FCC SAR TEST REPORT

FCC ID	:	**2AJOTTA-1112**
Equipment	:	**Smart Phone**
Brand Name	:	**NOKIA**
Model Name	:	**TA-1112**
Applicant	:	**HMD Global Oy** **Karaportti 2, 02610 Espoo, Finland**
Manufacturer	:	**HMD Global Oy** **Karaportti 2, 02610 Espoo, Finland**
Standard	:	**FCC 47 CFR Part 2 (2.1093)** **ANSI/IEEE C95.1-1992** **IEEE 1528-2013**

The product was received on Jun. 04, 2018 and testing was started from Jun. 08, 2018 and completed on Jun. 20, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

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

Jones Tsai

Approved by: Jones Tsai / Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA852420-01	01	Initial issue of report	Jul. 06, 2018

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for HMD Global Oy, Smart Phone, TA-1112 are as follows.

Equipment Class	Frequency Band	Highest SAR Summary			Highest Simultaneous Transmission 1g SAR (W/kg)
		Head (Separation 0mm)	Body-worn (Separation 15mm)	Hotspot (Separation 10mm)	
		1g SAR (W/kg)			
Licensed	GSM850	0.37	0.44	0.52	1.51
	GSM1900	0.06	0.53	1.27	
	WCDMA II	0.14	1.15	1.37	
	WCDMA IV	0.40	0.75	1.34	
	WCDMA V	1.10	0.12	0.62	
	LTE Band 2	0.15	0.91	1.40	
	LTE Band 5	0.72	0.37	0.37	
	LTE Band 7	0.29	0.55	1.25	
	LTE Band 12 / 17	0.44	0.32	0.35	
	LTE Band 13	0.63	0.42	0.54	
	LTE Band 38	0.17	0.22	0.43	
	LTE Band 4 / 66	0.35	0.85	1.51	
DTS	2.4GHz WLAN	0.34	0.07	0.12	1.51
NII	5GHz WLAN	0.22	0.01	0.01	1.51
Date of Testing:		2018/06/08 ~ 2018/06/20			

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

Reviewed by: Eric Huang
Report Producer: Wan Liu

2. Guidance Applied

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

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

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Smart Phone
Brand Name	NOKIA
Model Name	TA-1112
FCC ID	2AJOTTA-1112
S/N	PDAGAD2850200019
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz 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
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz : 802.11b/g/n HT20/HT40 WLAN 5GHz : 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
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. The TA-1112 and TA-1120 is similar device, in this report, all the SAR test results and conducted RF output power are referenced from TA-1120, FCC ID: 2AJOTTA-1120, Sporton Report No: FA852420B. 2. When hotspot mode is enabled, power reduction will be activated to limit the maximum power of GSM1900, WCDMA B2 / B4 and LTE B2 / B4 / B66. 3. This device has two antennas. The Primary Cellular Antenna (LAT) is location on the bottom edge of the device and the Secondary Cellular Antenna (UAT) is location on the top edge of the device.	

3.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	2AJOTTA-1112
Equipment Name	Smart Phone
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz
Channel Bandwidth	LTE Band 02:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 04:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 05:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 07: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM / 64QAM
LTE Voice / Data requirements	Voice and Data
LTE MPR permanently built-in by design	**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3** Modulation | Channel bandwidth / Transmission bandwidth (N_{RB}) | MPR (dB) 1.4 MHz | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz QPSK: > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 1 16 QAM: ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 1 16 QAM: > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 2 64 QAM: ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 2 64 QAM: > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 3 256 QAM: ≥ 1 | ≤ 5
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	Yes, when operating in hotspot mode that LTE B2 / B4 / B66 power reduction applied to satisfy SAR compliance.

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

LTE Band 2

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

LTE Band 4

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

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

LTE Band 7								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

LTE Band 12								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 13				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5	23230	782
M	23230	782		
H	23255	784.5		

LTE Band 17				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq. (MHz)
L	23755	706.5	23780	709
M	23790	710	23790	710
H	23825	713.5	23800	711

LTE Band 38								
	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	37775	2572.5	37800	2575	37825	2577.5	37850	2580
M	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610

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

4. RF Exposure Limits

4.1 Uncontrolled Environment

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

4.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

5. Specific Absorption Rate (SAR)

5.1 Introduction

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

5.2 SAR Definition

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

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

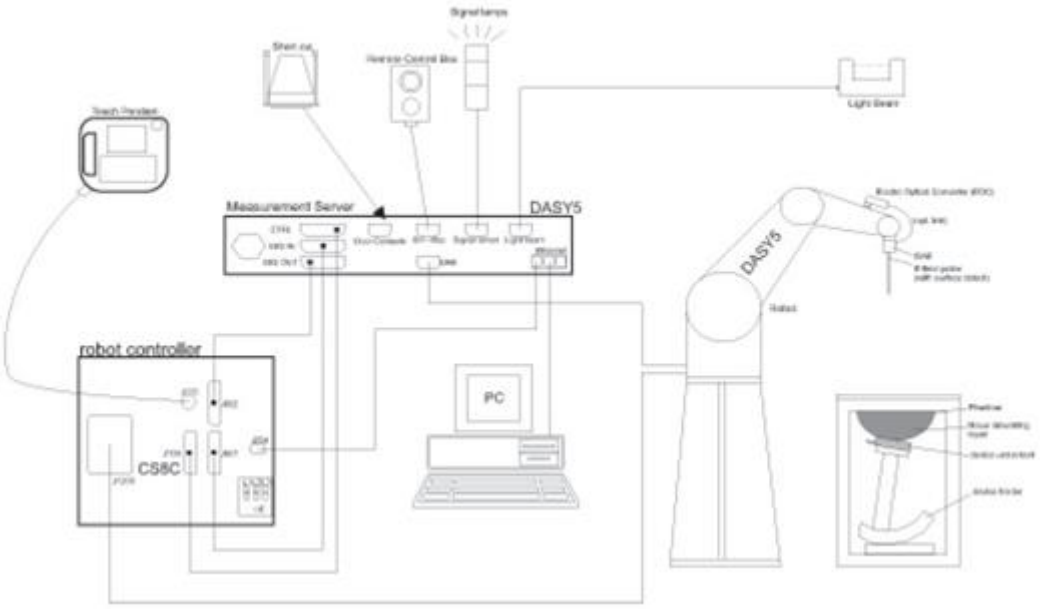
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

6. System Description and Setup

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



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

6.1 E-Field Probe

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

<ES3DV3 Probe>

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

<EX3DV4 Probe>

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

6.2 Data Acquisition Electronics (DAE)

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

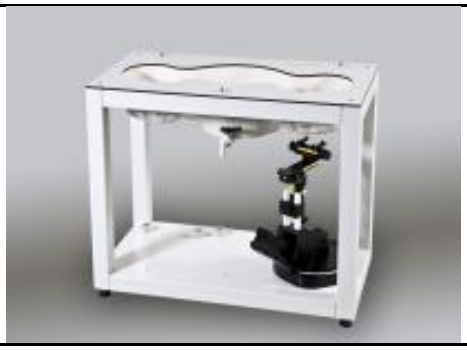
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

6.3 Phantom

<SAM Twin Phantom>

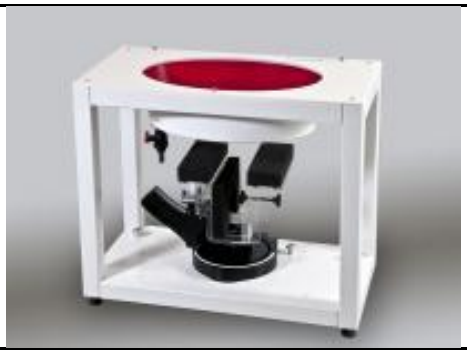
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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

<ELI Phantom>

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



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

6.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

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

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

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

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

Mounting Device for Laptops

7. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix 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

7.1 Spatial Peak SAR Evaluation

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

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

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

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

7.2 Power Reference Measurement

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

7.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

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

7.4 Zoom Scan

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

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

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

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

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

7.5 Volume Scan Procedures

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

7.6 Power Drift Monitoring

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

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1107	Feb. 27, 2018	Feb. 26, 2019
SPEAG	835MHz System Validation Kit	D835V2	4d167	Feb. 27, 2018	Feb. 26, 2019
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Nov. 15, 2017	Nov. 14, 2018
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Sep. 28, 2017	Sep. 27, 2018
SPEAG	2450MHz System Validation Kit	D2450V2	736	Sep. 18, 2017	Sep. 17, 2018
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Sep. 18, 2017	Sep. 17, 2018
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Sep. 26, 2017	Sep. 25, 2018
SPEAG	Data Acquisition Electronics	DAE4	1424	Jan. 18, 2018	Jan. 17, 2019
SPEAG	Data Acquisition Electronics	DAE3	495	May. 24, 2018	May. 23, 2019
SPEAG	Data Acquisition Electronics	DAE4	778	May. 25, 2018	May. 24, 2019
SPEAG	Data Acquisition Electronics	DAE4	1210	May. 28, 2018	May. 27, 2019
SPEAG	Data Acquisition Electronics	DAE4	1338	Dec. 04, 2017	Dec. 03, 2018
SPEAG	Data Acquisition Electronics	DAE4	1279	Jan. 03, 2018	Jan. 02, 2019
SPEAG	Dosimetric E-Field Probe	EX3DV4	3976	Jan. 23, 2018	Jan. 22, 2019
SPEAG	Dosimetric E-Field Probe	EX3DV4	3925	Mar. 31, 2018	May. 30, 2019
SPEAG	Dosimetric E-Field Probe	ES3DV3	3169	May. 28, 2018	May. 27, 2019
SPEAG	Dosimetric E-Field Probe	EX3DV3	3954	Jan. 31, 2018	Jan. 30, 2019
SPEAG	Dosimetric E-Field Probe	EX3DV4	3293	Sep. 25, 2017	Sep. 24, 2018
RCPTWN	Thermometer	HTC-1	TM560-1	Mar. 16, 2018	Mar. 15, 2019
Gencom	Thermometer	TE1	TM225-1	Mar. 16, 2018	Mar. 15, 2019
WonDer	Thermometer	WD-5016	TM642-1	Mar. 16, 2018	Mar. 15, 2019
WonDer	Thermometer	WD-5016	TM131-1	Mar. 16, 2018	Mar. 15, 2019
WonDer	Thermometer	WD-5016	TM132-1	Mar. 16, 2018	Mar. 15, 2019
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Apr. 17, 2018	Apr. 16, 2019
Agilent	Wireless Communication Test Set	E5515C	MY50267236	Mar. 29, 2017	Mar. 28, 2019
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Dec. 07, 2017	Dec. 06, 2018
Agilent	ENA Network Analyzer	E5071C	MY46316648	Jan. 17, 2018	Jan. 16, 2019
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 26, 2017	Sep. 25, 2018
LINE SEIKI	Digital Thermometer	DTM3000-spezial	2942	Dec. 08, 2017	Dec. 07, 2018
Anritsu	Power Meter	ML2495A	1419002	May. 18, 2018	May. 17, 2019
Anritsu	Power Sensor	MA2411B	1339124	May. 18, 2018	May. 17, 2019
Anritsu	Power Meter	ML2495A	1218006	Oct. 06, 2017	Oct. 05, 2018
Anritsu	Power Sensor	MA2411B	1207363	Oct. 06, 2017	Oct. 05, 2018
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jun. 26, 2017	Jun. 25, 2018
Mini-Circuits	Power Amplifier	ZVE-8G+	D120604	Mar. 12, 2018	Mar. 11, 2019
Mini-Circuits	Power Amplifier	ZHL-42W+	QA1344002	Mar. 12, 2018	Mar. 11, 2019
AR	Power Amplifier	5S1G4	0325228	Jul. 06, 2017	Jul. 05, 2018
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

