FCC SAR Test Report

APPLICANT	:	Motorola Mobility, LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola Mobility, LLC
MODEL NAME	:	3584
FCC ID	:	IHDT56PK1
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2003

We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

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Revision History

Report No.	Version	Description	Issued Date
FA462024A	Rev. 01	Initial issue of report	Aug. 06, 2014

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility, LLC, Mobile Cellular Phone, 3584,** are as follows.

Equipment Class	Frequency Band	Highest SAR Summary			
		Head (Separation 0mm) 1g SAR (W/kg)	Body-worn (Separation 15mm) 1g SAR (W/kg)	Wireless Router (Separation 10mm) 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
PCE	GSM850	0.34	0.47	0.60	1.41
	GSM1900	0.14	0.65	0.71	
	WCDMA Band V	0.27	0.47	0.47	
	WCDMA Band II	0.32	1.19	0.69	
	CDMA 2000 BC0	0.38	0.60	0.60	
	CDMA 2000 BC1	0.32	1.24	**1.05**	
	LTE Band 13	**0.39**	0.56	0.68	
	LTE Band 4	0.24	**1.38**	0.97	
	LTE Band 2	0.29	1.19	1.04	
	LTE Band 7	0.18	0.15	0.30	
DTS	WLAN 2.4GHz Band	0.19	0.17	0.38	1.41
NII	WLAN 5.2GHz Band	0.06	0.17	0.48	1.41
	WLAN 5.3GHz Band	0.08	0.27		
	WLAN 5.5GHz Band	0.09	0.25		
	WLAN 5.8GHz Band	0.15	0.22	0.40	
DSS	Bluetooth	0.03	0.02	0.04	1.39
Date of Testing:		2014/07/04 ~ 2014/08/04			

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) 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 1528-2003.

2. Administration Data

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

Applicant	
Company Name	Motorola Mobility, LLC
Address	222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

Manufacturer	
Company Name	Motorola Mobility, LLC
Address	222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

3. Guidance Standard

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 1528-2003
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- FCC KDB 865664 D02 SAR Reporting v01r01
- FCC KDB 447498 D01 General RF Exposure Guidance v05r02
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r02
- FCC KDB 248227 D01 SAR meas for 802 11abg v01r02
- FCC KDB 644545 D01 Guidance for IEEE 802 11ac v01r02
- FCC KDB 941225 D01 SAR test for 3G devices v02
- FCC KDB 941225 D02 HSPA and 1x Advanced v02r02
- FCC KDB 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- FCC KDB 941225 D05 SAR for LTE Devices v02r03
- FCC KDB 941225 D06 Hotspot Mode SAR v01r01

4. Equipment Under Test (EUT)

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola Mobility, LLC
Model Name	3584
FCC ID	IHDT56PK1
IMEI Code	990005110029601
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz CDMA2000 BC0: 824.7 MHz ~ 848.31 MHz CDMA 2000 BC1: 1851.25 MHz ~ 1908.75 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 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 • DC-HSDPA • LTE: QPSK, 16QAM • CDMA2000: 1xRTT/1xEv-Do(Rev.0)/1xEv-Do(Rev.A) • 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 • Bluetooth v3.0+EDR，Bluetooth v4.0-LE • NFC:ASK
HW Version	P2
SW Version	5821.0.4623.EN.US
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 supported VoIP in EGPRS, WCDMA, CDMA and LTE (e.g. 3rd party VoIP).
2. This device 2.4GHz / 5.2GHz / 5.8GHz WLAN supports Hotspot operation and WiFi Direct (Group Client / Group Owner), and 5.3GHz / 5.5GHz WLAN supports WiFi Direct (Group Client).
3. While operating in body-adjacent exposure configurations during a mobile hotspot session, reduced power limits are enforced on the GSM1900, WCDMA B2, CDMA BC1 and LTE B2 / B4 transmitter. And while operating in body-worn accessory exposure conditions, reduced power limits are enforced on the CDMA BC1 and LTE B4 transmitter. More detailed information which can be referred to “operational description”.

4.2 Maximum Tune-up Limit

Mode	Burst average power(dBm)	
	GSM 850	GSM 1900
GSM (GMSK, 1 Tx slot)	33.50	30.50
GPRS (GMSK, 1 Tx slot)	33.50	30.50
GPRS (GMSK, 2 Tx slots)	30.50	28.00
GPRS (GMSK, 3 Tx slots)	28.75	26.25
GPRS (GMSK, 4 Tx slots)	27.50	25.00
EDGE (8PSK, 1 Tx slot)	28.50	27.50
EDGE (8PSK, 2 Tx slots)	25.50	24.50
EDGE (8PSK, 3 Tx slots)	23.75	22.75
EDGE (8PSK, 4 Tx slots)	22.50	21.50

Band / Mode			Average power(dBm)
WCDMA	Band V / II	AMR / RMC 12.2Kbps	24.0
		HSDPA Subtest-1	23.0
		DC-HSDPA Subtest-1	23.0
		HSUPA Subtest-5	23.0
CDMA		BC0	25.0
		BC1	25.0
LTE		Band 13	24.0
		Band 4	24.0
		Band 2	24.0
		Band 7	24.0
2.4GHz WLAN		802.11b	19.0
		802.11g/n/ac	18.0
2.4GHz Bluetooth		v3.0+EDR	10.5
		v4.0-LE	3.0

Band / Mode	Freq. (MHz)	Channel	Average Power (dBm)					
			11a	HT20	HT40	VHT20	VTH40	VTH80
5.2GHz WLAN	5180	Ch 36	15	15		15		
	5190	Ch 38			10.5		10.5	
	5200	Ch 40	15	15		15		
	5210	Ch 42						9.5
	5220	Ch 44	15	15		15		
	5230	Ch 46			15		15	
	5240	Ch 48	15	15		15		
5.3GHz WLAN	5260	Ch 52	15	15		15		
	5270	Ch 54			15		15	
	5280	Ch 56	15	15		15		
	5290	Ch 58						10.5
	5300	Ch 60	15	15		15		
	5310	Ch 62			10.5		11	
	5320	Ch 64	15	15		15		
5.5GHz WLAN	5500	Ch 100	15	15		15		
	5510	Ch 102			9.5		10.5	
	5520	Ch 104	15	15		15		
	5530	Ch 106						9.5
	5540	Ch 108	15	15		15		
	5550	Ch 110			15		15	
	5560	Ch 112	15	15		15		
	5580	Ch 116	15	15		15		
	5660	Ch 132	15	15		15		
	5670	Ch 134			15		15	
	5680	Ch 136	15	15		15		
	5690	Ch 138						15
	5700	Ch 140	15	15		15		
	5710	Ch 142			15		15	
	5720	Ch 144	15	15		15		
5.8GHz WLAN	5745	Ch 149	15	14		14		
	5755	Ch 151			10.5		10	
	5765	Ch 153	15	15		15		
	5775	Ch 155						15
	5785	Ch 157	15	15		15		
	5795	Ch 159			15		15	
	5805	Ch 161	15	15		15		
	5825	Ch 165	15	15		15		

4.3 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r03	
FCC ID	IHDT56PK1
Equipment Name	Mobile Cellular Phone
Operating Frequency Range of each LTE transmission band	LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz
Channel Bandwidth	LTE Band 13: 5MHz, 10MHz LTE Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK, and 16QAM
LTE Voice / Data requirements	Data only
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3
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 power reduction applied to satisfy SAR compliance.

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

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

LTE Band 13

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

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 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 7

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

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

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

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:

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

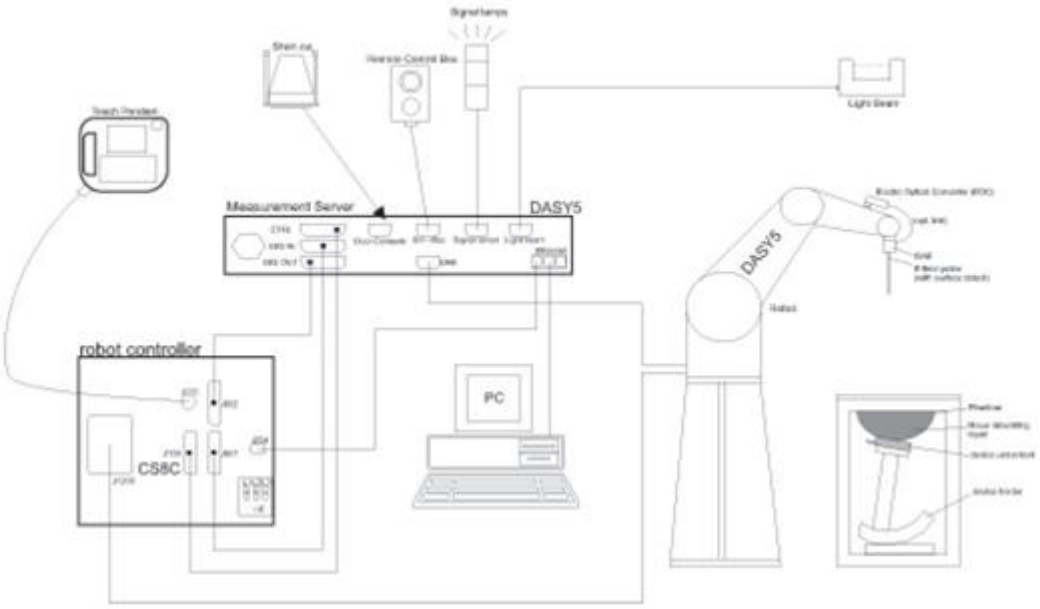
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

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.

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 form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

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 D01v01r03 SAR measurement 100 MHz to 6 GHz.

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

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 D01v01r03 SAR measurement 100 MHz to 6 GHz.

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

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

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

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	1012	May. 16, 2014	May. 15, 2015
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 24, 2014	Mar. 23, 2015
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 27, 2013	Nov. 26, 2014
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 21, 2014	Mar. 20, 2015
SPEAG	2450MHz System Validation Kit	D2450V2	924	Nov. 13, 2013	Nov. 12, 2014
SPEAG	2600MHz System Validation Kit	D2600V2	1070	Nov. 13, 2013	Nov. 12, 2014
SPEAG	5GHz System Validation Kit	D5GHzV2	1040	Jun. 20, 2014	Jun. 19, 2015
SPEAG	Data Acquisition Electronics	DAE4	778	Aug. 21, 2013	Aug. 20, 2014
SPEAG	Data Acquisition Electronics	DAE4	1338	Nov. 05, 2013	Nov. 04, 2014
SPEAG	Data Acquisition Electronics	DAE3	577	May. 15, 2014	May. 14, 2015
SPEAG	Data Acquisition Electronics	DAE4	1425	Mar. 03, 2014	Mar. 02, 2015
SPEAG	Data Acquisition Electronics	DAE3	495	May. 19, 2014	May. 18, 2015
SPEAG	Data Acquisition Electronics	DAE4	1399	Nov. 07, 2013	Nov. 06, 2014
SPEAG	Dosimetric E-Field Probe	ES3DV3	3270	Sep. 24, 2013	Sep. 23, 2014
SPEAG	Dosimetric E-Field Probe	EX3DV4	3935	Nov. 04, 2013	Nov. 03, 2014
SPEAG	Dosimetric E-Field Probe	EX3DV4	3931	Sep. 10, 2013	Sep. 09, 2014
SPEAG	Dosimetric E-Field Probe	EX3DV4	3954	Nov. 04, 2013	Nov. 03, 2014
SPEAG	Dosimetric E-Field Probe	EX3DV4	3925	May. 22, 2014	May. 21, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3955	Nov. 12, 2013	Nov. 11, 2014
Wisewind	Thermometer	ETP-101	TM560	Oct. 22, 2013	Oct. 21, 2014
Wisewind	Thermometer	ETP-101	TM685	Oct. 22, 2013	Oct. 21, 2014
Wisewind	Thermometer	HTC-1	TM642	Oct. 22, 2013	Oct. 21, 2014
Wisewind	Thermometer	HTC-1	TM281	Oct. 22, 2013	Oct. 21, 2014
H.M.IRIS	Thermometer	TH-08	TM658	Oct. 22, 2013	Oct. 21, 2014
WonDer	Thermometer	WD-5015	TM225	Dec. 02, 2013	Dec. 01, 2014
Anritsu	Radio Communication Analyzer	MT8820C	6201074414	Feb. 11, 2014	Feb. 10, 2015
Anritsu	Radio Communication Analyzer	MT8820C	6201341950	Dec. 25, 2013	Dec. 24, 2014
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 10, 2014	Jan. 09, 2015
R&S	Radio communication Tester	CMW500	113998	Oct. 04, 2013	Oct. 03, 2014
R&S	BT Base Station	CBT32	100522	Feb. 19, 2014	Feb. 18, 2015
SPEAG	Device Holder	N/A	N/A	NCR	NCR
Agilent	Signal Generator	E4438C	MY49070755	Oct. 08, 2013	Oct. 07, 2014
SPEAG	Dielectric Probe Kit	DAKS-3.5	0004	Mar. 04, 2014	Mar. 03, 2015
Agilent	ENA Network Analyzer	E5071C	MY46316648	Feb. 07, 2014	Feb. 06, 2015
Anritsu	Power Meter	ML2495A	1349001	Dec. 04, 2013	Dec. 03, 2014
Anritsu	Power Sensor	MA2411B	1306099	Dec. 03, 2013	Dec. 02, 2014
R&S	Spectrum Analyzer	FSP30	101067	Nov. 20, 2013	Nov. 19, 2014
Agilent	Dual Directional Coupler	778D	50422	Note 1	
Woken	Attenuator	WK0602-XX	N/A	Note 1	
PE	Attenuator	PE7005-10	N/A	Note 1	
PE	Attenuator	PE7005- 3	N/A	Note 1	
AR	Power Amplifier	5S1G4M2	0328767	Note 1	
Mini-Circuits	Power Amplifier	ZVE-3W	162601250	Note 1	
Mini-Circuits	Power Amplifier	ZHL-42W+	13440021344	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

10. System Verification

10.1 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 (εr)
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
2600	54.8	0	0	0.1	0	45.1	1.96	39.0
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
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

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. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Body	22.3	0.966	54.300	0.96	55.50	0.63	-2.16	±5	2014/7/6
750	Body	22.3	0.962	54.809	0.96	55.50	0.21	-1.25	±5	2014/7/28
750	Head	22.3	0.907	41.009	0.89	41.90	1.91	-2.13	±5	2014/7/6
835	Body	22.5	0.996	55.380	0.97	55.20	2.68	0.33	±5	2014/7/5
835	Body	22.3	0.963	54.541	0.97	55.20	-0.72	-1.19	±5	2014/7/21
835	Head	22.6	0.924	41.960	0.90	41.50	2.67	1.11	±5	2014/7/4
1750	Body	22.4	1.455	54.501	1.49	53.40	-2.35	2.06	±5	2014/7/5
1750	Body	22.6	1.489	53.395	1.49	53.40	-0.07	-0.01	±5	2014/7/29
1750	Body	22.6	1.489	53.395	1.49	53.40	-0.07	-0.01	±5	2014/7/29
1750	Head	22.3	1.382	39.852	1.37	40.10	0.88	-0.62	±5	2014/7/28
1900	Body	22.6	1.548	52.056	1.52	53.30	1.84	-2.33	±5	2014/7/5
1900	Body	22.2	1.544	51.591	1.52	53.30	1.58	-3.21	±5	2014/7/18
1900	Body	22.3	1.563	51.122	1.52	53.30	2.83	-4.09	±5	2014/7/21
1900	Body	22.5	1.563	52.204	1.52	53.30	2.83	-2.06	±5	2014/7/28
1900	Body	22.6	1.562	52.399	1.52	53.30	2.76	-1.69	±5	2014/7/29
1900	Head	22.3	1.458	38.959	1.40	40.00	4.14	-2.60	±5	2014/7/4
1900	Head	22.4	1.428	41.406	1.40	40.00	2.00	3.52	±5	2014/7/5
2450	Body	22.4	2.020	53.936	1.95	52.70	3.59	2.35	±5	2014/7/26
2450	Body	22.3	1.925	52.423	1.95	52.70	-1.28	-0.53	±5	2014/8/4
2450	Head	22.3	1.873	37.851	1.80	39.20	4.06	-3.44	±5	2014/7/28
2450	Head	22.3	1.836	39.458	1.80	39.20	2.00	0.66	±5	2014/8/4
2600	Body	22.5	2.211	51.180	2.16	52.50	2.36	-2.51	±5	2014/7/6
2600	Body	22.3	2.201	52.823	2.16	52.50	1.90	0.62	±5	2014/7/30
2600	Head	22.3	1.970	38.084	1.96	39.00	0.51	-2.35	±5	2014/7/6
5200	Body	22.6	5.418	47.889	5.30	49.00	2.23	-2.27	±5	2014/7/28
5200	Body	22.6	5.325	48.639	5.30	49.00	0.47	-0.74	±5	2014/8/2
5200	Head	22.6	4.777	35.313	4.66	36.00	2.51	-1.91	±5	2014/8/1
5300	Body	22.3	5.473	48.500	5.42	48.88	0.98	-0.78	±5	2014/8/2
5300	Head	22.3	4.918	35.297	4.76	35.87	3.32	-1.60	±5	2014/8/2
5600	Body	22.5	5.681	48.192	5.77	48.47	-1.54	-0.57	±5	2014/8/4
5600	Head	22.5	5.205	34.778	5.06	35.53	2.87	-2.12	±5	2014/8/4
5800	Body	22.3	6.106	47.392	6.00	48.20	1.77	-1.68	±5	2014/8/2
5800	Head	22.3	5.419	34.318	5.27	35.30	2.83	-2.78	±5	2014/8/2

