FCC SAR Test Report

APPLICANT	:	Motorola Mobility, LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola Mobility, LLC
MODEL NAME	:	3578
FCC ID	:	IHDT56QA1
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

SPORTON INTERNATIONAL INC.
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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA442943A	Rev. 01	Initial issue of report	Jun. 20, 2014
FA442943A	Rev. 02	1. Corrected the LTE B17 left Side summation SAR value on page64 / 65. 2. Corrected the power drift value on page50 / 51 / 54 /59. 3. Corrected LTE B17 measured SAR value on page56.	Jul. 07, 2014
FA442943A	Rev. 03	1. Updated 5.2GHz / 5.8GHz WALN conducted power and SAR test results.	Jul. 17, 2014
FA442943A	Rev. 04	1. Additional FCC request test channel.	Jul. 30, 2014

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility, LLC, Mobile Cellular Phone, 3578,** 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)	Simultaneous Transmission 1g SAR (W/kg)
PCE	GSM850	0.63	0.85	**1.04**	1.58
	GSM1900	0.20	0.82	0.63	
	WCDMA Band V	0.57	0.66	0.93	
	WCDMA Band IV	0.43	1.07	0.76	
	WCDMA Band II	0.35	1.17	0.81	
	LTE Band 17	0.41	0.49	0.63	
	LTE Band 5	0.56	0.78	0.85	
	LTE Band 4	0.34	1.19	0.85	
	LTE Band 2	0.36	**1.27**	0.81	
	LTE Band 7	0.54	1.18	0.82	
DTS	WLAN 2.4GHz Band	0.79	0.07	0.16	1.42
NII	WLAN 5.2GHz Band	**1.46**	0.11	0.19	1.58
	WLAN 5.3GHz Band	1.08	0.18		
	WLAN 5.5GHz Band	0.86	0.40		
	WLAN 5.8GHz Band	0.88	0.39	0.21	
DSS	Bluetooth	0.19	0.02	0.04	1.28
Date of Testing:		05/02/2014 ~ 07/29/2014			

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	3578
FCC ID	IHDT56QA1
IMEI Code	Sample for WWAN SAR testing: 359279050020178 Sample for WLAN SAR testing: 359279050020160
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 IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 5: 824.7 MHz ~ 848.3 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 • 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	KXE21.99.169
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, 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 / B4, and LTE B2 / B4 / B7 transmitter. More detailed information which can be referred to “operational description”.
4. While operation simultaneously with any other transmitters active, like WiFi Direct or Hotspot function, a reduced maximum power limit is enforced on the WiFi transmitter in 2.4GHz / 5.2GHz / 5.8GHz WLAN. 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)	32.50	28.70
GPRS (GMSK, 3 Tx slots)	29.50	25.80
GPRS (GMSK, 4 Tx slots)	27.50	24.50
EDGE (8PSK, 1 Tx slot)	28.00	26.00
EDGE (8PSK, 2 Tx slots)	26.50	24.80
EDGE (8PSK, 3 Tx slots)	24.00	22.00
EDGE (8PSK, 4 Tx slots)	23.00	21.00

Band / Mode			Average power(dBm)
WCDMA	Band V / IV / II	AMR / RMC 12.2Kbps	24.0
		HSDPA Subtest-1	23.0
		DC-HSDPA Subtest-1	23.0
		HSUPA Subtest-5	23.0
LTE		Band 17	24.0
		Band 5	24.0
		Band 4	24.0
		Band 2	24.0
		Band 7	24.0
Bluetooth		v3.0+EDR	12.0
		v4.0-LE	3.0

Band / Mode	Freq (MHz)	Channel	Average Power (dBm)				
			Full Power Mode				
			11b 1M / 2M	11b 5.5M / 11M	11g	HT20	VTH20
2.4GHz WLAN	2412	Ch 1	16.5	18.0	14.5	13.5	13.0
	2437	Ch 6	16.5	18.0	16.0	16.0	13.0
	2462	Ch 11	16.5	18.0	12.0	11.0	11.0

Band / Mode	Freq (MHz)	Channel	Average Power (dBm)			
			Reduced Power Mode			
			11b	11g	HT20	VTH20
2.4GHz WLAN	2412	Ch 1	16.0	14.5	13.5	13.0
	2437	Ch 6	16.0	16.0	16.0	13.0
	2462	Ch 11	16.0	12.0	11.0	11.0

Band / Mode	Freq (MHz)	Channel	Average Power (dBm)					
			Full Power Mode					
			11a	HT20	HT40	VHT20	VTH40	VTH80
5.2GHz WLAN	5180	Ch 36	17.50	17.50		17.50		
	5190	Ch 38			15.50		15.50	
	5200	Ch 40	17.50	17.50		17.50		
	5210	Ch 42						17.50
	5220	Ch 44	17.50	17.50		17.50		
	5230	Ch 46			17.50		17.50	
	5240	Ch 48	17.50	17.50		17.50		
5.3GHz WLAN	5260	Ch 52	17.00	17.00		17.00		
	5270	Ch 54			17.00		17.00	
	5280	Ch 56	17.00	17.00		17.00		
	5290	Ch 58						15.00
	5300	Ch 60	17.00	17.00		17.00		
	5310	Ch 62			15.00		15.00	
	5320	Ch 64	17.00	17.00		17.00		
5.5GHz WLAN	5500	Ch 100	17.50	17.50		17.50		
	5510	Ch 102			15.50		15.50	
	5520	Ch 104	17.50	17.50		17.50		
	5530	Ch 106						15.00
	5540	Ch 108	17.50	17.50		17.50		
	5550	Ch 110			17.50		17.50	
	5560	Ch 112	17.50	17.50		17.50		
	5580	Ch 116	17.50	17.50		17.50		
	5660	Ch 132	17.50	17.50		17.50		
	5670	Ch 134			17.50		17.50	
	5680	Ch 136	17.50	17.50		17.50		
	5700	Ch 140	14.50	14.50		14.50		
5.8GHz WLAN	5745	Ch 149	11.00	11.00		11.00		
	5755	Ch 151			10.00		10.00	
	5765	Ch 153	17.50	17.50		17.50		
	5775	Ch 155						9.50
	5785	Ch 157	17.50	17.50		17.50		
	5795	Ch 159			16.50		16.50	
	5805	Ch 161	17.50	17.50		17.50		
	5825	Ch 165	13.50	13.50		13.50		

Band / Mode	Freq (MHz)	Channel	average Power (dBm)					
			Repuce Power Mode					
			11a	HT20	HT40	VHT20	VTH40	VTH80
5.2GHz WLAN	5180	Ch 36	16.00	16.00		16.00		
	5190	Ch 38			15.50		15.50	
	5200	Ch 40	16.00	16.00		16.00		
	5210	Ch 42						16.00
	5220	Ch 44	16.00	16.00		16.00		
	5230	Ch 46			16.00		16.00	
	5240	Ch 48	16.00	16.00		16.00		
5.8GHz WLAN	5745	Ch 149	11.00	11.00		11.00		
	5755	Ch 151			10.00		10.00	
	5765	Ch 153	16.00	16.00		16.00		
	5775	Ch 155						9.50
	5785	Ch 157	16.00	16.00		16.00		
	5795	Ch 159			16.00		16.00	
	5805	Ch 161	16.00	16.00		16.00		
	5825	Ch 165	13.50	13.50		13.50		

4.3 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r03	
FCC ID	IHDT56QA1
Equipment Name	Mobile Cellular Phone
Operating Frequency Range of each LTE transmission band	LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 5: 824.7 MHz ~ 848.3 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 17: 5MHz, 10MHz LTE Band 5: 1.4MHz, 3MHz, 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

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

LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	Yes, When operating in hotspot mode that LTE B2 / B4 / B7 power reduction applied to satisfy SAR compliance.

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

LTE Band 17

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

LTE Band 5

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

LTE Band 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:

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

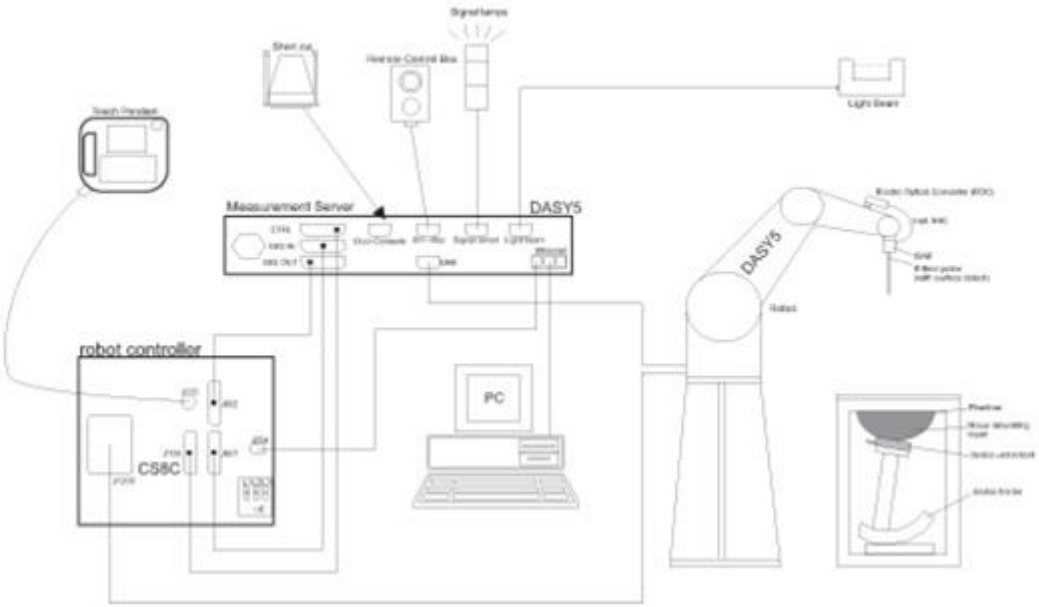
SAR is expressed in units of Watts per kilogram (W/kg)

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

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	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

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

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

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	1099	Nov. 11, 2013	Nov. 10, 2014
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	1008	Aug. 23, 2013	Aug. 22, 2014
SPEAG	5GHz System Validation Kit	D5GHzV2	1128	Jul. 24, 2013	Jul. 23, 2014
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	DAE4	914	Dec. 18, 2013	Dec. 17, 2014
SPEAG	Data Acquisition Electronics	DAE4	1279	Jan. 30, 2014	Jan. 29, 2015
SPEAG	Data Acquisition Electronics	DAE3	495	May. 08, 2013	May. 07, 2014
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	3770	Apr. 24, 2014	Apr. 23, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3925	Jun. 12, 2013	Jun. 11, 2014
SPEAG	Dosimetric E-Field Probe	EX3DV4	3925	May. 22, 2014	May. 21, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3954	Nov. 04, 2013	Nov. 03, 2014
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, 2016
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	DAK-3.5	1126	Jul. 23, 2013	Jul. 22, 2014
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	FSP 7	101131	Jul. 09, 2013	Jul. 08, 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	Head	22.5	0.880	40.797	0.89	41.90	-1.12	-2.63	±5	2014/5/4
750	Body	22.7	0.970	54.642	0.96	55.50	1.04	-1.55	±5	2014/5/11
750	Body	22.2	0.975	54.039	0.96	55.50	1.56	-2.63	±5	2014/5/14
835	Head	22.4	0.906	42.966	0.87	43.50	4.14	-1.23	±5	2014/5/5
835	Head	22.3	0.903	40.394	0.90	41.50	0.33	-2.67	±5	2014/5/15
835	Head	22.3	0.918	41.074	0.90	41.50	2.00	-1.03	±5	2014/7/27
835	Body	22.5	0.967	54.182	0.97	55.20	-0.31	-1.84	±5	2014/5/8
835	Body	22.3	0.954	52.753	0.97	55.20	-1.65	-4.43	±5	2014/5/15
835	Body	22.2	0.996	55.380	0.97	55.20	2.68	0.33	±5	2014/6/13
850	Body	22.3	0.963	54.498	0.97	55.20	-0.72	-1.27	±5	2014/7/28
1750	Head	22.2	1.405	39.044	1.37	40.10	2.55	-2.63	±5	2014/5/4
1750	Head	22.6	1.404	39.373	1.37	40.10	2.48	-1.81	±5	2014/6/17
1750	Body	22.7	1.523	51.635	1.49	53.40	2.21	-3.31	±5	2014/5/10
1750	Body	22.5	1.503	52.602	1.49	53.40	0.87	-1.49	±5	2014/5/13
1750	Body	22.6	1.528	51.762	1.49	53.40	2.55	-3.07	±5	2014/6/17
1900	Head	22.6	1.432	39.131	1.40	40.00	2.29	-2.17	±5	2014/5/3
1900	Head	22.3	1.403	41.313	1.40	40.00	0.21	3.28	±5	2014/7/28
1900	Body	22.6	1.530	52.859	1.52	53.30	0.66	-0.83	±5	2014/5/2
1900	Body	22.3	1.516	53.631	1.52	53.30	-0.26	0.62	±5	2014/5/8
1900	Body	22.6	1.526	52.813	1.52	53.30	0.39	-0.91	±5	2014/5/9
1900	Body	22.2	1.548	51.871	1.52	53.30	1.84	-2.68	±5	2014/5/12
1900	Body	22.3	1.544	52.320	1.52	53.30	1.58	-1.84	±5	2014/7/29
2450	Head	22.1	1.865	38.126	1.80	39.20	3.61	-2.74	±5	2014/5/14
2450	Head	22.3	1.880	37.800	1.80	39.20	4.44	-3.57	±5	2014/5/17
2450	Body	22.2	1.998	52.036	1.95	52.70	2.46	-1.26	±5	2014/5/14
2450	Body	22.4	2.000	54.000	1.95	52.70	2.56	2.47	±5	2014/5/17
2450	Body	22.4	1.922	53.185	1.95	52.70	-1.44	0.92	±5	2014/6/13
2600	Head	22.5	1.981	38.254	1.96	39.00	1.07	-1.91	±5	2014/5/4
2600	Head	22.5	1.970	38.084	1.96	39.00	0.51	-2.35	±5	2014/7/29
2600	Body	22.4	2.209	51.123	2.16	52.50	2.27	-2.62	±5	2014/5/11
2600	Body	22.6	2.165	53.823	2.16	52.50	0.23	2.52	±5	2014/5/14
2600	Body	22.5	2.201	52.823	2.16	52.50	1.90	0.62	±5	2014/7/29
5200	Head	22.3	4.793	35.493	4.66	36.00	2.85	-1.41	±5	2014/7/11
5200	Body	22.3	5.330	48.600	5.30	49.00	0.57	-0.82	±5	2014/5/19
5200	Body	22.4	5.287	48.755	5.30	49.00	-0.25	-0.50	±5	2014/7/12
5300	Head	22.5	4.920	35.315	4.76	35.90	3.36	-1.63	±5	2014/6/12
5300	Body	22.5	5.270	47.255	5.42	48.90	-2.77	-3.36	±5	2014/6/13
5600	Head	22.5	5.231	34.710	5.07	35.50	3.18	-2.23	±5	2014/6/12
5600	Body	22.5	5.653	46.801	5.77	45.50	-2.03	2.86	±5	2014/6/13
5800	Head	22.4	5.071	36.496	5.27	35.30	-3.78	3.39	±5	2014/7/12
5800	Body	22.4	6.120	47.381	6.00	48.20	2.00	-1.70	±5	2014/7/12

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 SAR (W/kg)	Targeted SAR (W/kg)	Normalized SAR (W/kg)	Deviation (%)
2014/5/4	750	Head	250	D750V3-1099	3925	495	2.03	8.42	8.12	-3.56
2014/5/11	750	Body	250	D750V3-1099	3955	1399	2.16	8.56	8.64	0.93
2014/5/14	750	Body	250	D750V3-1099	3770	914	2.31	8.56	9.24	7.94
2014/5/5	835	Head	250	D835V2-499	3935	495	2.23	9.13	8.92	-2.30
2014/5/15	835	Head	250	D835V2-499	3270	778	2.36	9.13	9.44	3.40
2014/7/27	835	Head	250	D835V2-499	3925	495	2.22	9.13	8.88	-2.74
2014/5/8	835	Body	250	D835V2-499	3270	778	2.44	9.46	9.76	3.17
2014/5/15	835	Body	250	D835V2-499	3270	778	2.40	9.46	9.60	1.48
2014/6/13	835	Body	250	D835V2-499	3770	914	2.46	9.46	9.84	4.02
2014/7/28	850	Body	250	D835V2-499	3925	495	2.20	9.46	8.80	-6.98
2014/5/4	1750	Head	250	D1750V2-1068	3270	778	8.82	37.30	35.28	-5.42
2014/6/17	1750	Head	250	D1750V2-1068	3270	778	8.60	37.30	34.40	-7.77
2014/5/10	1750	Body	250	D1750V2-1068	3270	778	8.91	37.50	35.64	-4.96
2014/5/13	1750	Body	250	D1750V2-1068	3770	914	9.94	37.50	39.76	6.03
2014/6/17	1750	Body	250	D1750V2-1068	3270	778	9.03	37.50	36.12	-3.68
2014/5/3	1900	Head	250	D1900V2-5d041	3270	778	9.70	41.00	38.80	-5.37
2014/7/28	1900	Head	250	D1900V2-5d041	3925	495	10.00	41.00	40.00	-2.44
2014/5/2	1900	Body	250	D1900V2-5d041	3270	778	9.44	41.00	37.76	-7.90
2014/5/8	1900	Body	250	D1900V2-5d041	3270	778	9.60	41.00	38.40	-6.34
2014/5/9	1900	Body	250	D1900V2-5d041	3270	778	9.66	41.00	38.64	-5.76
2014/5/12	1900	Body	250	D1900V2-5d041	3955	1399	9.47	41.00	37.88	-7.61
2014/7/29	1900	Body	250	D1900V2-5d041	3925	495	9.89	41.00	39.56	-3.51
2014/5/14	2450	Head	250	D2450V2-924	3935	1338	13.70	52.40	54.80	4.58
2014/5/17	2450	Head	250	D2450V2-924	3935	1338	13.80	52.40	55.20	5.34
2014/5/14	2450	Body	250	D2450V2-924	3935	1338	12.40	50.20	49.60	-1.20
2014/5/17	2450	Body	250	D2450V2-924	3935	1338	11.70	50.20	46.80	-6.77
2014/6/13	2450	Body	250	D2450V2-924	3954	1279	12.90	50.20	51.60	2.79
2014/5/4	2600	Head	250	D2600V2-1008	3935	495	15.60	58.80	62.40	6.12
2014/7/29	2600	Head	250	D2600V2-1008	3925	495	13.90	58.80	55.60	-5.44
2014/5/11	2600	Body	250	D2600V2-1008	3955	1399	13.30	55.20	53.20	-3.62
2014/5/14	2600	Body	250	D2600V2-1008	3935	1338	14.50	55.20	58.00	5.07
2014/7/29	2600	Body	250	D2600V2-1008	3925	495	12.70	55.20	50.80	-7.97
2014/7/11	5200	Head	100	D5GHzV2-1128	3935	1338	7.47	78.20	74.70	-4.48
2014/5/19	5200	Body	100	D5GHzV2-1128	3954	1279	7.44	73.40	74.40	1.36
2014/7/12	5200	Body	100	D5GHzV2-1128	3935	1338	7.31	73.40	73.10	-0.41
2014/6/12	5300	Head	100	D5GHzV2-1128	3954	1279	8.29	80.60	82.90	2.85
2014/6/13	5300	Body	100	D5GHzV2-1128	3954	1279	7.25	74.30	72.50	-2.42
2014/6/12	5600	Head	100	D5GHzV2-1128	3954	1279	7.66	80.50	76.60	-4.84
2014/6/13	5600	Body	100	D5GHzV2-1128	3954	1279	8.24	77.80	82.40	5.91
2014/7/12	5800	Head	100	D5GHzV2-1128	3935	1338	7.64	77.20	76.40	-1.04
2014/7/12	5800	Body	100	D5GHzV2-1128	3935	1338	7.30	72.20	73.00	1.11

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.

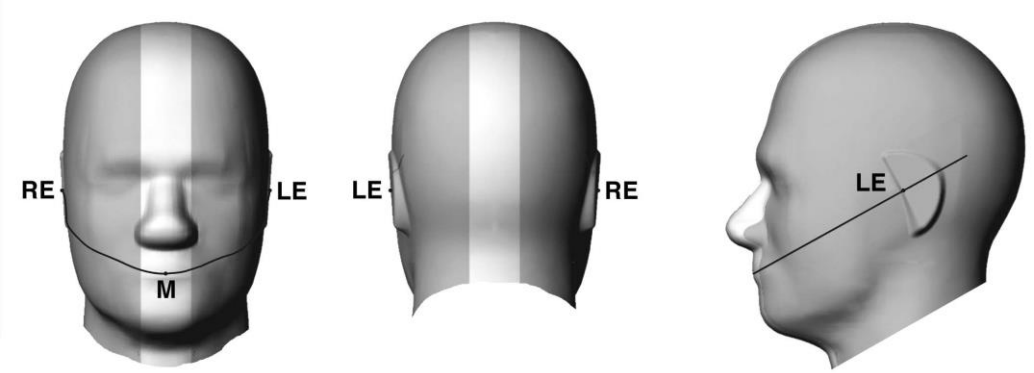


Fig 9.1.1 Front, back, and side views of SAM twin phantom

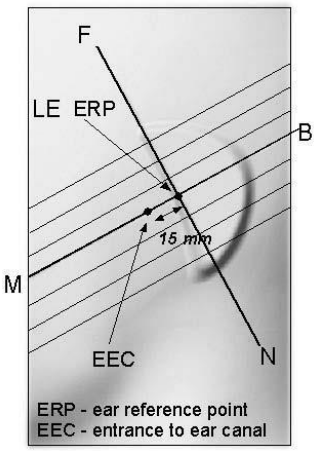


Fig 9.1.2 Close-up side view of phantom showing the ear region.

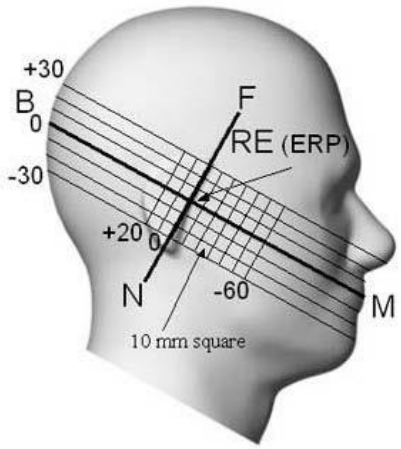


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

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.