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

9. System Verification

9.1 Tissue Simulating Liquids

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

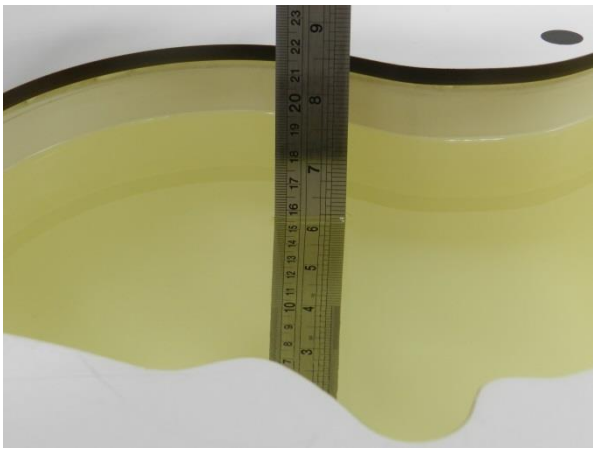


Fig 10.1Photo of Liquid Height for Head SAR

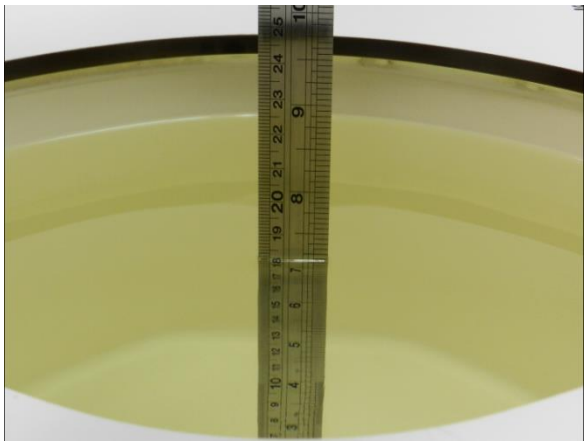


Fig 10.2 Photo of Liquid Height for Body SAR

9.2 Tissue Verification

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

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	HSL	22.8	0.907	42.423	0.89	41.90	1.91	1.25	±5	2018/6/12
750	HSL	22.4	0.894	40.536	0.89	41.90	0.45	-3.26	±5	2018/6/18
750	MSL	22.7	0.966	56.166	0.96	55.50	0.63	1.20	±5	2018/6/15
750	MSL	22.4	0.976	54.301	0.96	55.50	1.67	-2.16	±5	2018/6/19
750	MSL	22.1	0.972	54.233	0.96	55.50	1.25	-2.28	±5	2018/6/19
835	HSL	22.8	0.914	42.773	0.90	41.50	1.56	3.07	±5	2018/6/9
835	HSL	22.4	0.895	41.465	0.90	41.50	-0.56	-0.08	±5	2018/6/18
835	MSL	22.7	0.984	56.510	0.97	55.20	1.44	2.37	±5	2018/6/16
835	MSL	22.4	0.986	55.456	0.97	55.20	1.65	0.46	±5	2018/6/18
1750	HSL	22.6	1.353	40.644	1.37	40.10	-1.24	1.36	±5	2018/6/14
1750	MSL	22.6	1.491	54.729	1.49	53.40	0.07	2.49	±5	2018/6/10
1750	MSL	22.1	1.487	54.801	1.49	53.40	-0.20	2.62	±5	2018/6/19
1900	HSL	22.6	1.428	41.108	1.40	40.00	2.00	2.77	±5	2018/6/8
1900	HSL	22.2	1.409	39.391	1.40	40.00	0.64	-1.52	±5	2018/6/15
1900	MSL	22.8	1.537	53.469	1.52	53.30	1.12	0.32	±5	2018/6/11
1900	MSL	22.2	1.548	53.548	1.52	53.30	1.84	0.47	±5	2018/6/15
2450	HSL	22.3	1.814	40.543	1.80	39.20	0.78	3.43	±5	2018/6/12
2450	MSL	22.5	1.982	52.348	1.95	52.70	1.64	-0.67	±5	2018/6/20
2600	HSL	22.8	2.021	38.375	1.96	39.00	3.11	-1.60	±5	2018/6/15
2600	HSL	22.2	1.956	37.867	1.96	39.00	-0.20	-2.91	±5	2018/6/16
2600	MSL	22.8	2.231	52.422	2.16	52.50	3.29	-0.15	±5	2018/6/15
2600	MSL	22.4	2.175	51.722	2.16	52.50	0.69	-1.48	±5	2018/6/15
2600	MSL	22.5	2.191	50.637	2.16	52.50	1.44	-3.55	±5	2018/6/19
5250	HSL	22.5	4.550	36.802	4.71	35.95	-3.40	2.37	±5	2018/6/10
5250	MSL	22.5	5.494	46.886	5.36	48.95	2.50	-4.22	±5	2018/6/20
5600	HSL	22.3	4.916	36.309	5.07	35.50	-3.04	2.28	±5	2018/6/11
5600	MSL	22.5	5.935	46.211	5.77	48.50	2.86	-4.72	±5	2018/6/20
5750	HSL	22.5	5.063	36.094	5.22	35.35	-3.01	2.10	±5	2018/6/10
5750	MSL	22.5	6.133	45.931	5.94	48.28	3.25	-4.87	±5	2018/6/20

9.3 System Performance Check Results

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

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2018/6/12	750	HSL	250	D750V3-1107	3293	1279	2.08	8.18	8.32	1.71
2018/6/18	750	HSL	250	D750V3-1107	3976	778	1.98	8.18	7.92	-3.18
2018/6/15	750	MSL	250	D750V3-1107	3293	1279	2.12	8.52	8.48	-0.47
2018/6/19	750	MSL	250	D750V3-1107	3976	778	2.27	8.52	9.08	6.57
2018/6/19	750	MSL	250	D750V3-1107	3169	1424	2.20	8.52	8.80	3.29
2018/6/9	835	HSL	250	D835V2-4d167	3954	1210	2.34	9.26	9.36	1.08
2018/6/18	835	HSL	250	D835V2-4d167	3976	778	2.40	9.26	9.60	3.67
2018/6/16	835	MSL	250	D835V2-4d167	3293	1279	2.36	9.62	9.44	-1.87
2018/6/18	835	MSL	250	D835V2-4d167	3976	778	2.51	9.62	10.04	4.37
2018/6/14	1750	HSL	250	D1750V2-1068	3954	1338	8.52	36.70	34.08	-7.14
2018/6/10	1750	MSL	250	D1750V2-1068	3954	1338	9.00	37.20	36.00	-3.23
2018/6/19	1750	MSL	250	D1750V2-1068	3169	1424	9.46	37.20	37.84	1.72
2018/6/8	1900	HSL	250	D1900V2-5d041	3954	1210	9.80	40.50	39.20	-3.21
2018/6/15	1900	HSL	250	D1900V2-5d041	3169	1424	9.59	40.50	38.36	-5.28
2018/6/11	1900	MSL	250	D1900V2-5d041	3954	1338	10.30	40.70	41.20	1.23
2018/6/15	1900	MSL	250	D1900V2-5d041	3169	1424	9.72	40.70	38.88	-4.47
2018/6/12	2450	HSL	250	D2450V2-736	3976	778	12.10	52.40	48.40	-7.63
2018/6/20	2450	MSL	250	D2450V2-736	3169	1424	12.50	50.80	50.00	-1.57
2018/6/15	2600	HSL	250	D2600V2-1008	3954	1338	13.20	56.80	52.80	-7.04
2018/6/16	2600	HSL	250	D2600V2-1008	3169	1424	14.90	56.80	59.60	4.93
2018/6/15	2600	MSL	250	D2600V2-1008	3954	1338	14.70	55.00	58.80	6.91
2018/6/15	2600	MSL	250	D2600V2-1008	3169	1424	14.50	55.00	58.00	5.45
2018/6/19	2600	MSL	250	D2600V2-1008	3925	495	14.10	55.00	56.40	2.55
2018/6/10	5250	HSL	100	D5GHzV2-1006	3976	778	7.55	78.30	75.50	-3.58
2018/6/20	5250	MSL	100	D5GHzV2-1006	3976	778	7.59	77.00	75.90	-1.43
2018/6/11	5600	HSL	100	D5GHzV2-1006	3976	778	8.73	85.00	87.30	2.71
2018/6/20	5600	MSL	100	D5GHzV2-1006	3976	778	8.42	80.10	84.20	5.12
2018/6/10	5750	HSL	100	D5GHzV2-1006	3976	778	7.94	78.50	79.40	1.15
2018/6/20	5750	MSL	100	D5GHzV2-1006	3976	778	7.80	75.10	78.00	3.86