10.2 System Performance Check Results

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

Date	Frequency (MHz)	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 (%)
2014/7/6	750	Body	250	D750V3-1012	EX3DV4 - SN3955	DAE4 Sn1399	2.29	8.65	9.16	5.90
2014/7/28	750	Body	250	D750V3-1012	EX3DV4 - SN3925	DAE3 Sn495	2.18	8.65	8.72	0.81
2014/7/6	750	Head	250	D750V3-1012	EX3DV4 - SN3955	DAE4 Sn1399	2.12	8.12	8.48	4.43
2014/7/5	835	Body	250	D835V2-499	ES3DV3 - SN3270	DAE4 Sn778	2.47	9.46	9.88	4.44
2014/7/21	835	Body	250	D835V2-499	ES3DV3 - SN3270	DAE4 Sn1425	2.39	9.46	9.56	1.06
2014/7/4	835	Head	250	D835V2-499	EX3DV4 - SN3925	DAE3 Sn495	2.46	9.13	9.84	7.78
2014/7/5	1750	Body	250	D1750V2-1068	ES3DV3 - SN3270	DAE4 Sn778	9.63	37.50	38.52	2.72
2014/7/29	1750	Body	250	D1750V2-1068	EX3DV4 - SN3935	DAE4 Sn1338	9.77	37.50	39.08	4.21
2014/7/29	1750	Body	250	D1750V2-1068	EX3DV4 - SN3931	DAE3 Sn577	8.71	37.50	34.84	-7.09
2014/7/28	1750	Head	250	D1750V2-1068	EX3DV4 - SN3925	DAE3 Sn495	9.41	37.30	37.64	0.91
2014/7/5	1900	Body	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	10.80	41.00	43.20	5.37
2014/7/18	1900	Body	250	D1900V2-5d041	EX3DV4 - SN3954	DAE4 Sn1425	10.70	41.00	42.80	4.39
2014/7/21	1900	Body	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	9.89	41.00	39.56	-3.51
2014/7/28	1900	Body	250	D1900V2-5d041	EX3DV4 - SN3935	DAE4 Sn1338	11.00	41.00	44.00	7.32
2014/7/29	1900	Body	250	D1900V2-5d041	EX3DV4 - SN3931	DAE3 Sn577	9.78	41.00	39.12	-4.59
2014/7/4	1900	Head	250	D1900V2-5d041	EX3DV4 - SN3925	DAE3 Sn495	10.30	41.00	41.20	0.49
2014/7/5	1900	Head	250	D1900V2-5d041	ES3DV3 - SN3270	DAE4 Sn778	10.60	41.00	42.40	3.41
2014/7/26	2450	Body	250	D2450V2-924	EX3DV4 - SN3935	DAE4 Sn1338	13.20	50.20	52.80	5.18
2014/8/4	2450	Body	250	D2450V2-924	EX3DV4 - SN3935	DAE4 Sn1338	12.20	50.20	48.80	-2.79
2014/7/28	2450	Head	250	D2450V2-924	EX3DV4 - SN3935	DAE4 Sn1338	12.20	52.40	48.80	-6.87
2014/8/4	2450	Head	250	D2450V2-924	EX3DV4 - SN3935	DAE4 Sn1338	13.80	52.40	55.20	5.34
2014/7/6	2600	Body	250	D2600V2-1070	EX3DV4 - SN3955	DAE4 Sn1399	13.60	55.70	54.40	-2.33
2014/7/30	2600	Body	250	D2600V2-1070	EX3DV4 - SN3925	DAE3 Sn495	13.60	55.70	54.40	-2.33
2014/7/6	2600	Head	250	D2600V2-1070	EX3DV4 - SN3955	DAE4 Sn1399	13.10	56.60	52.40	-7.42
2014/7/28	5200	Body	100	D5GHzV2-1040	EX3DV4 - SN3935	DAE4 Sn1338	8.06	77.80	80.60	3.60
2014/8/2	5200	Body	100	D5GHzV2-1040	EX3DV4 - SN3954	DAE4 Sn1425	7.90	77.80	79.00	1.54
2014/8/1	5200	Head	100	D5GHzV2-1040	EX3DV4 - SN3954	DAE4 Sn1425	8.14	80.80	81.40	0.74
2014/8/2	5300	Body	100	D5GHzV2-1040	EX3DV4 - SN3954	DAE4 Sn1425	7.42	79.10	74.20	-6.19
2014/8/2	5300	Head	100	D5GHzV2-1040	EX3DV4 - SN3954	DAE4 Sn1425	8.26	84.00	82.60	-1.67
2014/8/4	5600	Body	100	D5GHzV2-1040	EX3DV4 - SN3954	DAE4 Sn1425	8.26	82.70	82.60	-0.12
2014/8/4	5600	Head	100	D5GHzV2-1040	EX3DV4 - SN3954	DAE4 Sn1425	7.95	84.40	79.50	-5.81
2014/8/2	5800	Body	100	D5GHzV2-1040	EX3DV4 - SN3954	DAE4 Sn1425	7.88	77.30	78.80	1.94
2014/8/2	5800	Head	100	D5GHzV2-1040	EX3DV4 - SN3954	DAE4 Sn1425	8.00	80.40	80.00	-0.50

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.

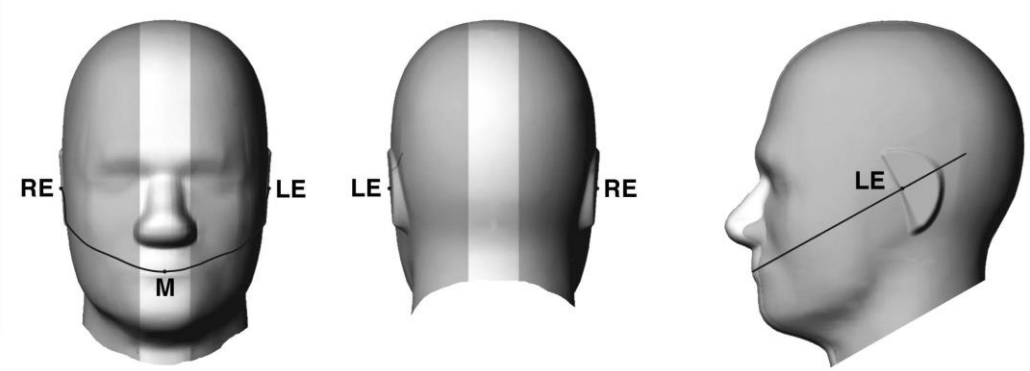


Fig 9.1.1 Front, back, and side views of SAM twin phantom

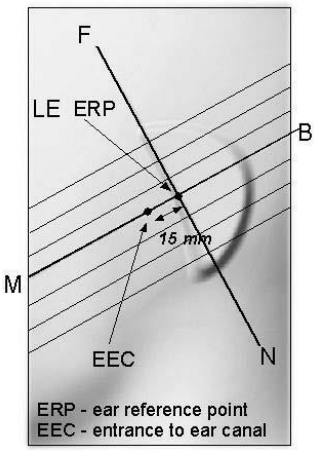


Fig 9.1.2 Close-up side view of phantom showing the ear region.

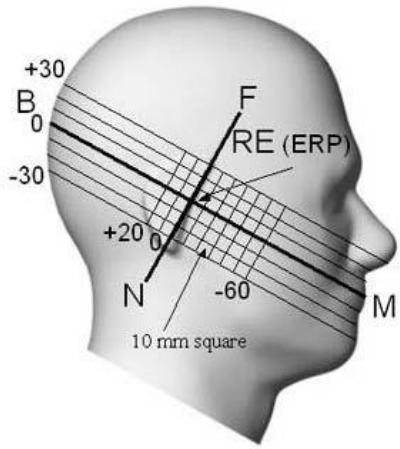


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

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

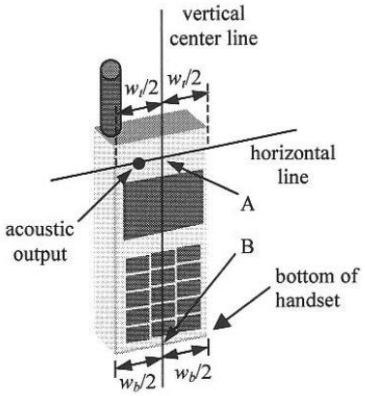


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

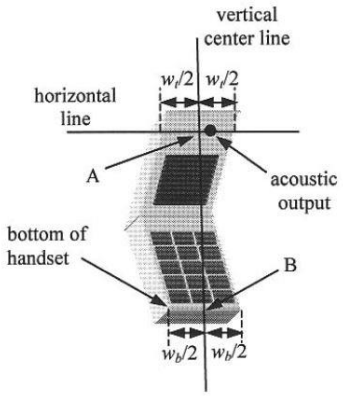


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

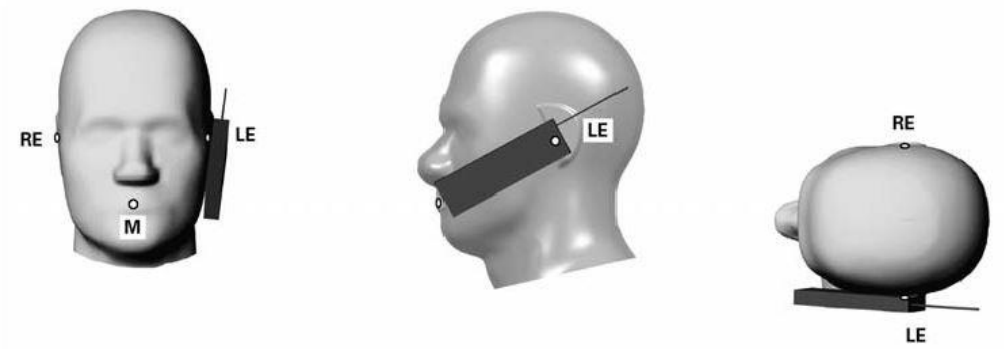


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

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

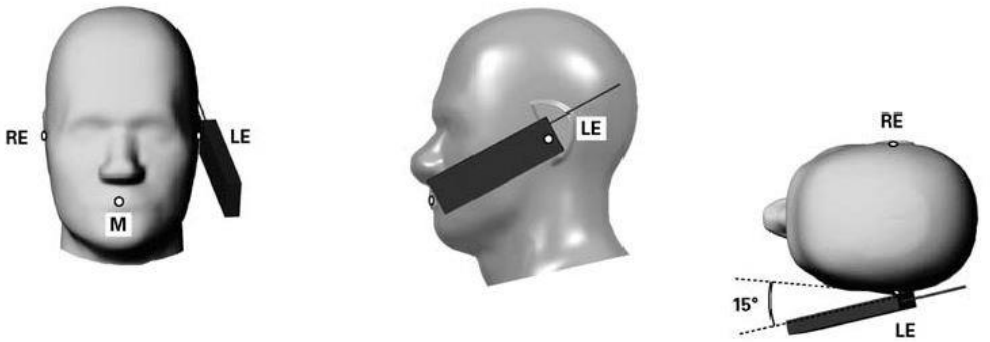


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

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 KDB 648474 D04v01r02, 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 D01v05r02 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is < 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

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

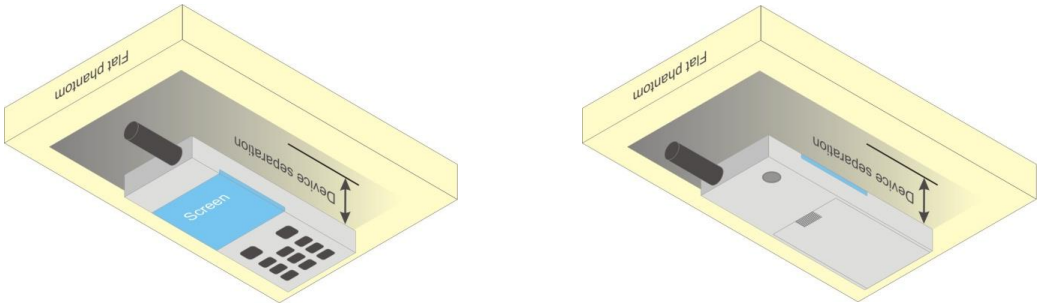


Fig 9.4 Body Worn Position

11.5 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 HDB Publication 941225 D06v01r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v05r02 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>

General Note:

1. According to October 2013TCB Workshop, For GSM / EGPRS, the number of time slots to test for SAR should correspond to the highest source-based time-averaged maximum output power configuration, Considering the possibility of e.g. 3rd party VoIP operation for head and body-worn SAR testing, the EUT was set in GPRS (4Tx slots) for GSM850/GSM1900 band due to its highest frame-average power.
2. For hotspot mode SAR testing, GPRS / EDGE should be evaluated, therefore the EUT was set in GPRS 4 Tx slots for GSM850/GSM1900 band due to its highest frame-average power.

Band GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM (GMSK, 1 Tx slot)	31.95	31.91	31.87	33.50	22.95	22.91	22.87	24.50
GPRS (GMSK, 1 Tx slot) – CS1	31.89	31.85	31.80	33.50	22.89	22.85	22.80	24.50
GPRS (GMSK, 2 Tx slots) – CS1	28.95	28.97	28.95	30.50	22.95	22.97	22.95	24.50
GPRS (GMSK, 3 Tx slots) – CS1	27.08	27.12	27.15	28.75	22.82	22.86	22.89	24.49
GPRS (GMSK, 4 Tx slots) – CS1	25.83	25.90	25.86	27.50	22.83	22.90	22.86	24.50
EDGE (8PSK, 1 Tx slot) – MCS5	26.08	26.03	26.40	28.50	17.08	17.03	17.40	19.50
EDGE (8PSK, 2 Tx slots) – MCS5	23.43	23.38	23.42	25.50	17.43	17.38	17.42	19.50
EDGE (8PSK, 3 Tx slots) – MCS5	21.80	21.78	21.81	23.75	17.54	17.52	17.55	19.49
EDGE (8PSK, 4 Tx slots) – MCS5	20.47	20.52	20.48	22.50	17.47	17.52	17.48	19.50

Band 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 (GMSK, 1 Tx slot)	29.15	29.21	28.97	30.50	20.15	20.21	19.97	21.50
GPRS (GMSK, 1 Tx slot) – CS1	29.13	29.30	28.97	30.50	20.13	20.30	19.97	21.50
GPRS (GMSK, 2 Tx slots) – CS1	26.20	26.15	26.01	28.00	20.20	20.15	20.01	22.00
GPRS (GMSK, 3 Tx slots) – CS1	24.35	24.35	24.21	26.25	20.09	20.09	19.95	21.99
GPRS (GMSK, 4 Tx slots) – CS1	23.19	23.15	23.04	25.00	20.19	20.15	20.04	22.00
EDGE (8PSK, 1 Tx slot) – MCS5	24.79	24.73	24.73	27.50	15.79	15.73	15.73	18.50
EDGE (8PSK, 2 Tx slots) – MCS5	22.26	22.22	22.04	24.50	16.26	16.22	16.04	18.50
EDGE (8PSK, 3 Tx slots) – MCS5	20.81	20.75	20.69	22.75	16.55	16.49	16.43	18.49
EDGE (8PSK, 4 Tx slots) – MCS5	19.78	19.65	19.53	21.50	16.78	16.65	16.53	18.50

<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 D01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

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} *(Note1, 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 Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_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 Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH 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 β_c = 11/15 and β_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-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
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 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	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	β_{ed}1: 47/15 β_{ed}2: 47/15	4 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 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_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 β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: 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 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
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 RMC 12.2Kbps + HSDPA mode.
   ii. Set Cell Power = -25 dBm
   iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
   iv. Select HSDPA Uplink Parameters
   v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
      a). Subtest 1: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_d=15/4
   vi. Set Delta ACK, Delta NACK and Delta CQI = 8
   vii. Set Ack-Nack Repetition Factor to 3
   viii. Set CQI Feedback Cycle (k) to 4 ms
   ix. Set CQI Repetition Factor to 2
   x. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
A summary of these settings are illustrated below:

C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Proces ses	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

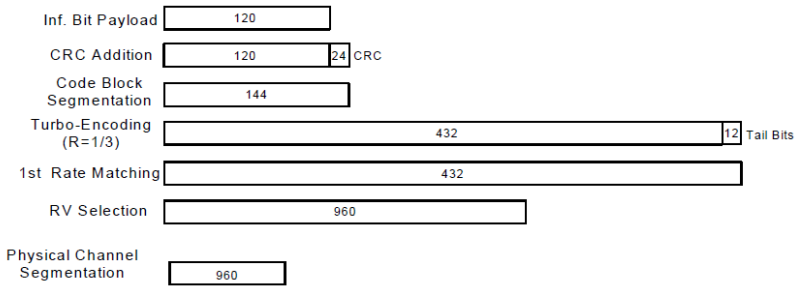


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. SAR testing in AMR configuration is not required when the maximum average output of each RF channel for AMR 12.2Kbps is less than 0.25dB higher than that measured in RMC 12.2Kbps
2. Per KDB 941225 D02v02r02, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA/HSUPA/DC-HSDPA output power is < 0.25dB higher than RMC, or reported SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA/HSUPA/DC-HSDPA SAR evaluation can be excluded..

