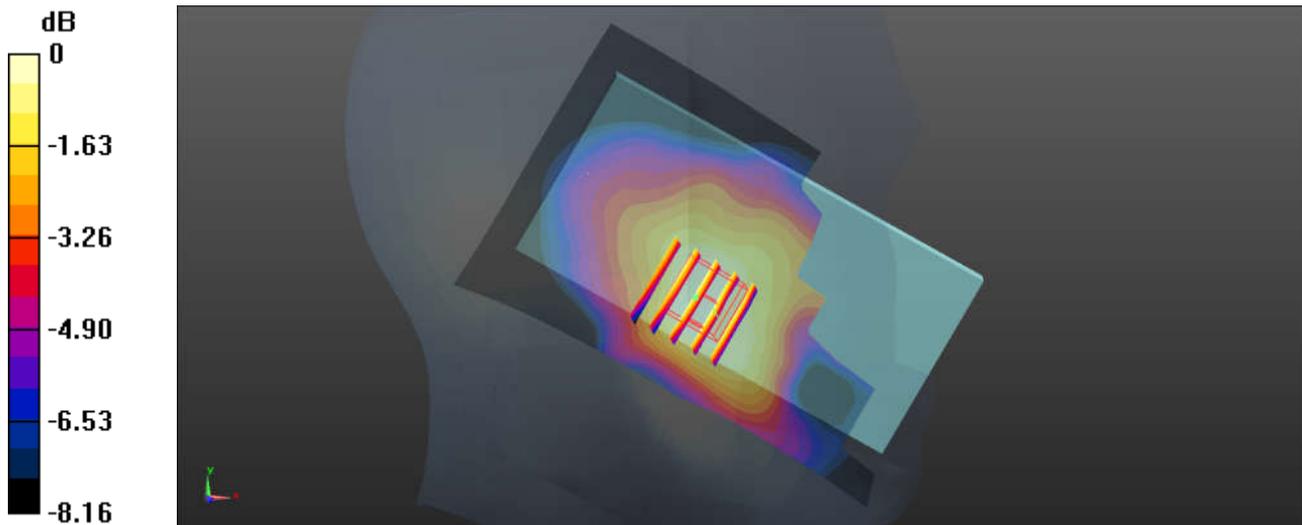
Communication System: UID 0, GPRS/EDGE (2 Tx slots) (0); Frequency: 836.4 MHz; Duty Cycle: 1:4.15
Medium: HSL_850 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.912$ S/m; $\epsilon_r = 42.192$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(10.52, 10.52, 10.52); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch189/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.520 W/kg

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.71 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.551 W/kg
SAR(1 g) = 0.427 W/kg; SAR(10 g) = 0.340 W/kg
Maximum value of SAR (measured) = 0.489 W/kg



0 dB = 0.489 W/kg = -3.11 dBW/kg

02_GSM1900_GPRS 2 Tx slots_Right Cheek_0mm_Ch512

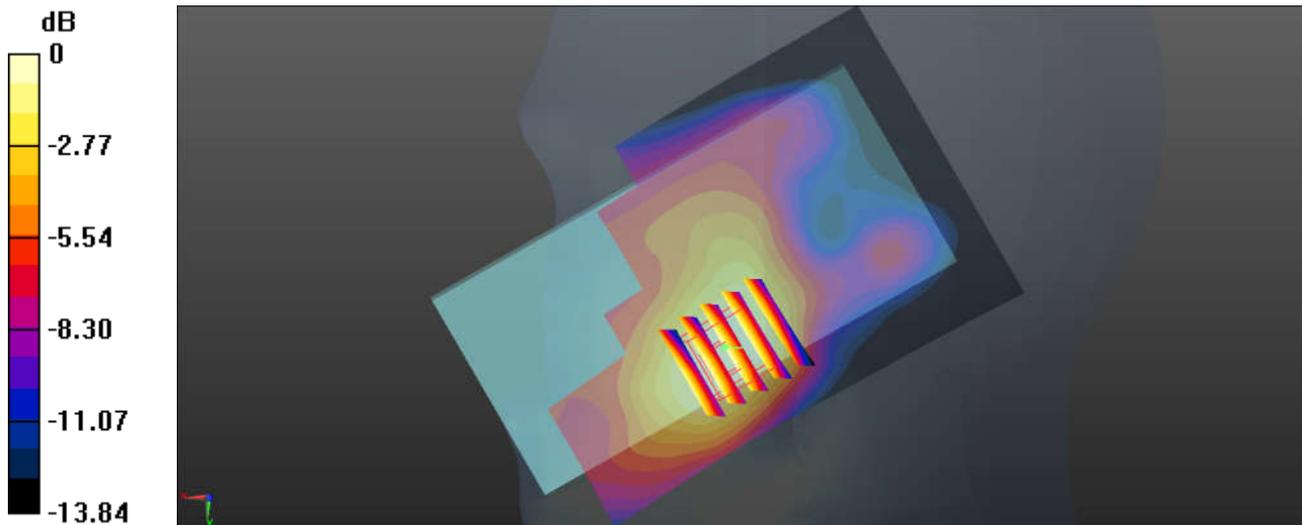
Communication System: UID 0, GPRS/EDGE (2 Tx slots) (0); Frequency: 1850.2 MHz; Duty Cycle: 1:4.15
Medium: HSL_1900 Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.374$ S/m; $\epsilon_r = 39.569$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.4 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(8.32, 8.32, 8.32); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch512/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.220 W/kg

Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.332 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.217 W/kg
SAR(1 g) = 0.170 W/kg; SAR(10 g) = 0.114 W/kg
Maximum value of SAR (measured) = 0.194 W/kg



0 dB = 0.194 W/kg = -7.12 dBW/kg

03_WCDMA Band V_RMC 12.2Kbps_Left Cheek_0mm_Ch4132

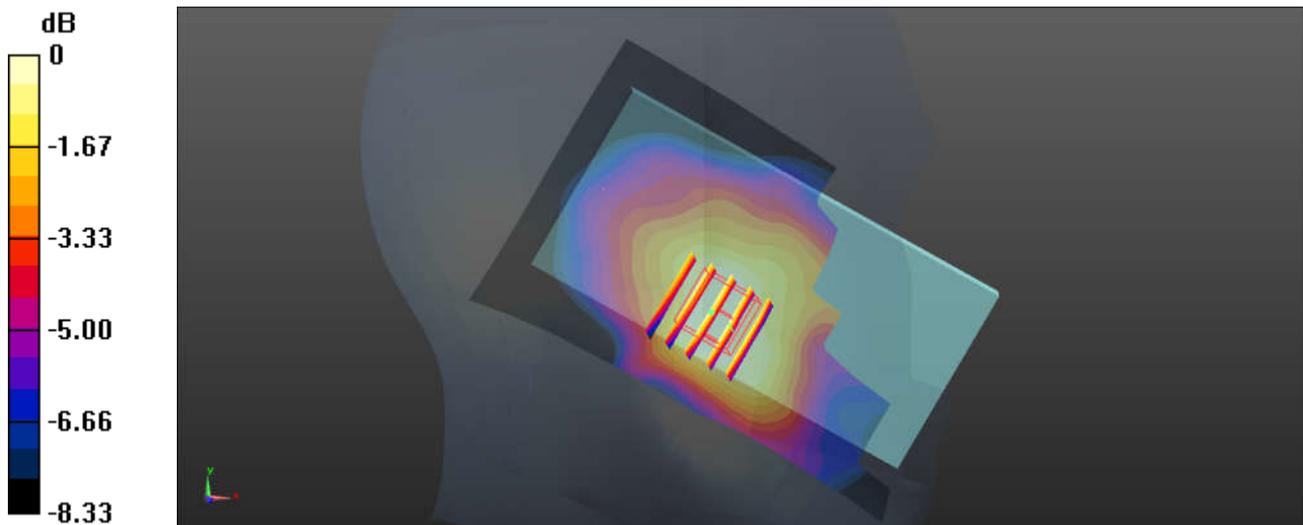
Communication System: UID 0, UMTS (0); Frequency: 826.4 MHz; Duty Cycle: 1:1
 Medium: HSL_850 Medium parameters used: $f = 826.4 \text{ MHz}$; $\sigma = 0.902 \text{ S/m}$; $\epsilon_r = 42.333$; $\rho = 1000 \text{ kg/m}^3$
 Ambient Temperature : $23.5 \text{ }^\circ\text{C}$; Liquid Temperature : $22.8 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(10.52, 10.52, 10.52); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch4132/Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
 Maximum value of SAR (interpolated) = 0.305 W/kg