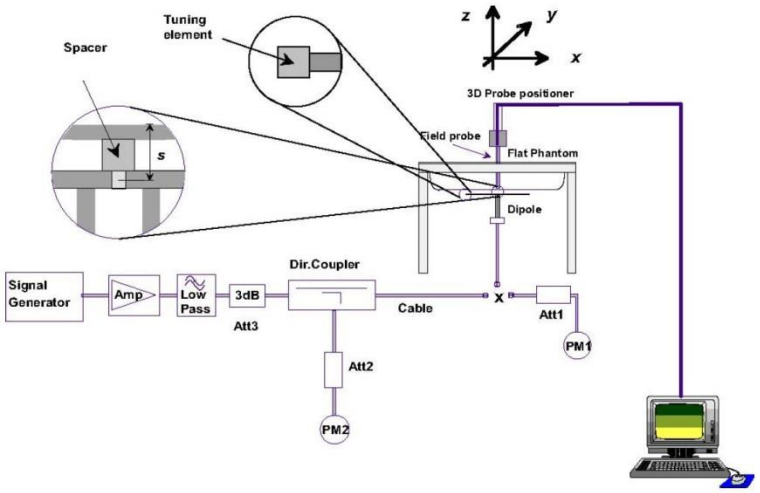


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

10. RF Exposure Positions

10.1 Ear and handset reference point

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

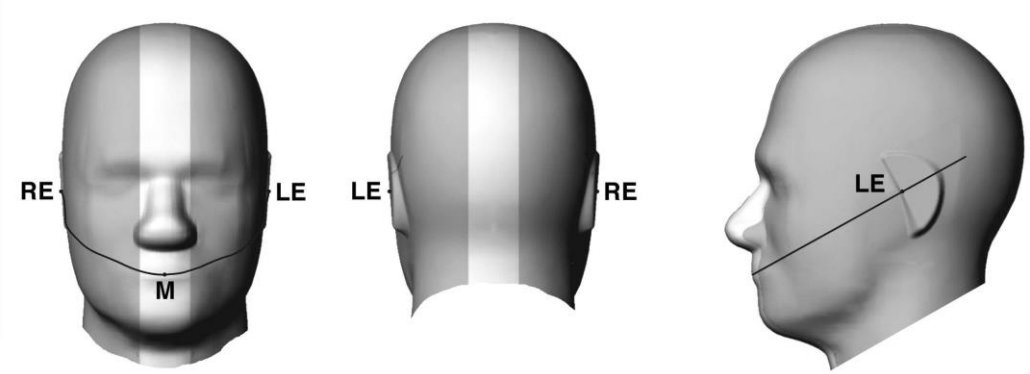


Fig 9.1.1 Front, back, and side views of SAM twin phantom

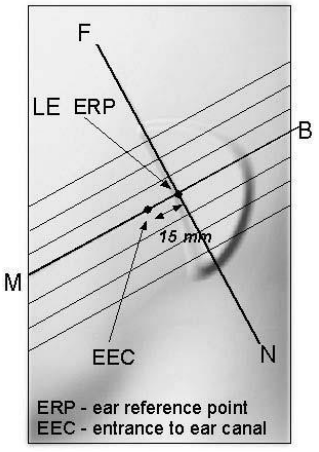


Fig 9.1.2 Close-up side view of phantom showing the ear region.

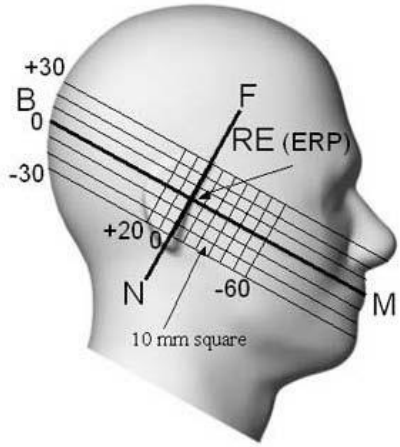


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

10.2 Definition of the cheek position

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

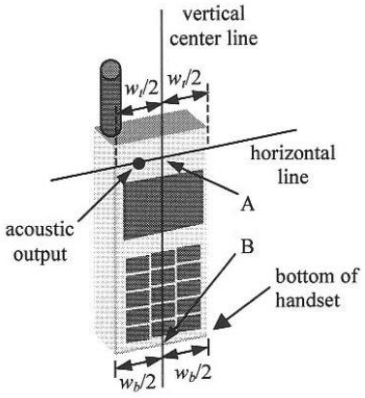


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

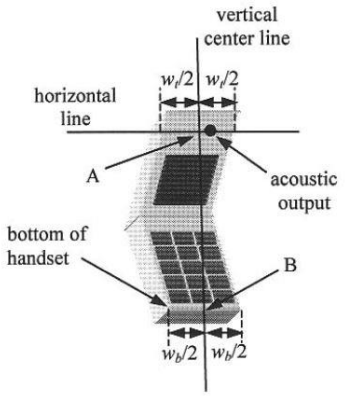


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

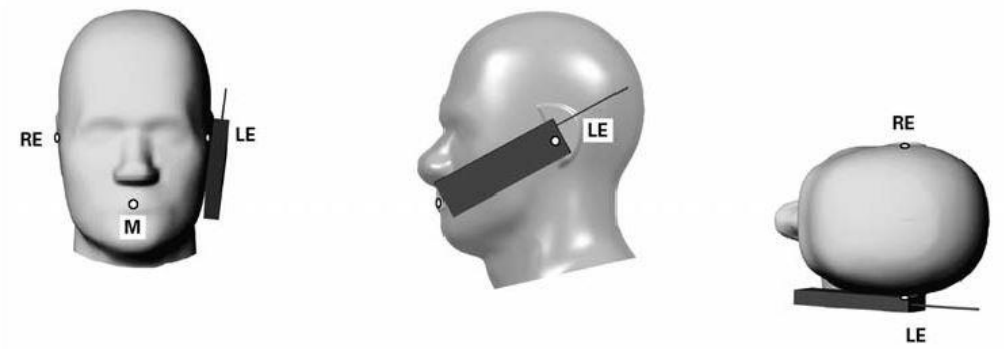


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

10.3 Definition of the tilt position

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

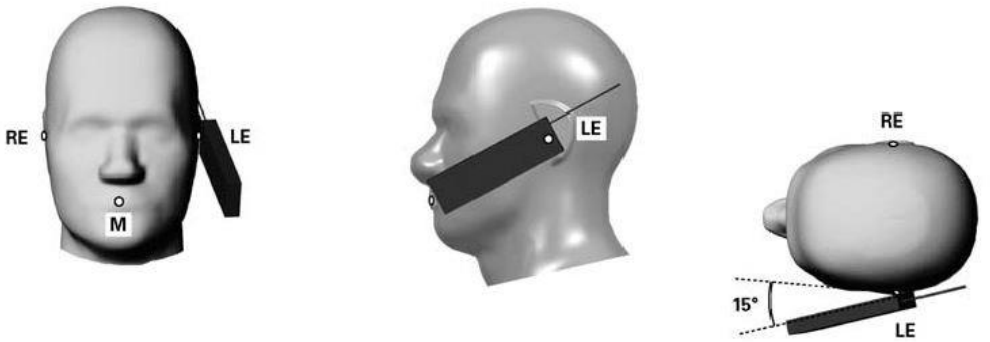


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

10.4 Body Worn Accessory

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

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

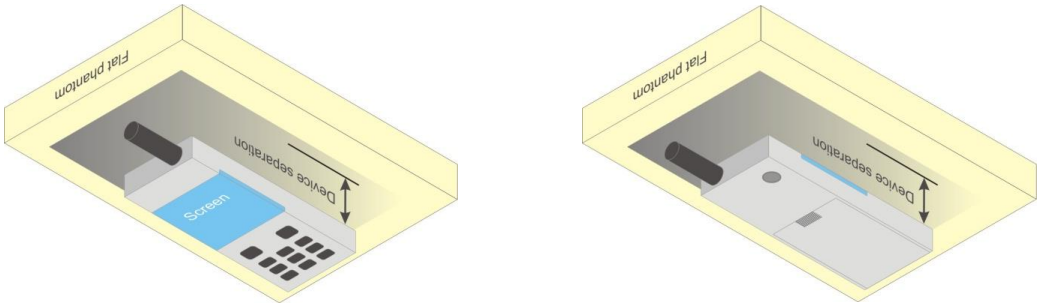


Fig 9.4 Body Worn Position

10.5 Wireless Router

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

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

11. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (1Tx slots) for GSM850/GSM1900 is considered as the primary mode.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the secondary mode
4. Power reduction which is triggered by hotspot mode is implemented in GSM1900 band, for hotspot mode SAR testing EUT was set in reduced power mode and GPRS 3 Tx slots due to its highest frame-average power.