Band			WCDMA V			WCDMA II		
TX Channel			4132	4182	4233	9262	9400	9538
Rx Channel			4357	4407	4458	9662	9800	9938
Frequency (MHz)			826.4	836.4	846.6	1852.4	1880	1907.6
MPR (dB)	3GPP Rel 99	AMR 12.2Kbps	22.08	22.35	22.24	22.37	22.43	22.34
	3GPP Rel 99	RMC 12.2Kbps	22.11	22.35	22.28	22.41	22.48	22.36
0	3GPP Rel 6	HSDPA Subtest-1	21.05	21.30	21.20	21.11	21.40	21.13
0	3GPP Rel 6	HSDPA Subtest-2	21.02	21.23	21.22	21.20	21.44	21.22
0.5	3GPP Rel 6	HSDPA Subtest-3	21.03	21.20	21.13	20.70	20.90	20.65
0.5	3GPP Rel 6	HSDPA Subtest-4	21.00	21.03	21.26	20.69	20.94	20.65
0	3GPP Rel 8	DC-HSDPA Subtest-1	21.00	21.20	21.13	21.10	21.38	21.12
0	3GPP Rel 8	DC-HSDPA Subtest-2	21.09	21.17	21.20	21.18	21.41	21.21
0.5	3GPP Rel 8	DC-HSDPA Subtest-3	21.00	21.20	21.13	20.75	20.91	20.68
0.5	3GPP Rel 8	DC-HSDPA Subtest-4	20.99	21.14	21.12	20.74	21.00	20.66
0	3GPP Rel 6	HSUPA Subtest-1	21.30	21.35	21.42	21.25	21.40	21.20
2	3GPP Rel 6	HSUPA Subtest-2	20.53	20.75	20.79	20.00	20.15	20.35
1	3GPP Rel 6	HSUPA Subtest-3	20.40	20.59	20.60	20.45	20.63	20.34
2	3GPP Rel 6	HSUPA Subtest-4	20.99	21.39	21.30	20.63	20.30	20.29
0	3GPP Rel 6	HSUPA Subtest-5	21.53	21.80	21.86	21.03	21.18	21.10

<CDMA2000 Conducted Power>

General Note:

1. Per KDB 941225 D01v02, Head SAR for RC1+SO55 is not required because the maximum average output power of RC1 is less than 1/4 dB higher than RC3+SO55, and was additional
2. Per KDB 941225 D01v02, in Hotspot mode EUT is treated as data device and SAR is tested with Ev-Do Rev 0 (RTAP 153.6kbps). If 1xRTT and Ev-Do Rev A (RETAP 4096 bits) power is high than 1/4dB higher than Re v0, SAR tests with those settings are necessary.
3. Per KDB 941225 D01v02, SAR for body-worn exposure configurations is measured in RC3 with the DUT configured to transmit at full rate on FCH with all other code channels disabled using TDSO / SO32. SAR for multiple code channels (FCH + SCH) is not required when the maximum average output of each RF channel is less than ¼ dB higher than that measured with FCH only.

Band	CDMA2000 BC0			CDMA2000 BC1		
TX Channel	1013	384	777	25	600	1175
Frequency (MHz)	824.7	836.52	848.31	1851.25	1880	1908.75
1xRTT RC1 SO55	23.65	23.78	23.72	24.13	24.25	23.97
1xRTT RC3 SO55	23.65	23.78	23.70	24.08	24.16	23.89
1xRTT RC3 SO32(+ F-SCH)	23.62	23.75	23.70	24.05	24.17	23.90
1xRTT RC3 SO32(+SCH)	23.52	23.74	23.68	24.07	24.16	23.91
1xEVDO RTAP 153.6 Kbps	23.65	23.85	23.77	24.21	24.13	24.00
1xEVDO RETAP 4096 bits	23.64	23.80	23.78	24.22	24.21	24.02

<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 D05v02r03, 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 D05v02r03, 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 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r03, 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 D05v02r03, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r03, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.

<LTE Band 13>

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					23230			
Frequency (MHz)					782			
10	QPSK	1	0		22.87		24.0	0
10	QPSK	1	24		22.76			
10	QPSK	1	49		22.86			
10	QPSK	25	0		21.80		23.0	1
10	QPSK	25	12		21.86			
10	QPSK	25	24		21.87			
10	QPSK	50	0		21.89			
10	16QAM	1	0		21.87		23.0	1
10	16QAM	1	24		21.72			
10	16QAM	1	49		21.79			
10	16QAM	25	0		20.79		22.0	2
10	16QAM	25	12		20.80			
10	16QAM	25	24		20.82			
10	16QAM	50	0		20.83			
Channel				23205	23230	23255	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	22.25	22.26	22.30	24.0	0
5	QPSK	1	12	22.31	22.44	22.34		
5	QPSK	1	24	22.40	22.44	22.33		
5	QPSK	12	0	21.29	21.40	21.28	23.0	1
5	QPSK	12	6	21.20	21.38	21.28		
5	QPSK	12	11	21.44	21.41	21.48		
5	QPSK	25	0	21.25	21.37	21.41		
5	16QAM	1	0	21.08	21.40	21.12	23.0	1
5	16QAM	1	12	21.24	21.20	21.17		
5	16QAM	1	24	21.43	21.36	21.36		
5	16QAM	12	0	20.30	20.38	20.27	22.0	2
5	16QAM	12	6	20.43	20.49	20.48		
5	16QAM	12	11	20.44	20.52	20.28		
5	16QAM	25	0	20.45	20.48	20.48		

<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	23.00	23.01	23.07	24.0	0
20	QPSK	1	49	22.89	23.00	23.03		
20	QPSK	1	99	22.81	22.84	23.04		
20	QPSK	50	0	22.05	22.09	22.01	23.0	1
20	QPSK	50	24	21.95	22.04	22.05		
20	QPSK	50	49	22.05	22.09	22.12		
20	QPSK	100	0	22.02	22.00	22.11		
20	16QAM	1	0	21.95	21.95	21.96	23.0	1
20	16QAM	1	49	21.89	21.92	21.96		
20	16QAM	1	99	21.82	21.88	21.99		
20	16QAM	50	0	21.07	21.06	21.00	22.0	2
20	16QAM	50	24	20.98	21.03	21.05		
20	16QAM	50	49	20.98	21.12	21.06		
20	16QAM	100	0	20.97	20.99	21.03		
Channel				20025	20175	20325	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.30	22.30	22.27	24.0	0
15	QPSK	1	37	22.12	22.35	22.26		
15	QPSK	1	74	22.15	22.27	22.36		
15	QPSK	36	0	21.20	21.42	21.30	23.0	1
15	QPSK	36	18	21.23	21.43	21.30		
15	QPSK	36	37	21.15	21.43	21.45		
15	QPSK	75	0	21.19	21.40	21.43		
15	16QAM	1	0	21.33	21.27	21.21	23.0	1
15	16QAM	1	37	21.20	21.30	21.21		
15	16QAM	1	74	21.02	21.13	21.19		
15	16QAM	36	0	20.21	20.30	20.48	22.0	2
15	16QAM	36	18	20.23	20.42	20.28		
15	16QAM	36	37	20.19	20.34	20.37		
15	16QAM	75	0	20.18	20.47	20.35		
Channel				20000	20175	20350	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.30	22.37	22.30	24.0	0
10	QPSK	1	24	22.17	22.32	22.33		
10	QPSK	1	49	22.30	22.32	22.34		
10	QPSK	25	0	21.20	21.38	21.36	23.0	1
10	QPSK	25	12	21.29	21.39	21.33		
10	QPSK	25	24	21.23	21.35	21.41		
10	QPSK	50	0	21.26	21.44	21.46		
10	16QAM	1	0	21.32	21.38	21.26	23.0	1
10	16QAM	1	24	21.16	21.30	21.25		
10	16QAM	1	49	21.03	21.14	21.27		
10	16QAM	25	0	20.21	20.37	20.37	22.0	2
10	16QAM	25	12	20.24	20.44	20.26		
10	16QAM	25	24	20.30	20.28	20.40		
10	16QAM	50	0	20.16	20.44	20.33		

Channel				19975	20175	20375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.24	22.27	22.28	24.0	0
5	QPSK	1	12	22.13	22.38	22.36		
5	QPSK	1	24	22.29	22.18	22.36		
5	QPSK	12	0	21.12	21.49	21.41	23.0	1
5	QPSK	12	6	21.14	21.49	21.35		
5	QPSK	12	11	21.23	21.36	21.43		
5	QPSK	25	0	21.28	21.42	21.38		
5	16QAM	1	0	21.28	21.32	21.18	23.0	1
5	16QAM	1	12	21.17	21.30	21.19		
5	16QAM	1	24	21.05	21.11	21.24		
5	16QAM	12	0	20.19	20.41	20.45	22.0	2
5	16QAM	12	6	20.17	20.44	20.17		
5	16QAM	12	11	20.19	20.32	20.32		
5	16QAM	25	0	20.17	20.41	20.39		
Channel				19965	20175	20385	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.32	22.33	22.26	24.0	0
3	QPSK	1	7	22.20	22.41	22.30		
3	QPSK	1	14	22.22	22.22	22.31		
3	QPSK	8	0	21.09	21.47	21.39	23.0	1
3	QPSK	8	4	21.19	21.33	21.32		
3	QPSK	8	7	21.14	21.29	21.36		
3	QPSK	15	0	21.19	21.43	21.38		
3	16QAM	1	0	21.30	21.29	21.30	23.0	1
3	16QAM	1	7	21.11	21.33	21.23		
3	16QAM	1	14	21.10	21.22	21.24		
3	16QAM	8	0	20.18	20.37	20.35	22.0	2
3	16QAM	8	4	20.28	20.43	20.18		
3	16QAM	8	7	20.26	20.30	20.32		
3	16QAM	15	0	20.22	20.48	20.34		
Channel				19957	20175	20393	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.32	22.33	22.22	24.0	0
1.4	QPSK	1	2	22.16	22.38	22.26		
1.4	QPSK	1	5	22.27	22.25	22.26		
1.4	QPSK	3	0	22.05	22.09	22.05		
1.4	QPSK	3	1	22.07	22.07	22.07		
1.4	QPSK	3	2	22.07	22.04	22.09		
1.4	QPSK	6	0	21.18	21.39	21.40	23.0	1
1.4	16QAM	1	0	21.26	21.22	21.15	23.0	1
1.4	16QAM	1	2	21.21	21.26	21.21		
1.4	16QAM	1	5	21.12	21.17	21.22		
1.4	16QAM	3	0	21.05	21.03	21.08		
1.4	16QAM	3	1	21.03	21.07	21.02		
1.4	16QAM	3	2	21.02	21.04	21.01		
1.4	16QAM	6	0	20.19	20.40	20.36	22.0	2

<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	23.09	23.30	23.11	24.0	0
20	QPSK	1	49	23.05	23.29	23.08		
20	QPSK	1	99	23.01	23.01	22.94		
20	QPSK	50	0	22.11	22.32	22.04	23.0	1
20	QPSK	50	24	22.13	22.38	22.07		
20	QPSK	50	49	22.11	22.27	22.03		
20	QPSK	100	0	22.14	22.23	22.06		
20	16QAM	1	0	22.06	22.13	22.13	23.0	1
20	16QAM	1	49	22.06	22.28	22.18		
20	16QAM	1	99	21.97	22.11	21.96		
20	16QAM	50	0	21.22	21.20	21.14	22.0	2
20	16QAM	50	24	21.12	21.38	21.08		
20	16QAM	50	49	21.18	21.28	21.07		
20	16QAM	100	0	21.19	21.32	21.15		
Channel				18675	18900	19125	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.78	22.88	22.66	24.0	0
15	QPSK	1	37	22.79	22.87	22.72		
15	QPSK	1	74	22.79	22.75	22.64		
15	QPSK	36	0	21.88	21.92	21.79	23.0	1
15	QPSK	36	18	21.81	21.97	21.75		
15	QPSK	36	37	21.86	21.86	21.55		
15	QPSK	75	0	21.91	21.89	21.74		
15	16QAM	1	0	21.75	21.92	21.89	23.0	1
15	16QAM	1	37	21.78	21.84	21.91		
15	16QAM	1	74	21.67	21.75	21.45		
15	16QAM	36	0	20.84	20.90	20.89	22.0	2
15	16QAM	36	18	20.71	21.01	20.72		
15	16QAM	36	37	20.94	20.79	20.68		
15	16QAM	75	0	20.90	20.86	20.85		
Channel				18650	18900	19150	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.91	22.77	22.74	24.0	0
10	QPSK	1	24	22.79	22.99	22.66		
10	QPSK	1	49	22.78	22.83	22.54		
10	QPSK	25	0	21.87	21.92	21.84	23.0	1
10	QPSK	25	12	21.69	22.06	21.65		
10	QPSK	25	24	21.99	21.81	21.58		
10	QPSK	50	0	21.85	22.01	21.91		
10	16QAM	1	0	21.82	21.98	21.82	23.0	1
10	16QAM	1	24	21.68	21.88	21.88		
10	16QAM	1	49	21.63	21.83	21.56		
10	16QAM	25	0	20.86	20.91	20.91	22.0	2
10	16QAM	25	12	20.78	20.84	20.88		
10	16QAM	25	24	20.79	20.80	20.56		
10	16QAM	50	0	20.82	20.85	20.72		

Channel				18625	18900	19175	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.83	22.90	22.87	24.0	0
5	QPSK	1	12	22.82	22.88	22.70		
5	QPSK	1	24	22.74	22.89	22.50		
5	QPSK	12	0	21.91	22.06	21.94	23.0	1
5	QPSK	12	6	21.86	22.02	21.77		
5	QPSK	12	11	21.81	21.82	21.64		
5	QPSK	25	0	21.89	21.96	21.94		
5	16QAM	1	0	21.81	21.90	21.88	23.0	1
5	16QAM	1	12	21.74	21.81	21.84		
5	16QAM	1	24	21.73	21.66	21.55		
5	16QAM	12	0	20.93	20.99	20.74	22.0	2
5	16QAM	12	6	20.78	20.95	20.85		
5	16QAM	12	11	20.86	20.78	20.58		
5	16QAM	25	0	20.96	20.75	20.80		
Channel				18615	18900	19185	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.70	22.91	22.79	24.0	0
3	QPSK	1	7	22.80	22.77	22.65		
3	QPSK	1	14	22.79	22.80	22.49		
3	QPSK	8	0	21.95	21.92	21.96	23.0	1
3	QPSK	8	4	21.92	22.00	21.76		
3	QPSK	8	7	21.85	21.86	21.59		
3	QPSK	15	0	21.94	21.79	21.79		
3	16QAM	1	0	21.87	21.97	21.82	23.0	1
3	16QAM	1	7	21.77	21.92	21.99		
3	16QAM	1	14	21.58	21.68	21.59		
3	16QAM	8	0	20.84	20.96	20.87	22.0	2
3	16QAM	8	4	20.89	20.99	20.90		
3	16QAM	8	7	21.02	20.88	20.76		
3	16QAM	15	0	20.88	20.89	20.83		
Channel				18607	18900	19193	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.79	22.91	22.89	24.0	0
1.4	QPSK	1	2	22.78	22.96	22.78		
1.4	QPSK	1	5	22.81	22.74	22.70		
1.4	QPSK	3	0	22.20	22.35	22.28		
1.4	QPSK	3	1	22.19	22.26	22.22		
1.4	QPSK	3	2	22.25	22.26	22.26		
1.4	QPSK	6	0	21.83	21.92	21.89	23.0	1
1.4	16QAM	1	0	21.84	21.78	21.84	23.0	1
1.4	16QAM	1	2	21.82	21.90	21.79		
1.4	16QAM	1	5	21.75	21.70	21.51		
1.4	16QAM	3	0	21.13	21.29	21.24		
1.4	16QAM	3	1	21.16	21.30	21.21		
1.4	16QAM	3	2	21.24	21.30	21.21		
1.4	16QAM	6	0	20.74	20.96	20.79	22.0	2