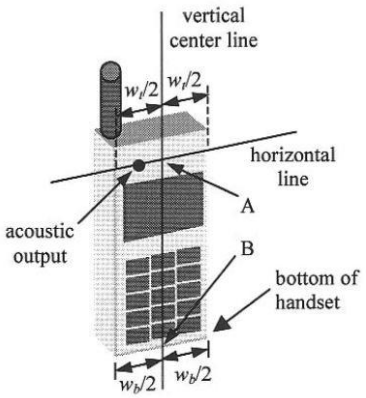


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

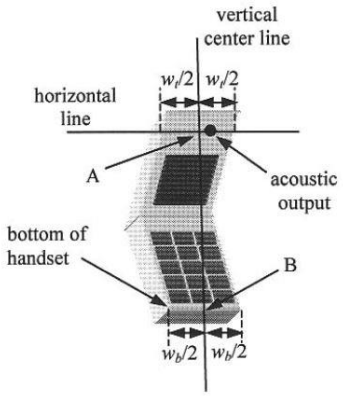


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

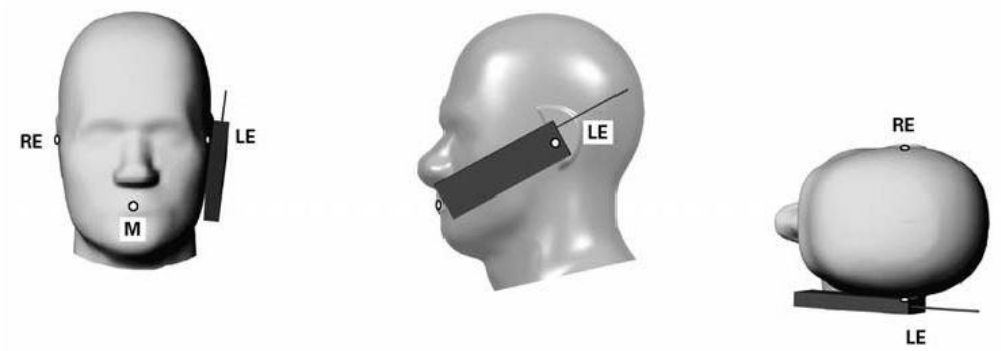


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

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

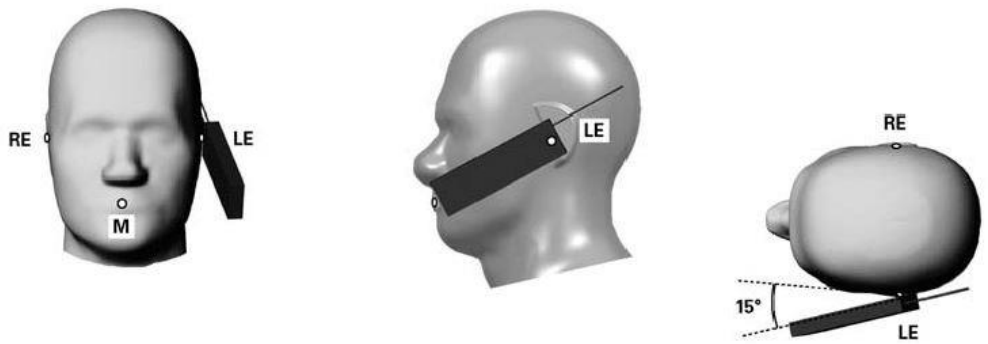


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

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.

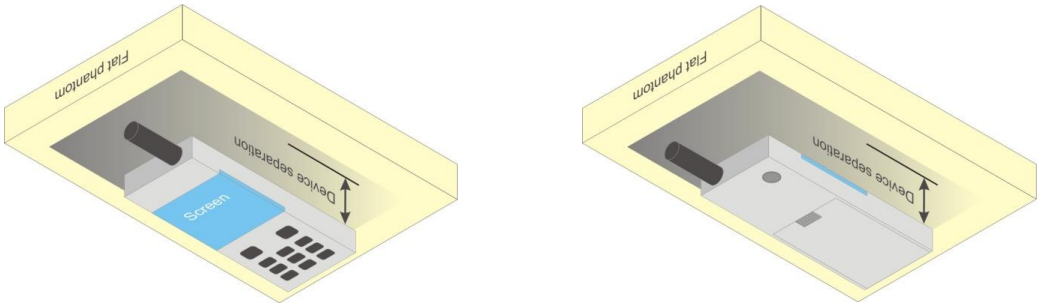


Fig 9.4 Body Worn Position

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 (2Tx 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 2 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)	32.32	32.37	32.72	33.50	23.32	23.37	23.72	24.50
GPRS (GMSK, 1 Tx slot) – CS1	32.31	32.33	32.79	33.50	23.31	23.33	23.79	24.50
GPRS (GMSK, 2 Tx slots) – CS1	31.25	31.33	31.49	32.50	25.25	25.33	25.49	26.50
GPRS (GMSK, 3 Tx slots) – CS1	28.25	28.30	28.40	29.50	23.99	24.04	24.14	25.24
GPRS (GMSK, 4 Tx slots) – CS1	26.48	26.50	26.48	27.50	23.48	23.50	23.48	24.50
EDGE (8PSK, 1 Tx slot) – MCS5	26.71	26.80	26.92	28.00	17.71	17.80	17.92	19.00
EDGE (8PSK, 2 Tx slots) – MCS5	25.31	25.33	25.44	26.50	19.31	19.33	19.44	20.50
EDGE (8PSK, 3 Tx slots) – MCS5	22.81	22.84	23.10	24.00	18.55	18.58	18.84	19.74
EDGE (8PSK, 4 Tx slots) – MCS5	21.70	21.79	21.89	23.00	18.70	18.79	18.89	20.00

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)	29.45	29.43	29.31	30.50	20.45	20.43	20.31	21.50
GPRS (GMSK, 1 Tx slot) – CS1	29.39	29.36	29.30	30.50	20.39	20.36	20.30	21.50
GPRS (GMSK, 2 Tx slots) – CS1	28.58	28.67	28.65	28.70	22.58	22.67	22.65	22.70
GPRS (GMSK, 3 Tx slots) – CS1	25.74	25.72	25.67	25.80	21.48	21.46	21.41	21.54
GPRS (GMSK, 4 Tx slots) – CS1	23.40	23.31	23.29	24.50	20.40	20.31	20.29	21.50
EDGE (8PSK, 1 Tx slot) – MCS5	25.83	25.81	25.79	26.00	16.83	16.81	16.79	17.00
EDGE (8PSK, 2 Tx slots) – MCS5	24.42	24.43	24.40	24.80	18.42	18.43	18.40	18.80
EDGE (8PSK, 3 Tx slots) – MCS5	21.88	21.92	21.84	22.00	17.62	17.66	17.58	17.74
EDGE (8PSK, 4 Tx slots) – MCS5	20.70	20.81	20.74	21.00	17.70	17.81	17.74	18.00

<For FCC Additional Test Channel>

Band GSM850	Burst Average Power (dBm)		Tune-up Limit (dBm)	Frame-Average Power (dBm)		Tune-up Limit (dBm)
TX Channel	148	231		148	231	
Frequency (MHz)	828.2	844.8		828.2	844.8	
GPRS (GMSK, 2 Tx slots) – CS1	31.56	31.80	32.5	25.56	25.80	26.50

Band GSM1900	Burst Average Power (dBm)		Tune-up Limit (dBm)	Frame-Average Power (dBm)		Tune-up Limit (dBm)
TX Channel	561	761		561	761	
Frequency (MHz)	1860	1900		1860	1900	
GPRS (GMSK, 2 Tx slots) – CS1	28.54	28.47	28.70	22.54	22.47	22.70

<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	Processes	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.		

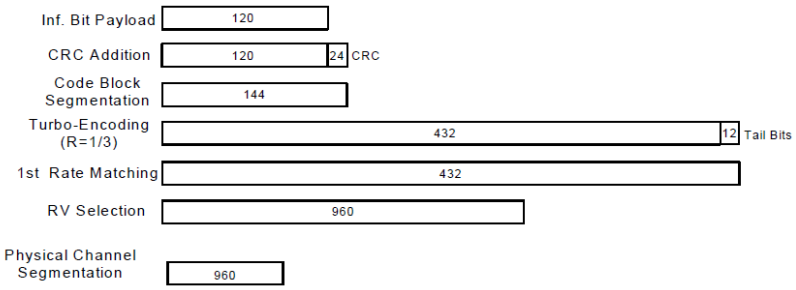


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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			WCDMA IV		
TX Channel			4132	4182	4233	9262	9400	9538	1312	1413	1513
Rx Channel			4357	4407	4458	9662	9800	9938	1537	1638	1738
Frequency (MHz)			826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6
MPR (dB)	3GPP Rel 99	AMR 12.2Kbps	22.78	22.79	22.90	22.69	22.67	22.88	22.76	22.81	22.85
	3GPP Rel 99	RMC 12.2Kbps	22.87	22.84	23.01	22.73	22.80	22.90	22.78	22.83	22.86
0	3GPP Rel 6	HSDPA Subtest-1	21.94	21.98	22.12	21.92	21.91	21.99	21.94	21.97	21.99
0	3GPP Rel 6	HSDPA Subtest-2	21.92	21.91	22.06	21.89	21.84	21.98	21.89	21.98	21.98
0.5	3GPP Rel 6	HSDPA Subtest-3	21.38	21.38	21.43	21.32	21.30	21.50	21.36	21.41	21.42
0.5	3GPP Rel 6	HSDPA Subtest-4	21.32	21.33	21.43	21.27	21.27	21.47	21.29	21.40	21.41
0	3GPP Rel 8	DC-HSDPA Subtest-1	21.89	21.82	22.03	21.82	21.79	21.94	21.85	21.87	21.95
0	3GPP Rel 8	DC-HSDPA Subtest-2	21.88	21.83	22.02	21.72	21.78	21.92	21.78	21.84	21.86
0.5	3GPP Rel 8	DC-HSDPA Subtest-3	21.23	21.27	21.42	21.21	21.19	21.38	21.28	21.33	21.36
0.5	3GPP Rel 8	DC-HSDPA Subtest-4	21.19	21.25	21.42	21.19	21.15	21.36	21.24	21.31	21.27
0	3GPP Rel 6	HSUPA Subtest-1	21.50	21.51	21.61	21.22	21.35	21.57	21.22	21.47	21.71
2	3GPP Rel 6	HSUPA Subtest-2	20.56	20.68	20.91	20.40	20.62	20.93	20.48	20.74	20.96
1	3GPP Rel 6	HSUPA Subtest-3	20.56	20.64	20.86	20.37	20.58	20.74	20.34	20.62	20.87
2	3GPP Rel 6	HSUPA Subtest-4	21.50	21.63	21.73	21.05	21.17	21.41	21.12	21.18	21.43
0	3GPP Rel 6	HSUPA Subtest-5	21.79	21.85	22.06	21.73	21.82	21.89	21.82	21.87	21.92

<For FCC Additional Test Channel>

Band		WCDMA V		WCDMA II	
TX Channel		4141	4224	9300	9500
Frequency (MHz)		828.2	844.8	1860	1900
3GPP Rel 99	RMC 12.2Kbps	22.96	22.95	22.49	22.80

<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 17 Conducted Power>

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				23780	23790	23800		
Frequency (MHz)				709	710	711		
10	QPSK	1	0	22.95	22.96	22.86	24.0	0
10	QPSK	1	24	22.91	22.76	22.79		
10	QPSK	1	49	22.88	22.86	22.84		
10	QPSK	25	0	21.91	21.91	21.86	23.0	1
10	QPSK	25	12	21.91	21.92	21.88		
10	QPSK	25	24	21.87	21.82	21.86		
10	QPSK	50	0	22.00	21.99	21.99		
10	16QAM	1	0	21.94	21.94	21.86	23.0	1
10	16QAM	1	24	21.85	21.77	21.75		
10	16QAM	1	49	21.86	21.85	21.85		
10	16QAM	25	0	20.92	20.90	20.93	22.0	2
10	16QAM	25	12	20.97	20.93	20.83		
10	16QAM	25	24	20.86	20.87	20.86		
10	16QAM	50	0	20.99	20.94	20.98		
Channel				23755	23790	23825	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	22.90	22.85	22.78	24.0	0
5	QPSK	1	12	22.89	22.78	22.77		
5	QPSK	1	24	22.89	22.84	22.77		
5	QPSK	12	0	21.99	21.88	21.87	23.0	1
5	QPSK	12	6	21.93	21.91	21.86		
5	QPSK	12	11	21.97	21.86	21.86		
5	QPSK	25	0	21.89	21.93	21.85		
5	16QAM	1	0	21.92	21.80	21.78	23.0	1
5	16QAM	1	12	21.84	21.72	21.76		
5	16QAM	1	24	21.91	21.77	21.77		
5	16QAM	12	0	21.00	20.93	20.87	22.0	2
5	16QAM	12	6	20.94	20.95	20.86		
5	16QAM	12	11	20.94	20.87	20.89		
5	16QAM	25	0	20.94	20.93	20.86		

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.87	22.64	22.63	24.0	0
10	QPSK	1	24	22.59	22.57	22.59		
10	QPSK	1	49	22.64	22.63	22.62		
10	QPSK	25	0	21.73	21.99	21.98	23.0	1
10	QPSK	25	12	21.61	21.96	21.96		
10	QPSK	25	24	21.65	21.95	21.97		
10	QPSK	50	0	21.76	21.72	21.91		
10	16QAM	1	0	21.81	21.78	21.76	23.0	1
10	16QAM	1	24	21.60	21.59	21.74		
10	16QAM	1	49	21.65	21.76	21.75		
10	16QAM	25	0	20.74	20.98	20.99	22.0	2
10	16QAM	25	12	20.71	20.95	20.96		
10	16QAM	25	24	20.66	20.99	20.98		
10	16QAM	50	0	20.71	20.74	20.87		
Channel				20425	20525	20625	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.81	22.66	22.62	24.0	0
5	QPSK	1	12	22.69	22.57	22.61		
5	QPSK	1	24	22.61	22.65	22.59		
5	QPSK	12	0	21.89	21.96	21.96	23.0	1
5	QPSK	12	6	21.85	21.97	21.98		
5	QPSK	12	11	21.78	21.96	21.99		
5	QPSK	25	0	21.74	21.70	21.77		
5	16QAM	1	0	21.75	21.65	21.80	23.0	1
5	16QAM	1	12	21.67	21.53	21.79		
5	16QAM	1	24	21.58	21.57	21.74		
5	16QAM	12	0	20.92	20.99	20.98	22.0	2
5	16QAM	12	6	20.88	20.96	20.96		
5	16QAM	12	11	20.78	20.97	20.96		
5	16QAM	25	0	20.77	20.68	20.80		
Channel				20415	20525	20635	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.80	22.66	22.58	24.0	0
3	QPSK	1	7	22.79	22.59	22.51		
3	QPSK	1	14	22.72	22.63	22.57		
3	QPSK	8	0	21.85	21.96	21.98	23.0	1
3	QPSK	8	4	21.86	21.97	21.97		
3	QPSK	8	7	21.87	21.98	21.95		
3	QPSK	15	0	21.92	21.72	21.85		
3	16QAM	1	0	21.78	21.66	21.53	23.0	1
3	16QAM	1	7	21.77	21.56	21.52		
3	16QAM	1	14	21.72	21.65	21.50		
3	16QAM	8	0	20.91	20.96	20.99	22.0	2
3	16QAM	8	4	20.87	20.99	20.90		
3	16QAM	8	7	20.89	21.00	20.98		
3	16QAM	15	0	20.85	20.67	20.82		

Channel				20407	20525	20643	Tune up Limit (dBm)	Target MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.85	22.70	22.86	24.0	0
1.4	QPSK	1	2	22.83	22.66	22.79		
1.4	QPSK	1	5	22.82	22.67	22.85		
1.4	QPSK	3	0	22.84	22.67	22.85		
1.4	QPSK	3	1	22.84	22.68	22.84		
1.4	QPSK	3	2	22.83	22.69	22.84		
1.4	QPSK	6	0	21.86	21.77	21.89	23.0	1
1.4	16QAM	1	0	21.87	21.68	21.86	23.0	1
1.4	16QAM	1	2	21.85	21.66	21.80		
1.4	16QAM	1	5	21.86	21.61	21.85		
1.4	16QAM	3	0	21.86	21.67	21.84		
1.4	16QAM	3	1	21.86	21.66	21.80		
1.4	16QAM	3	2	21.85	21.65	21.79		
1.4	16QAM	6	0	20.80	20.61	20.79	22.0	2

<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	22.85	22.89	22.99	24.0	0
20	QPSK	1	49	22.81	22.87	22.89		
20	QPSK	1	99	22.84	22.84	22.77		
20	QPSK	50	0	21.93	21.96	21.97	23.0	1
20	QPSK	50	24	21.92	21.91	21.90		
20	QPSK	50	49	21.88	21.94	21.91		
20	QPSK	100	0	21.87	21.95	21.93		
20	16QAM	1	0	21.79	21.87	21.94	23.0	1
20	16QAM	1	49	21.77	21.84	21.80		
20	16QAM	1	99	21.78	21.76	21.73		
20	16QAM	50	0	20.80	20.89	20.94	22.0	2
20	16QAM	50	24	20.80	20.85	20.86		
20	16QAM	50	49	20.83	20.88	20.82		
20	16QAM	100	0	20.87	20.91	20.92		
Channel				20025	20175	20325	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.77	22.86	22.94	24.0	0
15	QPSK	1	37	22.76	22.85	22.87		
15	QPSK	1	74	22.76	22.83	22.79		
15	QPSK	36	0	21.78	21.92	21.91	23.0	1
15	QPSK	36	18	21.76	21.89	21.93		
15	QPSK	36	37	21.82	21.84	21.89		
15	QPSK	75	0	21.87	21.92	21.98		
15	16QAM	1	0	21.77	21.85	21.90	23.0	1
15	16QAM	1	37	21.76	21.79	21.80		
15	16QAM	1	74	21.75	21.74	21.75		
15	16QAM	36	0	20.77	20.86	20.89	22.0	2
15	16QAM	36	18	20.75	20.84	20.85		
15	16QAM	36	37	20.73	20.82	20.84		
15	16QAM	75	0	20.80	20.89	20.90		
Channel				20000	20175	20350	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.75	22.89	22.86	24.0	0
10	QPSK	1	24	22.73	22.82	22.80		
10	QPSK	1	49	22.73	22.82	22.81		
10	QPSK	25	0	21.78	21.86	21.94	23.0	1
10	QPSK	25	12	21.82	21.87	21.91		
10	QPSK	25	24	21.83	21.88	21.81		
10	QPSK	50	0	21.84	21.96	21.87		
10	16QAM	1	0	21.77	21.85	21.85	23.0	1
10	16QAM	1	24	21.71	21.84	21.79		
10	16QAM	1	49	21.74	21.79	21.75		
10	16QAM	25	0	20.78	20.89	20.89	22.0	2
10	16QAM	25	12	20.78	20.90	20.89		
10	16QAM	25	24	20.77	20.85	20.87		
10	16QAM	50	0	20.77	20.87	20.83		

Channel				19975	20175	20375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.74	22.85	22.86	24.0	0
5	QPSK	1	12	22.71	22.81	22.83		
5	QPSK	1	24	22.73	22.84	22.77		
5	QPSK	12	0	21.76	21.92	21.91	23.0	1
5	QPSK	12	6	21.80	21.87	21.87		
5	QPSK	12	11	21.81	21.90	21.86		
5	QPSK	25	0	21.81	21.91	21.86		
5	16QAM	1	0	21.72	21.99	21.82	23.0	1
5	16QAM	1	12	21.69	21.80	21.78		
5	16QAM	1	24	21.68	21.76	21.73		
5	16QAM	12	0	20.79	20.91	20.90	22.0	2
5	16QAM	12	6	20.78	20.88	20.87		
5	16QAM	12	11	20.77	20.86	20.87		
5	16QAM	25	0	20.75	20.86	20.88		
Channel				19965	20175	20385	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.76	22.84	22.86	24.0	0
3	QPSK	1	7	22.73	22.80	22.81		
3	QPSK	1	14	22.75	22.83	22.85		
3	QPSK	8	0	21.81	21.87	21.87	23.0	1
3	QPSK	8	4	21.78	21.87	21.89		
3	QPSK	8	7	21.79	21.87	21.85		
3	QPSK	15	0	21.82	21.93	21.87		
3	16QAM	1	0	21.74	21.82	21.83	23.0	1
3	16QAM	1	7	21.67	21.81	21.77		
3	16QAM	1	14	21.72	21.81	21.81		
3	16QAM	8	0	20.80	20.91	20.87	22.0	2
3	16QAM	8	4	20.78	20.88	20.90		
3	16QAM	8	7	20.80	20.88	20.86		
3	16QAM	15	0	20.76	20.86	20.84		
Channel				19957	20175	20393	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.79	22.94	22.88	24.0	0
1.4	QPSK	1	2	22.77	22.88	22.87		
1.4	QPSK	1	5	22.76	22.91	22.87		
1.4	QPSK	3	0	22.77	22.93	22.87		
1.4	QPSK	3	1	22.78	22.87	22.86		
1.4	QPSK	3	2	22.77	22.88	22.83		
1.4	QPSK	6	0	21.84	21.92	21.92	23.0	1
1.4	16QAM	1	0	21.74	21.87	21.89	23.0	1
1.4	16QAM	1	2	21.71	21.85	21.78		
1.4	16QAM	1	5	21.71	21.81	21.82		
1.4	16QAM	3	0	21.73	21.86	21.88		
1.4	16QAM	3	1	21.73	21.84	21.83		
1.4	16QAM	3	2	21.72	21.85	21.85		
1.4	16QAM	6	0	20.67	20.80	20.74	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	22.96	22.99	22.98	24.0	0
20	QPSK	1	49	22.86	22.91	22.97		
20	QPSK	1	99	22.80	22.98	22.96		
20	QPSK	50	0	21.96	21.99	22.00	23.0	1
20	QPSK	50	24	21.95	21.97	21.98		
20	QPSK	50	49	21.96	21.99	21.98		
20	QPSK	100	0	21.93	21.98	21.97		
20	16QAM	1	0	21.91	21.96	21.96	23.0	1
20	16QAM	1	49	21.85	21.90	21.92		
20	16QAM	1	99	21.75	21.94	21.89		
20	16QAM	50	0	20.86	20.86	20.93	22.0	2
20	16QAM	50	24	20.84	20.89	20.92		
20	16QAM	50	49	20.91	20.86	20.88		
20	16QAM	100	0	20.84	20.92	20.98		
Channel				18675	18900	19125	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.93	22.95	22.97	24.0	0
15	QPSK	1	37	22.83	22.94	22.96		
15	QPSK	1	74	22.86	22.90	22.96		
15	QPSK	36	0	21.89	21.98	21.98	23.0	1
15	QPSK	36	18	21.85	21.93	21.97		
15	QPSK	36	37	21.88	21.93	21.92		
15	QPSK	75	0	21.88	21.96	21.96		
15	16QAM	1	0	21.84	21.87	21.97	23.0	1
15	16QAM	1	37	21.80	21.86	21.93		
15	16QAM	1	74	21.79	21.87	21.91		
15	16QAM	36	0	20.80	20.90	20.91	22.0	2
15	16QAM	36	18	20.77	20.90	20.90		
15	16QAM	36	37	20.80	20.83	20.89		
15	16QAM	75	0	20.84	20.92	20.87		
Channel				18650	18900	19150	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.87	22.93	22.98	24.0	0
10	QPSK	1	24	22.74	22.92	22.98		
10	QPSK	1	49	22.79	22.92	22.95		
10	QPSK	25	0	21.89	21.97	21.96	23.0	1
10	QPSK	25	12	21.81	21.94	21.91		
10	QPSK	25	24	21.81	21.94	21.98		
10	QPSK	50	0	21.85	21.98	21.96		
10	16QAM	1	0	21.85	21.86	21.95	23.0	1
10	16QAM	1	24	21.74	21.85	21.90		
10	16QAM	1	49	21.81	21.84	21.91		
10	16QAM	25	0	20.88	20.94	20.99	22.0	2
10	16QAM	25	12	20.78	20.90	20.90		
10	16QAM	25	24	20.82	20.91	20.96		
10	16QAM	50	0	20.76	20.90	20.90		