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 9.258 V/m ; Power Drift = 0.07 dB
 Peak SAR (extrapolated) = 0.304 W/kg
SAR(1 g) = 0.241 W/kg ; SAR(10 g) = 0.192 W/kg
 Maximum value of SAR (measured) = 0.271 W/kg



0 dB = $0.271 \text{ W/kg} = -5.67 \text{ dBW/kg}$

04_WCDMA Band IV_RMC 12.2Kbps_Right Cheek_0mm_Ch1312

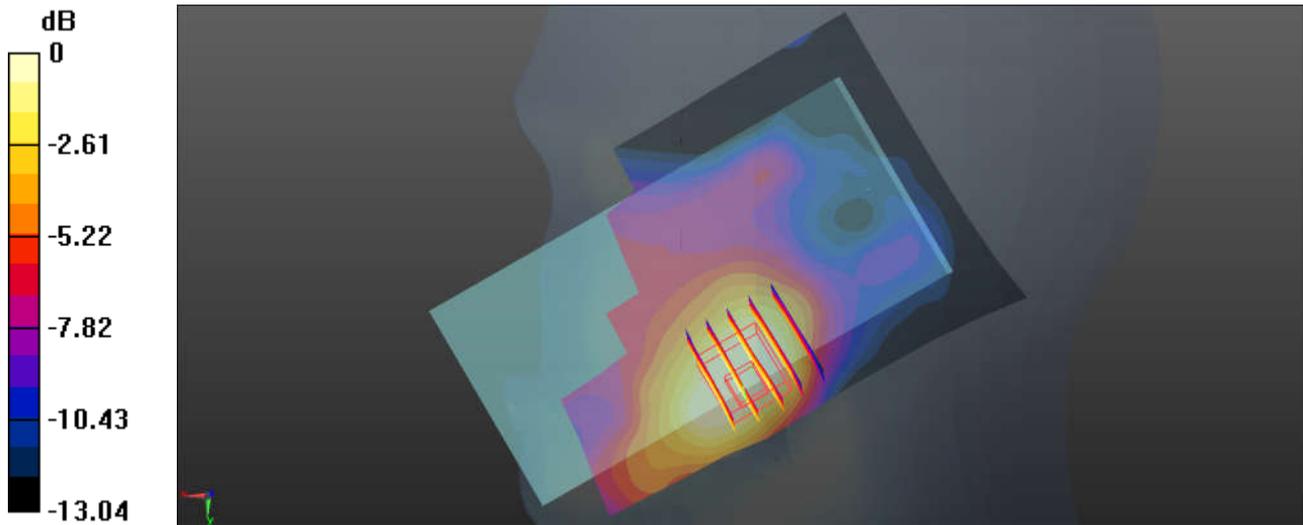
Communication System: UID 0, UMTS (0); Frequency: 1712.4 MHz; Duty Cycle: 1:1
 Medium: HSL_1750 Medium parameters used: $f = 1712.4$ MHz; $\sigma = 1.326$ S/m; $\epsilon_r = 40.979$; $\rho = 1000$ kg/m³
 Ambient Temperature : 23.4 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(8.58, 8.58, 8.58); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch1312/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.265 W/kg

Ch1312/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 3.270 V/m; Power Drift = 0.06 dB
 Peak SAR (extrapolated) = 0.242 W/kg
SAR(1 g) = 0.198 W/kg; SAR(10 g) = 0.135 W/kg
 Maximum value of SAR (measured) = 0.225 W/kg