<Default Power Mode>

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 1 Tx slot	33.59	33.61	33.60	34.00	24.59	24.61	24.60	25.00
GPRS 1 Tx slot	33.62	33.66	33.63	34.00	24.62	24.66	24.63	25.00
GPRS 2 Tx slots	30.33	30.41	30.40	30.50	24.33	24.41	24.40	24.50
GPRS 3 Tx slots	28.46	28.54	28.50	28.70	24.20	24.28	24.24	24.44
GPRS 4 Tx slots	27.37	27.45	27.45	27.50	24.37	24.45	24.45	24.50
EDGE 1 Tx slot	25.92	25.94	25.93	27.50	16.92	16.94	16.93	18.50
EDGE 2 Tx slots	23.92	23.91	23.93	25.50	17.92	17.91	17.93	19.50
EDGE 3 Tx slots	22.05	22.04	22.05	23.50	17.79	17.78	17.79	19.24
EDGE 4 Tx slots	20.99	20.99	21.03	22.50	17.99	17.99	18.03	19.50

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	30.85	30.81	30.79	31.00	21.85	21.81	21.79	22.00
GPRS 1 Tx slot	30.87	30.82	30.79	31.00	21.87	21.82	21.79	22.00
GPRS 2 Tx slots	27.03	27.19	27.34	27.50	21.03	21.19	21.34	21.50
GPRS 3 Tx slots	24.92	25.09	25.25	25.70	20.66	20.83	20.99	21.44
GPRS 4 Tx slots	23.89	24.05	24.22	24.50	20.89	21.05	21.22	21.50
EDGE 1 Tx slot	26.24	26.25	26.24	26.50	17.24	17.25	17.24	17.50
EDGE 2 Tx slots	24.42	24.43	24.41	24.50	18.42	18.43	18.41	18.50
EDGE 3 Tx slots	22.45	22.43	22.46	22.50	18.19	18.17	18.20	18.24
EDGE 4 Tx slots	21.40	21.32	21.34	21.50	18.40	18.32	18.34	18.50

<Reduced Power Mode>

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	27.40	27.45	27.63	29.00	18.40	18.45	18.63	20.00
GPRS 1 Tx slot	27.42	27.48	27.68	29.00	18.42	18.48	18.68	20.00
GPRS 2 Tx slots	24.27	24.31	24.54	26.00	18.27	18.31	18.54	20.00
GPRS 3 Tx slots	22.50	22.51	22.75	24.50	18.24	18.25	18.49	20.24
GPRS 4 Tx slots	21.29	21.16	21.42	23.00	18.29	18.16	18.42	20.00
EDGE 1 Tx slot	26.00	25.58	25.27	26.00	17.00	16.58	16.27	17.00
EDGE 2 Tx slots	22.98	22.55	22.25	23.00	16.98	16.55	16.25	17.00
EDGE 3 Tx slots	21.17	20.73	20.44	21.50	16.91	16.47	16.18	17.24
EDGE 4 Tx slots	19.92	19.40	19.12	20.00	16.92	16.40	16.12	17.00

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
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 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 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	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * 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: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

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

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

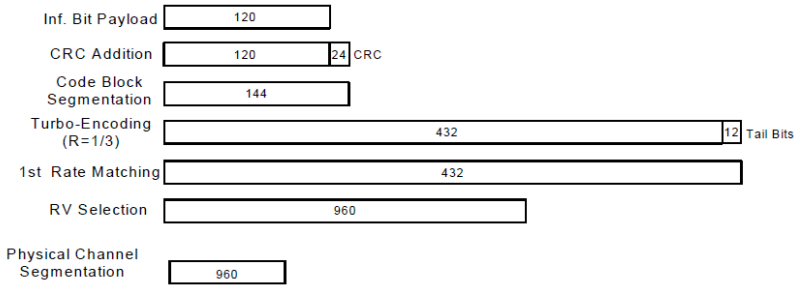


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

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

<Default Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513		4132	4182	4233	
Rx Channel		9662	9800	9938		1537	1638	1738		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	24.68	24.67	24.65	25.00	24.83	24.95	24.98	25.00	24.00	23.94	23.85	25.00
3GPP Rel 99	RMC 12.2Kbps	24.70	24.69	24.65	25.00	24.85	24.99	25.00	25.00	24.02	23.95	23.86	25.00
3GPP Rel 6	HSDPA Subtest-1	24.21	24.25	24.17	24.50	24.08	24.13	24.25	24.50	23.72	23.66	23.58	24.50
3GPP Rel 6	HSDPA Subtest-2	24.15	24.13	24.04	24.50	24.01	24.11	24.23	24.50	23.71	23.59	23.58	24.50
3GPP Rel 6	HSDPA Subtest-3	23.58	23.67	23.53	24.00	23.49	23.62	23.79	24.00	23.19	23.08	23.04	24.00
3GPP Rel 6	HSDPA Subtest-4	23.54	23.64	23.53	24.00	23.50	23.61	23.79	24.00	23.21	23.04	22.94	24.00
3GPP Rel 8	DC-HSDPA Subtest-1	24.20	24.16	24.15	24.50	23.99	24.12	24.19	24.50	23.72	23.60	23.57	24.50
3GPP Rel 8	DC-HSDPA Subtest-2	24.06	24.06	24.04	24.50	24.00	24.11	24.17	24.50	23.65	23.52	23.51	24.50
3GPP Rel 8	DC-HSDPA Subtest-3	23.54	23.63	23.53	24.00	23.46	23.62	23.77	24.00	23.15	23.06	22.96	24.00
3GPP Rel 8	DC-HSDPA Subtest-4	23.45	23.59	23.43	24.00	23.47	23.53	23.70	24.00	23.12	23.00	22.86	24.00
3GPP Rel 6	HSUPA Subtest-1	22.76	22.31	22.21	23.50	22.07	22.15	22.20	23.50	21.71	21.64	21.59	23.50
3GPP Rel 6	HSUPA Subtest-2	22.21	22.25	22.12	22.50	21.97	22.13	22.10	22.50	21.71	21.62	21.55	22.50
3GPP Rel 6	HSUPA Subtest-3	23.28	23.22	23.19	23.50	23.00	23.14	22.99	23.50	22.68	22.63	22.61	23.50
3GPP Rel 6	HSUPA Subtest-4	21.73	21.71	21.66	22.50	21.66	21.71	21.00	22.50	21.18	21.16	21.01	22.50
3GPP Rel 6	HSUPA Subtest-5	23.20	23.20	23.10	23.50	22.90	23.00	22.70	23.50	22.70	22.60	22.60	23.50

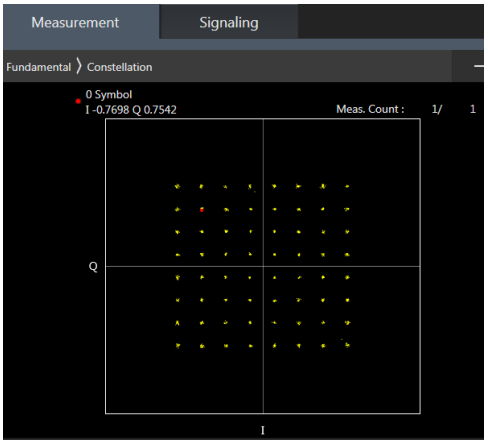
<Reduced Power Mode>

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		1312	1413	1513	
Rx Channel		9662	9800	9938		1537	1638	1738	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	AMR 12.2Kbps	19.38	19.38	19.35	20.00	21.80	21.92	21.99	22.00
3GPP Rel 99	RMC 12.2Kbps	19.40	19.39	19.35	20.00	21.82	21.94	22.00	22.00
3GPP Rel 6	HSDPA Subtest-1	19.18	19.18	19.12	20.00	21.48	21.57	21.64	22.00
3GPP Rel 6	HSDPA Subtest-2	19.19	19.26	19.14	20.00	21.49	21.57	21.60	22.00
3GPP Rel 6	HSDPA Subtest-3	18.77	18.79	18.69	19.50	21.10	21.13	21.20	21.50
3GPP Rel 6	HSDPA Subtest-4	18.68	18.80	18.66	19.50	21.05	21.07	21.17	21.50
3GPP Rel 8	DC-HSDPA Subtest-1	19.10	19.10	19.06	20.00	21.40	21.54	21.63	22.00
3GPP Rel 8	DC-HSDPA Subtest-2	19.15	19.20	19.09	20.00	21.43	21.51	21.57	22.00
3GPP Rel 8	DC-HSDPA Subtest-3	18.77	18.78	18.67	19.50	21.05	21.06	21.16	21.50
3GPP Rel 8	DC-HSDPA Subtest-4	18.60	18.72	18.58	19.50	20.98	21.01	21.14	21.50
3GPP Rel 6	HSUPA Subtest-1	17.19	17.69	17.66	19.00	20.03	20.16	20.23	21.50
3GPP Rel 6	HSUPA Subtest-2	18.60	17.67	17.59	19.00	20.02	20.12	20.23	21.50
3GPP Rel 6	HSUPA Subtest-3	18.90	18.74	18.64	19.00	21.00	21.16	21.26	21.50
3GPP Rel 6	HSUPA Subtest-4	17.56	17.20	17.17	19.00	19.54	19.63	19.65	21.50
3GPP Rel 6	HSUPA Subtest-5	18.88	18.60	18.50	19.00	21.00	21.10	21.20	21.50

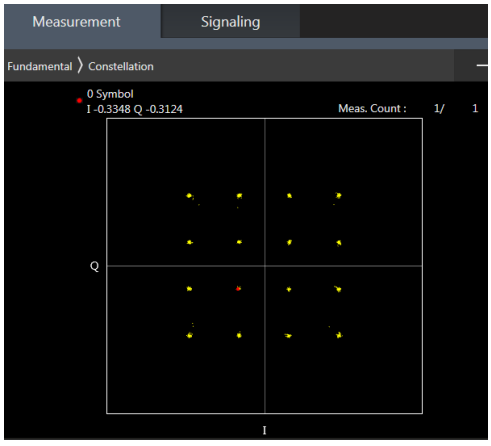
<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B5 / B12 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 4 / 17 SAR test was covered by Band 12 / 66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
   b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 64 QAM and 16 QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