<LTE Band 7>

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				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	23.70	23.47	23.20	24.0	0
20	QPSK	1	49	23.62	23.38	23.17		
20	QPSK	1	99	23.55	23.38	23.10		
20	QPSK	50	0	22.57	22.49	22.30	23.0	1
20	QPSK	50	24	22.58	22.44	22.22		
20	QPSK	50	49	22.70	22.57	22.35		
20	QPSK	100	0	22.63	22.52	22.32		
20	16QAM	1	0	22.33	22.46	22.18	23.0	1
20	16QAM	1	49	22.58	22.35	22.19		
20	16QAM	1	99	22.65	22.32	22.49		
20	16QAM	50	0	21.54	21.42	21.23	22.0	2
20	16QAM	50	24	21.54	21.33	21.15		
20	16QAM	50	49	21.64	21.46	21.33		
20	16QAM	100	0	21.55	21.41	21.22		
Channel				20825	21100	21375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	23.13	23.17	23.00	24.0	0
15	QPSK	1	37	22.98	23.09	23.10		
15	QPSK	1	74	22.82	22.87	22.91		
15	QPSK	36	0	22.10	22.17	22.18	23.0	1
15	QPSK	36	18	22.01	21.99	22.01		
15	QPSK	36	37	21.82	21.87	21.95		
15	QPSK	75	0	22.00	22.00	22.13		
15	16QAM	1	0	22.09	22.10	22.14	23.0	1
15	16QAM	1	37	21.94	21.86	21.96		
15	16QAM	1	74	21.82	21.97	21.90		
15	16QAM	36	0	21.20	21.08	21.12	22.0	2
15	16QAM	36	18	20.95	20.99	21.05		
15	16QAM	36	37	20.88	20.92	20.98		
15	16QAM	75	0	21.09	21.14	21.13		
Channel				20800	21100	21400	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	23.06	23.09	22.92	24.0	0
10	QPSK	1	24	23.05	22.97	23.02		
10	QPSK	1	49	22.87	22.83	22.77		
10	QPSK	25	0	22.22	22.28	22.27	23.0	1
10	QPSK	25	12	22.21	22.21	22.24		
10	QPSK	25	24	21.93	21.87	21.90		
10	QPSK	50	0	22.21	22.20	22.15		
10	16QAM	1	0	22.11	22.04	22.08	23.0	1
10	16QAM	1	24	21.86	22.00	21.87		
10	16QAM	1	49	21.85	21.89	21.72		
10	16QAM	25	0	20.97	21.00	21.10	22.0	2
10	16QAM	25	12	21.03	21.13	20.99		
10	16QAM	25	24	20.88	20.99	20.87		
10	16QAM	50	0	21.10	21.09	21.07		

Channel				20775	21100	21425	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	23.09	22.93	23.09	24.0	0
5	QPSK	1	12	22.95	23.03	23.08		
5	QPSK	1	24	22.88	22.80	22.90		
5	QPSK	12	0	22.06	22.25	22.15	23.0	1
5	QPSK	12	6	22.08	22.04	22.04		
5	QPSK	12	11	21.86	21.96	21.92		
5	QPSK	25	0	22.07	22.05	22.05		
5	16QAM	1	0	22.12	22.07	22.06	23.0	1
5	16QAM	1	12	22.01	22.02	21.91		
5	16QAM	1	24	21.91	21.94	21.81		
5	16QAM	12	0	21.14	21.22	21.22	22.0	2
5	16QAM	12	6	21.14	21.01	21.14		
5	16QAM	12	11	20.90	20.89	20.89		
5	16QAM	25	0	20.93	20.94	21.06		

<2.4GHz Bluetooth v3.0+EDR>

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The duty factor is selected theoretical 83.3% perform Bluetooth SAR testing.

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
v3.0+EDR	CH 00	2402	5.63	3.54	3.62
	CH 39	2441	10.23	7.38	7.28
	CH 78	2480	8.53	5.04	5.01

<2.4GHz Bluetooth v4.0-LE>

Mode / Band	Maximum Average power(dBm)
2.4GHz Bluetooth v4.0-LE	3.0

Note:

1. Per KDB 447498 D01v05r02, 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:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 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)	Separation Distance (mm)	Frequency (GHz)	exclusion thresholds
3	< 5	2.48	0.63

Note:

Per KDB 447498 D01v05r02, when the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion. The test exclusion threshold is 0.63 which is <= 3, SAR testing is not required.

<WLAN Conducted Power>

General Note:

1. For 2.4GHz WLAN SAR testing, highest average RF output power channel include tune-up tolerance for the lowest data rate for 802.11b were selected for SAR evaluation. 802.11g/n/ac HT20/HT40/VHT20/VHT40 were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of 802.11b mode.
2. For 5GHz WLAN SAR testing, highest average RF output power channel include tune-up tolerance for the lowest data rate for 802.11a were selected for SAR evaluation. 802.11n/ac HT20/HT40/VHT20/VHT40 were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of 802.11b mode.
3. Per April 2013 TCB Workshop notes, full SAR tests for IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than IEEE 802.11a mode. IEEE 802.11ac was evaluated for the highest IEEE 802.11a position in each 5 GHz band and exposure condition.

<2.4GHz WLAN>

Mode	Channel	Frequency (MHz)	Average power (dBm)			
			Data Rate			
			1Mbps	2Mbps	5.5Mbps	11Mbps
802.11b	CH 1	2412	18.63	18.62	18.48	18.53
	CH 6	2437	18.65	18.51	18.54	18.53
	CH 11	2462	18.45	18.35	18.44	18.27

Mode	Channel	Frequency (MHz)	Average power (dBm)							
			Data Rate							
			6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
802.11g	CH 1	2412	17.05	16.91	16.98	16.94	16.90	16.97	16.87	17.04
	CH 6	2437	17.27	17.18	17.13	17.10	17.09	17.02	17.13	17.06
	CH 11	2462	17.18	17.03	17.12	17.03	17.16	17.04	17.04	17.07

Mode	Channel	Frequency (MHz)	Average power (dBm)							
			MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT20	CH 1	2412	16.94	16.82	16.92	16.78	16.79	16.85	16.83	16.82
	CH 6	2437	16.99	16.91	16.85	16.96	16.87	16.77	16.84	16.75
	CH 11	2462	16.88	16.82	16.73	16.87	16.76	16.72	16.85	16.71

Mode	Channel	Frequency (MHz)	Average Power (dBm)								
			MCS Index								
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac-VHT20	CH 1	2412	16.93	16.79	16.78	16.78	16.92	16.85	16.86	16.88	16.88
	CH 6	2437	17.18	17.14	17.10	17.11	16.96	17.02	17.10	16.90	16.85
	CH 11	2462	17.13	17.10	17.03	17.04	16.95	16.95	17.00	17.08	17.04

Mode	Channel	Frequency (MHz)	Average power (dBm)							
			MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT40	CH 3	2422	16.60	16.44	16.45	16.40	16.55	16.47	16.48	16.59
	CH 6	2437	17.27	17.09	17.07	17.20	17.23	17.15	17.13	17.19
	CH 9	2452	18.00	17.92	17.94	17.9	17.87	17.87	17.77	17.81

Mode	Channel	Frequency (MHz)	Average Power (dBm)									
			MCS Index									
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac-VHT40	CH 3	2422	16.60	16.60	16.55	16.52	16.55	16.50	16.44	16.58	16.48	16.42
	CH 6	2437	17.27	17.15	17.11	17.22	17.22	17.11	17.14	17.19	17.23	17.23
	CH 9	2452	18.00	17.87	17.91	17.97	17.82	17.80	17.86	17.80	17.76	17.80

<5GHz WLAN>

Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate							
			6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
802.11a	CH 36	5180	14.86	14.86	14.81	14.84	14.76	14.78	14.77	14.77
	CH 40	5200	15.00	14.90	14.93	14.89	14.87	14.83	14.74	14.78
	CH 44	5220	14.84	14.76	14.73	14.67	14.74	14.69	14.77	14.83
	CH 48	5240	14.78	14.73	14.58	14.60	14.62	14.77	14.77	14.63
	CH 52	5260	14.91	14.84	14.78	14.80	14.83	14.78	14.62	14.77
	CH 56	5280	14.90	14.90	14.72	14.89	14.76	14.84	14.76	14.88
	CH 60	5300	14.70	14.68	14.67	14.53	14.66	14.64	14.65	14.56
	CH 64	5320	14.35	14.16	14.29	14.22	14.22	14.24	14.21	14.32
	CH 100	5500	14.60	14.45	14.42	14.45	14.60	14.42	14.57	14.57
	CH 104	5520	14.57	14.45	14.38	14.56	14.49	14.45	14.37	14.44
	CH 108	5540	14.49	14.33	14.35	14.47	14.48	14.35	14.40	14.30
	CH 112	5560	14.51	14.43	14.37	14.38	14.36	14.40	14.44	14.51
	CH 116	5580	14.52	14.35	14.52	14.49	14.36	14.43	14.49	14.51
	CH 132	5660	14.23	14.15	14.13	14.18	14.07	14.21	14.20	14.21
	CH 136	5680	14.27	14.24	14.08	14.11	14.13	14.07	14.25	14.09
	CH 140	5700	13.60	13.56	13.50	13.60	13.50	13.50	13.49	13.55
	CH 144	5720	14.93	14.80	14.88	14.87	14.71	14.74	14.78	14.66
	CH 149	5745	14.71	14.68	14.52	14.70	14.55	14.58	14.65	14.61
	CH 153	5765	14.41	14.37	14.40	14.31	14.34	14.29	14.41	14.32
	CH 157	5785	14.42	14.34	14.34	14.25	14.36	14.33	14.35	14.39
	CH 161	5805	14.72	14.58	14.59	14.60	14.62	14.51	14.57	14.58
	CH 165	5825	14.53	14.46	14.50	14.48	14.40	14.41	14.52	14.49

Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT20	CH 36	5180	14.54	14.36	14.50	14.37	14.45	14.41	14.49	14.34
	CH 40	5200	14.66	14.56	14.63	14.51	14.44	14.59	14.43	14.53
	CH 44	5220	14.47	14.38	14.28	14.36	14.44	14.41	14.38	14.47
	CH 48	5240	14.40	14.26	14.33	14.36	14.24	14.24	14.33	14.40
	CH 52	5260	14.35	14.35	14.30	14.19	14.15	14.34	14.28	14.30
	CH 56	5280	14.46	14.42	14.31	14.34	14.37	14.21	14.29	14.29
	CH 60	5300	14.26	14.24	14.22	14.06	14.13	14.16	14.16	14.20
	CH 64	5320	14.18	14.05	14.15	14.01	14.01	14.05	14.12	14.16
	CH 100	5500	14.47	14.33	14.39	14.45	14.34	14.37	14.30	14.27
	CH 104	5520	14.43	14.27	14.40	14.27	14.27	14.43	14.33	14.42
	CH 108	5540	14.47	14.44	14.27	14.39	14.30	14.29	14.28	14.43
	CH 112	5560	14.56	14.55	14.37	14.44	14.42	14.38	14.40	14.48
	CH 116	5580	14.26	14.17	14.25	14.24	14.06	14.11	14.07	14.20
	CH 132	5660	14.09	13.98	14.00	14.02	13.90	14.00	14.07	14.08
	CH 136	5680	13.94	13.85	13.76	13.75	13.86	13.80	13.83	13.90
	CH 140	5700	14.08	13.99	14.06	14.06	13.95	14.06	14.06	13.99
	CH 144	5720	14.77	14.70	14.69	14.66	14.68	14.61	14.57	14.48
	CH 149	5745	13.60	13.50	13.44	13.56	13.43	13.45	13.48	13.52
	CH 153	5765	14.17	14.09	13.99	14.07	14.08	14.04	13.99	14.09
	CH 157	5785	14.14	14.13	14.01	13.97	13.95	14.06	14.06	14.04
	CH 161	5805	14.25	14.16	14.20	14.18	14.23	14.23	14.22	14.05
	CH 165	5825	14.26	14.19	14.18	14.14	14.07	14.07	14.18	14.00

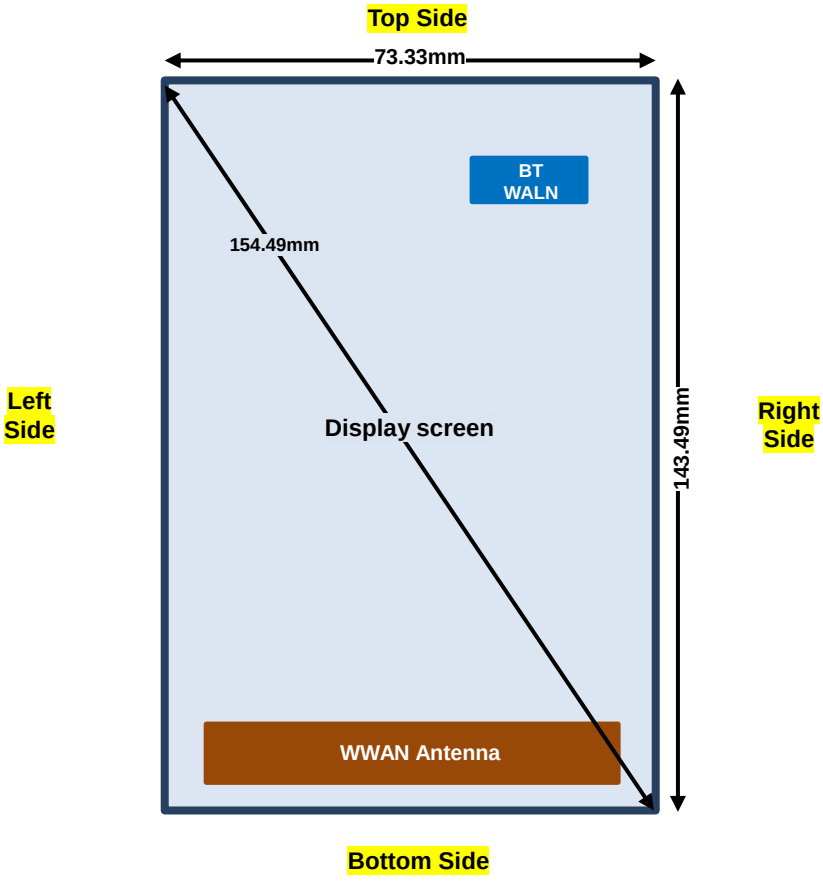
Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT40	CH 38	5190	10.46	10.27	10.32	10.46	10.46	10.39	10.27	10.31
	CH 46	5230	14.99	14.85	14.95	14.94	14.74	14.91	14.83	14.85
	CH 54	5270	14.98	14.86	14.97	14.91	14.84	14.88	14.84	14.84
	CH 62	5310	10.25	10.21	10.19	10.20	10.24	10.21	10.10	10.10
	CH 102	5510	9.21	9.03	9.19	9.20	9.04	9.08	9.14	9.13
	CH 110	5550	14.04	13.97	14.02	13.98	14.01	14.00	13.85	14.02
	CH 134	5670	13.61	13.46	13.52	13.46	13.53	13.54	13.51	13.53
	CH 142	5710	14.51	14.35	14.33	14.31	14.34	14.26	14.33	14.25
	CH 151	5755	10.21	10.10	10.18	10.05	10.05	10.11	10.21	10.09
	CH 159	5795	14.10	14.01	14.02	13.98	13.90	13.94	13.89	13.97

Mode	Channel	Frequency (MHz)	Average Power (dBm)								
			MCS Index								
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac-VHT20	CH 36	5180	14.47	14.38	14.33	14.47	14.37	14.46	14.28	14.30	14.41
	CH 40	5200	14.50	14.37	14.40	14.36	14.35	14.39	14.36	14.35	14.25
	CH 44	5220	14.39	14.19	14.19	14.22	14.39	14.30	14.23	14.25	14.19
	CH 48	5240	14.34	14.21	14.34	14.25	14.17	14.30	14.26	14.25	14.21
	CH 52	5260	14.31	14.11	14.24	14.29	14.24	14.27	14.15	14.21	14.28
	CH 56	5280	14.43	14.29	14.31	14.24	14.27	14.25	14.36	14.31	14.20
	CH 60	5300	14.30	14.16	14.15	14.18	14.22	14.24	14.25	14.13	14.17
	CH 64	5320	14.14	14.07	13.94	14.11	14.08	14.05	14.10	14.08	14.13
	CH 100	5500	14.48	14.48	14.35	14.38	14.36	14.45	14.45	14.43	14.33
	CH 104	5520	14.61	14.41	14.45	14.49	14.47	14.54	14.60	14.42	14.48
	CH 108	5540	14.58	14.48	14.54	14.45	14.57	14.51	14.47	14.42	14.38
	CH 112	5560	14.47	14.43	14.46	14.38	14.45	14.35	14.45	14.44	14.41
	CH 116	5580	14.24	14.10	14.08	14.16	14.09	14.17	14.11	14.12	14.15
	CH 132	5660	14.26	14.24	14.06	14.19	14.06	14.14	14.23	14.06	14.09
	CH 136	5680	14.29	14.15	14.22	14.15	14.16	14.22	14.10	14.22	14.18
	CH 140	5700	14.04	13.85	13.89	13.88	13.90	13.94	13.91	13.89	13.90
	CH 144	5720	14.77	14.68	14.70	14.72	14.64	14.52	14.57	14.54	14.58
	CH 149	5745	13.57	13.54	13.41	13.44	13.46	13.52	13.40	13.46	13.38
	CH 153	5765	14.38	14.29	14.30	14.19	14.38	14.25	14.26	14.34	14.37
	CH 157	5785	14.18	14.16	14.15	13.98	14.06	14.08	14.03	14.17	14.09
	CH 161	5805	14.56	14.48	14.49	14.42	14.31	14.41	14.38	14.35	14.26
	CH 165	5825	14.30	14.20	14.26	14.22	14.15	14.25	14.21	14.21	14.21