0 dB = 0.225 W/kg = -6.48 dBW/kg

05_WCDMA Band II_RMC 12.2Kbps_Right Cheek_0mm_Ch9538

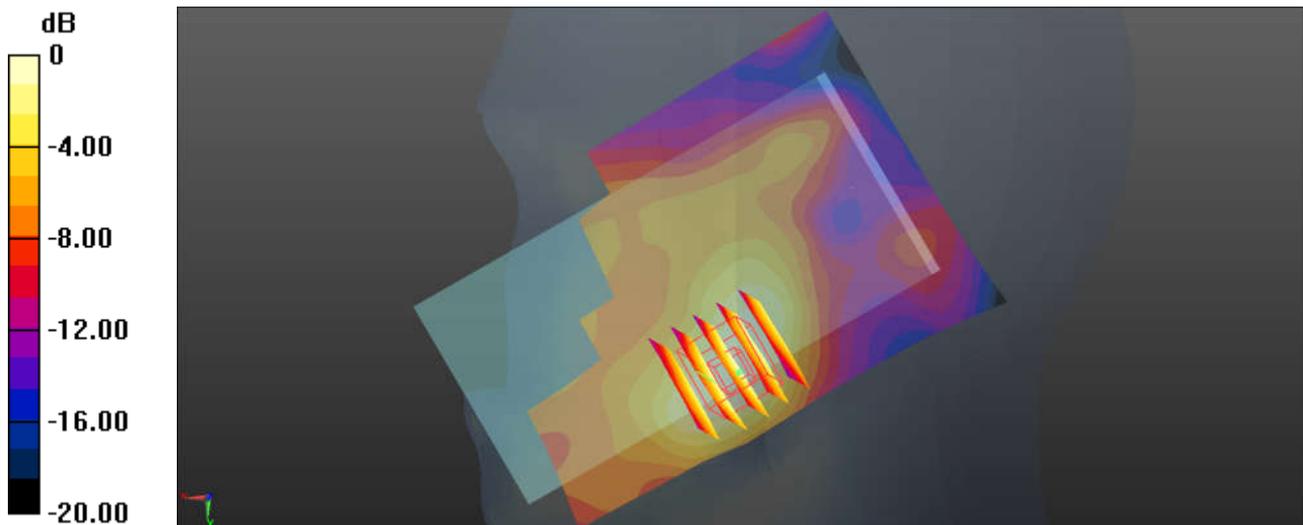
Communication System: UID 0, UMTS (0); Frequency: 1907.6 MHz; Duty Cycle: 1:1
 Medium: HSL_1900 Medium parameters used: $f = 1907.6 \text{ MHz}$; $\sigma = 1.434 \text{ S/m}$; $\epsilon_r = 39.329$; $\rho = 1000 \text{ kg/m}^3$
 Ambient Temperature : $23.4 \text{ }^\circ\text{C}$; Liquid Temperature : $22.7 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(8.32, 8.32, 8.32); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch9538/Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
 Maximum value of SAR (interpolated) = 0.266 W/kg

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 2.950 V/m ; Power Drift = 0.02 dB
 Peak SAR (extrapolated) = 0.258 W/kg
SAR(1 g) = 0.195 W/kg ; SAR(10 g) = 0.122 W/kg
 Maximum value of SAR (measured) = 0.236 W/kg



$0 \text{ dB} = 0.236 \text{ W/kg} = -6.27 \text{ dBW/kg}$

06_LTE Band 12_10M_QPSK_1RB_0Offset_Left Cheek_0mm_Ch23095

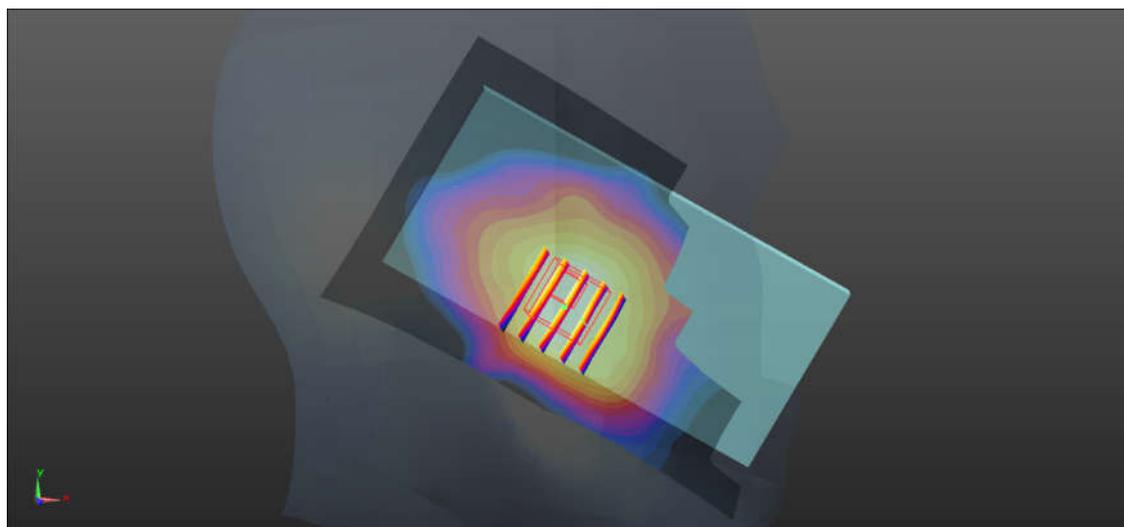
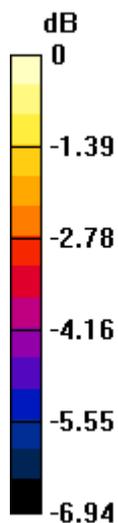
Communication System: UID 0, FDD_LTE (0); Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: HSL_750 Medium parameters used: $f = 707.5$ MHz; $\sigma = 0.853$ S/m; $\epsilon_r = 41.815$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.5 °C; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(10.98, 10.98, 10.98); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch23095/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.161 W/kg