64QAM



16QAM

<Default Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	23.39	23.16	23.01	24	0
20	QPSK	1	49	23.51	23.32	23.10		
20	QPSK	1	99	23.07	22.94	22.71		
20	QPSK	50	0	22.52	22.38	22.00	23	1
20	QPSK	50	24	22.46	22.29	22.05		
20	QPSK	50	50	22.41	22.05	21.71		
20	QPSK	100	0	22.46	22.22	21.86		
20	16QAM	1	0	22.71	22.48	22.38	23	1
20	16QAM	1	49	22.84	22.63	22.41		
20	16QAM	1	99	22.37	22.30	22.07		
20	16QAM	50	0	21.51	21.36	21.01	22	2
20	16QAM	50	24	21.48	21.30	21.03		
20	16QAM	50	50	21.42	21.08	20.71		
20	16QAM	100	0	21.46	21.23	20.87		
20	64QAM	1	0	21.57	21.36	21.24	22	2
20	64QAM	1	49	21.69	21.50	21.27		
20	64QAM	1	99	21.25	21.14	20.95		
20	64QAM	50	0	20.57	20.40	20.05	21	3
20	64QAM	50	24	20.51	20.34	20.10		
20	64QAM	50	50	20.45	20.10	19.74		
20	64QAM	100	0	20.51	20.28	19.92		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	23.56	23.41	23.16	24	0
15	QPSK	1	37	23.70	23.60	23.35		
15	QPSK	1	74	23.36	23.29	23.06		
15	QPSK	36	0	22.72	22.48	22.19	23	1
15	QPSK	36	20	22.64	22.53	22.21		
15	QPSK	36	39	22.58	22.44	22.13		
15	QPSK	75	0	22.63	22.43	22.13		
15	16QAM	1	0	22.84	22.72	22.52	23	1
15	16QAM	1	37	22.95	22.89	22.67		
15	16QAM	1	74	22.70	22.62	22.39		
15	16QAM	36	0	21.66	21.44	21.17	22	2
15	16QAM	36	20	21.60	21.48	21.18		
15	16QAM	36	39	21.56	21.37	21.11		
15	16QAM	75	0	21.59	21.41	21.11		
15	64QAM	1	0	21.67	21.59	21.38	22	2
15	64QAM	1	37	21.90	21.73	21.55		
15	64QAM	1	74	21.54	21.49	21.29		
15	64QAM	36	0	20.74	20.52	20.25	21	3
15	64QAM	36	20	20.67	20.57	20.26		
15	64QAM	36	39	20.62	20.48	20.14		
15	64QAM	75	0	20.64	20.45	20.18		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	23.59	23.41	23.20	24	0
10	QPSK	1	25	23.66	23.55	23.24		
10	QPSK	1	49	23.44	23.37	23.13		
10	QPSK	25	0	22.71	22.47	22.22	23	1
10	QPSK	25	12	22.65	22.50	22.21		
10	QPSK	25	25	22.55	22.41	22.03		
10	QPSK	50	0	22.65	22.43	22.13		
10	16QAM	1	0	22.86	22.69	22.45	23	1
10	16QAM	1	25	22.97	22.81	22.49		
10	16QAM	1	49	22.79	22.67	22.44		
10	16QAM	25	0	21.69	21.47	21.19	22	2
10	16QAM	25	12	21.64	21.48	21.20		
10	16QAM	25	25	21.56	21.38	21.03		
10	16QAM	50	0	21.62	21.41	21.12		
10	64QAM	1	0	21.74	21.64	21.38	22	2
10	64QAM	1	25	21.84	21.70	21.35		
10	64QAM	1	49	21.64	21.59	21.33		
10	64QAM	25	0	20.75	20.52	20.24	21	3
10	64QAM	25	12	20.69	20.54	20.26		
10	64QAM	25	25	20.61	20.48	20.10		
10	64QAM	50	0	20.68	20.49	20.16		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	23.47	23.30	23.01	24	0
5	QPSK	1	12	23.69	23.59	23.31		
5	QPSK	1	24	23.43	23.28	23.02		
5	QPSK	12	0	22.63	22.43	22.26	23	1
5	QPSK	12	7	22.69	22.52	22.23		
5	QPSK	12	13	22.61	22.47	22.14		
5	QPSK	25	0	22.62	22.41	22.19		
5	16QAM	1	0	22.76	22.57	22.31	23	1
5	16QAM	1	12	22.95	22.85	22.62		
5	16QAM	1	24	22.74	22.56	22.33		
5	16QAM	12	0	21.60	21.41	21.24	22	2
5	16QAM	12	7	21.64	21.50	21.22		
5	16QAM	12	13	21.59	21.46	21.15		
5	16QAM	25	0	21.60	21.36	21.17		
5	64QAM	1	0	21.66	21.46	21.20	22	2
5	64QAM	1	12	21.85	21.72	21.57		
5	64QAM	1	24	21.62	21.42	21.26		
5	64QAM	12	0	20.68	20.48	20.31	21	3
5	64QAM	12	7	20.73	20.55	20.31		
5	64QAM	12	13	20.67	20.51	20.23		
5	64QAM	25	0	20.66	20.46	20.22		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	23.56	23.45	23.12	24	0
3	QPSK	1	8	23.75	23.56	23.30		
3	QPSK	1	14	23.52	23.40	23.13		
3	QPSK	8	0	22.62	22.46	22.17	23	1
3	QPSK	8	4	22.65	22.49	22.17		
3	QPSK	8	7	22.59	22.43	22.13		
3	QPSK	15	0	22.61	22.43	22.16		
3	16QAM	1	0	22.85	22.69	22.43	23	1
3	16QAM	1	8	22.93	22.83	22.59		
3	16QAM	1	14	22.82	22.69	22.47		
3	16QAM	8	0	21.66	21.50	21.28	22	2
3	16QAM	8	4	21.67	21.53	21.28		
3	16QAM	8	7	21.63	21.50	21.22		
3	16QAM	15	0	21.60	21.44	21.20		
3	64QAM	1	0	21.72	21.57	21.35	22	2
3	64QAM	1	8	21.85	21.78	21.52		
3	64QAM	1	14	21.71	21.56	21.36		
3	64QAM	8	0	20.70	20.52	20.29	21	3
3	64QAM	8	4	20.71	20.55	20.30		
3	64QAM	8	7	20.69	20.53	20.26		
3	64QAM	15	0	20.64	20.48	20.20		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	23.56	23.39	23.11	24	0
1.4	QPSK	1	3	23.71	23.56	23.30		
1.4	QPSK	1	5	23.57	23.39	23.10		
1.4	QPSK	3	0	23.66	23.50	23.21		
1.4	QPSK	3	1	23.74	23.59	23.26		
1.4	QPSK	3	3	23.71	23.55	23.25		
1.4	QPSK	6	0	22.68	22.51	22.23	23	1
1.4	16QAM	1	0	22.82	22.68	22.39	23	1
1.4	16QAM	1	3	22.96	22.80	22.59		
1.4	16QAM	1	5	22.81	22.65	22.42		
1.4	16QAM	3	0	22.66	22.48	22.24		
1.4	16QAM	3	1	22.72	22.53	22.32		
1.4	16QAM	3	3	22.67	22.48	22.28		
1.4	16QAM	6	0	21.76	21.56	21.31	22	2
1.4	64QAM	1	0	21.75	21.57	21.32	22	2
1.4	64QAM	1	3	21.86	21.71	21.49		
1.4	64QAM	1	5	21.73	21.57	21.36		
1.4	64QAM	3	0	21.75	21.60	21.33		
1.4	64QAM	3	1	21.80	21.67	21.40		
1.4	64QAM	3	3	21.79	21.66	21.37		
1.4	64QAM	6	0	20.72	20.54	20.31	21	3