Channel				18625	18900	19175	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.86	22.88	22.98	24.0	0
5	QPSK	1	12	22.85	22.87	22.92		
5	QPSK	1	24	22.81	22.87	22.96		
5	QPSK	12	0	21.93	21.99	21.93	23.0	1
5	QPSK	12	6	21.86	21.92	21.99		
5	QPSK	12	11	21.87	21.95	21.98		
5	QPSK	25	0	21.88	21.96	22.00		
5	16QAM	1	0	21.80	21.87	21.98	23.0	1
5	16QAM	1	12	21.79	21.86	21.89		
5	16QAM	1	24	21.68	21.82	21.90		
5	16QAM	12	0	20.87	20.93	20.93	22.0	2
5	16QAM	12	6	20.86	20.92	20.94		
5	16QAM	12	11	20.87	20.92	20.95		
5	16QAM	25	0	20.86	20.94	20.95		
Channel				18615	18900	19185	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.93	22.92	22.98	24.0	0
3	QPSK	1	7	22.85	22.91	22.96		
3	QPSK	1	14	22.92	22.89	22.98		
3	QPSK	8	0	21.87	21.98	21.98	23.0	1
3	QPSK	8	4	21.89	21.97	21.98		
3	QPSK	8	7	21.90	21.98	21.96		
3	QPSK	15	0	21.90	22.00	21.97		
3	16QAM	1	0	21.82	21.91	21.95	23.0	1
3	16QAM	1	7	21.79	21.86	21.85		
3	16QAM	1	14	21.81	21.87	21.94		
3	16QAM	8	0	20.90	20.96	20.99	22.0	2
3	16QAM	8	4	20.88	20.92	20.98		
3	16QAM	8	7	20.86	20.95	21.00		
3	16QAM	15	0	20.84	20.91	20.94		
Channel				18607	18900	19193	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.96	22.99	22.96	24.0	0
1.4	QPSK	1	2	22.87	22.96	22.98		
1.4	QPSK	1	5	22.94	22.97	22.98		
1.4	QPSK	3	0	22.95	22.99	22.97		
1.4	QPSK	3	1	22.89	22.99	22.94		
1.4	QPSK	3	2	22.88	22.98	22.96		
1.4	QPSK	6	0	21.97	22.00	21.98	23.0	1
1.4	16QAM	1	0	21.91	21.95	21.98	23.0	1
1.4	16QAM	1	2	21.81	21.94	21.97		
1.4	16QAM	1	5	21.81	21.89	21.96		
1.4	16QAM	3	0	21.90	21.92	21.97		
1.4	16QAM	3	1	21.82	21.93	21.96		
1.4	16QAM	3	2	21.81	21.92	21.97		
1.4	16QAM	6	0	20.72	20.83	20.91	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	22.95	22.99	22.98	24.0	0
20	QPSK	1	49	22.90	22.98	22.94		
20	QPSK	1	99	22.94	22.97	22.97		
20	QPSK	50	0	21.94	21.98	21.96	23.0	1
20	QPSK	50	24	21.90	21.97	21.84		
20	QPSK	50	49	21.94	21.94	21.96		
20	QPSK	100	0	21.94	22.00	21.91		
20	16QAM	1	0	21.89	21.95	21.96	23.0	1
20	16QAM	1	49	21.84	21.89	21.85		
20	16QAM	1	99	21.88	21.94	21.95		
20	16QAM	50	0	20.90	20.89	20.81	22.0	2
20	16QAM	50	24	20.92	20.94	20.77		
20	16QAM	50	49	20.89	20.99	20.95		
20	16QAM	100	0	20.87	20.91	20.81		
Channel				20825	21100	21375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	22.97	22.96	22.97	24.0	0
15	QPSK	1	37	22.96	22.95	22.92		
15	QPSK	1	74	22.95	22.95	22.96		
15	QPSK	36	0	21.96	22.00	21.84	23.0	1
15	QPSK	36	18	21.96	21.94	21.93		
15	QPSK	36	37	21.98	21.96	21.98		
15	QPSK	75	0	21.99	21.94	21.87		
15	16QAM	1	0	21.88	21.92	21.98	23.0	1
15	16QAM	1	37	21.87	21.91	21.86		
15	16QAM	1	74	21.85	21.91	21.97		
15	16QAM	36	0	20.98	20.91	20.76	22.0	2
15	16QAM	36	18	20.89	20.92	20.85		
15	16QAM	36	37	20.94	20.94	20.95		
15	16QAM	75	0	21.00	20.91	20.84		
Channel				20800	21100	21400	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	22.97	22.98	22.99	24.0	0
10	QPSK	1	24	22.96	22.94	22.95		
10	QPSK	1	49	22.92	22.97	22.98		
10	QPSK	25	0	21.92	21.98	22.00	23.0	1
10	QPSK	25	12	21.97	21.96	21.94		
10	QPSK	25	24	21.84	21.99	21.97		
10	QPSK	50	0	21.92	21.98	21.96		
10	16QAM	1	0	21.88	21.92	21.96	23.0	1
10	16QAM	1	24	21.87	21.86	21.87		
10	16QAM	1	49	21.83	21.90	21.95		
10	16QAM	25	0	21.00	20.98	20.93	22.0	2
10	16QAM	25	12	21.00	21.00	20.96		
10	16QAM	25	24	20.88	21.00	20.98		
10	16QAM	50	0	20.89	20.95	20.95		

Channel				20775	21100	21425	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	22.99	22.98	22.98	24.0	0
5	QPSK	1	12	22.96	22.93	22.94		
5	QPSK	1	24	22.98	22.97	22.97		
5	QPSK	12	0	21.91	21.97	21.97	23.0	1
5	QPSK	12	6	21.92	22.00	21.97		
5	QPSK	12	11	21.97	21.99	21.98		
5	QPSK	25	0	21.92	21.94	22.00		
5	16QAM	1	0	21.91	21.89	21.95	23.0	1
5	16QAM	1	12	21.84	21.88	21.89		
5	16QAM	1	24	21.90	21.88	21.94		
5	16QAM	12	0	20.98	20.99	20.99	22.0	2
5	16QAM	12	6	20.96	21.00	21.00		
5	16QAM	12	11	21.00	20.98	21.00		
5	16QAM	25	0	20.97	20.96	20.99		

<For FCC Additional Test Channel>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20867	21333		
Frequency (MHz)				2511.7	2558.3		
20	QPSK	1	0	23.29	23.40	24.0	0

<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	10.30	8.34	8.35
	CH 39	2441	11.96	10.13	10.10
	CH 78	2480	10.04	8.15	8.15

<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.

<Full Power Mode WLAN Conducted Power>

General Note:

1. For IEEE802.11a/b/g SAR testing, highest average RF output power channel for the lowest data rate for 802.11a/b were selected for SAR evaluation. 802.11g 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 IEEE802.11n/ac, SAR testing can be conducted on channel with the highest output power when taking into consideration tune-up tolerance for same test configuration that was identified during SAR evaluations for IEEE802.11a/b/g (as applicable) provided bandwidth and test position are the same.
3. For IEEE802.11n/a with multiple channel BW configurations, highest channel BW configuration with highest output power limit shall be tested.
4. Testing of lower BW configurations is not required when the maximum average output of the default test channels in each lower BW configuration is less than 1/4dB higher than the default test channel in the highest BW configuration.

<2.4GHz WLAN>

Mode	Channel	Frequency (MHz)	Average power (dBm)			
			Data Rate			
			1Mbps	2Mbps	5.5Mbps	11Mbps
802.11b	CH 1	2412	16.12	16.06	17.70	17.33
	CH 6	2437	16.33	16.24	17.89	17.48
	CH 11	2462	16.25	16.18	17.85	17.36

Mode	Channel	Frequency (MHz)	Average power (dBm)							
			Data Rate							
			6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
802.11g	CH 1	2412	14.28	14.27	14.18	14.07	14.17	14.24	14.31	14.26
	CH 6	2437	15.67	15.44	15.50	15.47	14.57	14.64	14.66	13.67
	CH 11	2462	11.67	11.62	11.66	11.54	11.72	11.62	11.67	11.65

Mode	Channel	Frequency (MHz)	Average power (dBm)							
			MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT20	CH 1	2412	13.31	13.19	13.24	13.18	13.23	13.23	13.48	12.83
	CH 6	2437	15.84	15.81	15.43	14.89	14.55	14.01	13.24	12.18
	CH 11	2462	10.64	10.61	10.52	10.54	10.61	10.59	10.55	10.57

Mode	Channel	Frequency (MHz)	Average Power (dBm)								
			MCS Index								
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac-VHT20	CH 1	2412	12.52	12.44	12.21	12.17	11.04	11.06	9.04	8.89	7.98
	CH 6	2437	13.00	12.93	12.52	12.00	11.58	11.14	9.98	8.80	8.84
	CH 11	2462	10.95	10.89	10.88	10.33	10.83	10.79	9.63	8.45	8.49

<5GHz WLAN>

Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate							
			6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
802.11a	CH 36	5180	17.48	17.40	17.44	17.48	17.48	17.46	17.46	15.97
	CH 40	5200	17.29	17.25	17.21	17.20	17.15	17.13	17.10	17.10
	CH 44	5220	17.21	17.17	17.20	17.14	17.19	17.17	17.15	15.66
	CH 48	5240	17.25	17.15	17.19	17.22	17.24	17.21	17.16	15.80
	CH 52	5260	16.88	16.73	16.74	16.73	16.76	16.66	16.71	15.37
	CH 56	5280	16.85	16.83	16.84	16.83	16.86	16.76	16.81	15.47
	CH 60	5300	16.92	16.85	16.86	16.85	16.88	16.78	16.83	15.49
	CH 64	5320	16.84	16.78	16.79	16.78	16.81	16.71	16.76	15.42
	CH 100	5500	17.19	17.05	17.10	17.04	17.11	16.08	15.32	14.45
	CH 104	5520	17.15	17.08	17.13	17.07	17.14	16.11	15.35	14.48
	CH 108	5540	17.15	17.11	17.16	17.10	17.17	16.14	15.38	14.51
	CH 112	5560	17.22	17.14	17.19	17.13	17.20	16.17	15.41	14.54
	CH 116	5580	17.21	17.15	17.20	17.14	17.21	16.18	15.42	14.55
	CH 132	5660	16.92	16.78	16.83	16.77	16.84	15.81	15.05	14.18
	CH 136	5680	16.68	16.48	16.53	16.47	16.54	15.51	14.75	13.88
	CH 140	5700	14.38	14.30	14.34	14.32	14.40	14.26	14.23	14.24
	CH 149	5745	10.48	10.47	10.47	10.47	10.36	10.43	10.45	10.46
	CH 153	5765	17.03	16.98	16.94	15.92	16.88	16.73	15.65	14.77
	CH 157	5785	16.96	16.82	16.85	16.75	16.69	15.67	14.66	13.86
	CH 161	5805	17.25	17.18	16.16	17.12	16.97	15.89	15.01	14.34
	CH 165	5825	12.06	12.03	12.04	12.04	12.05	12.03	12.05	12.05

Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT20	CH 36	5180	17.49	17.48	17.48	17.45	17.43	17.45	16.07	13.86
	CH 40	5200	17.39	17.35	17.31	17.25	17.12	17.15	17.19	17.17
	CH 44	5220	17.31	17.29	17.33	17.26	17.23	17.30	15.94	13.87
	CH 48	5240	17.26	17.25	17.23	17.16	17.14	17.25	15.90	13.88
	CH 52	5260	16.87	16.77	16.84	16.76	16.81	16.80	15.43	13.42
	CH 56	5280	16.97	16.87	16.94	16.86	16.91	16.90	15.53	13.52
	CH 60	5300	16.73	16.60	16.67	16.59	16.64	16.63	15.26	13.25
	CH 64	5320	16.71	16.58	16.65	16.57	16.62	16.61	15.24	13.23
	CH 100	5500	16.22	16.16	16.21	16.06	16.08	15.28	14.36	13.22
	CH 104	5520	16.66	16.62	16.67	16.52	16.54	15.74	14.82	13.68
	CH 108	5540	16.87	16.83	16.85	16.73	16.75	15.95	15.03	13.89
	CH 112	5560	16.89	16.88	16.83	16.78	16.80	16.00	15.08	13.94
	CH 116	5580	17.01	16.88	16.88	16.85	15.99	15.19	14.27	13.13
	CH 132	5660	16.77	16.54	16.54	16.51	15.65	14.85	13.93	12.79
	CH 136	5680	16.47	16.24	16.24	16.21	15.35	14.55	13.63	12.49
	CH 140	5700	13.71	13.61	13.68	13.44	13.68	13.70	13.58	13.01
	CH 149	5745	10.71	10.69	10.69	10.70	10.69	10.70	10.66	10.67
	CH 153	5765	17.01	16.92	16.96	16.94	16.05	14.98	14.19	13.15
	CH 157	5785	16.93	16.91	16.91	16.90	16.01	14.96	14.12	13.13
	CH 161	5805	17.15	17.08	17.12	17.10	16.21	15.14	14.35	13.31
	CH 165	5825	12.88	12.87	12.83	12.85	12.83	12.85	12.86	12.83

Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT40	CH 38	5190	13.87	13.81	13.82	13.86	13.85	13.71	13.85	13.73
	CH 46	5230	17.49	17.31	17.30	17.33	17.36	17.30	15.94	14.01
	CH 54	5270	16.84	16.79	16.81	16.79	16.81	16.76	15.64	13.50
	CH 62	5310	14.60	14.63	14.60	14.58	14.56	14.56	14.68	13.27
	CH 102	5510	14.65	14.65	14.63	14.66	14.70	14.64	14.77	14.64
	CH 110	5550	17.14	17.06	17.02	17.03	16.95	16.01	15.45	14.57
	CH 134	5670	17.14	17.06	17.02	17.03	16.95	16.01	15.45	14.57
	CH 151	5755	9.50	9.45	9.48	9.46	9.48	9.45	9.45	9.48
	CH 159	5795	15.92	15.89	15.87	15.90	15.90	15.05	14.21	13.10

Mode	Channel	Frequency (MHz)	Average Power (dBm)								
			MCS Index								
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac-VHT20	CH 36	5180	17.49	17.43	17.48	17.41	17.33	17.43	16.14	15.14	13.87
	CH 40	5200	17.30	17.25	17.27	17.15	17.13	17.05	17.07	17.01	17.03
	CH 44	5220	17.23	17.18	17.20	17.22	17.12	17.21	16.13	15.04	13.84
	CH 48	5240	17.34	17.33	17.30	17.32	17.22	17.31	16.23	15.14	13.94
	CH 52	5260	16.91	16.89	16.88	16.79	16.81	16.87	15.36	14.46	13.56
	CH 56	5280	16.85	16.80	16.79	16.70	16.72	16.78	15.27	14.37	13.47
	CH 60	5300	17.00	16.99	16.96	16.91	16.93	16.99	15.48	14.58	13.68
	CH 64	5320	16.78	16.72	16.71	16.62	16.64	16.70	15.19	14.29	13.39
	CH 100	5500	17.15	17.14	17.11	17.07	16.08	15.42	14.46	13.39	12.28
	CH 104	5520	17.14	17.11	17.08	17.04	16.05	15.39	14.43	13.36	12.25
	CH 108	5540	17.14	17.08	17.05	17.01	16.02	15.36	14.40	13.33	12.22
	CH 112	5560	17.16	17.10	17.07	17.03	16.04	15.38	14.42	13.35	12.24
	CH 116	5580	17.11	17.07	17.04	17.00	16.01	15.35	14.39	13.32	12.21
	CH 132	5660	16.90	16.78	16.75	16.71	15.72	15.06	14.10	13.03	12.09
	CH 136	5680	16.50	16.38	16.35	16.31	15.32	14.66	13.70	12.63	11.69
	CH 140	5700	14.50	14.46	14.44	14.45	14.39	14.42	14.33	13.26	12.15
	CH 149	5745	10.25	10.19	10.22	10.19	10.06	10.20	10.14	10.16	10.05
	CH 153	5765	17.11	17.03	17.13	16.92	16.04	15.12	14.16	13.26	12.00
	CH 157	5785	17.10	17.03	17.06	16.95	16.00	15.10	14.20	13.26	11.97
	CH 161	5805	17.27	17.22	17.32	17.11	16.23	15.31	14.35	13.45	12.19
	CH 165	5825	13.50	13.45	13.22	13.41	13.20	13.49	13.42	13.45	12.29

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	15.14	15.04	15.13	14.95	15.13	15.08	15.12	13.87	13.06	12.42
	CH 46	5230	17.15	17.12	17.13	17.09	17.14	17.06	15.11	13.69	12.74	12.14
	CH 54	5270	16.85	16.75	16.77	16.70	16.82	16.81	14.79	13.62	12.59	11.91
	CH 62	5310	14.49	14.43	14.41	14.37	14.44	14.45	14.42	13.45	12.60	11.87
	CH 102	5510	15.07	14.91	14.88	14.91	15.03	14.95	14.94	14.38	13.50	12.43
	CH 110	5550	16.98	16.92	16.81	16.91	16.94	16.35	15.68	14.67	13.64	12.65
	CH 134	5670	16.96	16.92	16.81	16.91	16.94	16.35	15.68	14.67	13.64	12.65
	CH 151	5755	9.42	9.36	9.33	9.43	9.40	9.36	9.36	9.29	9.41	9.40
	CH 159	5795	16.37	16.12	16.33	16.12	15.89	15.27	14.32	12.90	12.31	12.23

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	17.49	17.48	17.48	17.48	17.02	16.28	15.47	14.63	13.45	12.84
	CH 58	5290	14.99	14.80	14.96	14.96	14.86	14.88	14.88	13.89	12.75	12.22
	CH 106	5530	14.99	14.80	14.96	14.96	14.86	14.88	14.88	13.89	12.75	12.22
	CH 155	5775	9.35	9.33	9.19	9.10	9.31	9.28	9.03	9.14	9.29	9.33

<Reduced Power Mode WLAN Conducted Power>

General Note:

1. For IEEE802.11a/b/g SAR testing, highest average RF output power channel for the lowest data rate for 802.11a/b were selected for SAR evaluation. 802.11g 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 IEEE802.11n/ac, SAR testing can be conducted on channel with the highest output power when taking into consideration tune-up tolerance for same test configuration that was identified during SAR evaluations for IEEE802.11a/b/g (as applicable) provided bandwidth and test position are the same.
3. For IEEE802.11n/a with multiple channel BW configurations, highest channel BW configuration with highest output power limit shall be tested.
4. Testing of lower BW configurations is not required when the maximum average output of the default test channels in each lower BW configuration is less than 1/4dB higher than the default test channel in the highest BW configuration.

<2.4GHz WLAN>

Mode	Channel	Frequency (MHz)	Average power (dBm)			
			Data Rate			
			1Mbps	2Mbps	5.5Mbps	11Mbps
802.11b	CH 1	2412	15.57	15.45	15.44	15.37
	CH 6	2437	15.56	15.45	15.48	15.49
	CH 11	2462	15.79	15.65	15.78	15.78

Mode	Channel	Frequency (MHz)	Average power (dBm)							
			Data Rate							
			6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
802.11g	CH 1	2412	14.28	14.27	14.18	14.07	14.17	14.24	14.31	14.26
	CH 6	2437	15.67	15.44	15.50	15.47	14.57	14.64	14.66	13.67
	CH 11	2462	11.67	11.62	11.66	11.54	11.72	11.62	11.67	11.65

Mode	Channel	Frequency (MHz)	Average power (dBm)							
			MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT20	CH 1	2412	13.31	13.19	13.24	13.18	13.23	13.23	13.48	12.83
	CH 6	2437	15.84	15.81	15.43	14.89	14.55	14.01	13.24	12.18
	CH 11	2462	10.64	10.61	10.52	10.54	10.61	10.59	10.55	10.57

Mode	Channel	Frequency (MHz)	Average Power (dBm)								
			MCS Index								
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac-VHT20	CH 1	2412	12.52	12.44	12.21	12.17	11.04	11.06	9.04	8.89	7.98
	CH 6	2437	13.00	12.93	12.52	12.00	11.58	11.14	9.98	8.80	8.84
	CH 11	2462	10.95	10.89	10.88	10.33	10.83	10.79	9.63	8.45	8.49

<5GHz WLAN>

Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate							
			6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
802.11a	CH 36	5180	15.71	15.61	15.62	15.61	15.52	15.69	15.62	15.63
	CH 40	5200	15.50	15.31	15.32	15.31	15.22	15.39	15.32	15.33
	CH 44	5220	15.43	15.38	15.39	15.38	15.29	15.39	15.39	15.40
	CH 48	5240	15.34	15.32	15.33	15.32	15.23	15.33	15.33	15.32
	CH 149	5745	10.48	10.47	10.47	10.47	10.36	10.43	10.45	10.46
	CH 153	5765	15.62	15.60	15.55	15.51	15.45	15.41	15.35	15.31
	CH 157	5785	15.63	15.51	15.54	15.50	15.45	15.32	15.31	15.28
	CH 161	5805	15.70	15.65	15.61	15.63	15.69	15.58	15.55	15.53
	CH 165	5825	12.06	12.03	12.04	12.04	12.05	12.03	12.05	12.05

Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT20	CH 36	5180	15.67	15.58	15.63	15.56	15.58	15.57	15.28	13.21
	CH 40	5200	15.69	15.60	15.65	15.58	15.60	15.59	15.30	13.23
	CH 44	5220	15.91	15.85	15.90	15.83	15.85	15.84	15.55	13.48
	CH 48	5240	15.75	15.68	15.73	15.66	15.68	15.67	15.38	13.31
	CH 149	5745	10.71	10.69	10.69	10.70	10.69	10.70	10.66	10.67
	CH 153	5765	15.80	15.75	15.73	15.71	15.65	15.61	15.55	15.50
	CH 157	5785	15.79	15.75	15.65	15.61	15.52	15.55	15.51	15.45
	CH 161	5805	15.75	15.73	15.71	15.61	15.60	15.65	15.63	15.61
	CH 165	5825	12.88	12.87	12.83	12.85	12.83	12.85	12.86	12.83