Ch23095/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.645 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.164 W/kg
SAR(1 g) = 0.131 W/kg; SAR(10 g) = 0.107 W/kg
Maximum value of SAR (measured) = 0.148 W/kg



0 dB = 0.148 W/kg = -8.30 dBW/kg

07_LTE Band 5_10M_QPSK_1RB_0Offset_Left Cheek_0mm_Ch20525

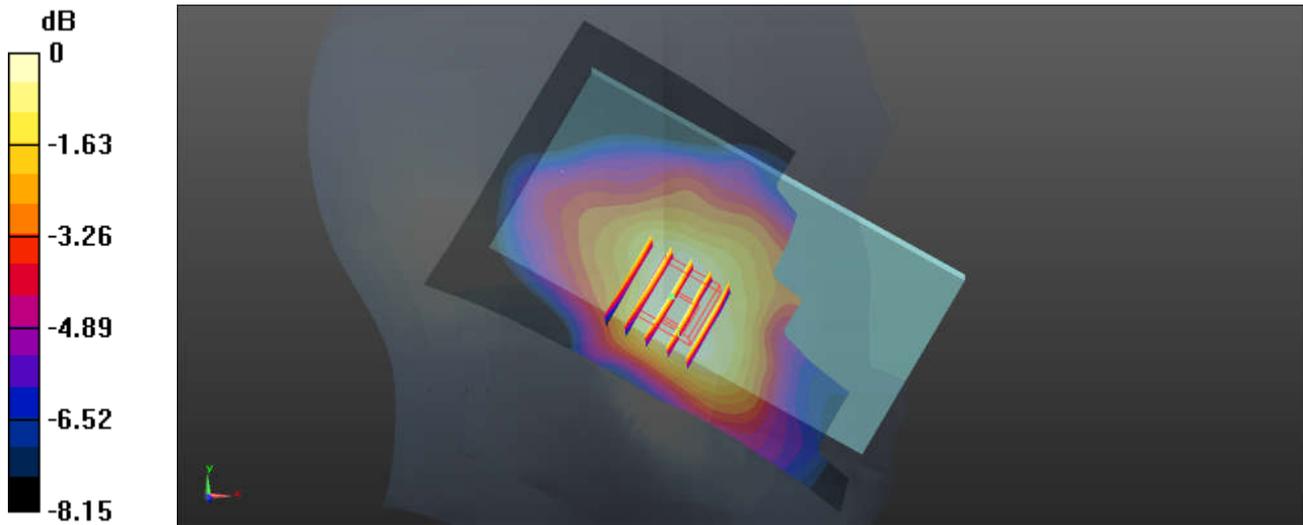
Communication System: UID 0, FDD_LTE (0); Frequency: 836.5 MHz; Duty Cycle: 1:1
 Medium: HSL_850 Medium parameters used: $f = 836.5 \text{ MHz}$; $\sigma = 0.912 \text{ S/m}$; $\epsilon_r = 42.191$; $\rho = 1000 \text{ kg/m}^3$
 Ambient Temperature : $23.5 \text{ }^\circ\text{C}$; Liquid Temperature : $22.8 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(10.52, 10.52, 10.52); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20525/Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
 Maximum value of SAR (interpolated) = 0.251 W/kg

Ch20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 8.899 V/m ; Power Drift = 0.01 dB
 Peak SAR (extrapolated) = 0.250 W/kg
SAR(1 g) = 0.196 W/kg ; SAR(10 g) = 0.155 W/kg
 Maximum value of SAR (measured) = 0.219 W/kg