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	23.68	23.76	23.73	24	0
20	QPSK	1	49	23.90	23.93	23.94		
20	QPSK	1	99	23.58	23.60	23.60		
20	QPSK	50	0	22.84	22.87	22.97	23	1
20	QPSK	50	24	22.90	22.92	22.96		
20	QPSK	50	50	22.98	22.70	22.80		
20	QPSK	100	0	22.94	22.75	23.00		
20	16QAM	1	0	22.99	22.98	22.95	23	1
20	16QAM	1	49	22.93	22.85	22.88		
20	16QAM	1	99	22.87	22.87	22.92		
20	16QAM	50	0	21.85	21.84	21.93	22	2
20	16QAM	50	24	21.92	21.89	21.95		
20	16QAM	50	50	21.99	21.65	21.80		
20	16QAM	100	0	21.93	21.71	21.99		
20	64QAM	1	0	21.83	21.95	21.87	22	2
20	64QAM	1	49	21.93	21.96	21.91		
20	64QAM	1	99	21.75	21.76	21.82		
20	64QAM	50	0	20.82	20.80	20.91	21	3
20	64QAM	50	24	20.90	20.87	20.94		
20	64QAM	50	50	20.96	20.66	20.77		
20	64QAM	100	0	20.94	20.72	20.97		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.65	23.72	23.77	24	0
15	QPSK	1	37	23.90	23.95	23.93		
15	QPSK	1	74	23.60	23.63	23.69		
15	QPSK	36	0	22.80	22.84	23.00	23	1
15	QPSK	36	20	22.86	22.86	22.92		
15	QPSK	36	39	22.93	22.75	22.88		
15	QPSK	75	0	22.86	22.77	22.94		
15	16QAM	1	0	22.84	23.00	22.95	23	1
15	16QAM	1	37	22.95	22.86	22.78		
15	16QAM	1	74	22.91	22.84	22.95		
15	16QAM	36	0	21.79	21.77	21.96	22	2
15	16QAM	36	20	21.82	21.76	21.89		
15	16QAM	36	39	21.92	21.67	21.87		
15	16QAM	75	0	21.86	21.70	21.93		
15	64QAM	1	0	21.77	21.92	21.90	22	2
15	64QAM	1	37	21.95	21.90	21.90		
15	64QAM	1	74	21.82	21.78	21.87		
15	64QAM	36	0	20.80	20.77	20.98	21	3
15	64QAM	36	20	20.85	20.77	20.89		
15	64QAM	36	39	20.92	20.67	20.88		
15	64QAM	75	0	20.84	20.67	20.92		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.65	23.76	23.78	24	0
10	QPSK	1	25	23.82	23.86	23.87		
10	QPSK	1	49	23.67	23.68	23.70		
10	QPSK	25	0	22.81	22.90	22.94	23	1
10	QPSK	25	12	22.80	22.83	22.90		
10	QPSK	25	25	22.88	22.71	22.89		
10	QPSK	50	0	22.88	22.81	22.96		
10	16QAM	1	0	22.85	23.00	22.98	23	1
10	16QAM	1	25	22.95	22.94	22.86		
10	16QAM	1	49	22.95	22.81	22.96		
10	16QAM	25	0	21.80	21.83	21.95	22	2
10	16QAM	25	12	21.81	21.79	21.89		
10	16QAM	25	25	21.88	21.64	21.89		
10	16QAM	50	0	21.87	21.76	21.96		
10	64QAM	1	0	21.80	21.92	21.97	22	2
10	64QAM	1	25	22.00	21.93	21.89		
10	64QAM	1	49	21.87	21.78	21.93		
10	64QAM	25	0	20.87	20.80	20.94	21	3
10	64QAM	25	12	20.79	20.78	20.89		
10	64QAM	25	25	20.87	20.62	20.90		
10	64QAM	50	0	20.85	20.74	20.93		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.54	23.66	23.69	24	0
5	QPSK	1	12	23.82	23.86	23.92		
5	QPSK	1	24	23.56	23.62	23.65		
5	QPSK	12	0	22.73	22.82	22.83	23	1
5	QPSK	12	7	22.74	22.83	22.87		
5	QPSK	12	13	22.74	22.75	22.85		
5	QPSK	25	0	22.73	22.77	22.86		
5	16QAM	1	0	22.73	22.84	22.96	23	1
5	16QAM	1	12	22.99	22.86	22.95		
5	16QAM	1	24	22.79	22.80	22.97		
5	16QAM	12	0	21.70	21.74	21.83	22	2
5	16QAM	12	7	21.71	21.72	21.87		
5	16QAM	12	13	21.73	21.66	21.86		
5	16QAM	25	0	21.70	21.70	21.88		
5	64QAM	1	0	21.70	21.80	21.87	22	2
5	64QAM	1	12	22.00	21.95	21.92		
5	64QAM	1	24	21.74	21.71	21.86		
5	64QAM	12	0	20.81	20.73	20.84	21	3
5	64QAM	12	7	20.80	20.75	20.89		
5	64QAM	12	13	20.75	20.71	20.88		
5	64QAM	25	0	20.76	20.70	20.85		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.64	23.73	23.79	24	0
3	QPSK	1	8	23.74	23.89	23.92		
3	QPSK	1	14	23.65	23.71	23.77		
3	QPSK	8	0	22.68	22.79	22.81	23	1
3	QPSK	8	4	22.70	22.80	22.84		
3	QPSK	8	7	22.66	22.76	22.81		
3	QPSK	15	0	22.70	22.80	22.83		
3	16QAM	1	0	22.84	22.92	22.98	23	1
3	16QAM	1	8	22.99	22.94	22.99		
3	16QAM	1	14	22.88	22.89	22.86		
3	16QAM	8	0	21.73	21.77	21.87	22	2
3	16QAM	8	4	21.72	21.77	21.92		
3	16QAM	8	7	21.70	21.73	21.87		
3	16QAM	15	0	21.69	21.70	21.82		
3	64QAM	1	0	21.77	21.81	21.93	22	2
3	64QAM	1	8	21.91	21.95	21.95		
3	64QAM	1	14	21.79	21.82	21.96		
3	64QAM	8	0	20.77	20.76	20.87	21	3
3	64QAM	8	4	20.79	20.76	20.90		
3	64QAM	8	7	20.75	20.70	20.85		
3	64QAM	15	0	20.74	20.70	20.83		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	23.59	23.67	23.73	24	0
1.4	QPSK	1	3	23.72	23.84	23.88		
1.4	QPSK	1	5	23.58	23.69	23.73		
1.4	QPSK	3	0	23.70	23.80	23.85		
1.4	QPSK	3	1	23.78	23.86	23.92		
1.4	QPSK	3	3	23.73	23.84	23.86		
1.4	QPSK	6	0	22.75	22.82	22.87	23	1
1.4	16QAM	1	0	22.79	22.83	22.86	23	1
1.4	16QAM	1	3	22.91	22.86	22.95		
1.4	16QAM	1	5	22.81	22.83	22.78		
1.4	16QAM	3	0	22.62	22.71	22.85		
1.4	16QAM	3	1	22.68	22.78	22.91		
1.4	16QAM	3	3	22.64	22.76	22.85		
1.4	16QAM	6	0	21.77	21.83	21.96	22	2
1.4	64QAM	1	0	21.72	21.78	21.96	22	2
1.4	64QAM	1	3	21.87	21.89	21.95		
1.4	64QAM	1	5	21.75	21.78	21.94		
1.4	64QAM	3	0	21.79	21.83	22.00		
1.4	64QAM	3	1	21.81	21.87	21.90		
1.4	64QAM	3	3	21.82	21.84	21.99		
1.4	64QAM	6	0	20.75	20.77	20.86	21	3

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	23.67	23.67	23.66	24	0
10	QPSK	1	25	23.81	23.73	23.79		
10	QPSK	1	49	23.67	23.61	23.65		
10	QPSK	25	0	22.72	22.83	22.79	23	1
10	QPSK	25	12	22.77	22.74	22.77		
10	QPSK	25	25	22.70	22.66	22.76		
10	QPSK	50	0	22.72	22.79	22.82		
10	16QAM	1	0	22.95	22.93	23.00	23	1
10	16QAM	1	25	22.95	22.86	22.89		
10	16QAM	1	49	22.99	22.99	22.95		
10	16QAM	25	0	21.73	21.81	21.85	22	2
10	16QAM	25	12	21.77	21.73	21.82		
10	16QAM	25	25	21.71	21.70	21.83		
10	16QAM	50	0	21.73	21.79	21.84		
10	64QAM	1	0	21.89	21.83	21.86	22	2
10	64QAM	1	25	21.98	21.95	21.86		
10	64QAM	1	49	21.82	21.84	21.93		
10	64QAM	25	0	20.73	20.81	20.82	21	3
10	64QAM	25	12	20.77	20.73	20.81		
10	64QAM	25	25	20.70	20.67	20.80		
10	64QAM	50	0	20.71	20.77	20.81		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.58	23.54	23.60	24	0
5	QPSK	1	12	23.80	23.77	23.80		
5	QPSK	1	24	23.60	23.54	23.56		
5	QPSK	12	0	22.69	22.71	22.76	23	1
5	QPSK	12	7	22.82	22.78	22.82		
5	QPSK	12	13	22.81	22.73	22.80		
5	QPSK	25	0	22.72	22.70	22.76		
5	16QAM	1	0	22.95	22.86	22.95	23	1
5	16QAM	1	12	22.86	22.78	22.96		
5	16QAM	1	24	22.96	22.88	22.93		
5	16QAM	12	0	21.68	21.70	21.81	22	2
5	16QAM	12	7	21.81	21.76	21.86		
5	16QAM	12	13	21.76	21.73	21.82		
5	16QAM	25	0	21.74	21.72	21.82		
5	64QAM	1	0	21.82	21.75	21.88	22	2
5	64QAM	1	12	21.96	21.98	21.86		
5	64QAM	1	24	21.80	21.77	21.83		
5	64QAM	12	0	20.70	20.74	20.80	21	3
5	64QAM	12	7	20.83	20.78	20.89		
5	64QAM	12	13	20.79	20.74	20.84		
5	64QAM	25	0	20.74	20.69	20.79		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.50	23.43	23.50	24	0
3	QPSK	1	8	23.65	23.56	23.64		
3	QPSK	1	14	23.50	23.44	23.44		
3	QPSK	8	0	22.49	22.48	22.54	23	1
3	QPSK	8	4	22.60	22.52	22.58		
3	QPSK	8	7	22.56	22.48	22.55		
3	QPSK	15	0	22.51	22.48	22.55		
3	16QAM	1	0	22.80	22.71	22.85	23	1
3	16QAM	1	8	22.98	22.83	22.96		
3	16QAM	1	14	22.80	22.73	22.82		
3	16QAM	8	0	21.61	21.55	21.68	22	2
3	16QAM	8	4	21.66	21.59	21.71		
3	16QAM	8	7	21.63	21.57	21.66		
3	16QAM	15	0	21.54	21.52	21.61		
3	64QAM	1	0	21.70	21.64	21.77	22	2
3	64QAM	1	8	21.92	21.79	21.98		
3	64QAM	1	14	21.72	21.67	21.73		
3	64QAM	8	0	20.59	20.52	20.63	21	3
3	64QAM	8	4	20.65	20.57	20.66		
3	64QAM	8	7	20.61	20.51	20.62		
3	64QAM	15	0	20.51	20.46	20.57		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	23.43	23.36	23.40	24	0
1.4	QPSK	1	3	23.55	23.50	23.51		
1.4	QPSK	1	5	23.45	23.35	23.38		
1.4	QPSK	3	0	23.52	23.44	23.53		
1.4	QPSK	3	1	23.56	23.51	23.57		
1.4	QPSK	3	3	23.56	23.47	23.51		
1.4	QPSK	6	0	22.53	22.46	22.52	23	1
1.4	16QAM	1	0	22.73	22.65	22.79	23	1
1.4	16QAM	1	3	22.82	22.79	22.90		
1.4	16QAM	1	5	22.77	22.65	22.74		
1.4	16QAM	3	0	22.58	22.47	22.57		
1.4	16QAM	3	1	22.59	22.54	22.65		
1.4	16QAM	3	3	22.58	22.49	22.57		
1.4	16QAM	6	0	21.63	21.53	21.68	22	2
1.4	64QAM	1	0	21.65	21.58	21.74	22	2
1.4	64QAM	1	3	21.75	21.71	21.83		
1.4	64QAM	1	5	21.64	21.58	21.68		
1.4	64QAM	3	0	21.65	21.58	21.72		
1.4	64QAM	3	1	21.70	21.64	21.79		
1.4	64QAM	3	3	21.69	21.61	21.69		
1.4	64QAM	6	0	20.52	20.45	20.60	21	3