Mode	Channel	Frequency (MHz)	Average Power (dBm)									
			MCS Index									
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac-VHT40	CH 38	5190	10.05	9.98	9.96	9.92	9.92	10.03	9.89	10.00	9.95	9.90
	CH 46	5230	14.94	14.85	14.85	14.84	14.79	14.88	14.70	14.80	14.68	14.71
	CH 54	5270	15.00	14.88	14.84	14.88	14.84	14.79	14.84	14.82	14.80	14.80
	CH 62	5310	10.85	10.66	10.70	10.81	10.76	10.74	10.78	10.82	10.68	10.77
	CH 102	5510	10.01	9.94	9.99	9.92	9.88	9.90	9.87	9.94	9.95	10.00
	CH 110	5550	14.14	14.14	14.03	13.95	14.07	13.99	14.11	14.13	14.08	14.12
	CH 134	5670	13.69	13.56	13.51	13.68	13.54	13.49	13.58	13.64	13.57	13.61
	CH 142	5710	14.61	14.49	14.47	14.58	14.48	14.45	14.37	14.34	14.45	14.48
	CH 151	5755	9.98	9.85	9.82	9.83	9.83	9.81	9.83	9.89	9.83	9.92
	CH 159	5795	14.02	13.88	13.88	13.96	13.81	13.76	13.89	13.74	13.73	13.79

Mode	Channel	Frequency (MHz)	Average Power (dBm)									
			MCS Index									
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac-VHT80	CH 42	5210	9.49	9.45	9.38	9.28	9.37	9.23	9.35	9.27	9.27	9.33
	CH 58	5290	10.48	10.40	10.37	10.42	10.39	10.24	10.32	10.23	10.31	10.37
	CH 106	5530	9.16	8.97	9.10	9.04	8.96	9.00	9.08	8.97	9.11	8.97
	CH 138	5690	14.98	14.94	14.85	14.87	14.79	14.82	14.82	14.76	14.78	14.70
	CH 155	5775	14.85	14.78	14.79	14.74	14.70	14.67	14.63	14.65	14.72	14.66

13. Antenna Location



Front View

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN	≤ 25mm	≤ 25mm	> 25mm	≤ 25mm	≤ 25mm	≤ 25mm
BT&WLAN	≤ 25mm	≤ 25mm	≤ 25mm	> 25mm	≤ 25mm	> 25mm
Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN	Yes	Yes	No	Yes	Yes	Yes
BT&WLAN	Yes	Yes	Yes	No	Yes	No

General Note:

1. Referring to KDB 941225 D06 v01r01, 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

14. SAR Test Results

General Note:

1. Per KDB 447498 D01v05r02, 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 D01v05r02, 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. Pre KDB648474 D04v01r02, when the reported SAR for a 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, if reported SAR < 1.2 W/kg connected to the headset is not required.
4. While operating in body-adjacent exposure configurations during a mobile hotspot session, reduced power limits are enforced on the GSM1900, WCDMA B2, CDMA BC1 and LTE B2 / B4 transmitter. And while operating in body-worn accessory exposure conditions, reduced power limits are enforced on the CDMA BC1 and LTE B4 transmitter. More detailed information which can be referred to “operational description”.

GSM Note:

1. According to October 2013TCB Workshop, For GSM / EGPRS, the number of time slots to test for SAR should correspond to the highest source-based time-averaged maximum output power configuration, Considering the possibility of e.g. 3rd party VoIP operation for head and body-worn SAR testing, the EUT was set in GPRS (4Tx slots) for GSM85 and GSM1900, due to its highest frame-average power.
2. For hotspot mode SAR testing, GPRS / EDGE should be evaluated, therefore the EUT was set in GPRS (4Tx slots) for GSM850, and GSM1900, due to its highest frame-average power.

WCDMA Note:

1. Per KDB 941225 D02v02r02, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA/HSUPA/DC-HSDPA output power is < 0.25dB higher than RMC, or reported SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA/HSUPA/DC-HSDPA SAR evaluation can be excluded.

CDMA Note:

1. Per KDB 941225 D01v02, Head SAR for RC3+SO55 is not required because the maximum average output power of RC1 is less than 1/4 dB higher than RC3+SO55 and considering the possibility of e.g. 3rd party VoIP was additional Ev-Do Rev A (RETAP 4096 bits) SAR testing performed on RC3+SO55 worse case.
2. Per KDB 941225 D01v02, in Hotspot mode EUT is treated as data device and SAR is tested with Ev-Do Rev 0 (RTAP 153.6kbps). If 1xRTT and Ev-Do Rev A (RETAP 4096 bits) power is high than 1/4dB higher than Re v0, SAR tests with those settings are necessary.
3. Per KDB 941225 D01v02, SAR for body-worn exposure configurations is measured in RC3 with the DUT configured to transmit at full rate on FCH with all other code channels disabled using TDSO / SO32. SAR for multiple code channels (FCH + SCH) is not required when the maximum average output of each RF channel is less than ¼ dB higher than that measured with FCH only.
4. To account for VOIP operation, Ev-Do Rev. A (RETAP 4096 bits) SAR testing was performed at the worst position identified by 1xRTT SAR test results, for both head and body-worn accessory exposure conditions.

LTE Note:

1. Per KDB 941225 D05v02r03, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r03, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r03, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.

14.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	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)
01	GSM850	GPRS (4 Tx slots)	Right Cheek	189	836.4	25.90	27.50	1.445	0.06	0.233	**0.337**
	GSM850	GPRS (4 Tx slots)	Right Tilted	189	836.4	25.90	27.50	1.445	0.06	0.145	0.210
	GSM850	GPRS (4 Tx slots)	Left Cheek	189	836.4	25.90	27.50	1.445	-0.07	0.198	0.286
	GSM850	GPRS (4 Tx slots)	Left Tilted	189	836.4	25.90	27.50	1.445	0.16	0.128	0.185
	GSM1900	GPRS (4 Tx slots)	Right Cheek	512	1850.2	23.19	25.00	1.517	0.18	0.046	0.070
	GSM1900	GPRS (4 Tx slots)	Right Tilted	512	1850.2	23.19	25.00	1.517	0.19	0.031	0.047
02	GSM1900	GPRS (4 Tx slots)	Left Cheek	512	1850.2	23.19	25.00	1.517	0.02	0.092	**0.140**
	GSM1900	GPRS (4 Tx slots)	Left Tilted	512	1850.2	23.19	25.00	1.517	0.12	0.032	0.049

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
03	WCDMA V	RMC 12.2Kbps	Right Cheek	4182	836.4	22.35	24.00	1.462	0.01	0.187	**0.273**
	WCDMA V	RMC 12.2Kbps	Right Tilted	4182	836.4	22.35	24.00	1.462	-0.05	0.103	0.151
	WCDMA V	RMC 12.2Kbps	Left Cheek	4182	836.4	22.35	24.00	1.462	0	0.162	0.237
	WCDMA V	RMC 12.2Kbps	Left Tilted	4182	836.4	22.35	24.00	1.462	-0.05	0.103	0.151
	WCDMA II	RMC 12.2Kbps	Right Cheek	9400	1880	22.48	24.00	1.419	0.07	0.114	0.162
	WCDMA II	RMC 12.2Kbps	Right Tilted	9400	1880	22.48	24.00	1.419	0.03	0.070	0.099
04	WCDMA II	RMC 12.2Kbps	Left Cheek	9400	1880	22.48	24.00	1.419	-0.01	0.225	**0.319**
	WCDMA II	RMC 12.2Kbps	Left Tilted	9400	1880	22.48	24.00	1.419	0.06	0.052	0.074

<CDMA SAR>

Plot No.	Band	Mode	Test Position	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)
	CDMA BC0	1xRTT RC3 SO55	Right Cheek	384	836.52	23.78	25.00	1.324	0.01	0.275	0.364
05	CDMA BC0	RETAP 4096 bits	Right Cheek	384	836.52	23.80	25.00	1.318	0.01	0.286	**0.377**
	CDMA BC0	1xRTT RC3 SO55	Right Tilted	384	836.52	23.78	25.00	1.324	0.01	0.169	0.224
	CDMA BC0	1xRTT RC3 SO55	Left Cheek	384	836.52	23.78	25.00	1.324	-0.16	0.247	0.327
	CDMA BC0	1xRTT RC3 SO55	Left Tilted	384	836.52	23.78	25.00	1.324	0.07	0.157	0.208
	CDMA BC1	1xRTT RC3 SO55	Right Cheek	600	1880	24.16	25.00	1.213	-0.03	0.136	0.165
	CDMA BC1	1xRTT RC3 SO55	Right Tilted	600	1880	24.16	25.00	1.213	0.07	0.079	0.096
06	CDMA BC1	1xRTT RC3 SO55	Left Cheek	600	1880	24.16	25.00	1.213	-0.03	0.265	**0.322**
	CDMA BC1	RETAP 4096 bits	Left Cheek	25	1851.25	24.22	25.00	1.197	-0.07	0.261	0.312
	CDMA BC1	1xRTT RC3 SO55	Left Tilted	600	1880	24.16	25.00	1.213	0.13	0.062	0.075

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	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)
07	LTE Band 13	10M	QPSK	1	0	Right Cheek	23230	782	22.87	24.00	1.297	-0.02	0.302	**0.392**
	LTE Band 13	10M	QPSK	25	24	Right Cheek	23230	782	21.87	23.00	1.297	0.01	0.212	0.275
	LTE Band 13	10M	QPSK	1	0	Right Tilted	23230	782	22.87	24.00	1.297	-0.06	0.208	0.270
	LTE Band 13	10M	QPSK	25	24	Right Tilted	23230	782	21.87	23.00	1.297	0.04	0.153	0.198
	LTE Band 13	10M	QPSK	1	0	Left Cheek	23230	782	22.87	24.00	1.297	0	0.288	0.374
	LTE Band 13	10M	QPSK	25	24	Left Cheek	23230	782	21.87	23.00	1.297	0.05	0.204	0.265
	LTE Band 13	10M	QPSK	1	0	Left Tilted	23230	782	22.87	24.00	1.297	0.02	0.201	0.261
	LTE Band 13	10M	QPSK	25	24	Left Tilted	23230	782	21.87	23.00	1.297	0.03	0.145	0.188
	LTE Band 4	20M	QPSK	1	0	Right Cheek	20300	1745	23.07	24.00	1.239	0	0.164	0.203
	LTE Band 4	20M	QPSK	50	49	Right Cheek	20300	1745	22.12	23.00	1.225	0.04	0.113	0.138
	LTE Band 4	20M	QPSK	1	0	Right Tilted	20300	1745	23.07	24.00	1.239	0	0.080	0.099
	LTE Band 4	20M	QPSK	50	49	Right Tilted	20300	1745	22.12	23.00	1.225	0.16	0.063	0.077
08	LTE Band 4	20M	QPSK	1	0	Left Cheek	20300	1745	23.07	24.00	1.239	-0.08	0.190	**0.235**
	LTE Band 4	20M	QPSK	50	49	Left Cheek	20300	1745	22.12	23.00	1.225	-0.1	0.160	0.196
	LTE Band 4	20M	QPSK	1	0	Left Tilted	20300	1745	23.07	24.00	1.239	0.02	0.106	0.131
	LTE Band 4	20M	QPSK	50	49	Left Tilted	20300	1745	22.12	23.00	1.225	0.08	0.082	0.100
	LTE Band 2	20M	QPSK	1	0	Right Cheek	18900	1880	23.30	24.00	1.175	0.03	0.118	0.139
	LTE Band 2	20M	QPSK	50	24	Right Cheek	18900	1880	22.38	23.00	1.153	0.05	0.096	0.111
	LTE Band 2	20M	QPSK	1	0	Right Tilted	18900	1880	23.30	24.00	1.175	0.03	0.079	0.093
	LTE Band 2	20M	QPSK	50	24	Right Tilted	18900	1880	22.38	23.00	1.153	0.05	0.063	0.073
09	LTE Band 2	20M	QPSK	1	0	Left Cheek	18900	1880	23.30	24.00	1.175	0.01	0.249	**0.293**
	LTE Band 2	20M	QPSK	50	24	Left Cheek	18900	1880	22.38	23.00	1.153	0.03	0.211	0.243
	LTE Band 2	20M	QPSK	1	0	Left Tilted	18900	1880	23.30	24.00	1.175	0.04	0.059	0.069
	LTE Band 2	20M	QPSK	50	24	Left Tilted	18900	1880	22.38	23.00	1.153	0.06	0.047	0.054
	LTE Band 7	20M	QPSK	1	0	Right Cheek	20850	2510	23.70	24.00	1.072	0.16	0.059	0.063
	LTE Band 7	20M	QPSK	50	49	Right Cheek	20850	2510	22.70	23.00	1.072	0.11	0.037	0.040
	LTE Band 7	20M	QPSK	1	0	Right Tilted	20850	2510	23.70	24.00	1.072	0.14	0.062	0.066
	LTE Band 7	20M	QPSK	50	49	Right Tilted	20850	2510	22.70	23.00	1.072	0.16	0.041	0.044
10	LTE Band 7	20M	QPSK	1	0	Left Cheek	20850	2510	23.70	24.00	1.072	-0.17	0.164	**0.176**
	LTE Band 7	20M	QPSK	50	49	Left Cheek	20850	2510	22.70	23.00	1.072	0.07	0.106	0.114
	LTE Band 7	20M	QPSK	1	0	Left Tilted	20850	2510	23.70	24.00	1.072	-0.1	0.060	0.064
	LTE Band 7	20M	QPSK	50	49	Left Tilted	20850	2510	22.70	23.00	1.072	-0.14	0.042	0.045

<WLAN SAR>

Plot No.	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)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	6	2437	18.65	19.00	1.084	100	1.000	0.17	0.080	0.087
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	6	2437	18.65	19.00	1.084	100	1.000	0.15	0.092	0.100
11	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	6	2437	18.65	19.00	1.084	100	1.000	-0.03	0.172	**0.186**
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	6	2437	18.65	19.00	1.084	100	1.000	0.04	0.085	0.092
	WLAN5GHz	802.11a 6Mbps	Right Cheek	40	5200	15.00	15.00	1.000	95.83	1.044	-0.01	0.020	0.021
	WLAN5GHz	802.11a 6Mbps	Right Tilted	40	5200	15.00	15.00	1.000	95.83	1.044	-0.08	0.027	0.028
12	WLAN5GHz	802.11a 6Mbps	Left Cheek	40	5200	15.00	15.00	1.000	95.83	1.044	0.09	0.059	**0.062**
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	42	5210	9.49	9.50	1.002	84.62	1.182	-0.13	0.024	0.028
	WLAN5GHz	802.11a 6Mbps	Left Tilted	40	5200	15.00	15.00	1.000	95.83	1.044	0.09	0.051	0.053
	WLAN5GHz	802.11a 6Mbps	Right Cheek	52	5260	14.91	15.00	1.021	95.83	1.044	-0.12	0.046	0.049
	WLAN5GHz	802.11a 6Mbps	Right Tilted	52	5260	14.91	15.00	1.021	95.83	1.044	-0.11	0.045	0.048
	WLAN5GHz	802.11a 6Mbps	Left Cheek	52	5260	14.91	15.00	1.021	95.83	1.044	-0.1	0.063	0.067
13	WLAN5GHz	802.11a 6Mbps	Left Tilted	52	5260	14.91	15.00	1.021	95.83	1.044	-0.1	0.074	**0.079**
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Tilted	58	5290	10.48	10.50	1.005	84.62	1.182	0.16	0.020	0.024
	WLAN5GHz	802.11a 6Mbps	Right Cheek	144	5720	14.93	15.00	1.016	95.83	1.044	-0.16	0.050	0.053
	WLAN5GHz	802.11a 6Mbps	Right Tilted	144	5720	14.93	15.00	1.016	95.83	1.044	-0.13	0.052	0.055
14	WLAN5GHz	802.11a 6Mbps	Left Cheek	144	5720	14.93	15.00	1.016	95.83	1.044	0.17	0.087	**0.092**
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	138	5690	14.98	15.00	1.005	84.62	1.182	0.11	0.077	0.091
	WLAN5GHz	802.11a 6Mbps	Left Tilted	144	5720	14.93	15.00	1.016	95.83	1.044	-0.17	0.061	0.065
	WLAN5GHz	802.11a 6Mbps	Right Cheek	161	5805	14.72	15.00	1.067	95.83	1.044	-0.13	0.049	0.055
	WLAN5GHz	802.11a 6Mbps	Right Tilted	161	5805	14.72	15.00	1.067	95.83	1.044	0.15	0.049	0.055
15	WLAN5GHz	802.11a 6Mbps	Left Cheek	161	5805	14.72	15.00	1.067	95.83	1.044	0.14	0.131	**0.146**
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Cheek	155	5775	14.85	15.00	1.035	84.62	1.182	0.03	0.105	0.128
	WLAN5GHz	802.11a 6Mbps	Left Tilted	161	5805	14.72	15.00	1.067	95.83	1.044	0.02	0.103	0.115