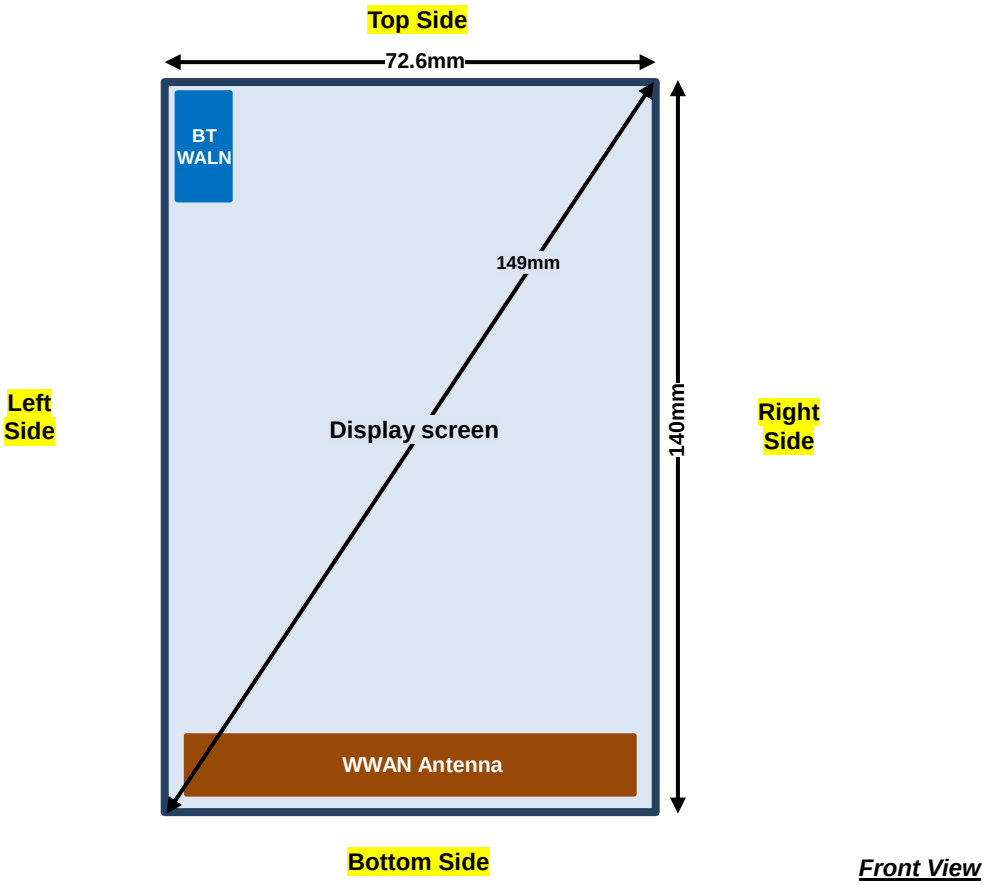
Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n-HT40	CH 38	5190	13.76	13.68	13.68	13.56	13.64	13.70	13.73	13.75
	CH 46	5230	15.56	15.45	15.48	15.26	15.36	15.29	15.38	15.46
	CH 151	5755	9.50	9.45	9.48	9.46	9.48	9.45	9.45	9.48
	CH 159	5795	15.54	15.38	15.36	15.34	15.28	15.43	15.35	15.40

Mode	Channel	Frequency (MHz)	Average Power (dBm)								
			MCS Index								
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac-VHT20	CH 36	5180	15.72	15.64	15.62	15.62	15.57	15.50	15.55	14.84	13.57
	CH 40	5200	15.70	15.65	15.63	15.63	15.58	15.51	15.56	14.85	13.58
	CH 44	5220	15.54	15.51	15.49	15.49	15.44	15.37	15.57	14.71	13.44
	CH 48	5240	15.31	15.27	15.25	15.25	15.20	15.13	15.18	14.47	13.20
	CH 149	5745	10.25	10.19	10.22	10.19	10.06	10.20	10.14	10.16	10.05
	CH 153	5765	15.96	15.91	15.85	15.81	15.93	15.90	15.86	15.81	15.80
	CH 157	5785	15.93	15.91	15.92	15.89	15.90	15.87	15.92	15.88	15.90
	CH 161	5805	15.90	15.85	15.81	15.82	15.83	15.89	15.87	15.83	15.81
	CH 165	5825	13.50	13.45	13.22	13.41	13.20	13.49	13.42	13.45	12.29

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	14.08	14.02	14.02	13.99	14.04	14.05	13.94	13.46	12.55	12.31
	CH 46	5230	15.79	15.78	15.78	15.73	15.76	15.77	15.72	15.76	15.76	15.73
	CH 151	5755	9.42	9.36	9.33	9.43	9.40	9.36	9.36	9.29	9.41	9.40
	CH 159	5795	15.79	15.75	15.78	15.74	15.72	15.73	15.71	15.66	15.68	15.66

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	15.63	15.53	15.54	15.53	15.44	15.61	15.54	15.55	15.54	15.55
	CH 155	5775	9.35	9.33	9.19	9.10	9.31	9.28	9.03	9.14	9.29	9.33

13. Antenna Location



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	No	Yes

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. 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 (2Tx slots) for GSM850/GSM1900 band due to its highest frame-average power.
4. For hotspot mode SAR testing, GPRS / EDGE should be evaluated, therefore the EUT was set in GPRS 2 Tx slots for GSM850/GSM1900 band due to its highest frame-average power.
5. 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.
6. 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.
7. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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).
13. While operating in body-adjacent exposure configurations during a mobile hotspot session, reduced power limits are enforced on the GSM1900, WCDMA B2 / B4, and LTE B2 / B4 / B7 transmitter. More detailed information which can be referred to “operational description”.
14. While operation simultaneously with any other transmitters active, like WiFi Direct or Hotspot function, a reduced maximum power limit is enforced on the WiFi transmitter in 2.4GHz / 5.2GHz / 5.8GHz WLAN. More detailed information which can be referred to “operational description”.
15. This device utilizes dynamic antenna tuning on the main antenna. Please refer to the operational description (Exhibit 12) for functionality description, and FCC the pre-test KDB inquiry (Exhibit 12A) for test guidance. Test results for this specific condition are labeled as Triggered in the Antenna Tuner column contained in the tables below.
16. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

14.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Antenna Tuner	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 (2 Tx slots)	Right Cheek	non-Trigger	251	848.8	31.49	32.50	1.262	0.06	0.444	0.560
01	GSM850	GPRS (2 Tx slots)	Right Cheek	non-Trigger	128	824.2	31.25	32.50	1.334	0	0.471	**0.628**
	GSM850	GPRS (2 Tx slots)	Right Cheek	non-Trigger	189	836.4	31.33	32.50	1.309	0.05	0.462	0.605
	GSM850	GPRS (2 Tx slots)	Right Cheek	Trigger	128	824.2	31.25	32.50	1.334	-0.05	0.193	0.257
	GSM850	GPRS (2 Tx slots)	Right Cheek	Trigger	148	828.2	31.56	32.50	1.242	-0.01	0.226	0.281
	GSM850	GPRS (2 Tx slots)	Right Cheek	Trigger	231	844.8	31.80	32.50	1.175	-0.07	0.260	0.305
	GSM850	GPRS (2 Tx slots)	Right Tilted	non-Trigger	251	848.8	31.49	32.50	1.262	0.04	0.258	0.326
	GSM850	GPRS (2 Tx slots)	Left Cheek	non-Trigger	251	848.8	31.49	32.50	1.262	0.01	0.409	0.516
	GSM850	GPRS (2 Tx slots)	Left Tilted	non-Trigger	251	848.8	31.49	32.50	1.262	-0.04	0.297	0.375
	GSM1900	GPRS (2 Tx slots)	Right Cheek	non-Trigger	661	1880	28.67	28.70	1.007	0.09	0.111	0.112
	GSM1900	GPRS (2 Tx slots)	Right Tilted	non-Trigger	661	1880	28.67	28.70	1.007	0.04	0.074	0.075
02	GSM1900	GPRS (2 Tx slots)	Left Cheek	non-Trigger	661	1880	28.67	28.70	1.007	0.05	0.203	**0.204**
	GSM1900	GPRS (2 Tx slots)	Left Cheek	non-Trigger	512	1850.2	28.58	28.70	1.028	0.04	0.175	0.180
	GSM1900	GPRS (2 Tx slots)	Left Cheek	non-Trigger	810	1909.8	28.65	28.70	1.012	0.01	0.173	0.175
	GSM1900	GPRS (2 Tx slots)	Left Cheek	Trigger	661	1880	28.67	28.70	1.007	-0.13	0.128	0.129
	GSM1900	GPRS (2 Tx slots)	Left Cheek	Trigger	561	1860	28.54	28.70	1.038	-0.03	0.176	0.183
	GSM1900	GPRS (2 Tx slots)	Left Cheek	Trigger	761	1900	28.47	28.70	1.054	-0.03	0.168	0.177
	GSM1900	GPRS (2 Tx slots)	Left Tilted	non-Trigger	661	1880	28.67	28.70	1.007	-0.01	0.084	0.085

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Antenna Tuner	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	RMC12.2Kbps	Right Cheek	non-Trigger	4233	846.6	23.01	24.00	1.256	0.07	0.429	0.539
03	WCDMA V	RMC12.2Kbps	Right Cheek	non-Trigger	4132	826.4	22.87	24.00	1.297	-0.01	0.440	**0.571**
	WCDMA V	RMC12.2Kbps	Right Cheek	non-Trigger	4182	836.4	22.84	24.00	1.306	0.05	0.430	0.562
	WCDMA V	RMC12.2Kbps	Right Cheek	Trigger	4132	826.4	22.87	24.00	1.297	-0.02	0.363	0.471
	WCDMA V	RMC12.2Kbps	Right Cheek	Trigger	4141	828.2	22.96	24.00	1.271	-0.12	0.318	0.404
	WCDMA V	RMC12.2Kbps	Right Cheek	Trigger	4224	844.8	22.95	24.00	1.274	0.07	0.308	0.392
	WCDMA V	RMC12.2Kbps	Right Tilted	non-Trigger	4233	846.6	23.01	24.00	1.256	0.03	0.244	0.306
	WCDMA V	RMC12.2Kbps	Left Cheek	non-Trigger	4233	846.6	23.01	24.00	1.256	0.04	0.355	0.446
	WCDMA V	RMC12.2Kbps	Left Tilted	non-Trigger	4233	846.6	23.01	24.00	1.256	0.02	0.243	0.305
	WCDMA IV	RMC12.2Kbps	Right Cheek	non-Trigger	1513	1752.6	22.86	24.00	1.300	-0.01	0.182	0.237
	WCDMA IV	RMC12.2Kbps	Right Tilted	non-Trigger	1513	1752.6	22.86	24.00	1.300	0.04	0.125	0.163
	WCDMA IV	RMC12.2Kbps	Left Cheek	non-Trigger	1513	1752.6	22.86	24.00	1.300	-0.05	0.330	0.429
04	WCDMA IV	RMC12.2Kbps	Left Cheek	non-Trigger	1312	1712.4	22.78	24.00	1.324	-0.05	0.326	**0.432**
	WCDMA IV	RMC12.2Kbps	Left Cheek	non-Trigger	1413	1732.6	22.83	24.00	1.309	0.02	0.317	0.415
	WCDMA IV	RMC12.2Kbps	Left Cheek	Trigger	1312	1712.4	22.78	24.00	1.324	0	0.220	0.291
	WCDMA IV	RMC12.2Kbps	Left Tilted	non-Trigger	1513	1752.6	22.86	24.00	1.300	-0.02	0.09	0.117
	WCDMA II	RMC 12.2Kbps	Right Cheek	non-Trigger	9538	1907.6	22.90	24.00	1.288	0.04	0.164	0.211
	WCDMA II	RMC 12.2Kbps	Right Tilted	non-Trigger	9538	1907.6	22.90	24.00	1.288	0.04	0.091	0.117
	WCDMA II	RMC 12.2Kbps	Left Cheek	non-Trigger	9538	1907.6	22.90	24.00	1.288	0.01	0.244	0.314
	WCDMA II	RMC 12.2Kbps	Left Cheek	non-Trigger	9262	1852.4	22.73	24.00	1.340	-0.07	0.259	0.347
05	WCDMA II	RMC 12.2Kbps	Left Cheek	non-Trigger	9400	1880	22.80	24.00	1.318	0.06	0.268	**0.353**
	WCDMA II	RMC 12.2Kbps	Left Cheek	Trigger	9400	1880	22.80	24.00	1.318	-0.06	0.188	0.248
	WCDMA II	RMC 12.2Kbps	Left Cheek	Trigger	9300	1860	22.49	24.00	1.416	-0.04	0.245	0.347
	WCDMA II	RMC 12.2Kbps	Left Cheek	Trigger	9500	1900	22.80	24.00	1.318	-0.1	0.229	0.302
	WCDMA II	RMC 12.2Kbps	Left Tilted	non-Trigger	9538	1907.6	22.90	24.00	1.288	0	0.121	0.156

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Antenna Tuner	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)
06	LTE Band 17	10M	QPSK	1	0	Right Cheek	non-Trigger	23790	710	22.96	24.00	1.271	-0.03	0.322	**0.409**
	LTE Band 17	10M	QPSK	1	0	Right Cheek	non-Trigger	23780	709	22.95	24.00	1.274	0.07	0.316	0.402
	LTE Band 17	10M	QPSK	1	0	Right Cheek	non-Trigger	23800	711	22.86	24.00	1.300	0.02	0.299	0.389
	LTE Band 17	10M	QPSK	25	12	Right Cheek	non-Trigger	23790	710	21.92	23.00	1.282	0.09	0.201	0.258
	LTE Band 17	10M	QPSK	1	0	Right Cheek	Trigger	23790	710	22.96	24.00	1.271	0.09	0.112	0.142
	LTE Band 17	10M	QPSK	25	12	Right Cheek	Trigger	23790	710	21.92	23.00	1.282	0.02	0.068	0.087
	LTE Band 17	10M	QPSK	1	0	Right Tilted	non-Trigger	23790	710	22.96	24.00	1.271	-0.06	0.199	0.253
	LTE Band 17	10M	QPSK	25	12	Right Tilted	non-Trigger	23790	710	21.92	23.00	1.282	0.02	0.115	0.147
	LTE Band 17	10M	QPSK	1	0	Left Cheek	non-Trigger	23790	710	22.96	24.00	1.271	0.03	0.313	0.398
	LTE Band 17	10M	QPSK	25	12	Left Cheek	non-Trigger	23790	710	21.92	23.00	1.282	0.06	0.191	0.245
	LTE Band 17	10M	QPSK	1	0	Left Tilted	non-Trigger	23790	710	22.96	24.00	1.271	0.13	0.205	0.260
	LTE Band 17	10M	QPSK	25	12	Left Tilted	non-Trigger	23790	710	21.92	23.00	1.282	0.09	0.107	0.137
07	LTE Band 5	10M	QPSK	1	0	Right Cheek	non-Trigger	20450	829	22.87	24.00	1.297	0.02	0.431	**0.559**
	LTE Band 5	10M	QPSK	1	0	Right Cheek	non-Trigger	20525	836.5	22.64	24.00	1.368	-0.03	0.402	0.550
	LTE Band 5	10M	QPSK	1	0	Right Cheek	non-Trigger	20600	844	22.63	24.00	1.371	-0.02	0.403	0.552
	LTE Band 5	10M	QPSK	25	0	Right Cheek	non-Trigger	20525	836.5	21.99	23.00	1.262	-0.02	0.234	0.295
	LTE Band 5	10M	QPSK	1	0	Right Cheek	Trigger	20450	829	22.87	24.00	1.297	-0.04	0.215	0.279
	LTE Band 5	10M	QPSK	1	0	Right Cheek	Trigger	20525	836.5	22.64	24.00	1.368	0.07	0.220	0.301
	LTE Band 5	10M	QPSK	1	0	Right Cheek	Trigger	20600	844	22.63	24.00	1.371	0.01	0.219	0.300
	LTE Band 5	10M	QPSK	25	0	Right Cheek	Trigger	20525	836.5	21.99	23.00	1.262	0.01	0.142	0.179
	LTE Band 5	10M	QPSK	1	0	Right Tilted	non-Trigger	20450	829	22.87	24.00	1.297	-0.05	0.257	0.333
	LTE Band 5	10M	QPSK	25	0	Right Tilted	non-Trigger	20525	836.5	21.99	23.00	1.262	0.04	0.135	0.170
	LTE Band 5	10M	QPSK	1	0	Left Cheek	non-Trigger	20450	829	22.87	24.00	1.297	0.02	0.369	0.479
	LTE Band 5	10M	QPSK	25	0	Left Cheek	non-Trigger	20525	836.5	21.99	23.00	1.262	0.02	0.197	0.249
	LTE Band 5	10M	QPSK	1	0	Left Tilted	non-Trigger	20450	829	22.87	24.00	1.297	0	0.260	0.337
	LTE Band 5	10M	QPSK	25	0	Left Tilted	non-Trigger	20525	836.5	21.99	23.00	1.262	0.04	0.143	0.180
	LTE Band 4	20M	QPSK	1	0	Right Cheek	non-Trigger	20300	1745	22.99	24.00	1.262	-0.01	0.143	0.180
	LTE Band 4	20M	QPSK	50	0	Right Cheek	non-Trigger	20300	1745	21.97	23.00	1.268	0.05	0.108	0.137
	LTE Band 4	20M	QPSK	1	0	Right Tilted	non-Trigger	20300	1745	22.99	24.00	1.262	-0.19	0.115	0.145
	LTE Band 4	20M	QPSK	50	0	Right Tilted	non-Trigger	20300	1745	21.97	23.00	1.268	0.04	0.084	0.106
08	LTE Band 4	20M	QPSK	1	0	Left Cheek	non-Trigger	20300	1745	22.99	24.00	1.262	0.01	0.271	**0.342**
	LTE Band 4	20M	QPSK	1	0	Left Cheek	non-Trigger	20050	1720	22.85	24.00	1.303	0.01	0.238	0.310
	LTE Band 4	20M	QPSK	1	0	Left Cheek	non-Trigger	20175	1732.5	22.89	24.00	1.291	0.01	0.246	0.318
	LTE Band 4	20M	QPSK	50	0	Left Cheek	non-Trigger	20300	1745	21.97	23.00	1.268	0.02	0.218	0.276
	LTE Band 4	20M	QPSK	1	0	Left Cheek	Trigger	20300	1745	22.99	24.00	1.262	-0.01	0.268	0.338
	LTE Band 4	20M	QPSK	50	0	Left Cheek	Trigger	20300	1745	21.97	23.00	1.268	0.01	0.108	0.085
	LTE Band 4	20M	QPSK	1	0	Left Tilted	non-Trigger	20300	1745	22.99	24.00	1.262	0.09	0.096	0.121
	LTE Band 4	20M	QPSK	50	0	Left Tilted	non-Trigger	20300	1745	21.97	23.00	1.268	0.07	0.077	0.098

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Antenna Tuner	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Right Cheek	non-Trigger	18900	1880	22.99	24.00	1.262	0.15	0.163	0.206
	LTE Band 2	20M	QPSK	50	0	Right Cheek	non-Trigger	19100	1900	22.00	23.00	1.259	0.03	0.143	0.180
	LTE Band 2	20M	QPSK	1	0	Right Tilted	non-Trigger	18900	1880	22.99	24.00	1.262	0.04	0.105	0.132
	LTE Band 2	20M	QPSK	50	0	Right Tilted	non-Trigger	19100	1900	22.00	23.00	1.259	0.11	0.069	0.087
09	LTE Band 2	20M	QPSK	1	0	Left Cheek	non-Trigger	18900	1880	22.99	24.00	1.262	-0.01	0.282	**0.356**
	LTE Band 2	20M	QPSK	1	0	Left Cheek	non-Trigger	18700	1860	22.96	24.00	1.271	0.08	0.271	0.344
	LTE Band 2	20M	QPSK	1	0	Left Cheek	non-Trigger	19100	1900	22.98	24.00	1.265	0.08	0.254	0.321
	LTE Band 2	20M	QPSK	50	0	Left Cheek	non-Trigger	19100	1900	22.00	23.00	1.259	0.03	0.244	0.307
	LTE Band 2	20M	QPSK	1	0	Left Cheek	Trigger	18900	1880	22.99	24.00	1.262	0.05	0.210	0.265
	LTE Band 2	20M	QPSK	1	0	Left Cheek	Trigger	18700	1860	22.96	24.00	1.271	-0.08	0.251	0.319
	LTE Band 2	20M	QPSK	1	0	Left Cheek	Trigger	19100	1900	22.98	24.00	1.265	-0.07	0.237	0.300
	LTE Band 2	20M	QPSK	50	0	Left Cheek	Trigger	19100	1900	22.00	23.00	1.259	-0.08	0.185	0.233
	LTE Band 2	20M	QPSK	1	0	Left Tilted	non-Trigger	18900	1880	22.99	24.00	1.262	0.05	0.116	0.146
	LTE Band 2	20M	QPSK	50	0	Left Tilted	non-Trigger	19100	1900	22.00	23.00	1.259	0.17	0.076	0.096
	LTE Band 7	20M	QPSK	1	0	Right Cheek	non-Trigger	21100	2535	22.99	24.00	1.262	-0.06	0.177	0.223
	LTE Band 7	20M	QPSK	50	0	Right Cheek	non-Trigger	21100	2535	21.98	23.00	1.265	0.02	0.100	0.126
	LTE Band 7	20M	QPSK	1	0	Right Tilted	non-Trigger	21100	2535	22.99	24.00	1.262	-0.1	0.182	0.230
	LTE Band 7	20M	QPSK	50	0	Right Tilted	non-Trigger	21100	2535	21.98	23.00	1.265	-0.04	0.103	0.130
	LTE Band 7	20M	QPSK	1	0	Left Cheek	non-Trigger	21100	2535	22.99	24.00	1.262	0.19	0.355	0.448
	LTE Band 7	20M	QPSK	1	0	Left Cheek	non-Trigger	20850	2510	22.95	24.00	1.274	-0.01	0.362	0.461
10	LTE Band 7	20M	QPSK	1	0	Left Cheek	non-Trigger	21350	2560	22.98	24.00	1.265	-0.07	0.425	**0.538**
	LTE Band 7	20M	QPSK	50	0	Left Cheek	non-Trigger	21100	2535	21.98	23.00	1.265	0.04	0.203	0.257
	LTE Band 7	20M	QPSK	1	0	Left Cheek	Trigger	21350	2560	22.98	24.00	1.265	-0.01	0.243	0.307
	LTE Band 7	20M	QPSK	1	0	Left Cheek	Trigger	20867	2511.7	23.29	24.00	1.178	-0.01	0.307	0.362
	LTE Band 7	20M	QPSK	1	0	Left Cheek	Trigger	21333	2558.3	23.40	24.00	1.148	0.05	0.422	0.485
	LTE Band 7	20M	QPSK	50	0	Left Cheek	Trigger	21100	2535	21.98	23.00	1.265	-0.02	0.140	0.177
	LTE Band 7	20M	QPSK	1	0	Left Tilted	non-Trigger	21100	2535	22.99	24.00	1.262	0.19	0.159	0.201
	LTE Band 7	20M	QPSK	50	0	Left Tilted	non-Trigger	21100	2535	21.98	23.00	1.265	0.09	0.088	0.111