0 dB = $0.219 \text{ W/kg} = -6.60 \text{ dBW/kg}$

08_LTE Band 66_20M_QPSK_1RB_0Offset_Right Cheek_0mm_Ch132322

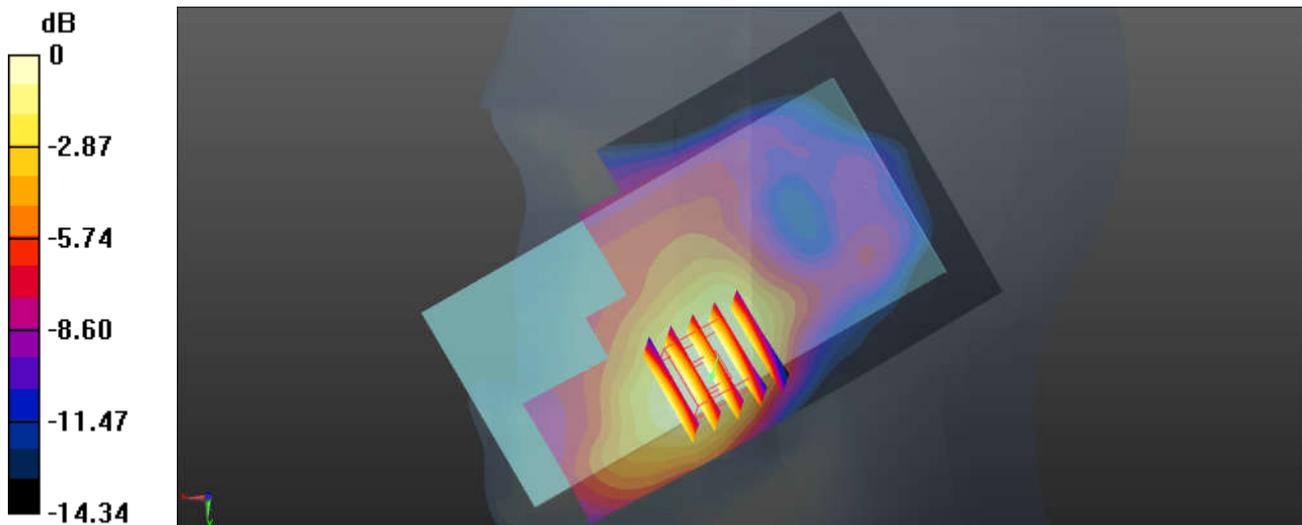
Communication System: UID 0, FDD_LTE (0); Frequency: 1745 MHz; Duty Cycle: 1:1
Medium: HSL_1750 Medium parameters used: $f = 1745$ MHz; $\sigma = 1.362$ S/m; $\epsilon_r = 40.821$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.4 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(8.58, 8.58, 8.58); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch132322/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.315 W/kg

Ch132322/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.388 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.314 W/kg
SAR(1 g) = 0.254 W/kg; SAR(10 g) = 0.179 W/kg
Maximum value of SAR (measured) = 0.295 W/kg



0 dB = 0.295 W/kg = -5.30 dBW/kg

09_LTE Band 2_20M_QPSK_1RB_0Offset_Right Cheek_0mm_Ch18900

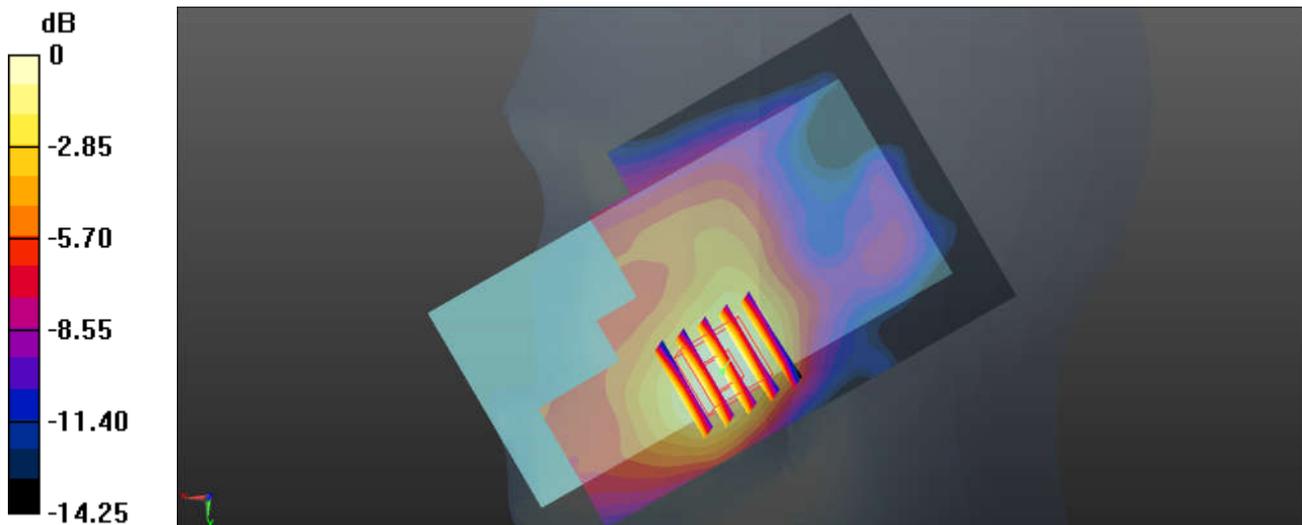
Communication System: UID 0, FDD_LTE (0); Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.404$ S/m; $\epsilon_r = 39.444$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.4 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(8.32, 8.32, 8.32); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch18900/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.221 W/kg