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Right Cheek	39	2441	10.23	10.50	1.064	0.1	0.013	0.014
	Bluetooth	1Mbps	Right Tilted	39	2441	10.23	10.50	1.064	0.08	0.015	0.016
16	Bluetooth	1Mbps	Left Cheek	39	2441	10.23	10.50	1.064	-0.06	0.030	**0.032**
	Bluetooth	1Mbps	Left Tilted	39	2441	10.23	10.50	1.064	-0.01	0.001	0.001

14.2 Wireless Router SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (4 Tx slots)	Front	1cm	OFF	189	836.4	25.90	27.50	1.445	0.05	0.297	0.429
	GSM850	GPRS (4 Tx slots)	Back	1cm	OFF	189	836.4	25.90	27.50	1.445	0.01	0.222	0.321
	GSM850	GPRS (4 Tx slots)	Left Side	1cm	OFF	189	836.4	25.90	27.50	1.445	0.01	0.342	0.494
16	GSM850	GPRS (4 Tx slots)	Right Side	1cm	OFF	189	836.4	25.90	27.50	1.445	0.01	0.416	**0.601**
	GSM850	GPRS (4 Tx slots)	Bottom Side	1cm	OFF	189	836.4	25.90	27.50	1.445	0.08	0.048	0.069
	GSM1900	GPRS (4 Tx slots)	Front	1cm	ON	512	1850.2		23.50	1.000	-0.03	0.477	0.477
	GSM1900	GPRS (4 Tx slots)	Back	1cm	ON	512	1850.2		23.50	1.000	0.05	0.239	0.239
	GSM1900	GPRS (4 Tx slots)	Left Side	1cm	ON	512	1850.2		23.50	1.000	0.02	0.060	0.060
	GSM1900	GPRS (4 Tx slots)	Right Side	1cm	ON	512	1850.2		23.50	1.000	0.12	0.004	0.004
18	GSM1900	GPRS (4 Tx slots)	Bottom Side	1cm	ON	512	1850.2		23.50	1.000	-0.08	0.712	**0.712**

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA V	RMC 12.2Kbps	Front	1cm	OFF	4182	836.4	22.35	24.00	1.462	0.02	0.279	0.408
	WCDMA V	RMC 12.2Kbps	Back	1cm	OFF	4182	836.4	22.35	24.00	1.462	-0.01	0.192	0.281
	WCDMA V	RMC 12.2Kbps	Left Side	1cm	OFF	4182	836.4	22.35	24.00	1.462	-0.01	0.221	0.323
19	WCDMA V	RMC 12.2Kbps	Right Side	1cm	OFF	4182	836.4	22.35	24.00	1.462	-0.01	0.324	**0.474**
	WCDMA V	RMC 12.2Kbps	Bottom Side	1cm	OFF	4182	836.4	22.35	24.00	1.462	0.01	0.036	0.053
	WCDMA II	RMC12.2Kbps	Front	1cm	ON	9400	1880		19.00	1.000	-0.05	0.492	0.492
	WCDMA II	RMC12.2Kbps	Back	1cm	ON	9400	1880		19.00	1.000	-0.07	0.232	0.232
	WCDMA II	RMC12.2Kbps	Left Side	1cm	ON	9400	1880		19.00	1.000	-0.15	0.061	0.061
	WCDMA II	RMC12.2Kbps	Right Side	1cm	ON	9400	1880		19.00	1.000	-0.12	0.009	0.009
20	WCDMA II	RMC12.2Kbps	Bottom Side	1cm	ON	9400	1880		19.00	1.000	-0.07	0.685	**0.685**

<CDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	CDMA2000 BC0	RTAP 153.6Kbps	Front	1cm	OFF	384	836.52	23.85	25.00	1.303	0	0.414	0.540
	CDMA2000 BC0	RTAP 153.6Kbps	Back	1cm	OFF	384	836.52	23.85	25.00	1.303	0.02	0.303	0.395
	CDMA2000 BC0	RTAP 153.6Kbps	Left Side	1cm	OFF	384	836.52	23.85	25.00	1.303	-0.01	0.328	0.427
21	CDMA2000 BC0	RTAP 153.6Kbps	Right Side	1cm	OFF	384	836.52	23.85	25.00	1.303	0	0.460	**0.599**
	CDMA2000 BC0	RTAP 153.6Kbps	Bottom Side	1cm	OFF	384	836.52	23.85	25.00	1.303	0	0.052	0.068
	CDMA2000 BC1	RTAP 153.6Kbps	Front	1cm	ON	25	1851.25		19.00	1.000	-0.1	0.695	0.695
	CDMA2000 BC1	RTAP 153.6Kbps	Back	1cm	ON	25	1851.25		19.00	1.000	-0.1	0.285	0.285
	CDMA2000 BC1	RTAP 153.6Kbps	Left Side	1cm	ON	25	1851.25		19.00	1.000	-0.1	0.073	0.073
	CDMA2000 BC1	RTAP 153.6Kbps	Right Side	1cm	ON	25	1851.25		19.00	1.000	-0.03	0.013	0.013
22	CDMA2000 BC1	RTAP 153.6Kbps	Bottom Side	1cm	ON	25	1851.25		19.00	1.000	-0.16	1.050	**1.050**
	CDMA2000 BC1	RTAP 153.6Kbps	Bottom Side	1cm	ON	600	1880		19.00	1.000	-0.15	0.910	0.910
	CDMA2000 BC1	RTAP 153.6Kbps	Bottom Side	1cm	ON	1175	1908.75		19.00	1.000	-0.11	0.819	0.819

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
23	LTE Band 13	10M	QPSK	1	0	Front	1cm	OFF	23230	782	22.87	24.00	1.297	0.01	0.526	**0.682**
	LTE Band 13	10M	QPSK	25	24	Front	1cm	OFF	23230	782	21.87	23.00	1.297	0.01	0.289	0.375
	LTE Band 13	10M	QPSK	1	0	Back	1cm	OFF	23230	782	22.87	24.00	1.297	-0.01	0.353	0.458
	LTE Band 13	10M	QPSK	25	24	Back	1cm	OFF	23230	782	21.87	23.00	1.297	-0.03	0.191	0.248
	LTE Band 13	10M	QPSK	1	0	Left Side	1cm	OFF	23230	782	22.87	24.00	1.297	0.02	0.448	0.581
	LTE Band 13	10M	QPSK	25	24	Left Side	1cm	OFF	23230	782	21.87	23.00	1.297	-0.07	0.244	0.317
	LTE Band 13	10M	QPSK	1	0	Right Side	1cm	OFF	23230	782	22.87	24.00	1.297	-0.01	0.460	0.597
	LTE Band 13	10M	QPSK	25	24	Right Side	1cm	OFF	23230	782	21.87	23.00	1.297	-0.07	0.266	0.345
	LTE Band 13	10M	QPSK	1	0	Bottom Side	1cm	OFF	23230	782	22.87	24.00	1.297	-0.08	0.061	0.079
	LTE Band 13	10M	QPSK	25	24	Bottom Side	1cm	OFF	23230	782	21.87	23.00	1.297	-0.12	0.035	0.045
	LTE Band 4	20M	QPSK	1	0	Front	1cm	ON	20300	1745		19.50	1.000	-0.08	0.831	0.831
	LTE Band 4	20M	QPSK	1	0	Front	1cm	ON	20050	1720		19.50	1.000	-0.06	0.584	0.584
	LTE Band 4	20M	QPSK	1	0	Front	1cm	ON	20175	1732.5		19.50	1.000	-0.07	0.751	0.751
	LTE Band 4	20M	QPSK	50	49	Front	1cm	ON	20300	1745		19.50	1.000	-0.05	0.915	0.915
	LTE Band 4	20M	QPSK	50	49	Front	1cm	ON	20050	1720		19.50	1.000	-0.06	0.668	0.668
	LTE Band 4	20M	QPSK	50	49	Front	1cm	ON	20175	1732.5		19.50	1.000	-0.07	0.826	0.826
	LTE Band 4	20M	QPSK	100	0	Front	1cm	ON	20300	1745		19.50	1.000	-0.02	0.894	0.894
	LTE Band 4	20M	QPSK	1	0	Back	1cm	ON	20300	1745		19.50	1.000	-0.05	0.374	0.374
	LTE Band 4	20M	QPSK	50	49	Back	1cm	ON	20300	1745		19.50	1.000	-0.01	0.382	0.382
	LTE Band 4	20M	QPSK	1	0	Left Side	1cm	ON	20300	1745		19.50	1.000	-0.1	0.036	0.036
	LTE Band 4	20M	QPSK	50	49	Left Side	1cm	ON	20300	1745		19.50	1.000	-0.14	0.037	0.037
	LTE Band 4	20M	QPSK	1	0	Right Side	1cm	ON	20300	1745		19.50	1.000	0.07	0.027	0.027
	LTE Band 4	20M	QPSK	50	49	Right Side	1cm	ON	20300	1745		19.50	1.000	0.09	0.023	0.023
	LTE Band 4	20M	QPSK	1	0	Bottom Side	1cm	ON	20300	1745		19.50	1.000	-0.17	0.808	0.808
	LTE Band 4	20M	QPSK	1	0	Bottom Side	1cm	ON	20050	1720		19.50	1.000	-0.15	0.464	0.464
	LTE Band 4	20M	QPSK	1	0	Bottom Side	1cm	ON	20175	1732.5		19.50	1.000	-0.06	0.628	0.628
	LTE Band 4	20M	QPSK	50	49	Bottom Side	1cm	ON	20300	1745		19.50	1.000	-0.11	0.945	0.945
	LTE Band 4	20M	QPSK	50	49	Bottom Side	1cm	ON	20050	1720		19.50	1.000	-0.18	0.687	0.687
	LTE Band 4	20M	QPSK	50	49	Bottom Side	1cm	ON	20175	1732.5		19.50	1.000	-0.13	0.871	0.687
24	LTE Band 4	20M	QPSK	100	0	Bottom Side	1cm	ON	20300	1745		19.50	1.000	-0.15	0.967	**0.967**
	LTE Band 2	20M	QPSK	1	0	Front	1cm	ON	18900	1880		19.00	1.000	-0.08	0.674	0.674
	LTE Band 2	20M	QPSK	50	24	Front	1cm	ON	18900	1880		19.00	1.000	-0.06	0.670	0.670
	LTE Band 2	20M	QPSK	1	0	Back	1cm	ON	18900	1880		19.00	1.000	-0.07	0.285	0.285
	LTE Band 2	20M	QPSK	50	24	Back	1cm	ON	18900	1880		19.00	1.000	-0.19	0.289	0.289
	LTE Band 2	20M	QPSK	1	0	Left Side	1cm	ON	18900	1880		19.00	1.000	-0.09	0.067	0.067
	LTE Band 2	20M	QPSK	50	24	Left Side	1cm	ON	18900	1880		19.00	1.000	-0.1	0.079	0.079
	LTE Band 2	20M	QPSK	1	0	Right Side	1cm	ON	18900	1880		19.00	1.000	-0.19	0.014	0.014
	LTE Band 2	20M	QPSK	50	24	Right Side	1cm	ON	18900	1880		19.00	1.000	0.07	0.014	0.014
	LTE Band 2	20M	QPSK	1	0	Bottom Side	1cm	ON	18900	1880		19.00	1.000	-0.05	0.982	0.982
25	LTE Band 2	20M	QPSK	1	0	Bottom Side	1cm	ON	18700	1860		19.00	1.000	-0.06	1.040	**1.040**
	LTE Band 2	20M	QPSK	1	0	Bottom Side	1cm	ON	19100	1900		19.00	1.000	-0.04	0.929	0.929
	LTE Band 2	20M	QPSK	50	24	Bottom Side	1cm	ON	18900	1880		19.00	1.000	-0.06	0.991	0.991
	LTE Band 2	20M	QPSK	50	24	Bottom Side	1cm	ON	18700	1860		19.00	1.000	-0.07	1.020	1.020
	LTE Band 2	20M	QPSK	50	24	Bottom Side	1cm	ON	19100	1900		19.00	1.000	-0.04	0.854	0.854
	LTE Band 2	20M	QPSK	100	0	Bottom Side	1cm	ON	18900	1880		19.00	1.000	-0.05	1.000	1.000

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
26	LTE Band 7	20M	QPSK	1	0	Front	1cm	OFF	20850	2510	23.70	24.00	1.072	0	0.279	**0.299**
	LTE Band 7	20M	QPSK	50	49	Front	1cm	OFF	20850	2510	22.70	23.00	1.072	-0.03	0.166	0.178
	LTE Band 7	20M	QPSK	1	0	Back	1cm	OFF	20850	2510	23.70	24.00	1.072	0.01	0.207	0.222
	LTE Band 7	20M	QPSK	50	49	Back	1cm	OFF	20850	2510	22.70	23.00	1.072	0.01	0.134	0.144
	LTE Band 7	20M	QPSK	1	0	Left Side	1cm	OFF	20850	2510	23.70	24.00	1.072	-0.02	0.164	0.176
	LTE Band 7	20M	QPSK	50	49	Left Side	1cm	OFF	20850	2510	22.70	23.00	1.072	0.07	0.111	0.119
	LTE Band 7	20M	QPSK	1	0	Right Side	1cm	OFF	20850	2510	23.70	24.00	1.072	-0.04	0.047	0.050
	LTE Band 7	20M	QPSK	50	49	Right Side	1cm	OFF	20850	2510	22.70	23.00	1.072	0.01	0.032	0.034
	LTE Band 7	20M	QPSK	1	0	Bottom Side	1cm	OFF	20850	2510	23.70	24.00	1.072	0.02	0.198	0.212
	LTE Band 7	20M	QPSK	50	49	Bottom Side	1cm	OFF	20850	2510	22.70	23.00	1.072	0.18	0.130	0.139

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	1cm	6	2437	18.65	19.00	1.084	100	1.000	-0.02	0.047	0.051
27	WLAN2.4GHz	802.11b 1Mbps	Back	1cm	6	2437	18.65	19.00	1.084	100	1.000	-0.09	0.349	**0.378**
	WLAN2.4GHz	802.11b 1Mbps	Right Side	1cm	6	2437	18.65	19.00	1.084	100	1.000	-0.04	0.111	0.120
	WLAN2.4GHz	802.11b 1Mbps	Top Side	1cm	6	2437	18.65	19.00	1.084	100	1.000	0.04	0.054	0.059
	WLAN5GHz	802.11a 6Mbps	Front	1cm	40	5200	15.00	15.00	1.000	95.83	1.044	-0.03	0.013	0.014
28	WLAN5GHz	802.11a 6Mbps	Back	1cm	40	5200	15.00	15.00	1.000	95.83	1.044	-0.07	0.461	**0.481**
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1cm	42	5210	9.49	9.50	1.002	84.62	1.182	-0.02	0.079	0.094
	WLAN5GHz	802.11a 6Mbps	Right Side	1cm	40	5200	15.00	15.00	1.000	95.83	1.044	-0.1	0.050	0.052
	WLAN5GHz	802.11a 6Mbps	Top Side	1cm	40	5200	15.00	15.00	1.000	95.83	1.044	-0.1	0.042	0.044
	WLAN5GHz	802.11a 6Mbps	Front	1cm	161	5805	14.72	15.00	1.067	95.83	1.044	-0.15	0.017	0.019
	WLAN5GHz	802.11a 6Mbps	Back	1cm	161	5805	14.72	15.00	1.067	95.83	1.044	-0.12	0.352	0.392
29	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1cm	155	5775	14.85	15.00	1.035	84.62	1.182	-0.1	0.329	**0.403**
	WLAN5GHz	802.11a 6Mbps	Right Side	1cm	161	5805	14.72	15.00	1.067	95.83	1.044	-0.17	0.053	0.059
	WLAN5GHz	802.11a 6Mbps	Top Side	1cm	161	5805	14.72	15.00	1.067	95.83	1.044	0.14	0.021	0.023

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Front	1cm	39	2441	10.23	10.50	1.064	-0.01	0.008	0.009
30	Bluetooth	1Mbps	Back	1cm	39	2441	10.23	10.50	1.064	-0.18	0.036	**0.038**
	Bluetooth	1Mbps	Left Side	1cm	39	2441	10.23	10.50	1.064	-0.02	0.002	0.002
	Bluetooth	1Mbps	Right Side	1cm	39	2441	10.23	10.50	1.064	-0.11	0.020	0.021
	Bluetooth	1Mbps	Top Side	1cm	39	2441	10.23	10.50	1.064	-0.03	0.013	0.014

14.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	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)
31	GSM850	GPRS (4 Tx slots)	Front	1.5cm	189	836.4	25.90	27.50	1.445	0.09	0.324	**0.468**
	GSM850	GPRS (4 Tx slots)	Back	1.5cm	189	836.4	25.90	27.50	1.445	-0.01	0.235	0.340
32	GSM1900	GPRS (4 Tx slots)	Front	1.5cm	512	1850.2	23.19	25.00	1.517	-0.09	0.426	**0.646**
	GSM1900	GPRS (4 Tx slots)	Back	1.5cm	512	1850.2	23.19	25.00	1.517	0.04	0.206	0.313