<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	16.33	16.50	1.040	96.91	1.032	-0.096	0.699	0.750
11	WLAN2.4GHz	802.11b 5.5Mbps	Right Cheek	6	2437	17.89	18.00	1.026	96.91	1.032	-0.079	0.744	**0.788**
	WLAN2.4GHz	802.11b 5.5Mbps	Right Cheek	1	2412	17.70	18.00	1.072	96.91	1.032	-0.075	0.649	0.718
	WLAN2.4GHz	802.11b 5.5Mbps	Right Cheek	11	2462	17.85	18.00	1.036	96.91	1.032	-0.079	0.661	0.707
	WLAN2.4GHz	802.11b 11Mbps	Right Cheek	6	2437	17.48	18.00	1.128	96.91	1.032	-0.004	0.650	0.756
	WLAN2.4GHz	802.11n-HT20 MCS0	Right Cheek	6	2437	15.84	16.00	1.037	83.76	1.194	-0.12	0.579	0.717
	WLAN2.4GHz	802.11ac-VHT20 MCS0	Right Cheek	6	2412	13.00	13.00	1.000	83.05	1.204	0.1	0.269	0.324
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	6	2437	16.33	16.50	1.040	96.91	1.032	-0.099	0.231	0.248
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	6	2437	16.33	16.50	1.040	96.91	1.032	-0.102	0.166	0.178
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	6	2437	16.33	16.50	1.040	96.91	1.032	0.096	0.187	0.201
	WLAN5GHz	802.11a 6Mbps	Right Cheek	36	5180	17.48	17.50	1.000	87.18	1.147	0.04	0.982	1.126
	WLAN5GHz	802.11a 6Mbps	Right Cheek	48	5240	17.25	17.50	1.000	87.18	1.147	-0.17	0.749	0.859
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	46	5230	17.49	17.50	1.000	76.43	1.308	0.04	0.754	0.986
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	38	5190	13.87	15.50	1.000	76.43	1.308	-0.05	0.354	0.463
12	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	42	5210	17.49	17.50	1.000	54.63	1.830	0.04	0.799	**1.462**
	WLAN5GHz	802.11a 6Mbps	Right Tilted	36	5180	17.48	17.50	1.000	87.18	1.147	-0.11	0.964	1.106
	WLAN5GHz	802.11a 6Mbps	Right Tilted	48	5240	17.25	17.50	1.000	87.18	1.147	-0.07	0.885	1.015
	WLAN5GHz	802.11a 6Mbps	Left Cheek	36	5180	17.48	17.50	1.000	87.18	1.147	0.08	0.301	0.345
	WLAN5GHz	802.11a 6Mbps	Left Tilted	36	5180	17.48	17.50	1.000	87.18	1.147	0.13	0.332	0.381

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)
	WLAN5GHz	802.11a 6Mbps	Right Cheek	60	5300	16.92	17.00	1.019	87.18	1.147	-0.085	0.702	0.820
	WLAN5GHz	802.11a 6Mbps	Right Cheek	52	5260	16.88	17.00	1.028	87.18	1.147	-0.198	0.719	0.848
	WLAN5GHz	802.11a 6Mbps	Right Tilted	60	5300	16.92	17.00	1.019	87.18	1.147	-0.053	0.814	0.951
	WLAN5GHz	802.11a 6Mbps	Right Tilted	52	5260	16.88	17.00	1.028	87.18	1.147	-0.19	0.858	1.012
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	54	5270	16.84	17.00	1.036	76.43	1.308	-0.157	0.662	0.897
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	62	5310	14.60	15.00	1.095	76.43	1.308	0.04	0.391	0.560
13	WLAN5GHz	802.11ac-VHT40 MCS0	Right Tilted	54	5270	16.85	17.00	1.035	71.26	1.403	0.09	0.745	**1.082**
	WLAN5GHz	802.11ac-VHT40 MCS0	Right Tilted	62	5310	14.49	15.00	1.124	71.26	1.403	-0.12	0.315	0.497
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Tilted	58	5290	14.99	15.00	1.002	54.63	1.830	-0.16	0.311	0.570
	WLAN5GHz	802.11a 6Mbps	Left Cheek	60	5300	16.92	17.00	1.019	87.18	1.147	-0.088	0.234	0.273
	WLAN5GHz	802.11a 6Mbps	Left Tilted	60	5300	16.92	17.00	1.019	87.18	1.147	-0.106	0.259	0.303
	WLAN5GHz	802.11a 6Mbps	Right Cheek	112	5560	17.14	17.50	1.086	87.18	1.147	0.154	0.537	0.669
	WLAN5GHz	802.11a 6Mbps	Right Cheek	100	5500	17.19	17.50	1.073	87.18	1.147	0.044	0.441	0.543
14	WLAN5GHz	802.11a 6Mbps	Right Cheek	132	5660	16.92	17.50	1.143	87.18	1.147	-0.1	0.653	**0.856**
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	102	5510	14.65	15.50	1.215	76.43	1.308	-0.02	0.280	0.445
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	110	5550	17.14	17.50	1.085	76.43	1.308	0	0.436	0.619
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	134	5670	17.14	17.50	1.085	76.43	1.308	0.012	0.427	0.606
	WLAN5GHz	802.11ac-VHT40 MCS0	Right Cheek	102	5510	15.07	15.50	1.104	71.26	1.403	-0.062	0.263	0.407
	WLAN5GHz	802.11ac-VHT40 MCS0	Right Cheek	110	5550	16.98	17.50	1.127	71.26	1.403	0	0.396	0.626
	WLAN5GHz	802.11ac-VHT40 MCS0	Right Cheek	134	5670	16.96	17.50	1.132	71.26	1.308	0.012	0.410	0.607
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	106	5530	14.99	15.00	1.002	54.63	1.830	-0.06	0.239	0.438
	WLAN5GHz	802.11a 6Mbps	Right Tilted	112	5560	17.14	17.50	1.086	87.18	1.147	-0.053	0.456	0.568
	WLAN5GHz	802.11a 6Mbps	Right Tilted	100	5500	17.19	17.50	1.073	87.18	1.147	0.03	0.347	0.427
	WLAN5GHz	802.11a 6Mbps	Right Tilted	132	5660	16.92	17.50	1.143	87.18	1.147	0.182	0.384	0.503
	WLAN5GHz	802.11a 6Mbps	Left Cheek	112	5560	17.14	17.50	1.086	87.18	1.147	-0.129	0.158	0.197
	WLAN5GHz	802.11a 6Mbps	Left Tilted	112	5560	17.14	17.50	1.086	87.18	1.147	0.075	0.165	0.205
	WLAN5GHz	802.11a 6Mbps	Right Cheek	161	5805	17.25	17.50	1.059	87.18	1.147	-0.03	0.602	0.731
	WLAN5GHz	802.11a 6Mbps	Right Cheek	153	5765	17.03	17.50	1.114	87.18	1.147	-0.07	0.590	0.754
	WLAN5GHz	802.11a 6Mbps	Right Cheek	157	5785	16.96	17.50	1.132	87.18	1.147	-0.12	0.604	0.784
	WLAN5GHz	802.11n-HT20 MCS0	Right Cheek	161	5805	17.15	17.50	1.084	87.18	1.147	-0.11	0.592	0.736
	WLAN5GHz	802.11n-HT20 MCS0	Right Cheek	153	5765	17.01	17.50	1.119	87.18	1.147	-0.13	0.666	0.855
15	WLAN5GHz	802.11n-HT20 MCS0	Right Cheek	157	5785	16.93	17.50	1.140	87.18	1.147	-0.1	0.669	**0.875**
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	159	5795	15.92	16.50	1.142	76.43	1.308	-0.08	0.347	0.518
	WLAN5GHz	802.11ac-VHT20 MCS0	Right Cheek	161	5805	17.27	17.50	1.054	82.99	1.205	0.02	0.615	0.781
	WLAN5GHz	802.11ac-VHT20 MCS0	Right Cheek	153	5765	17.11	17.50	1.094	82.99	1.205	-0.14	0.644	0.849
	WLAN5GHz	802.11ac-VHT20 MCS0	Right Cheek	157	5785	17.10	17.50	1.096	82.99	1.205	-0.14	0.617	0.815
	WLAN5GHz	802.11ac-VHT40 MCS0	Right Cheek	159	5795	16.37	16.50	1.030	71.26	1.403	-0.09	0.332	0.480
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Cheek	155	5775	9.35	9.50	1.035	54.63	1.830	0.11	0.039	0.074
	WLAN5GHz	802.11a 6Mbps	Right Tilted	161	5805	17.25	17.50	1.059	87.18	1.147	0.1	0.134	0.163
	WLAN5GHz	802.11a 6Mbps	Left Cheek	161	5805	17.25	17.50	1.059	87.18	1.147	0.08	0.105	0.128
	WLAN5GHz	802.11a 6Mbps	Left Tilted	161	5805	17.25	17.50	1.059	87.18	1.147	-0.08	0.062	0.075

<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	11.96	12.00	1.009	-0.05	0.180	0.182
16	Bluetooth	1Mbps	Right Cheek	0	2402	10.30	12.00	1.479	-0.07	0.128	**0.189**
	Bluetooth	1Mbps	Right Cheek	78	2480	10.04	12.00	1.570	-0.1	0.117	0.184
	Bluetooth	1Mbps	Right Tilted	39	2441	11.96	12.00	1.009	-0.09	0.057	0.058
	Bluetooth	1Mbps	Left Cheek	39	2441	11.96	12.00	1.009	-0.18	0.041	0.041
	Bluetooth	1Mbps	Left Tilted	39	2441	11.96	12.00	1.009	0.16	0.044	0.044

14.2 Wireless Router SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Hotspot 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 (2 Tx slots)	Front	1cm	OFF	251	848.8	31.49	32.50	1.262	-0.02	0.672	0.848
	GSM850	GPRS (2 Tx slots)	Front	1cm	OFF	128	824.2	31.25	32.50	1.334	-0.01	0.776	1.035
	GSM850	GPRS (2 Tx slots)	Front	1cm	OFF	189	836.4	31.33	32.50	1.309	0.02	0.747	0.978
	GSM850	GPRS (2 Tx slots)	Back	1cm	OFF	251	848.8	31.49	32.50	1.262	-0.05	0.717	0.905
	GSM850	GPRS (2 Tx slots)	Back	1cm	OFF	128	824.2	31.25	32.50	1.334	0	0.753	1.004
	GSM850	GPRS (2 Tx slots)	Back	1cm	OFF	189	836.4	31.33	32.50	1.309	-0.05	0.698	0.914
	GSM850	GPRS (2 Tx slots)	Left Side	1cm	OFF	251	848.8	31.49	32.50	1.262	0.05	0.445	0.562
	GSM850	GPRS (2 Tx slots)	Right Side	1cm	OFF	251	848.8	31.49	32.50	1.262	-0.05	0.815	1.028
	GSM850	GPRS (2 Tx slots)	Right Side	1cm	OFF	128	824.2	31.25	32.50	1.334	-0.01	0.730	0.973
17	GSM850	GPRS (2 Tx slots)	Right Side	1cm	OFF	189	836.4	31.33	32.50	1.309	-0.02	0.791	**1.036**
	GSM850	GPRS (2 Tx slots)	Bottom Side	1cm	OFF	251	848.8	31.49	32.50	1.262	0.04	0.335	0.423
	GSM1900	GPRS (2 Tx slots)	Front	1cm	ON	661	1880		23.70	1.000	-0.04	0.491	0.491
	GSM1900	GPRS (2 Tx slots)	Back	1cm	ON	661	1880		23.70	1.000	0.03	0.440	0.440
	GSM1900	GPRS (2 Tx slots)	Left Side	1cm	ON	661	1880		23.70	1.000	0.05	0.073	0.073
	GSM1900	GPRS (2 Tx slots)	Right Side	1cm	ON	661	1880		23.70	1.000	0.12	0.039	0.039
	GSM1900	GPRS (2 Tx slots)	Bottom Side	1cm	ON	661	1880		23.70	1.000	-0.07	0.616	0.616
	GSM1900	GPRS (2 Tx slots)	Bottom Side	1cm	ON	512	1850.2		23.70	1.000	0.03	0.594	0.594
18	GSM1900	GPRS (2 Tx slots)	Bottom Side	1cm	ON	810	1909.8		23.70	1.000	-0.04	0.633	**0.633**

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Hotspot 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	4233	846.6	23.01	24.00	1.256	0.07	0.606	0.761
	WCDMA V	RMC 12.2Kbps	Back	1cm	OFF	4233	846.6	23.01	24.00	1.256	-0.01	0.565	0.710
	WCDMA V	RMC 12.2Kbps	Left Side	1cm	OFF	4233	846.6	23.01	24.00	1.256	0.01	0.446	0.560
	WCDMA V	RMC 12.2Kbps	Right Side	1cm	OFF	4233	846.6	23.01	24.00	1.256	0.01	0.667	0.838
	WCDMA V	RMC 12.2Kbps	Right Side	1cm	OFF	4132	826.4	22.87	24.00	1.297	0.01	0.683	0.886
19	WCDMA V	RMC 12.2Kbps	Right Side	1cm	OFF	4182	836.4	22.84	24.00	1.306	0.03	0.714	**0.933**
	WCDMA V	RMC 12.2Kbps	Bottom Side	1cm	OFF	4233	846.6	23.01	24.00	1.256	0.02	0.282	0.354
	WCDMA IV	RMC 12.2Kbps	Front	1cm	ON	1513	1752.6		19.50	1.000	0	0.422	0.422
	WCDMA IV	RMC 12.2Kbps	Back	1cm	ON	1513	1752.6		19.50	1.000	0.02	0.385	0.385
	WCDMA IV	RMC 12.2Kbps	Left Side	1cm	ON	1513	1752.6		19.50	1.000	0.03	0.062	0.062
	WCDMA IV	RMC 12.2Kbps	Right Side	1cm	ON	1513	1752.6		19.50	1.000	0.03	0.026	0.026
	WCDMA IV	RMC 12.2Kbps	Bottom Side	1cm	ON	1513	1752.6		19.50	1.000	-0.13	0.763	0.763
20	WCDMA IV	RMC 12.2Kbps	Bottom Side	1cm	ON	1312	1712.4		19.50	1.000	-0.05	0.764	**0.764**
	WCDMA IV	RMC 12.2Kbps	Bottom Side	1cm	ON	1413	1732.6		19.50	1.000	0.04	0.678	0.678
	WCDMA II	RMC 12.2Kbps	Front	1cm	ON	9538	1907.6		18.00	1.000	-0.01	0.492	0.492
	WCDMA II	RMC 12.2Kbps	Back	1cm	ON	9538	1907.6		18.00	1.000	0	0.527	0.527
	WCDMA II	RMC 12.2Kbps	Left Side	1cm	ON	9538	1907.6		18.00	1.000	0.05	0.077	0.077
	WCDMA II	RMC 12.2Kbps	Right Side	1cm	ON	9538	1907.6		18.00	1.000	0.11	0.040	0.040
21	WCDMA II	RMC 12.2Kbps	Bottom Side	1cm	ON	9538	1907.6		18.00	1.000	0.03	0.811	**0.811**
	WCDMA II	RMC 12.2Kbps	Bottom Side	1cm	ON	9262	1852.4		18.00	1.000	-0.03	0.722	0.722
	WCDMA II	RMC12.2Kbps	Bottom Side	1cm	ON	9400	1880		18.00	1.000	0.02	0.737	0.737

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (cm)	Hotspot Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 17	10M	QPSK	1	0	Front	1cm	OFF	23790	710	22.96	24.00	1.271	-0.03	0.437	0.555
22	LTE Band 17	10M	QPSK	1	0	Front	1cm	OFF	23780	709	22.95	24.00	1.274	-0.13	0.492	**0.627**
	LTE Band 17	10M	QPSK	1	0	Front	1cm	OFF	23800	711	22.86	24.00	1.300	0.03	0.437	0.568
	LTE Band 17	10M	QPSK	25	12	Front	1cm	OFF	23790	710	21.92	23.00	1.282	0.01	0.285	0.365
	LTE Band 17	10M	QPSK	1	0	Back	1cm	OFF	23790	710	22.96	24.00	1.271	-0.08	0.414	0.526
	LTE Band 17	10M	QPSK	25	12	Back	1cm	OFF	23790	710	21.92	23.00	1.282	0	0.267	0.342
	LTE Band 17	10M	QPSK	1	0	Left Side	1cm	OFF	23790	710	22.96	24.00	1.271	-0.02	0.193	0.245
	LTE Band 17	10M	QPSK	25	12	Left Side	1cm	OFF	23790	710	21.92	23.00	1.282	0	0.197	0.253
	LTE Band 17	10M	QPSK	1	0	Right Side	1cm	OFF	23790	710	22.96	24.00	1.271	-0.07	0.269	0.342
	LTE Band 17	10M	QPSK	25	12	Right Side	1cm	OFF	23790	710	21.92	23.00	1.282	-0.01	0.157	0.201
	LTE Band 17	10M	QPSK	1	0	Bottom Side	1cm	OFF	23790	710	22.96	24.00	1.271	0.07	0.158	0.201
	LTE Band 17	10M	QPSK	25	12	Bottom Side	1cm	OFF	23790	710	21.92	23.00	1.282	-0.01	0.099	0.127
	LTE Band 5	10M	QPSK	1	0	Front	1cm	OFF	20450	829	22.87	24.00	1.297	0.01	0.648	0.841
	LTE Band 5	10M	QPSK	1	0	Front	1cm	OFF	20525	836.5	22.64	24.00	1.368	0.01	0.611	0.836
	LTE Band 5	10M	QPSK	1	0	Front	1cm	OFF	20600	844	22.63	24.00	1.371	0.02	0.603	0.827
	LTE Band 5	10M	QPSK	25	0	Front	1cm	OFF	20525	836.5	22.64	24.00	1.368	0.01	0.354	0.484
	LTE Band 5	10M	QPSK	50	0	Front	1cm	OFF	20600	844	22.63	24.00	1.371	0.04	0.357	0.489
	LTE Band 5	10M	QPSK	1	0	Back	1cm	OFF	20450	829	22.87	24.00	1.297	0.04	0.573	0.743
	LTE Band 5	10M	QPSK	25	0	Back	1cm	OFF	20525	836.5	22.64	24.00	1.368	0.03	0.306	0.419
	LTE Band 5	10M	QPSK	1	0	Left Side	1cm	OFF	20450	829	22.87	24.00	1.297	0.01	0.569	0.738
	LTE Band 5	10M	QPSK	25	0	Left Side	1cm	OFF	20525	836.5	22.64	24.00	1.368	-0.04	0.291	0.398
23	LTE Band 5	10M	QPSK	1	0	Right Side	1cm	OFF	20450	829	22.87	24.00	1.297	0.02	0.656	**0.851**
	LTE Band 5	10M	QPSK	1	0	Right Side	1cm	OFF	20525	836.5	22.64	24.00	1.368	-0.03	0.602	0.823
	LTE Band 5	10M	QPSK	1	0	Right Side	1cm	OFF	20600	844	22.87	24.00	1.297	-0.01	0.601	0.780
	LTE Band 5	10M	QPSK	25	0	Right Side	1cm	OFF	20525	836.5	22.64	24.00	1.368	0.03	0.350	0.479
	LTE Band 5	10M	QPSK	50	0	Right Side	1cm	OFF	20600	844	22.87	24.00	1.297	0	0.378	0.490
	LTE Band 5	10M	QPSK	1	0	Bottom Side	1cm	OFF	20450	829	22.87	24.00	1.297	0.09	0.268	0.348
	LTE Band 5	10M	QPSK	25	0	Bottom Side	1cm	OFF	20525	836.5	22.64	24.00	1.368	0.05	0.152	0.208
	LTE Band 4	20M	QPSK	1	0	Front	1cm	ON	20300	1745		18.50	1.000	-0.02	0.636	0.636
	LTE Band 4	20M	QPSK	50	0	Front	1cm	ON	20300	1745		18.50	1.000	-0.02	0.523	0.523
	LTE Band 4	20M	QPSK	1	0	Back	1cm	ON	20300	1745		18.50	1.000	0	0.513	0.513
	LTE Band 4	20M	QPSK	50	0	Back	1cm	ON	20300	1745		18.50	1.000	-0.06	0.416	0.416
	LTE Band 4	20M	QPSK	1	0	Left Side	1cm	ON	20300	1745		18.50	1.000	0.11	0.065	0.065
	LTE Band 4	20M	QPSK	50	0	Left Side	1cm	ON	20300	1745		18.50	1.000	-0.02	0.053	0.053
	LTE Band 4	20M	QPSK	1	0	Right Side	1cm	ON	20300	1745		18.50	1.000	0.14	0.045	0.045
	LTE Band 4	20M	QPSK	50	0	Right Side	1cm	ON	20300	1745		18.50	1.000	0.18	0.035	0.035
24	LTE Band 4	20M	QPSK	1	0	Bottom Side	1cm	ON	20300	1745		18.50	1.000	-0.06	0.845	**0.845**
	LTE Band 4	20M	QPSK	1	0	Bottom Side	1cm	ON	20050	1720		18.50	1.000	-0.05	0.762	0.762
	LTE Band 4	20M	QPSK	1	0	Bottom Side	1cm	ON	20175	1732.5		18.50	1.000	0.02	0.731	0.731
	LTE Band 4	20M	QPSK	50	0	Bottom Side	1cm	ON	20300	1745		18.50	1.000	-0.01	0.790	0.790
	LTE Band 4	20M	QPSK	100	0	Bottom Side	1cm	ON	20175	1732.5		18.50	1.000	-0.01	0.609	0.609