<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	22.83	23.28	23.58	24	0
20	QPSK	1	49	23.29	23.70	23.96		
20	QPSK	1	99	23.17	23.58	23.77		
20	QPSK	50	0	22.01	22.52	22.91	23	1
20	QPSK	50	24	22.25	22.67	22.94		
20	QPSK	50	50	22.30	22.72	22.94		
20	QPSK	100	0	22.15	22.61	22.93		
20	16QAM	1	0	22.09	22.57	22.83	23	1
20	16QAM	1	49	22.51	22.95	22.96		
20	16QAM	1	99	22.47	22.82	22.92		
20	16QAM	50	0	20.95	21.52	21.91	22	2
20	16QAM	50	24	21.20	21.65	21.93		
20	16QAM	50	50	21.25	21.70	21.94		
20	16QAM	100	0	21.09	21.59	21.94		
20	64QAM	1	0	20.97	21.46	21.73	22	2
20	64QAM	1	49	21.39	21.83	21.91		
20	64QAM	1	99	21.34	21.70	21.97		
20	64QAM	50	0	20.00	20.47	20.89	21	3
20	64QAM	50	24	20.17	20.62	20.90		
20	64QAM	50	50	20.21	20.66	20.93		
20	64QAM	100	0	20.26	20.75	20.93		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	23.19	23.43	23.72	24	0
15	QPSK	1	37	23.51	23.74	22.95		
15	QPSK	1	74	23.42	23.62	23.82		
15	QPSK	36	0	22.33	22.60	22.92	23	1
15	QPSK	36	20	22.48	22.67	22.96		
15	QPSK	36	39	22.53	22.73	23.00		
15	QPSK	75	0	22.41	22.65	22.94		
15	16QAM	1	0	22.43	22.69	22.97	23	1
15	16QAM	1	37	22.73	22.95	22.99		
15	16QAM	1	74	22.66	22.82	22.97		
15	16QAM	36	0	21.24	21.55	21.89	22	2
15	16QAM	36	20	21.41	21.63	21.94		
15	16QAM	36	39	21.46	21.67	21.98		
15	16QAM	75	0	21.36	21.63	21.93		
15	64QAM	1	0	21.33	21.57	21.86	22	2
15	64QAM	1	37	21.65	21.85	21.92		
15	64QAM	1	74	21.59	21.72	21.98		
15	64QAM	36	0	20.33	20.51	20.87	21	3
15	64QAM	36	20	20.39	20.60	20.93		
15	64QAM	36	39	20.44	20.66	20.97		
15	64QAM	75	0	20.33	20.59	20.92		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	23.21	23.50	23.76	24	0
10	QPSK	1	25	23.44	23.63	22.93		
10	QPSK	1	49	23.40	23.62	23.85		
10	QPSK	25	0	22.21	22.57	22.92	23	1
10	QPSK	25	12	22.37	22.64	22.96		
10	QPSK	25	25	22.46	22.73	22.96		
10	QPSK	50	0	22.37	22.67	22.93		
10	16QAM	1	0	22.42	22.79	22.99	23	1
10	16QAM	1	25	22.60	22.86	22.97		
10	16QAM	1	49	22.61	22.89	22.98		
10	16QAM	25	0	21.20	21.55	21.93	22	2
10	16QAM	25	12	21.31	21.63	21.97		
10	16QAM	25	25	21.42	21.69	21.98		
10	16QAM	50	0	21.34	21.64	21.94		
10	64QAM	1	0	21.38	21.63	21.93	22	2
10	64QAM	1	25	21.56	21.78	21.93		
10	64QAM	1	49	21.51	21.74	21.91		
10	64QAM	25	0	20.23	20.51	20.91	21	3
10	64QAM	25	12	20.40	20.58	20.94		
10	64QAM	25	25	20.39	20.66	20.96		
10	64QAM	50	0	20.39	20.60	20.92		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	22.79	23.43	23.76	24	0
5	QPSK	1	12	23.18	23.73	22.94		
5	QPSK	1	24	22.91	23.47	23.76		
5	QPSK	12	0	21.96	22.57	22.91	23	1
5	QPSK	12	7	22.04	22.66	22.98		
5	QPSK	12	13	22.09	22.66	22.95		
5	QPSK	25	0	21.98	22.62	22.91		
5	16QAM	1	0	22.00	22.65	23.00	23	1
5	16QAM	1	12	22.39	22.90	22.93		
5	16QAM	1	24	22.10	22.70	22.99		
5	16QAM	12	0	20.90	21.55	21.91	22	2
5	16QAM	12	7	21.02	21.65	21.96		
5	16QAM	12	13	21.05	21.62	21.94		
5	16QAM	25	0	20.98	21.61	21.92		
5	64QAM	1	0	20.96	21.59	21.96	22	2
5	64QAM	1	12	21.30	21.84	21.91		
5	64QAM	1	24	21.04	21.61	21.97		
5	64QAM	12	0	19.98	20.53	20.94	21	3
5	64QAM	12	7	20.09	20.63	20.98		
5	64QAM	12	13	20.13	20.60	20.95		
5	64QAM	25	0	20.02	20.56	20.90		

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	23.18	23.22	23.21	24	0
10	QPSK	1	25	23.42	23.41	23.37		
10	QPSK	1	49	23.31	23.31	23.33		
10	QPSK	25	0	22.63	22.26	22.09	23	1
10	QPSK	25	12	22.43	22.38	22.34		
10	QPSK	25	25	22.68	22.50	22.14		
10	QPSK	50	0	22.68	22.43	22.15		
10	16QAM	1	0	22.42	22.49	22.59	23	1
10	16QAM	1	25	22.67	22.78	22.62		
10	16QAM	1	49	22.69	22.54	22.52		
10	16QAM	25	0	21.66	21.37	21.17	22	2
10	16QAM	25	12	21.50	21.49	21.38		
10	16QAM	25	25	21.76	21.56	21.16		
10	16QAM	50	0	21.73	21.49	21.21		
10	64QAM	1	0	21.39	21.48	21.55	22	2
10	64QAM	1	25	21.66	21.73	21.58		
10	64QAM	1	49	21.65	21.51	21.52		
10	64QAM	25	0	20.70	20.38	20.15	21	3
10	64QAM	25	12	20.52	20.49	20.39		
10	64QAM	25	25	20.77	20.60	20.18		
10	64QAM	50	0	20.72	20.50	20.20		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	23.15	23.20	23.17	24	0
5	QPSK	1	12	23.50	23.48	23.51		
5	QPSK	1	24	23.27	23.20	23.26		
5	QPSK	12	0	22.45	22.25	22.54	23	1
5	QPSK	12	7	22.41	22.43	22.44		
5	QPSK	12	13	22.33	22.51	22.36		
5	QPSK	25	0	22.40	22.40	22.49		
5	16QAM	1	0	22.38	22.51	22.39	23	1
5	16QAM	1	12	22.70	22.75	22.65		
5	16QAM	1	24	22.51	22.54	22.43		
5	16QAM	12	0	21.48	21.35	21.55	22	2
5	16QAM	12	7	21.44	21.53	21.46		
5	16QAM	12	13	21.37	21.61	21.39		
5	16QAM	25	0	21.45	21.49	21.51		
5	64QAM	1	0	21.39	21.52	21.38	22	2
5	64QAM	1	12	21.66	21.81	21.62		
5	64QAM	1	24	21.49	21.50	21.45		
5	64QAM	12	0	20.51	20.39	20.61	21	3
5	64QAM	12	7	20.51	20.56	20.52		
5	64QAM	12	13	20.44	20.64	20.45		
5	64QAM	25	0	20.45	20.51	20.54		

Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	23.28	23.30	23.32	24	0
3	QPSK	1	8	23.45	23.50	23.51		
3	QPSK	1	14	23.32	23.31	23.34		
3	QPSK	8	0	22.31	22.33	22.40	23	1
3	QPSK	8	4	22.36	22.40	22.41		
3	QPSK	8	7	22.29	22.40	22.38		
3	QPSK	15	0	22.35	22.39	22.42		
3	16QAM	1	0	22.52	22.65	22.49	23	1
3	16QAM	1	8	22.63	22.84	22.66		
3	16QAM	1	14	22.55	22.66	22.52		
3	16QAM	8	0	21.41	21.51	21.48	22	2
3	16QAM	8	4	21.44	21.58	21.49		
3	16QAM	8	7	21.40	21.59	21.47		
3	16QAM	15	0	21.38	21.49	21.44		
3	64QAM	1	0	21.46	21.63	21.48	22	2
3	64QAM	1	8	21.61	21.81	21.66		
3	64QAM	1	14	21.55	21.66	21.55		
3	64QAM	8	0	20.45	20.53	20.51	21	3
3	64QAM	8	4	20.48	20.58	20.53		
3	64QAM	8	7	20.42	20.59	20.50		
3	64QAM	15	0	20.38	20.46	20.46		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	23.19	23.23	23.26	24	0
1.4	QPSK	1	3	23.32	23.38	23.40		
1.4	QPSK	1	5	23.21	23.26	23.28		
1.4	QPSK	3	0	23.30	23.33	23.36		
1.4	QPSK	3	1	23.36	23.38	23.42		
1.4	QPSK	3	3	23.36	23.35	23.40		
1.4	QPSK	6	0	22.33	22.34	22.40	23	1
1.4	16QAM	1	0	22.44	22.62	22.41	23	1
1.4	16QAM	1	3	22.56	22.73	22.54		
1.4	16QAM	1	5	22.44	22.64	22.44		
1.4	16QAM	3	0	22.26	22.38	22.28		
1.4	16QAM	3	1	22.31	22.43	22.34		
1.4	16QAM	3	3	22.31	22.43	22.32		
1.4	16QAM	6	0	21.42	21.54	21.49	22	2
1.4	64QAM	1	0	21.40	21.59	21.42	22	2
1.4	64QAM	1	3	21.53	21.68	21.54		
1.4	64QAM	1	5	21.40	21.59	21.45		
1.4	64QAM	3	0	21.45	21.57	21.46		
1.4	64QAM	3	1	21.46	21.62	21.54		
1.4	64QAM	3	3	21.46	21.58	21.49		
1.4	64QAM	6	0	20.35	20.46	20.41	21	3