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	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)
33	WCDMA V	RMC 12.2Kbps	Front	1.5cm	4182	836.4	22.35	24.00	1.462	0.01	0.323	**0.472**
	WCDMA V	RMC 12.2Kbps	Back	1.5cm	4182	836.4	22.35	24.00	1.462	0.01	0.189	0.276
	WCDMA II	RMC 12.2Kbps	Front	1.5cm	9400	1880	22.48	24.00	1.419	0.01	0.734	1.042
34	WCDMA II	RMC 12.2Kbps	Front	1.5cm	9262	1852.4	22.41	24.00	1.442	0	0.828	**1.194**
	WCDMA II	RMC 12.2Kbps	Front	1.5cm	9538	1907.6	22.36	24.00	1.459	0	0.603	0.880
	WCDMA II	RMC 12.2Kbps	Back	1.5cm	9400	1880	22.48	24.00	1.419	0.01	0.387	0.549

<CDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Headset	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
34	CDMA2000 BC0	1xRTT RC3 SO32	Front	1.5cm		OFF	384	836.52	23.75	25.00	1.334	0.02	0.449	**0.599**
	CDMA2000 BC0	RETAP 4096 bits	Front	1.5cm		OFF	384	836.52	23.80	25.00	1.318	-0.01	0.438	0.577
	CDMA2000 BC0	1xRTT RC3 SO32	Back	1.5cm		OFF	384	836.52	23.75	25.00	1.334	0	0.296	0.395
	CDMA2000 BC1	1xRTT RC3 SO32	Front	1.5cm		ON	600	1880		24.00	1.000	-0.12	1.070	1.070
36	CDMA2000 BC1	1xRTT RC3 SO32	Front	1.5cm		ON	25	1851.25		24.50	1.000	-0.13	1.240	**1.240**
	CDMA2000 BC1	1xRTT RC3 SO32	Front	1.5cm		ON	1175	1908.75		24.50	1.000	0.02	0.915	0.915
	CDMA2000 BC1	RETAP 4096 bits	Front	1.5cm		ON	600	1880		24.50	1.000	-0.13	1.030	1.030
	CDMA2000 BC1	RETAP 4096 bits	Front	1.5cm		ON	25	1851.25		24.50	1.000	-0.13	1.150	1.150
	CDMA2000 BC1	RETAP 4096 bits	Front	1.5cm		ON	1175	1908.75		24.50	1.000	-0.11	0.874	0.874
	CDMA2000 BC1	1xRTT RC3 SO32	Front	1.5cm	Headset	ON	600	1880		24.50	1.000	-0.12	0.984	0.984
	CDMA2000 BC1	1xRTT RC3 SO32	Front	1.5cm	Headset	ON	25	1851.25		24.50	1.000	-0.09	1.110	1.110
	CDMA2000 BC1	1xRTT RC3 SO32	Front	1.5cm	Headset	ON	1175	1908.75		24.50	1.000	-0.12	0.825	0.825
	CDMA2000 BC1	1xRTT RC3 SO32	Back	1.5cm		ON	600	1880		24.50	1.000	-0.13	0.519	0.519

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	Headset	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
37	LTE Band 13	10M	QPSK	1	0	Front	1.5cm		OFF	23230	782	22.87	24.00	1.297	-0.18	0.429	**0.556**
	LTE Band 13	10M	QPSK	25	24	Front	1.5cm		OFF	23230	782	21.87	23.00	1.297	0.03	0.270	0.350
	LTE Band 13	10M	QPSK	1	0	Back	1.5cm		OFF	23230	782	22.87	24.00	1.297	-0.03	0.305	0.396
	LTE Band 13	10M	QPSK	25	24	Back	1.5cm		OFF	23230	782	21.87	23.00	1.297	-0.01	0.188	0.244
38	LTE Band 4	20M	QPSK	1	0	Front	1.5cm		ON	20300	1745		23.50	1.000	-0.16	1.380	**1.380**
	LTE Band 4	20M	QPSK	1	0	Front	1.5cm		ON	20050	1720		23.50	1.000	-0.12	0.687	0.687
	LTE Band 4	20M	QPSK	1	0	Front	1.5cm		ON	20175	1732.5		23.50	1.000	-0.15	1.060	1.060
	LTE Band 4	20M	QPSK	50	49	Front	1.5cm		ON	20300	1745		23.50	1.000	-0.14	1.140	1.140
	LTE Band 4	20M	QPSK	50	49	Front	1.5cm		ON	20050	1720		23.50	1.000	-0.14	0.794	0.794
	LTE Band 4	20M	QPSK	50	49	Front	1.5cm		ON	20175	1732.5		23.50	1.000	-0.13	1.080	1.080
	LTE Band 4	20M	QPSK	100	0	Front	1.5cm		ON	20300	1745		23.50	1.000	-0.13	1.130	1.130
	LTE Band 4	20M	QPSK	1	0	Front	1.5cm	Headset	ON	20300	1745		23.50	1.000	-0.17	1.370	1.370
	LTE Band 4	20M	QPSK	1	0	Front	1.5cm	Headset	ON	20050	1720		23.50	1.000	-0.13	0.792	0.792
	LTE Band 4	20M	QPSK	1	0	Front	1.5cm	Headset	ON	20175	1732.5		23.50	1.000	-0.13	0.806	0.806
	LTE Band 4	20M	QPSK	50	49	Front	1.5cm	Headset	ON	20300	1745		23.50	1.000	-0.13	1.170	1.170
	LTE Band 4	20M	QPSK	50	49	Front	1.5cm	Headset	ON	20050	1720		23.50	1.000	-0.13	0.902	0.902
	LTE Band 4	20M	QPSK	50	49	Front	1.5cm	Headset	ON	20175	1732.5		23.50	1.000	-0.12	0.913	0.913
	LTE Band 4	20M	QPSK	100	0	Front	1.5cm	Headset	ON	20300	1745		23.50	1.000	-0.13	0.987	0.987
	LTE Band 4	20M	QPSK	1	0	Back	1.5cm		ON	20300	1745		23.50	1.000	-0.12	0.604	0.604
	LTE Band 4	20M	QPSK	50	49	Back	1.5cm		ON	20300	1745		23.50	1.000	-0.18	0.482	0.482
	LTE Band 2	20M	QPSK	1	0	Front	1.5cm		OFF	18900	1880	23.30	24.00	1.175	0	0.912	1.072
39	LTE Band 2	20M	QPSK	1	0	Front	1.5cm		OFF	18700	1860	23.09	24.00	1.233	-0.01	0.963	**1.187**
	LTE Band 2	20M	QPSK	1	0	Front	1.5cm		OFF	19100	1900	23.11	24.00	1.227	0.01	0.805	0.988
	LTE Band 2	20M	QPSK	50	24	Front	1.5cm		OFF	18900	1880	22.38	23.00	1.153	0	0.718	0.828
	LTE Band 2	20M	QPSK	50	24	Front	1.5cm		OFF	18700	1860	22.13	23.00	1.222	0	0.780	0.953
	LTE Band 2	20M	QPSK	50	24	Front	1.5cm		OFF	19100	1900	22.07	23.00	1.239	0.01	0.599	0.742
	LTE Band 2	20M	QPSK	100	0	Front	1.5cm		OFF	18900	1880	22.23	23.00	1.194	0.01	0.710	0.848
	LTE Band 2	20M	QPSK	1	0	Back	1.5cm		OFF	18900	1880	23.30	24.00	1.175	0.03	0.471	0.553
	LTE Band 2	20M	QPSK	50	24	Back	1.5cm		OFF	18900	1880	22.38	23.00	1.153	0.01	0.382	0.441
40	LTE Band 7	20M	QPSK	1	0	Front	1.5cm		OFF	20850	2510	23.70	24.00	1.072	-0.12	0.137	**0.147**
	LTE Band 7	20M	QPSK	50	49	Front	1.5cm		OFF	20850	2510	22.70	23.00	1.072	0.1	0.086	0.092
	LTE Band 7	20M	QPSK	1	0	Back	1.5cm		OFF	20850	2510	23.70	24.00	1.072	-0.03	0.110	0.118
	LTE Band 7	20M	QPSK	50	49	Back	1.5cm		OFF	20850	2510	22.70	23.00	1.072	-0.11	0.071	0.076

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	1.5cm	6	2437	18.65	19.00	1.084	100	1.000	0.13	0.030	0.033
41	WLAN2.4GHz	802.11b 1Mbps	Back	1.5cm	6	2437	18.65	19.00	1.084	100	1.000	0.02	0.154	**0.167**
	WLAN5GHz	802.11a 6Mbps	Front	1.5cm	40	5200	15.00	15.00	1.000	95.83	1.044	-0.06	0.010	0.010
42	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	40	5200	15.00	15.00	1.000	95.83	1.044	-0.13	0.165	**0.172**
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1.5cm	42	5210	9.49	9.50	1.002	84.62	1.182	0.01	0.031	0.037
	WLAN5GHz	802.11a 6Mbps	Front	1.5cm	52	5260	14.91	15.00	1.021	95.83	1.044	0.18	0.014	0.015
43	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	52	5260	14.91	15.00	1.021	95.83	1.044	-0.16	0.251	**0.268**
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1.5cm	58	5290	10.48	10.50	1.005	84.62	1.182	0.13	0.051	0.061
	WLAN5GHz	802.11a 6Mbps	Front	1.5cm	144	5720	14.93	15.00	1.016	95.83	1.044	-0.15	0.007	0.008
	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	144	5720	14.93	15.00	1.016	95.83	1.044	-0.17	0.180	0.191
44	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1.5cm	138	5690	14.98	15.00	1.005	84.62	1.182	-0.13	0.208	**0.247**
	WLAN5GHz	802.11a 6Mbps	Front	1.5cm	161	5805	14.72	15.00	1.067	95.83	1.044	-0.18	0.003	0.004
	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	161	5805	14.72	15.00	1.067	95.83	1.044	-0.12	0.195	0.217
45	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1.5cm	155	5775	14.85	15.00	1.035	84.62	1.182	-0.09	0.179	**0.219**

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Front	1.5cm	39	2441	10.23	10.50	1.064	0.09	0.006	0.006
46	Bluetooth	1Mbps	Back	1.5cm	39	2441	10.23	10.50	1.064	-0.09	0.020	**0.021**

14.4 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Mode	Test Position	Gap (cm)	Power Reduction	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	CDMA2000 BC1	-	-	-	-	1xRTT RC3 SO32	Front	1.5cm	ON	25	1851.25		24.50	1.000	-0.13	1.240	-	1.240
2nd	CDMA2000 BC1	-	-	-	-	1xRTT RC3 SO32	Front	1.5cm	ON	25	1851.25		24.50	1.000	-0.12	1.160	1.07	1.160
1st	LTE Band 4	20M	QPSK	1	0	-	Front	1.5cm	ON	20300	1745		23.50	1.000	-0.16	1.380	-	1.380
2nd	LTE Band 4	20M	QPSK	1	0	-	Front	1.5cm	ON	20300	1745		23.50	1.000	-0.13	1.360	1.01	1.360

General Note:

1. Per KDB 865664 D01v01r03, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg
2. Per KDB 865664 D01v01r03, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

15. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Mobile Phone			Note
		Head	Body-worn	Wireless Router	
1.	GSM(Voice) + WLAN2.4GHz(data)	Yes	Yes		
2.	WCDMA(Voice) + WLAN2.4GHz(data)	Yes	Yes		
3.	CDMA(Voice) + WLAN2.4GHz(data)	Yes	Yes		
4.	GSM(Voice) + Bluetooth(data)	Yes	Yes		
5.	WCDMA((Voice) + Bluetooth(data)	Yes	Yes		
6.	CDMA((Voice) + Bluetooth(data)	Yes	Yes		
7.	GSM(Voice) + WLAN5GHz(data)	Yes	Yes		
8.	WCDMA((Voice) + WLAN5GHz(data)	Yes	Yes		
9.	CDMA((Voice) + WLAN5GHz(data)	Yes	Yes		
10.	GPRS/EDGE(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
11.	WCDMA(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
12.	CDMA(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
13.	LTE(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
14.	GPRS/EDGE(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
15.	WCDMA(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
16.	CDMA(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
17.	LTE(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
18.	GPRS/EDGE(Data) + WLAN5GHz(data)	Yes	Yes	Yes	WiFi Direct
19.	WCDMA(Data) + WLAN5GHz(data)	Yes	Yes	Yes	WiFi Direct
20.	CDMA(Data) + WLAN5GHz(data)	Yes	Yes	Yes	WiFi Direct
21.	LTE(Data) + WLAN5GHz(data)	Yes	Yes	Yes	WiFi Direct

General Note:

1. This device supported VoIP in EGPRS, WCDMA, CDMA and LTE (e.g. 3rd party VoIP).
2. This device 2.4GHz / 5.2GHz / 5.8GHz WLAN supports Hotspot operation and WiFi Direct (Group Client / Group Owner), and 5.3GHz / 5.5GHz WLAN supports WiFi Direct (Group Client).
3. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
4. In body-worn exposure condition, the WWAN connection a headset SAR simultaneously transmission was selecting WLAN without connect a headset SAR for a conservatively summation.
5. The Scaled SAR summation is calculated based on the same configuration and test position.
6. The worst case 5GHz WLAN reported SAR for each configuration was used for SAR summation, Therefore, the following summations represent the absolute worst cases for simultaneous transmission with the 5GHz WLAN.
7. Per KDB 447498 D01v05r02, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg

15.1 Head Exposure Conditions

WWAN Band		Exposure Position	1	2	3	1+2 Summed SAR (W/kg)	1+3 Summed SAR (W/kg)
			WWAN	2.4GHz WLAN	2.4GHz Bluetooth		
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
GSM	GSM850	Right Cheek	0.337	0.087	0.014	**0.42**	**0.35**
		Right Tilted	0.210	0.100	0.016	**0.31**	**0.23**
		Left Cheek	0.286	0.186	0.032	**0.47**	**0.32**
		Left Tilted	0.185	0.092	0.001	**0.28**	**0.19**
	GSM1900	Right Cheek	0.070	0.087	0.014	**0.16**	**0.08**
		Right Tilted	0.047	0.100	0.016	**0.15**	**0.06**
		Left Cheek	0.140	0.186	0.032	**0.33**	**0.17**
		Left Tilted	0.049	0.092	0.001	**0.14**	**0.05**
WCMDA	Band V	Right Cheek	0.273	0.087	0.014	**0.36**	**0.29**
		Right Tilted	0.151	0.100	0.016	**0.25**	**0.17**
		Left Cheek	0.237	0.186	0.032	**0.42**	**0.27**
		Left Tilted	0.151	0.092	0.001	**0.24**	**0.15**
	Band II	Right Cheek	0.162	0.087	0.014	**0.25**	**0.18**
		Right Tilted	0.099	0.100	0.016	**0.20**	**0.12**
		Left Cheek	0.319	0.186	0.032	**0.51**	**0.35**
		Left Tilted	0.074	0.092	0.001	**0.17**	**0.08**
CDMA	BC0	Right Cheek	0.377	0.087	0.014	**0.46**	**0.39**
		Right Tilted	0.224	0.100	0.016	**0.32**	**0.24**
		Left Cheek	0.327	0.186	0.032	**0.51**	**0.36**
		Left Tilted	0.208	0.092	0.001	**0.30**	**0.21**
	BC1	Right Cheek	0.165	0.087	0.014	**0.25**	**0.18**
		Right Tilted	0.096	0.100	0.016	**0.20**	**0.11**
		Left Cheek	0.322	0.186	0.032	**0.51**	**0.35**
		Left Tilted	0.075	0.092	0.001	**0.17**	**0.08**
LTE	Band 13	Right Cheek	0.392	0.087	0.014	**0.48**	**0.41**
		Right Tilted	0.270	0.100	0.016	**0.37**	**0.29**
		Left Cheek	0.374	0.186	0.032	**0.56**	**0.41**
		Left Tilted	0.261	0.092	0.001	**0.35**	**0.26**
	Band 4	Right Cheek	0.203	0.087	0.014	**0.29**	**0.22**
		Right Tilted	0.099	0.100	0.016	**0.20**	**0.12**
		Left Cheek	0.235	0.186	0.032	**0.42**	**0.27**
		Left Tilted	0.131	0.092	0.001	**0.22**	**0.13**
	Band 2	Right Cheek	0.139	0.087	0.014	**0.23**	**0.15**
		Right Tilted	0.093	0.100	0.016	**0.19**	**0.11**
		Left Cheek	0.293	0.186	0.032	**0.48**	**0.33**
		Left Tilted	0.069	0.092	0.001	**0.16**	**0.07**
	Band 7	Right Cheek	0.063	0.087	0.014	**0.15**	**0.08**
		Right Tilted	0.066	0.100	0.016	**0.17**	**0.08**
		Left Cheek	0.176	0.186	0.032	**0.36**	**0.21**
		Left Tilted	0.064	0.092	0.001	**0.16**	**0.07**