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (cm)	Hotspot Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	1cm	ON	18900	1880		18.50	1.000	0.02	0.540	0.540
	LTE Band 2	20M	QPSK	50	0	Front	1cm	ON	19100	1900		18.50	1.000	0.02	0.447	0.447
	LTE Band 2	20M	QPSK	1	0	Back	1cm	ON	18900	1880		18.50	1.000	0.01	0.445	0.445
	LTE Band 2	20M	QPSK	50	0	Back	1cm	ON	19100	1900		18.50	1.000	0.03	0.357	0.357
	LTE Band 2	20M	QPSK	1	0	Left Side	1cm	ON	18900	1880		18.50	1.000	0.1	0.077	0.077
	LTE Band 2	20M	QPSK	50	0	Left Side	1cm	ON	19100	1900		18.50	1.000	0.09	0.064	0.064
	LTE Band 2	20M	QPSK	1	0	Right Side	1cm	ON	18900	1880		18.50	1.000	-0.08	0.040	0.040
	LTE Band 2	20M	QPSK	50	0	Right Side	1cm	ON	19100	1900		18.50	1.000	0.14	0.035	0.035
	LTE Band 2	20M	QPSK	1	0	Bottom Side	1cm	ON	18900	1880		18.50	1.000	0.01	0.777	0.777
	LTE Band 2	20M	QPSK	1	0	Bottom Side	1cm	ON	18700	1860		18.50	1.000	0	0.775	0.775
25	LTE Band 2	20M	QPSK	1	0	Bottom Side	1cm	ON	19100	1900		18.50	1.000	-0.02	0.814	**0.814**
	LTE Band 2	20M	QPSK	50	0	Bottom Side	1cm	ON	19100	1900		18.50	1.000	0.04	0.658	0.658
	LTE Band 2	20M	QPSK	100	0	Bottom Side	1cm	ON	18900	1880		18.50	1.000	-0.05	0.662	0.662
	LTE Band 7	20M	QPSK	1	0	Front	1cm	ON	21100	2535		17.50	1.000	0	0.402	0.402
	LTE Band 7	20M	QPSK	50	0	Front	1cm	ON	21100	2535		17.50	1.000	-0.06	0.324	0.324
	LTE Band 7	20M	QPSK	1	0	Back	1cm	ON	21100	2535		17.50	1.000	0.03	0.427	0.427
	LTE Band 7	20M	QPSK	50	0	Back	1cm	ON	21100	2535		17.50	1.000	0.04	0.341	0.341
	LTE Band 7	20M	QPSK	1	0	Left Side	1cm	ON	21100	2535		17.50	1.000	-0.01	0.172	0.172
	LTE Band 7	20M	QPSK	50	0	Left Side	1cm	ON	21100	2535		17.50	1.000	-0.01	0.138	0.138
	LTE Band 7	20M	QPSK	1	0	Right Side	1cm	ON	21100	2535		17.50	1.000	0.02	0.044	0.044
	LTE Band 7	20M	QPSK	50	0	Right Side	1cm	ON	21100	2535		17.50	1.000	-0.11	0.035	0.035
	LTE Band 7	20M	QPSK	1	0	Bottom Side	1cm	ON	21100	2535		17.50	1.000	-0.02	0.816	0.816
	LTE Band 7	20M	QPSK	1	0	Bottom Side	1cm	ON	20850	2510		17.50	1.000	-0.09	0.782	0.782
26	LTE Band 7	20M	QPSK	1	0	Bottom Side	1cm	ON	21350	2560		17.50	1.000	-0.05	0.820	**0.820**
	LTE Band 7	20M	QPSK	50	0	Bottom Side	1cm	ON	21100	2535		17.50	1.000	0.1	0.560	0.560
	LTE Band 7	20M	QPSK	100	0	Bottom Side	1cm	ON	21100	2535		17.50	1.000	0.02	0.553	0.553

<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	11	2462	15.79	16.00	1.050	96.91	1.032	-0.118	0.071	0.077
	WLAN2.4GHz	802.11b 1Mbps	Back	1cm	11	2462	15.79	16.00	1.050	96.91	1.032	0.116	0.046	0.050
	WLAN2.4GHz	802.11b 1Mbps	Left Side	1cm	11	2462	15.79	16.00	1.050	96.91	1.032	-0.051	0.106	0.115
27	WLAN2.4GHz	802.11n-HT20 MCS0	Left Side	1cm	6	2437	15.84	17.00	1.306	83.76	1.194	0.14	0.100	**0.156**
	WLAN2.4GHz	802.11n-HT20 MCS0	Left Side	1cm	1	2412	13.31	13.50	1.045	83.76	1.194	0.142	0.098	0.122
	WLAN2.4GHz	802.11n-HT20 MCS0	Left Side	1cm	11	2462	10.64	11.00	1.086	83.76	1.194	-0.026	0.055	0.071
	WLAN2.4GHz	802.11ac-VHT20 MCS0	Left Side	1cm	6	2437	13.00	13.00	1.000	83.05	1.204	-0.14	0.075	0.090
	WLAN2.4GHz	802.11b 1Mbps	Top Side	1cm	11	2462	15.79	16.00	1.050	96.91	1.032	0.186	0.039	0.042
	WLAN5GHz	802.11a 6Mbps	Front	1cm	36	5180	15.71	16.00	1.068	87.18	1.147	-0.003	0.109	0.134
	WLAN5GHz	802.11a 6Mbps	Back	1cm	36	5180	15.71	16.00	1.068	87.18	1.147	0.179	0.082	0.100
	WLAN5GHz	802.11a 6Mbps	Left Side	1cm	36	5180	15.71	16.00	1.068	87.18	1.147	-0.051	0.115	0.141
28	WLAN5GHz	802.11a 6Mbps	Top Side	1cm	36	5180	15.71	16.00	1.068	87.18	1.147	-0.132	0.154	**0.189**
	WLAN5GHz	802.11a 6Mbps	Top Side	1cm	44	5220	15.43	16.00	1.140	87.18	1.147	-0.041	0.135	0.176
	WLAN5GHz	802.11n-HT40 MCS0	Top Side	1cm	46	5230	15.56	16.00	1.107	76.43	1.308	-0.02	0.128	0.185
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	1cm	42	5210	15.63	16.00	1.088	54.63	1.830	-0.007	0.078	0.155
	WLAN5GHz	802.11a 6Mbps	Front	1cm	161	5805	15.70	16.00	1.072	87.18	1.147	-0.01	0.053	0.065
	WLAN5GHz	802.11a 6Mbps	Back	1cm	161	5805	15.70	16.00	1.072	87.18	1.147	-0.17	0.163	0.200
29	WLAN5GHz	802.11a 6Mbps	Back	1cm	153	5765	15.62	16.00	1.091	87.18	1.147	-0.06	0.169	**0.212**
	WLAN5GHz	802.11a 6Mbps	Back	1cm	157	5785	15.63	16.00	1.090	87.18	1.147	-0.05	0.169	0.211
	WLAN5GHz	802.11n-HT40 MCS0	Back	1cm	159	5795	15.54	16.00	1.112	76.43	1.308	-0.16	0.134	0.195
	WLAN5GHz	802.11ac-VHT40 MCS0	Back	1cm	159	5795	15.79	16.00	1.049	71.26	1.403	-0.11	0.126	0.185
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1cm	155	5775	9.35	9.50	1.035	54.63	1.830	-0.04	0.019	0.036
	WLAN5GHz	802.11a 6Mbps	Left Side	1cm	161	5805	15.70	16.00	1.072	87.18	1.147	-0.05	0.075	0.092
	WLAN5GHz	802.11a 6Mbps	Top Side	1cm	161	5805	15.70	16.00	1.072	87.18	1.147	0.06	0.018	0.022

<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	11.96	12.00	1.009	-0.11	0.024	0.024
	Bluetooth	1Mbps	Back	1cm	39	2441	11.96	12.00	1.009	0.11	0.019	0.019
	Bluetooth	1Mbps	Left Side	1cm	39	2441	11.96	12.00	1.009	-0.15	0.035	0.035
30	Bluetooth	1Mbps	Left Side	1cm	0	2402	10.30	12.00	1.479	-0.13	0.025	**0.037**
	Bluetooth	1Mbps	Left Side	1cm	78	2480	10.04	12.00	1.570	-0.1	0.023	0.036
	Bluetooth	1Mbps	Top Side	1cm	39	2441	11.96	12.00	1.009	0.02	0.011	0.011

14.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Headset	Antenna Tuner	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 (2 Tx slots)	Front	1.5cm		non-Trigger	251	848.8	31.49	32.50	1.262	-0.06	0.560	0.707
31	GSM850	GPRS (2 Tx slots)	Front	1.5cm		non-Trigger	128	824.2	31.25	32.50	1.334	-0.04	0.634	**0.845**
	GSM850	GPRS (2 Tx slots)	Front	1.5cm		non-Trigger	189	836.4	31.33	32.50	1.309	-0.04	0.559	0.732
	GSM850	GPRS (2 Tx slots)	Front	1.5cm	Headset	Trigger	128	824.2	31.25	32.50	1.334	0.18	0.558	0.744
	GSM850	GPRS (2 Tx slots)	Front	1.5cm	Headset	Trigger	148	828.2	31.56	32.50	1.242	-0.13	0.503	0.625
	GSM850	GPRS (2 Tx slots)	Front	1.5cm	Headset	Trigger	231	844.8	31.80	32.50	1.175	-0.06	0.516	0.606
	GSM850	GPRS (2 Tx slots)	Back	1.5cm		non-Trigger	251	848.8	31.49	32.50	1.262	0.02	0.546	0.689
32	GSM1900	GPRS (2 Tx slots)	Front	1.5cm		non-Trigger	661	1880	28.67	28.70	1.007	0.01	0.677	**0.820**
	GSM1900	GPRS (2 Tx slots)	Front	1.5cm		non-Trigger	512	1850.2	28.58	28.70	1.028	0.01	0.611	0.755
	GSM1900	GPRS (2 Tx slots)	Front	1.5cm		non-Trigger	810	1909.8	28.65	28.70	1.012	-0.01	0.624	0.759
	GSM1900	GPRS (2 Tx slots)	Front	1.5cm	Headset	Trigger	661	1880	28.67	28.70	1.007	0	0.608	0.612
	GSM1900	GPRS (2 Tx slots)	Front	1.5cm	Headset	Trigger	561	1860	28.54	28.70	1.038	-0.11	0.462	0.479
	GSM1900	GPRS (2 Tx slots)	Front	1.5cm	Headset	Trigger	761	1900	28.47	28.70	1.054	-0.02	0.495	0.522
	GSM1900	GPRS (2 Tx slots)	Back	1.5cm		non-Trigger	661	1880	28.67	28.70	1.007	0	0.598	0.724

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Headset	Antenna Tuner	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	1.5cm		non-Trigger	4233	846.6	23.01	24.00	1.256	-0.02	0.503	0.632
	WCDMA V	RMC 12.2Kbps	Front	1.5cm		non-Trigger	4132	826.4	22.87	24.00	1.297	0.02	0.484	0.628
33	WCDMA V	RMC 12.2Kbps	Front	1.5cm		non-Trigger	4182	836.4	22.84	24.00	1.306	-0.06	0.505	**0.660**
	WCDMA V	RMC 12.2Kbps	Front	1.5cm	Headset	Trigger	4182	836.4	22.84	24.00	1.306	-0.04	0.429	0.560
	WCDMA V	RMC 12.2Kbps	Front	1.5cm	Headset	Trigger	4141	828.2	22.96	24.00	1.271	-0.01	0.369	0.469
	WCDMA V	RMC 12.2Kbps	Front	1.5cm	Headset	Trigger	4224	844.8	22.95	24.00	1.274	0.01	0.377	0.480
	WCDMA V	RMC 12.2Kbps	Back	1.5cm		non-Trigger	4233	846.6	23.01	24.00	1.256	0.03	0.458	0.575
34	WCDMA IV	RMC 12.2Kbps	Front	1.5cm		non-Trigger	1513	1752.6	22.86	24.00	1.300	-0.02	0.826	**1.074**
	WCDMA IV	RMC 12.2Kbps	Front	1.5cm		non-Trigger	1312	1712.4	22.78	24.00	1.324	0.01	0.786	1.041
	WCDMA IV	RMC 12.2Kbps	Front	1.5cm		non-Trigger	1413	1732.6	22.83	24.00	1.309	-0.02	0.771	1.009
	WCDMA IV	RMC 12.2Kbps	Front	1.5cm	Headset	Trigger	1513	1752.6	22.86	24.00	1.300	0.02	0.814	1.058
	WCDMA IV	RMC 12.2Kbps	Front	1.5cm	Headset	Trigger	1312	1712.4	22.78	24.00	1.324	0.03	0.780	1.033
	WCDMA IV	RMC 12.2Kbps	Front	1.5cm	Headset	Trigger	1413	1732.6	22.83	24.00	1.309	0.11	0.788	1.032
	WCDMA IV	RMC 12.2Kbps	Back	1.5cm		non-Trigger	1513	1752.6	22.86	24.00	1.300	0.01	0.733	0.953
	WCDMA IV	RMC 12.2Kbps	Back	1.5cm		non-Trigger	1312	1712.4	22.78	24.00	1.324	0.08	0.683	0.905
	WCDMA IV	RMC 12.2Kbps	Back	1.5cm		non-Trigger	1413	1732.6	22.83	24.00	1.309	0.1	0.692	0.906
35	WCDMA II	RMC12.2Kbps	Front	1.5cm		non-Trigger	9538	1907.6	22.90	24.00	1.288	-0.01	0.910	**1.172**
	WCDMA II	RMC12.2Kbps	Front	1.5cm		non-Trigger	9262	1852.4	22.73	24.00	1.340	-0.02	0.859	1.151
	WCDMA II	RMC12.2Kbps	Front	1.5cm		non-Trigger	9400	1880	22.80	24.00	1.318	-0.09	0.883	1.164
	WCDMA II	RMC12.2Kbps	Front	1.5cm	Headset	Trigger	9538	1907.6	22.90	24.00	1.288	0.09	0.897	1.156
	WCDMA II	RMC12.2Kbps	Front	1.5cm	Headset	Trigger	9262	1852.4	22.73	24.00	1.340	0.01	0.858	1.149
	WCDMA II	RMC12.2Kbps	Front	1.5cm	Headset	Trigger	9400	1880	22.80	24.00	1.318	0.01	0.875	1.153
	WCDMA II	RMC12.2Kbps	Front	1.5cm	Headset	Trigger	9300	1860	22.49	24.00	1.416	-0.04	0.739	1.046
	WCDMA II	RMC12.2Kbps	Front	1.5cm	Headset	Trigger	9500	1900	22.80	24.00	1.318	0.06	0.725	0.956
	WCDMA II	RMC12.2Kbps	Back	1.5cm		non-Trigger	9538	1907.6	22.90	24.00	1.288	0.04	0.851	1.096
	WCDMA II	RMC 12.2Kbps	Back	1.5cm		non-Trigger	9262	1852.4	22.73	24.00	1.340	0.07	0.722	0.967
	WCDMA II	RMC 12.2Kbps	Back	1.5cm		non-Trigger	9400	1880	22.80	24.00	1.318	0.09	0.739	0.974

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (cm)	Headset	Antenna Tuner	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 17	10M	QPSK	1	0	Front	1.5cm		non-Trigger	23790	710	22.96	24.00	1.271	-0.04	0.364	0.462
36	LTE Band 17	10M	QPSK	1	0	Front	1.5cm		non-Trigger	23780	709	22.95	24.00	1.274	0.01	0.383	**0.488**
	LTE Band 17	10M	QPSK	1	0	Front	1.5cm		non-Trigger	23800	711	22.86	24.00	1.300	-0.16	0.345	0.449
	LTE Band 17	10M	QPSK	25	12	Front	1.5cm		non-Trigger	23790	710	21.92	23.00	1.282	-0.01	0.246	0.315
	LTE Band 17	10M	QPSK	1	0	Front	1.5cm	Headset	Trigger	23780	709	22.95	24.00	1.274	0.02	0.139	0.177
	LTE Band 17	10M	QPSK	25	12	Front	1.5cm	Headset	Trigger	23780	709	21.92	23.00	1.282	-0.03	0.086	0.110
	LTE Band 17	10M	QPSK	1	0	Back	1.5cm		non-Trigger	23790	710	22.96	24.00	1.271	-0.1	0.361	0.459
	LTE Band 17	10M	QPSK	25	12	Back	1.5cm		non-Trigger	23790	710	21.92	23.00	1.282	0.03	0.223	0.286
	LTE Band 5	10M	QPSK	1	0	Front	1.5cm		non-Trigger	20450	829	22.87	24.00	1.297	-0.04	0.378	0.490
	LTE Band 5	10M	QPSK	1	0	Front	1.5cm		non-Trigger	20525	836.5	22.64	24.00	1.368	-0.01	0.524	0.717
37	LTE Band 5	10M	QPSK	1	0	Front	1.5cm		non-Trigger	20600	844	22.63	24.00	1.371	0.01	0.571	**0.783**
	LTE Band 5	10M	QPSK	25	0	Front	1.5cm		non-Trigger	20525	836.5	21.99	23.00	1.262	0.05	0.286	0.361
	LTE Band 5	10M	QPSK	1	0	Front	1.5cm	Headset	Trigger	20600	844	22.63	24.00	1.371	-0.1	0.473	0.648
	LTE Band 5	10M	QPSK	1	0	Front	1.5cm	Headset	Trigger	20450	829	22.87	24.00	1.297	-0.08	0.433	0.562
	LTE Band 5	10M	QPSK	1	0	Front	1.5cm	Headset	Trigger	20525	836.5	22.64	24.00	1.368	-0.05	0.419	0.573
	LTE Band 5	10M	QPSK	25	0	Front	1.5cm	Headset	Trigger	20525	836.5	21.99	23.00	1.262	0.08	0.185	0.233
	LTE Band 5	10M	QPSK	1	0	Back	1.5cm		non-Trigger	20450	829	22.87	24.00	1.297	0.17	0.356	0.462
	LTE Band 5	10M	QPSK	25	0	Back	1.5cm		non-Trigger	20525	836.5	21.99	23.00	1.262	0.01	0.282	0.356
38	LTE Band 4	20M	QPSK	1	0	Front	1.5cm		non-Trigger	20300	1745	22.99	24.00	1.262	-0.03	0.941	**1.187**
	LTE Band 4	20M	QPSK	1	0	Front	1.5cm		non-Trigger	20050	1720	22.85	24.00	1.303	0.01	0.859	1.119
	LTE Band 4	20M	QPSK	1	0	Front	1.5cm		non-Trigger	20175	1732.5	22.89	24.00	1.291	0.04	0.884	1.141
	LTE Band 4	20M	QPSK	50	0	Front	1.5cm		non-Trigger	20300	1745	21.97	23.00	1.268	0.02	0.829	1.051
	LTE Band 4	20M	QPSK	50	0	Front	1.5cm		non-Trigger	20050	1720	21.93	23.00	1.279	0.19	0.788	1.008
	LTE Band 4	20M	QPSK	50	0	Front	1.5cm		non-Trigger	20175	1732.5	21.96	23.00	1.271	-0.01	0.817	1.038
	LTE Band 4	20M	QPSK	100	0	Front	1.5cm		non-Trigger	20175	1732.5	21.95	23.00	1.274	0.01	0.827	1.053
	LTE Band 4	20M	QPSK	1	0	Front	1.5cm	Headset	Trigger	20300	1745	22.99	24.00	1.262	-0.06	0.939	1.185
	LTE Band 4	20M	QPSK	1	0	Front	1.5cm	Headset	Trigger	20050	1720	22.85	24.00	1.303	-0.02	0.863	1.125
	LTE Band 4	20M	QPSK	1	0	Front	1.5cm	Headset	Trigger	20175	1732.5	22.89	24.00	1.291	-0.01	0.884	1.141
	LTE Band 4	20M	QPSK	50	0	Front	1.5cm	Headset	Trigger	20300	1745	21.97	23.00	1.268	0.02	0.732	0.928
	LTE Band 4	20M	QPSK	50	0	Front	1.5cm	Headset	Trigger	20050	1720	21.93	23.00	1.279	0.04	0.715	0.915
	LTE Band 4	20M	QPSK	50	0	Front	1.5cm	Headset	Trigger	20175	1732.5	21.96	23.00	1.271	-0.07	0.765	0.972
	LTE Band 4	20M	QPSK	100	0	Front	1.5cm	Headset	Trigger	20175	1732.5	21.95	23.00	1.274	0	0.767	0.977
	LTE Band 4	20M	QPSK	1	0	Back	1.5cm		non-Trigger	20300	1745	22.99	24.00	1.262	0.05	0.929	1.172
	LTE Band 4	20M	QPSK	1	0	Back	1.5cm		non-Trigger	20050	1720	22.85	24.00	1.303	-0.04	0.869	1.132
	LTE Band 4	20M	QPSK	1	0	Back	1.5cm		non-Trigger	20175	1732.5	22.89	24.00	1.291	0	0.890	1.149
	LTE Band 4	20M	QPSK	50	0	Back	1.5cm		non-Trigger	20300	1745	21.97	23.00	1.268	0.02	0.824	1.045
	LTE Band 4	20M	QPSK	50	0	Back	1.5cm		non-Trigger	20050	1720	21.93	23.00	1.279	0	0.698	0.893
	LTE Band 4	20M	QPSK	50	0	Back	1.5cm		non-Trigger	20175	1732.5	21.96	23.00	1.271	-0.04	0.770	0.978
	LTE Band 4	20M	QPSK	100	0	Back	1.5cm		non-Trigger	20175	1732.5	21.95	23.00	1.274	0	0.787	1.002