Ch18900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.633 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.226 W/kg
SAR(1 g) = 0.172 W/kg; SAR(10 g) = 0.114 W/kg
Maximum value of SAR (measured) = 0.207 W/kg



0 dB = 0.207 W/kg = -6.84 dBW/kg

10_LTE Band 30_10M_QPSK_1RB_0Offset_Right Cheek_0mm_Ch27710

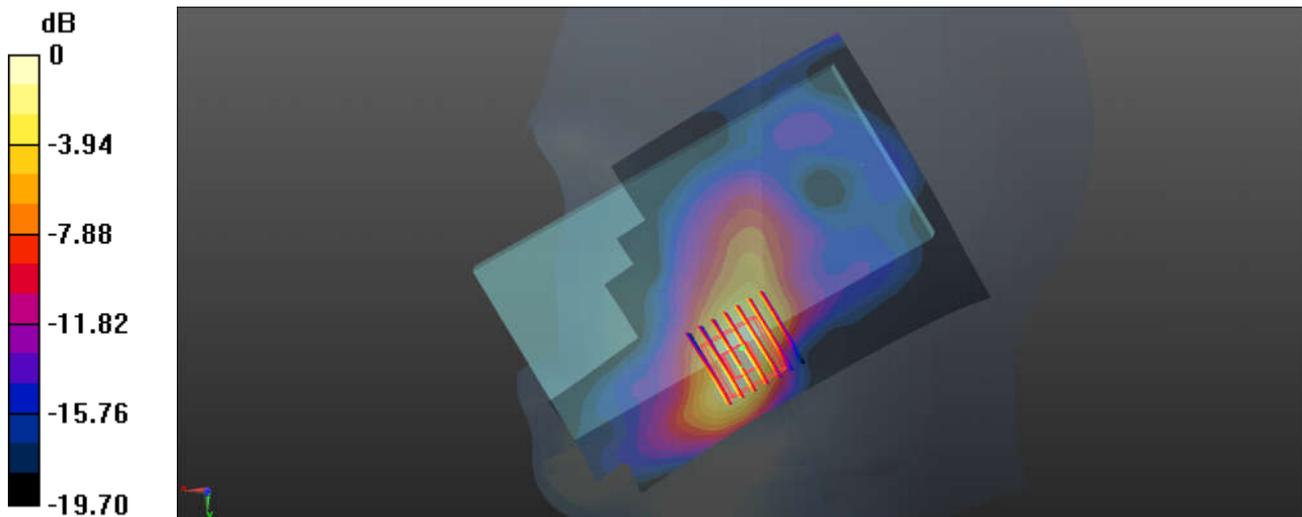
Communication System: UID 0, FDD_LTE (0); Frequency: 2310 MHz; Duty Cycle: 1:1
Medium: HSL_2300 Medium parameters used: $f = 2310$ MHz; $\sigma = 1.713$ S/m; $\epsilon_r = 38.798$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3954; ConvF(7.88, 7.88, 7.88); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2017.5.2
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch27710/Area Scan (91x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.40 W/kg

Ch27710/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.134 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.973 W/kg; SAR(10 g) = 0.517 W/kg
Maximum value of SAR (measured) = 1.35 W/kg



0 dB = 1.35 W/kg = 1.30 dBW/kg