WWAN Band		Exposure Position	1	2		1+2 Summed SAR (W/kg)
			WWAN	5.2GHz WLAN / 5.3GHz / 5.5GHz / 5.8GHz WLAN		
			1g SAR (W/kg)	Band	1g SAR (W/kg)	
GSM	GSM850	Right Cheek	0.337	5.8GHz WLAN	0.055	**0.39**
		Right Tilted	0.210	5.6GHz WLAN	0.055	**0.27**
		Left Cheek	0.286	5.8GHz WLAN	0.146	**0.43**
		Left Tilted	0.185	5.8GHz WLAN	0.115	**0.30**
	GSM1900	Right Cheek	0.070	5.8GHz WLAN	0.055	**0.13**
		Right Tilted	0.047	5.6GHz WLAN	0.055	**0.10**
		Left Cheek	0.140	5.8GHz WLAN	0.146	**0.29**
		Left Tilted	0.049	5.8GHz WLAN	0.115	**0.16**
WCMDA	Band V	Right Cheek	0.273	5.8GHz WLAN	0.055	**0.33**
		Right Tilted	0.151	5.6GHz WLAN	0.055	**0.21**
		Left Cheek	0.237	5.8GHz WLAN	0.146	**0.38**
		Left Tilted	0.151	5.8GHz WLAN	0.115	**0.27**
	Band II	Right Cheek	0.162	5.8GHz WLAN	0.055	**0.22**
		Right Tilted	0.099	5.6GHz WLAN	0.055	**0.15**
		Left Cheek	0.319	5.8GHz WLAN	0.146	**0.47**
		Left Tilted	0.074	5.8GHz WLAN	0.115	**0.19**
CDMA	BC0	Right Cheek	0.377	5.8GHz WLAN	0.055	**0.43**
		Right Tilted	0.224	5.6GHz WLAN	0.055	**0.28**
		Left Cheek	0.327	5.8GHz WLAN	0.146	**0.47**
		Left Tilted	0.208	5.8GHz WLAN	0.115	**0.32**
	BC1	Right Cheek	0.165	5.8GHz WLAN	0.055	**0.22**
		Right Tilted	0.096	5.6GHz WLAN	0.055	**0.15**
		Left Cheek	0.322	5.8GHz WLAN	0.146	**0.47**
		Left Tilted	0.075	5.8GHz WLAN	0.115	**0.19**
LTE	Band 13	Right Cheek	0.392	5.8GHz WLAN	0.055	**0.45**
		Right Tilted	0.270	5.6GHz WLAN	0.055	**0.33**
		Left Cheek	0.374	5.8GHz WLAN	0.146	**0.52**
		Left Tilted	0.261	5.8GHz WLAN	0.115	**0.38**
	Band 4	Right Cheek	0.203	5.8GHz WLAN	0.055	**0.26**
		Right Tilted	0.099	5.6GHz WLAN	0.055	**0.15**
		Left Cheek	0.235	5.8GHz WLAN	0.146	**0.38**
		Left Tilted	0.131	5.8GHz WLAN	0.115	**0.25**
	Band 2	Right Cheek	0.139	5.8GHz WLAN	0.055	**0.19**
		Right Tilted	0.093	5.6GHz WLAN	0.055	**0.15**
		Left Cheek	0.293	5.8GHz WLAN	0.146	**0.44**
		Left Tilted	0.069	5.8GHz WLAN	0.115	**0.18**
	Band 7	Right Cheek	0.063	5.8GHz WLAN	0.055	**0.12**
		Right Tilted	0.066	5.6GHz WLAN	0.055	**0.12**
		Left Cheek	0.176	5.8GHz WLAN	0.146	**0.32**
		Left Tilted	0.064	5.8GHz WLAN	0.115	**0.18**

15.2 Wireless Router Exposure Conditions

WWAN Band		Exposure Position	1	2	3	1+2 Summed SAR (W/kg)	1+3 Summed SAR (W/kg)
			WWAN	2.4GHz WLAN	2.4GHz Bluetooth		
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
GSM	GSM850	Front	0.429	0.051	0.009	**0.48**	**0.44**
		Back	0.321	0.378	0.038	**0.70**	**0.36**
		Left side	0.494			**0.49**	**0.49**
		Right side	0.601	0.120	0.021	**0.72**	**0.62**
		Top side		0.059	0.014	**0.06**	**0.01**
		Bottom side	0.069			**0.07**	**0.07**
	GSM1900	Front	0.477	0.051	0.009	**0.53**	**0.49**
		Back	0.239	0.378	0.038	**0.62**	**0.28**
		Left side	0.060			**0.06**	**0.06**
		Right side	0.004	0.120	0.021	**0.12**	**0.03**
		Top side		0.059	0.014	**0.06**	**0.01**
		Bottom side	0.712			**0.71**	**0.71**
WCMDA	Band V	Front	0.408	0.051	0.009	**0.46**	**0.42**
		Back	0.281	0.378	0.038	**0.66**	**0.32**
		Left side	0.323			**0.32**	**0.32**
		Right side	0.474	0.120	0.021	**0.59**	**0.50**
		Top side		0.059	0.014	**0.06**	**0.01**
		Bottom side	0.053			**0.05**	**0.05**
	Band II	Front	0.492	0.051	0.009	**0.54**	**0.50**
		Back	0.232	0.378	0.038	**0.61**	**0.27**
		Left side	0.061			**0.06**	**0.06**
		Right side	0.009	0.120	0.021	**0.13**	**0.03**
		Top side		0.059	0.014	**0.06**	**0.01**
		Bottom side	0.685			**0.69**	**0.69**
CDMA	BC0	Front	0.540	0.051	0.009	**0.59**	**0.55**
		Back	0.395	0.378	0.038	**0.77**	**0.43**
		Left side	0.427			**0.43**	**0.43**
		Right side	0.599	0.120	0.021	**0.72**	**0.62**
		Top side		0.059	0.014	**0.06**	**0.01**
		Bottom side	0.068			**0.07**	**0.07**
	BC1	Front	0.695	0.051	0.009	**0.75**	**0.70**
		Back	0.285	0.378	0.038	**0.66**	**0.32**
		Left side	0.073			**0.07**	**0.07**
		Right side	0.013	0.120	0.021	**0.13**	**0.03**
		Top side		0.059	0.014	**0.06**	**0.01**
		Bottom side	1.050			**1.05**	**1.05**

WWAN Band		Exposure Position	1	2	3	1+2 Summed SAR (W/kg)	1+3 Summed SAR (W/kg)
			WWAN	2.4GHz WLAN	2.4GHz Bluetooth		
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
LTE	Band 13	Front	0.682	0.051	0.009	**0.73**	**0.69**
		Back	0.458	0.378	0.038	**0.84**	**0.50**
		Left side	0.581			**0.58**	**0.58**
		Right side	0.597	0.120	0.021	**0.72**	**0.62**
		Top side		0.059	0.014	**0.06**	**0.01**
		Bottom side	0.079			**0.08**	**0.08**
	Band 4	Front	0.915	0.051	0.009	**0.97**	**0.92**
		Back	0.382	0.378	0.038	**0.76**	**0.42**
		Left side	0.037			**0.04**	**0.04**
		Right side	0.027	0.120	0.021	**0.15**	**0.05**
		Top side		0.059	0.014	**0.06**	**0.01**
		Bottom side	0.967			**0.97**	**0.97**
	Band 2	Front	0.674	0.051	0.009	**0.73**	**0.68**
		Back	0.289	0.378	0.038	**0.67**	**0.33**
		Left side	0.079			**0.08**	**0.08**
		Right side	0.014	0.120	0.021	**0.13**	**0.04**
		Top side		0.059	0.014	**0.06**	**0.01**
		Bottom side	1.040			**1.04**	**1.04**
	Band 7	Front	0.299	0.051	0.009	**0.35**	**0.31**
		Back	0.222	0.378	0.038	**0.60**	**0.26**
		Left side	0.176			**0.18**	**0.18**
		Right side	0.050	0.120	0.021	**0.17**	**0.07**
		Top side		0.059	0.014	**0.06**	**0.01**
		Bottom side	0.212			**0.21**	**0.21**

WWAN Band		Exposure Position	1	2		1+2 Summed SAR (W/kg)
			WWAN	5.2GHz WLAN / 5.8GHz WLAN		
			1g SAR (W/kg)	Band	1g SAR (W/kg)	
GSM	GSM850	Front	0.429	5.8GHz WLAN	0.019	**0.45**
		Back	0.321	5.2GHz WLAN	0.481	**0.80**
		Left side	0.494			**0.49**
		Right side	0.601	5.8GHz WLAN	0.059	**0.66**
		Top side		5.2GHz WLAN	0.044	**0.04**
		Bottom side	0.069			**0.07**
	GSM1900	Front	0.477	5.8GHz WLAN	0.019	**0.50**
		Back	0.239	5.2GHz WLAN	0.481	**0.72**
		Left side	0.060			**0.06**
		Right side	0.004	5.8GHz WLAN	0.059	**0.06**
		Top side		5.2GHz WLAN	0.044	**0.04**
		Bottom side	0.712			**0.71**
WCMDA	Band V	Front	0.408	5.8GHz WLAN	0.019	**0.43**
		Back	0.281	5.2GHz WLAN	0.481	**0.76**
		Left side	0.323			**0.32**
		Right side	0.474	5.8GHz WLAN	0.059	**0.53**
		Top side		5.2GHz WLAN	0.044	**0.04**
		Bottom side	0.053			**0.05**
	Band II	Front	0.492	5.8GHz WLAN	0.019	**0.51**
		Back	0.232	5.2GHz WLAN	0.481	**0.71**
		Left side	0.061			**0.06**
		Right side	0.009	5.8GHz WLAN	0.059	**0.07**
		Top side		5.2GHz WLAN	0.044	**0.04**
		Bottom side	0.685			**0.69**
CDMA	BC0	Front	0.540	5.8GHz WLAN	0.019	**0.56**
		Back	0.395	5.2GHz WLAN	0.481	**0.88**
		Left side	0.427			**0.43**
		Right side	0.599	5.8GHz WLAN	0.059	**0.66**
		Top side		5.2GHz WLAN	0.044	**0.04**
		Bottom side	0.068			**0.07**
	BC1	Front	0.695	5.8GHz WLAN	0.019	**0.71**
		Back	0.285	5.2GHz WLAN	0.481	**0.77**
		Left side	0.073			**0.07**
		Right side	0.013	5.8GHz WLAN	0.059	**0.07**
		Top side		5.2GHz WLAN	0.044	**0.04**
		Bottom side	1.050			**1.05**

WWAN Band		Exposure Position	1	2		1+2 Summed SAR (W/kg)
			WWAN	5.2GHz WLAN / 5.8GHz WLAN		
			1g SAR (W/kg)	Band	1g SAR (W/kg)	
LTE	Band 13	Front	0.682	5.8GHz WLAN	0.019	**0.70**
		Back	0.458	5.2GHz WLAN	0.481	**0.94**
		Left side	0.581			**0.58**
		Right side	0.597	5.8GHz WLAN	0.059	**0.66**
		Top side		5.2GHz WLAN	0.044	**0.04**
		Bottom side	0.079			**0.08**
	Band 4	Front	0.915	5.8GHz WLAN	0.019	**0.93**
		Back	0.382	5.2GHz WLAN	0.481	**0.86**
		Left side	0.037			**0.04**
		Right side	0.027	5.8GHz WLAN	0.059	**0.09**
		Top side		5.2GHz WLAN	0.044	**0.04**
		Bottom side	0.967			**0.97**
	Band 2	Front	0.674	5.8GHz WLAN	0.019	**0.69**
		Back	0.289	5.2GHz WLAN	0.481	**0.77**
		Left side	0.079			**0.08**
		Right side	0.014	5.8GHz WLAN	0.059	**0.07**
		Top side		5.2GHz WLAN	0.044	**0.04**
		Bottom side	1.040			**1.04**
	Band 7	Front	0.299	5.8GHz WLAN	0.019	**0.32**
		Back	0.222	5.2GHz WLAN	0.481	**0.70**
		Left side	0.176			**0.18**
		Right side	0.050	5.8GHz WLAN	0.059	**0.11**
		Top side		5.2GHz WLAN	0.044	**0.04**
		Bottom side	0.212			**0.21**

15.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1	2	3	1+2 Summed SAR (W/kg)	1+3 Summed SAR (W/kg)
			WWAN	2.4GHz WLAN	2.4GHz Bluetooth		
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
GSM	GSM850	Front	0.468	0.033	0.006	**0.50**	**0.47**
		Back	0.340	0.167	0.021	**0.51**	**0.36**
	GSM1900	Front	0.646	0.033	0.006	**0.68**	**0.65**
		Back	0.313	0.167	0.021	**0.48**	**0.33**
WCMDA	Band V	Front	0.472	0.033	0.006	**0.51**	**0.48**
		Back	0.276	0.167	0.021	**0.44**	**0.30**
	Band II	Front	1.194	0.033	0.006	**1.23**	**1.20**
		Back	0.549	0.167	0.021	**0.72**	**0.57**
CDMA	BC0	Front	0.599	0.033	0.006	**0.63**	**0.61**
		Back	0.395	0.167	0.021	**0.56**	**0.42**
	BC1	Front	1.240	0.033	0.006	**1.27**	**1.25**
		Front with Headset	1.110	0.033	0.006	**1.14**	**1.12**
		Back	0.519	0.167	0.021	**0.69**	**0.54**
LTE	Band 13	Front	0.556	0.033	0.006	**0.59**	**0.56**
		Back	0.396	0.167	0.021	**0.56**	**0.42**
	Band 4	Front	1.380	0.033	0.006	**1.41**	**1.39**
		Front with Headset	1.370	0.033	0.006	**1.40**	**1.38**
		Back	0.604	0.167	0.021	**0.77**	**0.63**
	Band 2	Front	1.187	0.033	0.006	**1.22**	**1.19**
		Back	0.553	0.167	0.021	**0.72**	**0.57**
	Band 7	Front	0.147	0.033	0.006	**0.18**	**0.15**
		Back	0.118	0.167	0.021	**0.29**	**0.14**

WWAN Band		Exposure Position	1	2		1+2 Summed SAR (W/kg)
			WWAN	5.2GHz WLAN / 5.3GHz / 5.5GHz / 5.8GHz WLAN		
			1g SAR (W/kg)	Band	1g SAR (W/kg)	
GSM	GSM850	Front	0.468	5.3GHz	0.015	**0.48**
		Back	0.340	5.3GHz	0.268	**0.61**
	GSM1900	Front	0.646	5.3GHz	0.008	**0.65**
		Back	0.313	5.3GHz	0.268	**0.58**
WCMDA	Band V	Front	0.472	5.3GHz	0.019	**0.49**
		Back	0.276	5.3GHz	0.268	**0.54**
	Band II	Front	1.194	5.3GHz	0.219	**1.41**
		Back	0.549	5.3GHz	0.268	**0.82**
CDMA	BC0	Front	0.599	5.3GHz	0.000	**0.60**
		Back	0.395	5.3GHz	0.268	**0.66**
	BC1	Front	1.240	5.3GHz	0.015	**1.26**
		Front with Headset	1.110	5.3GHz	0.015	**1.13**
		Back	0.519	5.3GHz	0.268	**0.79**
LTE	Band 13	Front	0.556	5.3GHz	0.000	**0.56**
		Back	0.396	5.3GHz	0.268	**0.66**
	Band 4	Front	1.380	5.3GHz	0.015	**1.40**
		Front with Headset	1.370	5.3GHz	0.015	**1.39**
		Back	0.604	5.3GHz	0.268	**0.87**
	Band 2	Front	1.187	5.3GHz	0.000	**1.19**
		Back	0.553	5.3GHz	0.268	**0.82**
	Band 7	Front	0.147	5.3GHz	0.000	**0.15**
		Back	0.118	5.3GHz	0.268	**0.39**

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16. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An 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 16.1. 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 Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.0	Normal	1	1	1	± 6.0 %	± 6.0 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.4	Rectangular	√3	1	1	± 0.2 %	± 0.2 %
Probe Positioning	2.9	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 11.0 %	± 10.8 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 22.0 %**	**± 21.5 %**

Table 16.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.55	Normal	1	1	1	± 6.55 %	± 6.55 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Probe Positioning	9.9	Rectangular	√3	1	1	± 5.7 %	± 5.7 %
Max. SAR Eval.	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 12.8 %	± 12.6 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 25.6 %**	**± 25.2 %**

Table 16.3. Uncertainty Budget for frequency range 3 GHz to 6 GHz

17. References

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

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[3] IEEE Std. 1528-2003, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, December 2003

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[5] FCC KDB 248227 D01 v01r02, “SAR Measurement Procedures for 802.11 a/b/g Transmitters”, May 2007

[6] FCC KDB 447498 D01 v05r02, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Feb 2014

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[10] FCC KDB 941225 D03 v01, “Recommended SAR Test Reduction Procedures for GSM / GPRS / EDGE”, December 2008

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[14] FCC KDB 865664 D01 v01r03, "SAR Measurement Requirements for 100 MHz to 6 GHz", Feb 2014.

[15] FCC KDB 865664 D02 v01r01, “RF Exposure Compliance Reporting and Documentation Considerations” May 2013.