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (cm)	Headset	Antenna Tuner	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	0	Front	1.5cm		non-Trigger	18900	1880	22.99	24.00	1.262	0.01	0.944	1.191
	LTE Band 2	20M	QPSK	1	0	Front	1.5cm		non-Trigger	18700	1860	22.96	24.00	1.271	-0.03	0.945	1.201
39	LTE Band 2	20M	QPSK	1	0	Front	1.5cm		non-Trigger	19100	1900	22.98	24.00	1.265	0.02	1.000	**1.265**
	LTE Band 2	20M	QPSK	50	0	Front	1.5cm		non-Trigger	19100	1900	22.00	23.00	1.259	0	0.795	1.001
	LTE Band 2	20M	QPSK	50	0	Front	1.5cm		non-Trigger	18700	1860	21.96	23.00	1.271	-0.06	0.756	0.961
	LTE Band 2	20M	QPSK	50	0	Front	1.5cm		non-Trigger	18900	1880	21.99	23.00	1.262	-0.04	0.769	0.970
	LTE Band 2	20M	QPSK	100	0	Front	1.5cm		non-Trigger	18900	1880	21.98	23.00	1.265	0	0.787	0.995
	LTE Band 2	20M	QPSK	1	0	Front	1.5cm	Headset	non-Trigger	19100	1900	22.98	24.00	1.265	-0.02	0.998	1.262
	LTE Band 2	20M	QPSK	1	0	Front	1.5cm	Headset	non-Trigger	18700	1860	22.96	24.00	1.271	0.01	0.981	1.246
	LTE Band 2	20M	QPSK	1	0	Front	1.5cm	Headset	non-Trigger	18900	1880	22.99	24.00	1.262	0	0.960	1.211
	LTE Band 2	20M	QPSK	50	0	Front	1.5cm	Headset	non-Trigger	19100	1900	22.00	23.00	1.259	-0.04	0.804	1.012
	LTE Band 2	20M	QPSK	50	0	Front	1.5cm	Headset	non-Trigger	18700	1860	21.96	23.00	1.271	0.03	0.820	1.042
	LTE Band 2	20M	QPSK	50	0	Front	1.5cm	Headset	non-Trigger	18900	1880	21.99	23.00	1.262	0.05	0.811	1.023
	LTE Band 2	20M	QPSK	100	0	Front	1.5cm	Headset	non-Trigger	18900	1880	21.98	23.00	1.265	0.01	0.824	1.042
	LTE Band 2	20M	QPSK	1	0	Front	1.5cm	Headset	Trigger	19100	1900	22.98	24.00	1.265	-0.04	0.699	0.884
	LTE Band 2	20M	QPSK	1	0	Front	1.5cm	Headset	Trigger	18700	1860	22.96	24.00	1.271	-0.01	0.656	0.833
	LTE Band 2	20M	QPSK	1	0	Front	1.5cm	Headset	Trigger	18900	1880	22.99	24.00	1.262	-0.01	0.692	0.873
	LTE Band 2	20M	QPSK	50	0	Front	1.5cm	Headset	Trigger	19100	1900	22.00	23.00	1.259	-0.01	0.580	0.730
	LTE Band 2	20M	QPSK	50	0	Front	1.5cm	Headset	Trigger	18700	1860	21.96	23.00	1.271	-0.04	0.581	0.738
	LTE Band 2	20M	QPSK	50	0	Front	1.5cm	Headset	Trigger	18900	1880	21.99	23.00	1.262	-0.04	0.556	0.702
	LTE Band 2	20M	QPSK	100	0	Front	1.5cm	Headset	Trigger	19100	1900	21.95	23.00	1.274	0	0.529	0.674
	LTE Band 2	20M	QPSK	1	0	Back	1.5cm		non-Trigger	18900	1880	22.99	24.00	1.262	0.05	0.824	1.040
	LTE Band 2	20M	QPSK	1	0	Back	1.5cm		non-Trigger	18700	1860	22.96	24.00	1.271	0.04	0.874	1.110
	LTE Band 2	20M	QPSK	1	0	Back	1.5cm		non-Trigger	19100	1900	22.98	24.00	1.265	0.03	0.878	1.110
	LTE Band 2	20M	QPSK	50	0	Back	1.5cm		non-Trigger	19100	1900	22.00	23.00	1.259	-0.03	0.729	0.918
	LTE Band 2	20M	QPSK	50	0	Back	1.5cm		non-Trigger	18700	1860	21.96	23.00	1.271	-0.03	0.704	0.894
	LTE Band 2	20M	QPSK	50	0	Back	1.5cm		non-Trigger	18900	1880	21.99	23.00	1.262	-0.01	0.703	0.887
	LTE Band 2	20M	QPSK	100	0	Back	1.5cm		non-Trigger	18900	1880	21.98	23.00	1.265	0.04	0.722	0.913
	LTE Band 7	20M	QPSK	1	0	Front	1.5cm		non-Trigger	21100	2535	22.99	24.00	1.262	0.02	0.909	1.147
	LTE Band 7	20M	QPSK	1	0	Front	1.5cm		non-Trigger	20850	2510	22.95	24.00	1.274	-0.11	0.812	1.034
	LTE Band 7	20M	QPSK	1	0	Front	1.5cm		non-Trigger	21350	2560	22.98	24.00	1.265	-0.01	0.872	1.103
	LTE Band 7	20M	QPSK	50	0	Front	1.5cm		non-Trigger	21100	2535	21.98	23.00	1.265	0.01	0.529	0.669
	LTE Band 7	20M	QPSK	100	0	Front	1.5cm		non-Trigger	21100	2535	22.00	23.00	1.259	-0.03	0.524	0.660
40	LTE Band 7	20M	QPSK	1	0	Back	1.5cm		non-Trigger	21100	2535	22.99	24.00	1.262	-0.03	0.937	**1.182**
	LTE Band 7	20M	QPSK	1	0	Back	1.5cm		non-Trigger	20850	2510	22.95	24.00	1.274	-0.05	0.879	1.119
	LTE Band 7	20M	QPSK	1	0	Back	1.5cm		non-Trigger	21350	2560	22.98	24.00	1.265	-0.14	0.927	1.172
	LTE Band 7	20M	QPSK	50	0	Back	1.5cm		non-Trigger	21100	2535	21.98	23.00	1.265	-0.08	0.490	0.620
	LTE Band 7	20M	QPSK	100	0	Back	1.5cm		non-Trigger	21100	2535	22.00	23.00	1.259	0.04	0.479	0.603
	LTE Band 7	20M	QPSK	1	0	Back	1.5cm	Headset	Trigger	21100	2535	22.99	24.00	1.262	-0.04	0.744	0.939
	LTE Band 7	20M	QPSK	1	0	Back	1.5cm	Headset	Trigger	20850	2510	22.95	24.00	1.274	-0.03	0.730	0.930
	LTE Band 7	20M	QPSK	1	0	Back	1.5cm	Headset	Trigger	21350	2560	22.98	24.00	1.265	0.01	0.772	0.976
	LTE Band 7	20M	QPSK	1	0	Back	1.5cm	Headset	Trigger	20867	2511.7	23.29	24.00	1.178	-0.05	0.728	0.857
	LTE Band 7	20M	QPSK	1	0	Back	1.5cm	Headset	Trigger	21333	2558.3	23.40	24.00	1.148	-0.04	0.710	0.815
	LTE Band 7	20M	QPSK	50	0	Back	1.5cm	Headset	Trigger	21100	2535	21.98	23.00	1.265	0	0.423	0.535
	LTE Band 7	20M	QPSK	100	0	Back	1.5cm	Headset	Trigger	21100	2535	22.00	23.00	1.259	-0.03	0.426	0.536

<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	16.33	16.50	1.040	96.91	1.032	-0.191	0.057	0.061
	WLAN2.4GHz	802.11b 5.5Mbps	Front	1.5cm	6	2437	17.89	18.00	1.026	96.91	1.032	-0.078	0.065	0.069
	WLAN2.4GHz	802.11b 11Mbps	Front	1.5cm	6	2437	17.48	18.00	1.128	96.91	1.032	-0.073	0.061	0.071
41	WLAN2.4GHz	802.11b 11Mbps	Front	1.5cm	1	2412	17.33	18.00	1.167	96.91	1.032	-0.17	0.060	**0.072**
	WLAN2.4GHz	802.11b 11Mbps	Front	1.5cm	11	2462	17.36	18.00	1.159	96.91	1.032	-0.073	0.054	0.065
	WLAN2.4GHz	802.11n-HT20 MCS0	Front	1.5cm	6	2437	16.62	17.00	1.091	83.76	1.194	0.17	0.043	0.056
	WLAN2.4GHz	802.11ac-VHT20 MCS0	Front	1.5cm	6	2437	13.77	14.00	1.054	83.05	1.204	-0.18	0.020	0.025
	WLAN2.4GHz	802.11b 1Mbps	Back	1.5cm	6	2437	16.98	18.00	1.266	96.91	1.032	0.11	0.046	0.060
	WLAN5GHz	802.11a 6Mbps	Front	1.5cm	36	5180	17.48	17.50	1.004	87.18	1.147	-0.03	0.065	0.075
42	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	36	5180	17.48	17.50	1.004	87.18	1.147	-0.03	0.093	**0.107**
	WLAN5GHz	802.11n-HT40 MCS0	Back	1.5cm	46	5230	17.49	17.50	1.001	76.43	1.308	-0.17	0.072	0.094
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1.5cm	42	5210	17.49	17.50	1.002	54.63	1.830	-0.09	0.058	0.106
	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	48	5240	17.25	17.50	1.059	87.18	1.147	-0.02	0.091	0.110
	WLAN5GHz	802.11a 6Mbps	Front	1.5cm	60	5300	16.92	17.00	1.019	87.18	1.147	0.17	0.010	0.012
	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	60	5300	16.92	17.00	1.019	87.18	1.147	-0.122	0.079	0.092
	WLAN5GHz	802.11n-HT40 MCS0	Back	1.5cm	54	5270	17.49	17.00	0.892	76.43	1.308	-0.165	0.067	0.078
43	WLAN5GHz	802.11ac-VHT40 MCS0	Back	1.5cm	54	5270	16.85	17.00	1.035	71.26	1.403	0.12	0.123	**0.179**
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1.5cm	58	5290	14.99	15.00	1.002	54.63	1.830	-0.06	0.060	0.110
	WLAN5GHz	802.11a 6Mbps	Front	1.5cm	112	5560	17.22	17.50	1.067	87.18	1.147	0.036	0.051	0.062
	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	112	5560	17.22	17.50	1.067	87.18	1.147	-0.075	0.272	0.333
	WLAN5GHz	802.11n-HT40 MCS0	Back	1.5cm	110	5550	17.14	17.50	1.085	76.43	1.308	-0.101	0.263	0.373
44	WLAN5GHz	802.11ac-VHT40 MCS0	Back	1.5cm	110	5550	16.98	17.50	1.127	71.26	1.403	-0.19	0.254	**0.402**
	WLAN5GHz	802.11ac-VHT40 MCS0	Back	1.5cm	102	5510	15.07	15.50	1.104	71.26	1.403	0.09	0.198	0.307
	WLAN5GHz	802.11ac-VHT40 MCS0	Back	1.5cm	134	5670	16.96	17.50	1.132	71.26	1.403	-0.01	0.249	0.396
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1.5cm	106	5530	14.27	14.50	1.055	54.63	1.830	-0.12	0.198	0.382
	WLAN5GHz	802.11a 6Mbps	Front	1.5cm	161	5805	17.25	17.50	1.059	87.18	1.147	-0.08	0.053	0.064
	WLAN5GHz	802.11a 6Mbps	Back	1.5cm	161	5805	17.25	17.50	1.059	87.18	1.147	-0.17	0.279	0.339
	WLAN5GHz	802.11n-HT20 MCS0	Back	1.5cm	161	5805	17.15	17.50	1.084	83.76	1.194	-0.08	0.294	0.380
	WLAN5GHz	802.11n-HT20 MCS0	Back	1.5cm	153	5765	17.01	17.50	1.119	83.76	1.194	-0.17	0.274	0.366
45	WLAN5GHz	802.11n-HT20 MCS0	Back	1.5cm	157	5785	16.93	17.50	1.140	83.76	1.194	-0.16	0.287	**0.391**
	WLAN5GHz	802.11n-HT40 MCS0	Back	1.5cm	159	5795	15.92	16.50	1.142	76.43	1.308	-0.15	0.177	0.264
	WLAN5GHz	802.11ac-VHT20 MCS0	Back	1.5cm	161	5805	17.27	17.50	1.054	82.99	1.205	-0.14	0.261	0.332
	WLAN5GHz	802.11ac-VHT40 MCS0	Back	1.5cm	159	5795	16.37	16.50	1.030	71.26	1.403	-0.1	0.172	0.249
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	1.5cm	155	5775	9.35	9.50	1.035	54.63	1.830	-0.02	0.022	0.042

<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	11.96	12.00	1.009	0.08	0.011	0.011
	Bluetooth	1Mbps	Back	1.5cm	39	2441	11.96	12.00	1.009	-0.1	0.012	0.012
	Bluetooth	1Mbps	Back	1.5cm	0	2402	10.30	12.00	1.479	-0.01	0.010	0.015
46	Bluetooth	1Mbps	Back	1.5cm	78	2480	10.04	12.00	1.570	-0.08	0.011	**0.017**

14.4 Repeated SAR Measurement

No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	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)	Ratio	Reported 1g SAR (W/kg)
1st	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right Side	1cm	251	848.8	31.49	32.50	1.262	-0.05	0.815	-	1.028
2nd	GSM850	-	-	-	-	GPRS (2 Tx slots)	Right Side	1cm	251	848.8	31.49	32.50	1.262	-0.06	0.796	1.02	1.004
1st	LTE Band 4	20M	QPSK	1	0	-	Front	1.5cm	20300	1745	22.99	24.00	1.262	-0.03	0.941	-	1.187
2nd	LTE Band 4	20M	QPSK	1	0	-	Front	1.5cm	20300	1745	22.99	24.00	1.262	-0.01	0.937	1.01	1.182
1st	LTE Band 2	20M	QPSK	1	0	-	Front	1.5cm	19100	1900	22.98	24.00	1.265	0.02	1.000	-	1.265
2nd	LTE Band 2	20M	QPSK	1	0	-	Front	1.5cm	19100	1900	22.98	24.00	1.265	-0.09	0.959	1.04	1.213
1st	LTE Band 7	20M	QPSK	1	0	-	Back	1.5cm	21100	2535	22.99	24.00	1.262	-0.03	0.937	-	1.182
2nd	LTE Band 7	20M	QPSK	1	0	-	Back	1.5cm	21100	2535	22.99	24.00	1.262	-0.01	0.911	1.03	1.150

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)	Ratio	Reported 1g SAR (W/kg)
1st	WLAN5GHz	802.11a 6Mbps	Right Cheek	36	5180	17.48	17.50	1.000	87.18	1.147	0.04	0.982	-	1.126
2nd	WLAN5GHz	802.11a 6Mbps	Right Cheek	36	5180	17.48	17.50	1.000	87.18	1.147	0.14	0.892	1.11	1.023
1st	WLAN5GHz	802.11a 6Mbps	Right Tilted	52	5260	16.88	17.00	1.028	87.18	1.147	-0.19	0.858	-	1.012
2nd	WLAN5GHz	802.11a 6Mbps	Right Tilted	52	5260	16.88	17.00	1.028	87.18	1.147	-0.04	0.754	1.14	0.889

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.	GSM(Voice) + Bluetooth(data)	Yes	Yes		
4.	WCDMA((Voice) + Bluetooth(data)	Yes	Yes		
5.	GSM(Voice) + WLAN5GHz(data)	Yes	Yes		
6.	WCDMA((Voice) + WLAN5GHz(data)	Yes	Yes		
7.	GPRS/EDGE(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
8.	WCDMA(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
9.	LTE(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
10.	GPRS/EDGE(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
11.	WCDMA(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
12.	LTE(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
13.	GPRS/EDGE(Data) + WLAN5GHz(data)	Yes	Yes	Yes	WiFi Direct
14.	WCDMA(Data) + WLAN5GHz(data)	Yes	Yes	Yes	WiFi Direct
15.	LTE(Data) + WLAN5GHz(data)	Yes	Yes	Yes	WiFi Direct

General Note:

1. This device supported VoIP in EGPRS, WCDMA, 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 select WLAN without connect a headset SAR for conservatively summation.
5. The Scaled SAR summation is calculated based on the same configuration and test position.
6. The worst case 2.4GHz / 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 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
   v) The SPLSR calculated results please refer to section 15.4.

15.1 Head Exposure Conditions

WWAN Band		Exposure Position	1 WWAN SAR (W/kg)	2 2.4GHz WLAN SAR (W/kg)	3 2.4GHz Bluetooth SAR (W/kg)	1+2 Summed SAR (W/kg)	1+3 Summed SAR (W/kg)
GSM	GSM850	Right Cheek	0.628	0.788	0.189	**1.42**	**0.82**
		Right Tilted	0.326	0.248	0.058	**0.57**	**0.38**
		Left Cheek	0.516	0.178	0.041	**0.69**	**0.56**
		Left Tilted	0.375	0.201	0.044	**0.58**	**0.42**
	GSM1900	Right Cheek	0.112	0.788	0.189	**0.90**	**0.30**
		Right Tilted	0.075	0.248	0.058	**0.32**	**0.13**
		Left Cheek	0.204	0.178	0.041	**0.38**	**0.25**
		Left Tilted	0.085	0.201	0.044	**0.29**	**0.13**
WCMDA	Band V	Right Cheek	0.571	0.788	0.189	**1.36**	**0.76**
		Right Tilted	0.306	0.248	0.058	**0.55**	**0.36**
		Left Cheek	0.446	0.178	0.041	**0.62**	**0.49**
		Left Tilted	0.305	0.201	0.044	**0.51**	**0.35**
	Band IV	Right Cheek	0.237	0.788	0.189	**1.03**	**0.43**
		Right Tilted	0.163	0.248	0.058	**0.41**	**0.22**
		Left Cheek	0.432	0.178	0.041	**0.61**	**0.47**
		Left Tilted	0.117	0.201	0.044	**0.32**	**0.16**
	Band II	Right Cheek	0.211	0.788	0.189	**1.00**	**0.40**
		Right Tilted	0.117	0.248	0.058	**0.37**	**0.18**
		Left Cheek	0.353	0.178	0.041	**0.53**	**0.39**
		Left Tilted	0.156	0.201	0.044	**0.36**	**0.20**
LTE	Band 17	Right Cheek	0.409	0.788	0.189	**1.20**	**0.60**
		Right Tilted	0.253	0.248	0.058	**0.50**	**0.31**
		Left Cheek	0.398	0.178	0.041	**0.58**	**0.44**
		Left Tilted	0.260	0.201	0.044	**0.46**	**0.30**
	Band 5	Right Cheek	0.559	0.788	0.189	**1.35**	**0.75**
		Right Tilted	0.333	0.248	0.058	**0.58**	**0.39**
		Left Cheek	0.479	0.178	0.041	**0.66**	**0.52**
		Left Tilted	0.337	0.201	0.044	**0.54**	**0.38**
	Band 4	Right Cheek	0.180	0.788	0.189	**0.97**	**0.37**
		Right Tilted	0.145	0.248	0.058	**0.39**	**0.20**
		Left Cheek	0.342	0.178	0.041	**0.52**	**0.38**
		Left Tilted	0.121	0.201	0.044	**0.32**	**0.17**
	Band 2	Right Cheek	0.206	0.788	0.189	**0.99**	**0.40**
		Right Tilted	0.132	0.248	0.058	**0.38**	**0.19**
		Left Cheek	0.356	0.178	0.041	**0.53**	**0.40**
		Left Tilted	0.146	0.201	0.044	**0.35**	**0.19**
	Band 7	Right Cheek	0.223	0.788	0.189	**1.01**	**0.41**
		Right Tilted	0.230	0.248	0.058	**0.48**	**0.29**
		Left Cheek	0.538	0.178	0.041	**0.72**	**0.58**
		Left Tilted	0.201	0.201	0.044	**0.40**	**0.25**

WWAN Band		Exposure Position	1	2		1+2 Summed SAR (W/kg)	SPLSR Results	Case No
			WWAN	5.2GHz / 5.3GHz / 5.5GHz / 5.8GHz WLAN				
			SAR (W/kg)	Band	SAR (W/kg)			
GSM	GSM850	Right Cheek	0.628	5.2GHz WLAN	1.462	**2.09**	0.04	Case 1
		Right Tilted	0.326	5.2GHz WLAN	1.106	**1.43**		
		Left Cheek	0.516	5.2GHz WLAN	0.345	**0.86**		
		Left Tilted	0.375	5.2GHz WLAN	0.381	**0.76**		
	GSM1900	Right Cheek	0.112	5.2GHz WLAN	1.462	**1.57**		
		Right Tilted	0.075	5.2GHz WLAN	1.106	**1.18**		
		Left Cheek	0.204	5.2GHz WLAN	0.345	**0.55**		
		Left Tilted	0.085	5.2GHz WLAN	0.381	**0.47**		
WCMDA	Band V	Right Cheek	0.571	5.2GHz WLAN	1.462	**2.03**	0.04	Case 2
		Right Tilted	0.306	5.2GHz WLAN	1.106	**1.41**		
		Left Cheek	0.446	5.2GHz WLAN	0.345	**0.79**		
		Left Tilted	0.305	5.2GHz WLAN	0.381	**0.69**		
	Band IV	Right Cheek	0.237	5.2GHz WLAN	1.462	**1.70**	0.02	Case 3
		Right Tilted	0.163	5.2GHz WLAN	1.106	**1.27**		
		Left Cheek	0.432	5.2GHz WLAN	0.345	**0.78**		
		Left Tilted	0.117	5.2GHz WLAN	0.381	**0.50**		
	Band II	Right Cheek	0.211	5.2GHz WLAN	1.462	**1.67**	0.04	Case 4
		Right Tilted	0.117	5.2GHz WLAN	1.106	**1.22**		
		Left Cheek	0.353	5.2GHz WLAN	0.345	**0.70**		
		Left Tilted	0.156	5.2GHz WLAN	0.381	**0.54**		
LTE	Band 17	Right Cheek	0.409	5.2GHz WLAN	1.462	**1.87**	0.03	Case 5
		Right Tilted	0.253	5.2GHz WLAN	1.106	**1.36**		
		Left Cheek	0.398	5.2GHz WLAN	0.345	**0.74**		
		Left Tilted	0.260	5.2GHz WLAN	0.381	**0.64**		
	Band 5	Right Cheek	0.559	5.2GHz WLAN	1.462	**2.02**	0.04	Case 6
		Right Tilted	0.333	5.2GHz WLAN	1.106	**1.44**		
		Left Cheek	0.479	5.2GHz WLAN	0.345	**0.82**		
		Left Tilted	0.337	5.2GHz WLAN	0.381	**0.72**		
	Band 4	Right Cheek	0.180	5.2GHz WLAN	1.462	**1.64**	0.02	Case 7
		Right Tilted	0.145	5.2GHz WLAN	1.106	**1.25**		
		Left Cheek	0.342	5.2GHz WLAN	0.345	**0.69**		
		Left Tilted	0.121	5.2GHz WLAN	0.381	**0.50**		
	Band 2	Right Cheek	0.206	5.2GHz WLAN	1.462	**1.67**	0.04	Case 8
		Right Tilted	0.132	5.2GHz WLAN	1.106	**1.24**		
		Left Cheek	0.356	5.2GHz WLAN	0.345	**0.70**		
		Left Tilted	0.146	5.2GHz WLAN	0.381	**0.53**		
	Band 7	Right Cheek	0.223	5.2GHz WLAN	1.462	**1.69**	0.04	Case 9
		Right Tilted	0.230	5.2GHz WLAN	1.106	**1.34**		
		Left Cheek	0.538	5.2GHz WLAN	0.345	**0.88**		
		Left Tilted	0.201	5.2GHz WLAN	0.381	**0.58**		

15.2 Wireless Router Exposure Conditions

WWAN Band		Exposure Position	1 WWAN SAR (W/kg)	2 2.4GHz WLAN SAR (W/kg)	3 2.4GHz Bluetooth SAR (W/kg)	1+2 Summed SAR (W/kg)	1+3 Summed SAR (W/kg)
GSM	GSM850	Front	1.035	0.077	0.024	**1.11**	**1.06**
		Back	1.004	0.050	0.019	**1.05**	**1.02**
		Left side	0.562	0.156	0.037	**0.72**	**0.60**
		Right side	1.036			**1.04**	**1.04**
		Top side		0.042	0.011	**0.04**	**0.01**
		Bottom side	0.423			**0.42**	**0.42**
	GSM1900	Front	0.491	0.077	0.024	**0.57**	**0.52**
		Back	0.440	0.050	0.019	**0.49**	**0.46**
		Left side	0.073	0.156	0.037	**0.23**	**0.11**
		Right side	0.039			**0.04**	**0.04**
		Top side		0.042	0.011	**0.04**	**0.01**
		Bottom side	0.633			**0.63**	**0.63**
WCMDA	Band V	Front	0.761	0.077	0.024	**0.84**	**0.79**
		Back	0.710	0.050	0.019	**0.76**	**0.73**
		Left side	0.560	0.156	0.037	**0.72**	**0.60**
		Right side	0.933			**0.93**	**0.93**
		Top side		0.042	0.011	**0.04**	**0.01**
		Bottom side	0.354			**0.35**	**0.35**
	Band IV	Front	0.422	0.077	0.024	**0.50**	**0.45**
		Back	0.385	0.050	0.019	**0.44**	**0.40**
		Left side	0.062	0.156	0.037	**0.22**	**0.10**
		Right side	0.026			**0.03**	**0.03**
		Top side		0.042	0.011	**0.04**	**0.01**
		Bottom side	0.764			**0.76**	**0.76**
	Band II	Front	0.492	0.077	0.024	**0.57**	**0.52**
		Back	0.527	0.050	0.019	**0.58**	**0.55**
		Left side	0.077	0.156	0.037	**0.23**	**0.11**
		Right side	0.040			**0.04**	**0.04**
		Top side		0.042	0.011	**0.04**	**0.01**
		Bottom side	0.811			**0.81**	**0.81**
LTE	Band 17	Front	0.627	0.077	0.024	**0.70**	**0.65**
		Back	0.526	0.050	0.019	**0.58**	**0.55**
		Left side	0.253	0.156	0.037	**0.41**	**0.29**
		Right side	0.342			**0.34**	**0.34**
		Top side		0.042	0.011	**0.04**	**0.01**
		Bottom side	0.201			**0.20**	**0.20**
	Band 5	Front	0.841	0.077	0.024	**0.92**	**0.87**
		Back	0.743	0.050	0.019	**0.79**	**0.76**
		Left side	0.738	0.156	0.037	**0.89**	**0.78**
		Right side	0.851			**0.85**	**0.85**
		Top side		0.042	0.011	**0.04**	**0.01**
		Bottom side	0.348			**0.35**	**0.35**
	Band 4	Front	0.636	0.077	0.024	**0.71**	**0.66**
		Back	0.513	0.050	0.019	**0.56**	**0.53**
		Left side	0.065	0.156	0.037	**0.22**	**0.10**
		Right side	0.045			**0.05**	**0.05**
		Top side		0.042	0.011	**0.04**	**0.01**
		Bottom side	0.845			**0.85**	**0.85**
	Band 2	Front	0.540	0.077	0.024	**0.62**	**0.56**
		Back	0.445	0.050	0.019	**0.50**	**0.46**
		Left side	0.077	0.156	0.037	**0.23**	**0.11**
		Right side	0.040			**0.04**	**0.04**
		Top side		0.042	0.011	**0.04**	**0.01**
		Bottom side	0.814			**0.81**	**0.81**
	Band 7	Front	0.402	0.077	0.024	**0.48**	**0.43**
		Back	0.427	0.050	0.019	**0.48**	**0.45**
		Left side	0.172	0.156	0.037	**0.33**	**0.21**
		Right side	0.044			**0.04**	**0.04**
		Top side		0.042	0.011	**0.04**	**0.01**
		Bottom side	0.820			**0.82**	**0.82**

WWAN Band		Exposure Position	1	2		1+2 Summed SAR (W/kg)
			WWAN	5.2GHz / 5.8GHz WLAN		
			SAR (W/kg)	Band	SAR (W/kg)	
GSM	GSM850	Front	1.035	5.2GHz WLAN	0.134	**1.17**
		Back	1.004	5.8GHz WLAN	0.212	**1.22**
		Left side	0.562	5.2GHz WLAN	0.141	**0.70**
		Right side	1.036			**1.04**
		Top side		5.2GHz WLAN	0.189	**0.19**
		Bottom side	0.423			**0.42**
	GSM1900	Front	0.491	5.2GHz WLAN	0.134	**0.63**
		Back	0.440	5.8GHz WLAN	0.212	**0.65**
		Left side	0.073	5.2GHz WLAN	0.141	**0.21**
		Right side	0.039			**0.04**
		Top side		5.2GHz WLAN	0.189	**0.19**
		Bottom side	0.633			**0.63**
WCMDA	Band V	Front	0.761	5.2GHz WLAN	0.134	**0.90**
		Back	0.710	5.8GHz WLAN	0.212	**0.92**
		Left side	0.560	5.2GHz WLAN	0.141	**0.70**
		Right side	0.933			**0.93**
		Top side		5.2GHz WLAN	0.189	**0.19**
		Bottom side	0.354			**0.35**
	Band IV	Front	0.422	5.2GHz WLAN	0.134	**0.56**
		Back	0.385	5.8GHz WLAN	0.212	**0.60**
		Left side	0.062	5.2GHz WLAN	0.141	**0.20**
		Right side	0.026			**0.03**
		Top side		5.2GHz WLAN	0.189	**0.19**
		Bottom side	0.764			**0.76**
	Band II	Front	0.492	5.2GHz WLAN	0.134	**0.63**
		Back	0.527	5.8GHz WLAN	0.212	**0.74**
		Left side	0.077	5.2GHz WLAN	0.141	**0.22**
		Right side	0.040			**0.04**
		Top side		5.2GHz WLAN	0.189	**0.19**
		Bottom side	0.811			**0.81**
LTE	Band 17	Front	0.627	5.2GHz WLAN	0.134	**0.76**
		Back	0.526	5.8GHz WLAN	0.212	**0.74**
		Left side	0.253	5.2GHz WLAN	0.141	**0.39**
		Right side	0.342			**0.34**
		Top side		5.2GHz WLAN	0.189	**0.19**
		Bottom side	0.201			**0.20**
	Band 5	Front	0.841	5.2GHz WLAN	0.134	**0.98**
		Back	0.743	5.8GHz WLAN	0.212	**0.96**
		Left side	0.738	5.2GHz WLAN	0.141	**0.88**
		Right side	0.851			**0.85**
		Top side		5.2GHz WLAN	0.189	**0.19**
		Bottom side	0.348			**0.35**
	Band 4	Front	0.636	5.2GHz WLAN	0.134	**0.77**
		Back	0.513	5.8GHz WLAN	0.212	**0.73**
		Left side	0.065	5.2GHz WLAN	0.141	**0.21**
		Right side	0.045			**0.05**
		Top side		5.2GHz WLAN	0.189	**0.19**
		Bottom side	0.845			**0.85**
	Band 2	Front	0.540	5.2GHz WLAN	0.134	**0.67**
		Back	0.445	5.8GHz WLAN	0.212	**0.66**
		Left side	0.077	5.2GHz WLAN	0.141	**0.22**
		Right side	0.040			**0.04**
		Top side		5.2GHz WLAN	0.189	**0.19**
		Bottom side	0.814			**0.81**
	Band 7	Front	0.402	5.2GHz WLAN	0.134	**0.54**
		Back	0.427	5.8GHz WLAN	0.212	**0.64**
		Left side	0.172	5.2GHz WLAN	0.141	**0.31**
		Right side	0.044			**0.04**
		Top side		5.2GHz WLAN	0.189	**0.19**
		Bottom side	0.820			**0.82**

15.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1 WWAN SAR (W/kg)	2 2.4GHz WLAN SAR (W/kg)	3 2.4GHz Bluetooth SAR (W/kg)	1+2 Summed SAR (W/kg)	1+3 Summed SAR (W/kg)
GSM	GSM850	Front	0.845	0.072	0.011	**0.92**	**0.86**
		Back	0.689	0.060	0.017	**0.75**	**0.71**
		Front with Headset	0.744	0.072	0.011	**0.82**	**0.76**
	GSM1900	Front	0.820	0.072	0.011	**0.89**	**0.83**
		Back	0.724	0.060	0.017	**0.78**	**0.74**
		Front with Headset	0.612	0.072	0.011	**0.68**	**0.62**
WCMDA	Band V	Front	0.660	0.072	0.011	**0.73**	**0.67**
		Back	0.575	0.060	0.017	**0.64**	**0.59**
		Front with Headset	0.560	0.072	0.011	**0.63**	**0.57**
	Band IV	Front	1.074	0.072	0.011	**1.15**	**1.09**
		Back	0.953	0.060	0.017	**1.01**	**0.97**
		Front with Headset	1.058	0.072	0.011	**1.13**	**1.07**
	Band II	Front	1.172	0.072	0.011	**1.24**	**1.18**
		Back	1.096	0.060	0.017	**1.16**	**1.11**
		Front with Headset	1.156	0.072	0.011	**1.23**	**1.17**
LTE	Band 17	Front	0.488	0.072	0.011	**0.56**	**0.50**
		Back	0.459	0.060	0.017	**0.52**	**0.48**
		Front with Headset	0.177	0.072	0.011	**0.25**	**0.19**
	Band 5	Front	0.783	0.072	0.011	**0.86**	**0.79**
		Back	0.462	0.060	0.017	**0.52**	**0.48**
		Front with Headset	0.648	0.072	0.011	**0.72**	**0.66**
	Band 4	Front	1.187	0.072	0.011	**1.26**	**1.20**
		Back	1.172	0.060	0.017	**1.23**	**1.19**
		Front with Headset	1.185	0.072	0.011	**1.26**	**1.20**
	Band 2	Front	1.265	0.072	0.011	**1.34**	**1.28**
		Back	1.110	0.060	0.017	**1.17**	**1.13**
		Front with Headset	1.262	0.072	0.011	**1.33**	**1.27**
	Band 7	Front	1.147	0.072	0.011	**1.22**	**1.16**
		Back	1.182	0.060	0.017	**1.24**	**1.20**
		Back with Headset	0.976	0.060	0.017	**1.04**	**0.99**

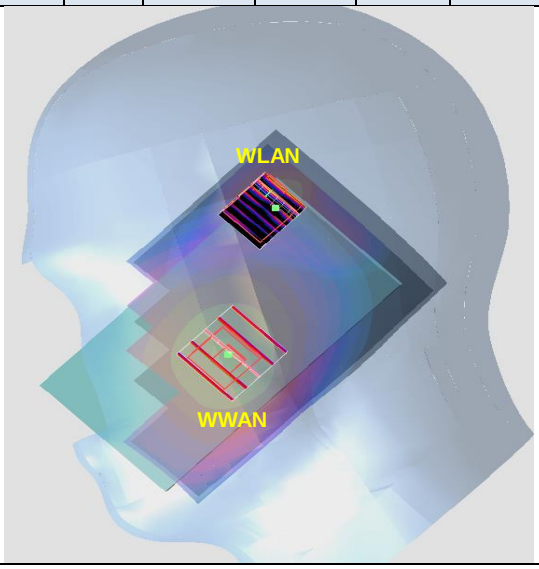
WWAN Band		Exposure Position	1	2		1+2 Summed SAR (W/kg)
			WWAN	5.2GHz / 5.3GHz / 5.5GHz / 5.8GHz WLAN		
			SAR (W/kg)	Band	SAR (W/kg)	
GSM	GSM850	Front	0.845	5.2GHz WLAN	0.075	**0.92**
		Back	0.689	5.5GHz WLAN	0.402	**1.09**
		Front with Headset	0.744	5.2GHz WLAN	0.075	**0.82**
	GSM1900	Front	0.820	5.2GHz WLAN	0.075	**0.90**
		Back	0.724	5.5GHz WLAN	0.402	**1.13**
		Front with Headset	0.612	5.2GHz WLAN	0.075	**0.69**
WCMDA	Band V	Front	0.660	5.2GHz WLAN	0.075	**0.74**
		Back	0.575	5.5GHz WLAN	0.402	**0.98**
		Front with Headset	0.560	5.2GHz WLAN	0.075	**0.64**
	Band IV	Front	1.074	5.2GHz WLAN	0.075	**1.15**
		Back	0.953	5.5GHz WLAN	0.402	**1.36**
		Front with Headset	1.058	5.2GHz WLAN	0.075	**1.13**
	Band II	Front	1.172	5.2GHz WLAN	0.075	**1.25**
		Back	1.096	5.5GHz WLAN	0.402	**1.50**
		Front with Headset	1.156	5.2GHz WLAN	0.075	**1.23**
LTE	Band 17	Front	0.488	5.2GHz WLAN	0.075	**0.56**
		Back	0.459	5.5GHz WLAN	0.402	**0.86**
		Front with Headset	0.177	5.2GHz WLAN	0.075	**0.25**
	Band 5	Front	0.783	5.2GHz WLAN	0.075	**0.86**
		Back	0.462	5.5GHz WLAN	0.402	**0.86**
		Front with Headset	0.648	5.2GHz WLAN	0.075	**0.72**
	Band 4	Front	1.187	5.2GHz WLAN	0.075	**1.26**
		Back	1.172	5.5GHz WLAN	0.402	**1.57**
		Front with Headset	1.185	5.2GHz WLAN	0.075	**1.26**
	Band 2	Front	1.265	5.2GHz WLAN	0.075	**1.34**
		Back	1.110	5.5GHz WLAN	0.402	**1.51**
		Front with Headset	1.262	5.2GHz WLAN	0.075	**1.34**
	Band 7	Front	1.147	5.2GHz WLAN	0.075	**1.22**
		Back	1.182	5.5GHz WLAN	0.402	**1.58**
		Back with Headset	0.976	5.5GHz WLAN	0.402	**1.38**

15.4 SPLSR Evaluation and Analysis

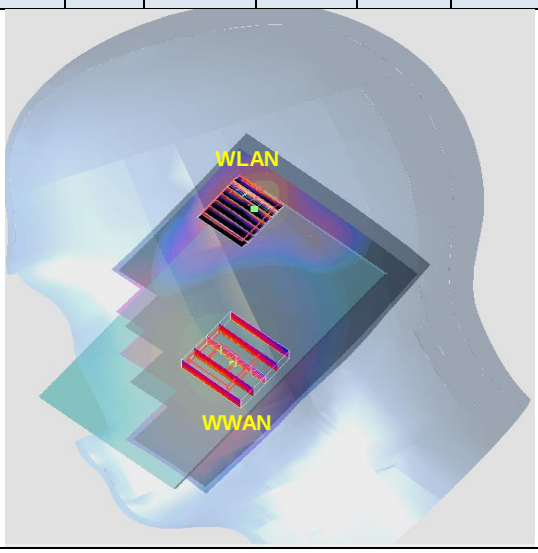
General Note:

1. SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*). If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary

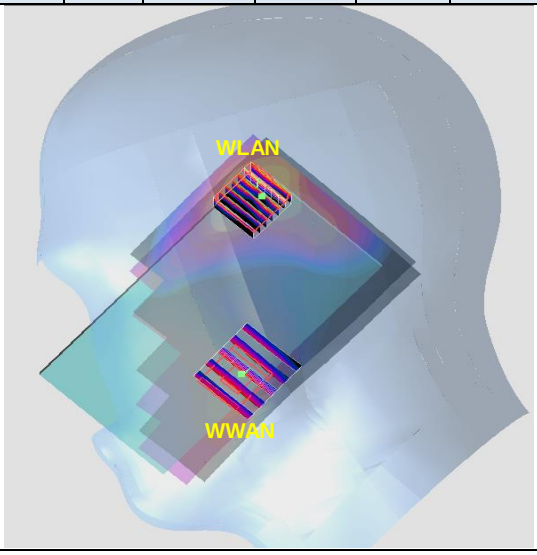
Case 1	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM850	Right Cheek	0.628	0	0.0674	-0.267	-0.171	79.7	2.09	0.04	Not required
	5.2GHz WLAN		1.462	0	0.0354	-0.34	-0.17				



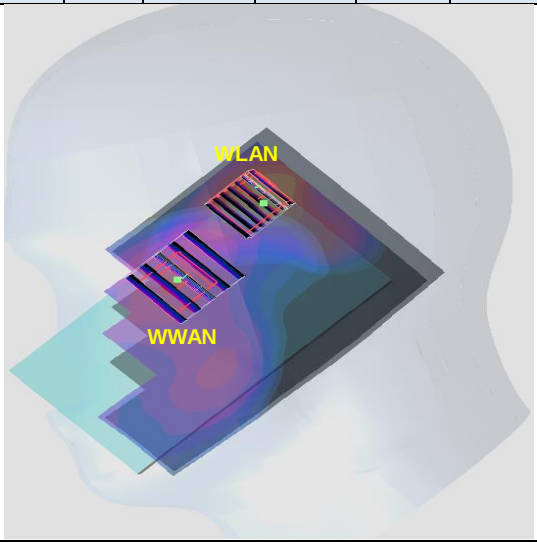
Case 2	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA V	Right Cheek	0.571	0	0.069	-0.267	-0.171	80.4	2.03	0.04	Not required
	5.2GHz WLAN		1.462	0	0.0354	-0.34	-0.17				



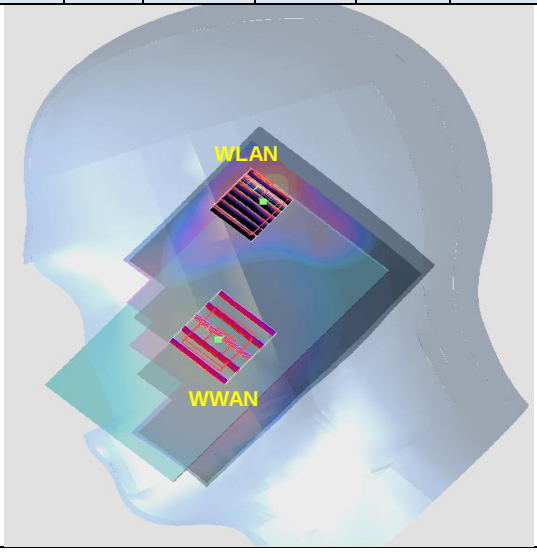
Case 3	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA IV	Right Cheek	0.237	0	0.0641	-0.249	-0.169	95.4	1.70	0.02	Not required
	5.2GHz WLAN		1.462	0	0.0354	-0.34	-0.17				



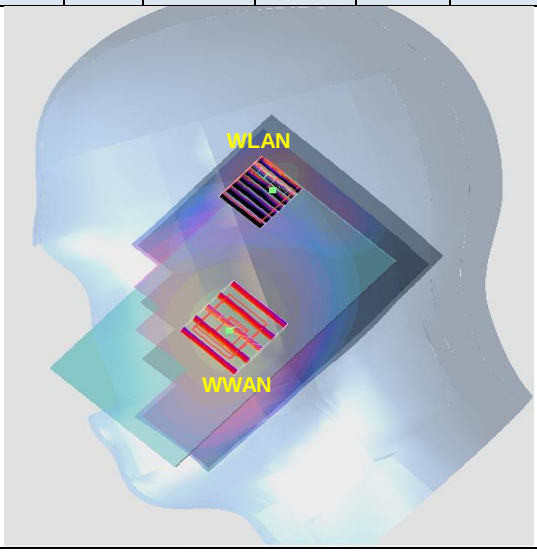
Case 4	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA II	Right Cheek	0.211	0	0.0715	-0.301	-0.17	53.1	1.67	0.04	Not required
	5.2GHz WLAN		1.462	0	0.0354	-0.34	-0.17				



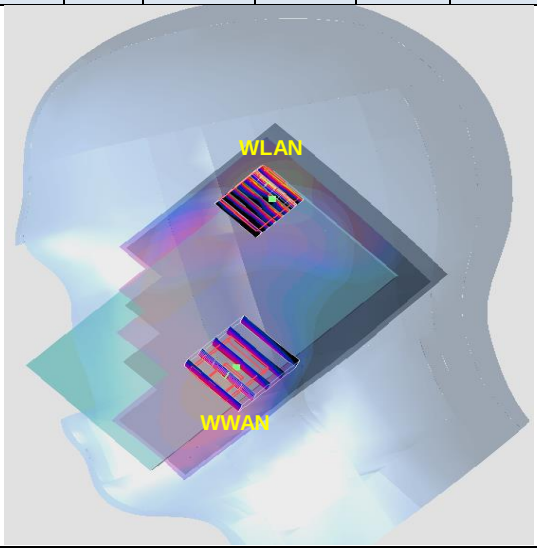
Case 5	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 17	Right Cheek	0.409	0	0.0696	-0.271	-0.17	77.0	1.87	0.03	Not required
	5.2GHz WLAN		1.462	0	0.0354	-0.34	-0.17				



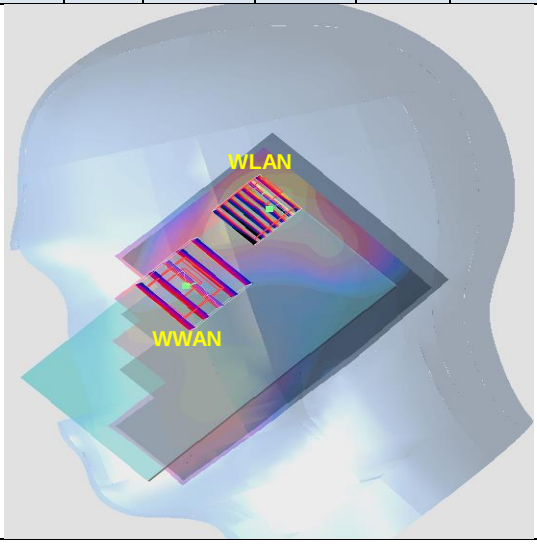
Case 6	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 5	Right Cheek	0.559	0	0.0681	-0.268	-0.17	79.1	2.02	0.04	Not required
	5.2GHz WLAN		1.462	0	0.0354	-0.34	-0.17				



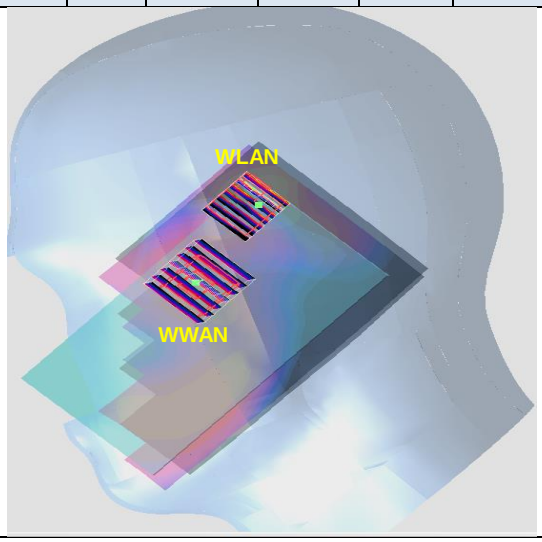
Case 7	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 4	Right Cheek	0.180	0	0.0703	-0.248	-0.168	98.4	1.64	0.02	Not required
	5.2GHz WLAN		1.462	0	0.0354	-0.34	-0.17				



Case 8	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 2	Right Cheek	0.206	0	0.0715	-0.302	-0.17	52.4	1.67	0.04	Not required
	5.2GHz WLAN		1.462	0	0.0354	-0.34	-0.17				



Case 9	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7	Right Cheek	0.223	0	0.0667	-0.299	-0.172	51.6	1.69	0.04	Not required
	5.2GHz WLAN		1.462	0	0.0354	-0.34	-0.17				



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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”

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

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

[4] SPEAG DASY System Handbook

[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

[7] FCC KDB 648474 D04 v01r02, “SAR Evaluation Considerations for Wireless Handsets”, Dec 2013.

[8] FCC KDB 941225 D01 v02, “SAR Measurement Procedures for 3G Devices – CDMA 2000 / Ev-Do / WCDMA / HSDPA / HSPA”, October 2007

[9] FCC KDB 941225 D02 v02r02, “SAR Guidance for HSPA, HSPA+, DC-HSDPA and 1x-Advanced”, May 2013.

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

[11] FCC KDB 941225 D05 v02r03, “SAR Evaluation Considerations for LTE Devices”, Dec 2013

[12] FCC KDB 941225 D06 v01r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", May 2013.

[13] FCC KDB 644545 D01 v01r02, "Guidance for IEEE 802.11ac and Pre-ac Device Emission Testing", Oct 2013.

[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.