<LTE Band 13>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23230				
Frequency (MHz)				782				
10	QPSK	1	0	23.49			24	0
10	QPSK	1	25	23.66				
10	QPSK	1	49	23.55				
10	QPSK	25	0	22.46			23	1
10	QPSK	25	12	22.67				
10	QPSK	25	25	22.70				
10	QPSK	50	0	22.59				
10	16QAM	1	0	22.68			23	1
10	16QAM	1	25	22.98				
10	16QAM	1	49	22.90				
10	16QAM	25	0	21.52			22	2
10	16QAM	25	12	21.73				
10	16QAM	25	25	21.78				
10	16QAM	50	0	21.64				
10	64QAM	1	0	21.66			22	2
10	64QAM	1	25	21.95				
10	64QAM	1	49	21.86				
10	64QAM	25	0	20.53			21	3
10	64QAM	25	12	20.74				
10	64QAM	25	25	20.80				
10	64QAM	50	0	20.63				
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	23.54	23.45	23.53	24	0
5	QPSK	1	12	23.60	23.64	23.60		
5	QPSK	1	24	23.50	23.54	23.54		
5	QPSK	12	0	22.41	22.73	22.78	23	1
5	QPSK	12	7	22.69	22.75	22.77		
5	QPSK	12	13	22.63	22.66	22.76		
5	QPSK	25	0	22.50	22.70	22.78		
5	16QAM	1	0	22.66	22.73	22.83	23	1
5	16QAM	1	12	22.95	22.90	22.86		
5	16QAM	1	24	22.80	22.93	22.83		
5	16QAM	12	0	21.48	21.77	21.85	22	2
5	16QAM	12	7	21.73	21.80	21.86		
5	16QAM	12	13	21.68	21.74	21.85		
5	16QAM	25	0	21.58	21.76	21.85		
5	64QAM	1	0	21.66	21.71	21.82	22	2
5	64QAM	1	12	21.95	21.86	21.80		
5	64QAM	1	24	21.75	21.86	21.82		
5	64QAM	12	0	20.54	20.82	20.94	21	3
5	64QAM	12	7	20.78	20.87	20.91		
5	64QAM	12	13	20.75	20.81	20.90		
5	64QAM	25	0	20.59	20.76	20.88		

<LTE Band 17>

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	23.16	23.15	23.15	24	0
10	QPSK	1	25	23.33	23.31	23.32		
10	QPSK	1	49	23.26	23.29	23.29		
10	QPSK	25	0	22.02	21.98	22.02	23	1
10	QPSK	25	12	22.28	22.25	22.29		
10	QPSK	25	25	22.15	22.06	22.08		
10	QPSK	50	0	22.10	22.05	22.07		
10	16QAM	1	0	22.46	22.46	22.50	23	1
10	16QAM	1	25	22.64	22.59	22.54		
10	16QAM	1	49	22.42	22.46	22.46		
10	16QAM	25	0	21.12	21.07	21.08	22	2
10	16QAM	25	12	21.35	21.31	21.32		
10	16QAM	25	25	21.17	21.08	21.09		
10	16QAM	50	0	21.16	21.08	21.11		
10	64QAM	1	0	21.43	21.45	21.47	22	2
10	64QAM	1	25	21.61	21.56	21.55		
10	64QAM	1	49	21.43	21.45	21.48		
10	64QAM	25	0	20.11	20.05	20.07	21	3
10	64QAM	25	12	20.34	20.30	20.32		
10	64QAM	25	25	20.21	20.10	20.09		
10	64QAM	50	0	20.16	20.08	20.12		
Channel				23755	23790	23825	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				706.5	710	713.5		
5	QPSK	1	0	23.18	23.14	23.11	24	0
5	QPSK	1	12	23.22	23.30	23.25		
5	QPSK	1	24	23.18	23.14	23.23		
5	QPSK	12	0	22.25	22.18	22.48	23	1
5	QPSK	12	7	22.38	22.33	22.40		
5	QPSK	12	13	22.51	22.29	22.35		
5	QPSK	25	0	22.40	22.16	22.44		
5	16QAM	1	0	22.41	22.51	22.33	23	1
5	16QAM	1	12	22.76	22.67	22.59		
5	16QAM	1	24	22.55	22.33	22.41		
5	16QAM	12	0	21.33	21.24	21.47	22	2
5	16QAM	12	7	21.45	21.36	21.37		
5	16QAM	12	13	21.57	21.32	21.33		
5	16QAM	25	0	21.50	21.21	21.43		
5	64QAM	1	0	21.39	21.48	21.31	22	2
5	64QAM	1	12	21.72	21.64	21.55		
5	64QAM	1	24	21.46	21.32	21.39		
5	64QAM	12	0	20.38	20.23	20.54	21	3
5	64QAM	12	7	20.50	20.38	20.45		
5	64QAM	12	13	20.62	20.36	20.42		
5	64QAM	25	0	20.50	20.20	20.45		

<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	23.62	23.73	23.72	24	0
20	QPSK	1	49	23.84	23.89	23.90		
20	QPSK	1	99	23.56	23.56	23.55		
20	QPSK	50	0	22.77	22.93	22.83	23	1
20	QPSK	50	24	22.80	22.93	22.94		
20	QPSK	50	50	22.89	22.78	22.65		
20	QPSK	100	0	22.82	22.95	22.74		
20	16QAM	1	0	22.86	22.96	22.98	23	1
20	16QAM	1	49	22.95	22.97	22.96		
20	16QAM	1	99	22.83	22.89	22.82		
20	16QAM	50	0	21.79	21.89	21.82	22	2
20	16QAM	50	24	21.80	21.90	21.87		
20	16QAM	50	50	21.92	21.77	21.64		
20	16QAM	100	0	21.85	21.94	21.71		
20	64QAM	1	0	21.80	21.85	21.97	22	2
20	64QAM	1	49	21.98	21.97	21.99		
20	64QAM	1	99	21.70	21.80	21.75		
20	64QAM	50	0	20.83	20.89	20.78	21	3
20	64QAM	50	24	20.86	20.88	20.85		
20	64QAM	50	50	20.97	20.75	20.63		
20	64QAM	100	0	20.89	20.93	20.71		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	23.56	23.71	23.76	24	0
15	QPSK	1	37	23.75	23.89	23.93		
15	QPSK	1	74	23.53	23.61	23.62		
15	QPSK	36	0	22.70	22.97	22.95	23	1
15	QPSK	36	20	22.70	22.86	22.90		
15	QPSK	36	39	22.83	22.81	22.77		
15	QPSK	75	0	22.75	22.88	22.86		
15	16QAM	1	0	22.78	22.90	23.00	23	1
15	16QAM	1	37	22.95	22.95	22.90		
15	16QAM	1	74	22.82	22.85	22.86		
15	16QAM	36	0	21.68	21.91	21.89	22	2
15	16QAM	36	20	21.69	21.84	21.82		
15	16QAM	36	39	21.80	21.78	21.73		
15	16QAM	75	0	21.76	21.88	21.81		
15	64QAM	1	0	21.74	21.83	21.94	22	2
15	64QAM	1	37	21.97	22.00	21.86		
15	64QAM	1	74	21.74	21.79	21.83		
15	64QAM	36	0	20.74	20.93	20.87	21	3
15	64QAM	36	20	20.77	20.84	20.83		
15	64QAM	36	39	20.89	20.79	20.73		
15	64QAM	75	0	20.81	20.86	20.78		

Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	23.67	23.79	23.82	24	0
10	QPSK	1	25	23.82	23.91	23.94		
10	QPSK	1	49	23.67	23.69	23.74		
10	QPSK	25	0	22.82	22.86	22.86	23	1
10	QPSK	25	12	22.80	22.92	22.95		
10	QPSK	25	25	22.84	22.85	22.83		
10	QPSK	50	0	22.82	22.98	22.99		
10	16QAM	1	0	22.86	23.00	22.89	23	1
10	16QAM	1	25	22.89	22.95	22.98		
10	16QAM	1	49	22.96	22.96	22.86		
10	16QAM	25	0	21.80	21.86	21.86	22	2
10	16QAM	25	12	21.82	21.93	21.93		
10	16QAM	25	25	21.85	21.83	21.80		
10	16QAM	50	0	21.84	21.96	21.96		
10	64QAM	1	0	21.85	21.93	21.97	22	2
10	64QAM	1	25	21.89	21.86	21.95		
10	64QAM	1	49	21.90	21.90	21.94		
10	64QAM	25	0	20.89	20.08	20.15	21	3
10	64QAM	25	12	20.87	20.93	20.94		
10	64QAM	25	25	20.87	20.83	20.81		
10	64QAM	50	0	20.87	20.97	20.95		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	23.54	23.69	23.72	24	0
5	QPSK	1	12	23.84	23.94	23.95		
5	QPSK	1	24	23.55	23.65	23.69		
5	QPSK	12	0	22.72	22.89	22.97	23	1
5	QPSK	12	7	22.75	22.90	22.96		
5	QPSK	12	13	22.70	22.85	22.89		
5	QPSK	25	0	22.71	22.88	22.92		
5	16QAM	1	0	22.78	22.90	22.97	23	1
5	16QAM	1	12	22.86	22.95	22.98		
5	16QAM	1	24	22.82	22.91	22.94		
5	16QAM	12	0	21.70	21.87	21.94	22	2
5	16QAM	12	7	21.74	21.87	21.95		
5	16QAM	12	13	21.71	21.84	21.89		
5	16QAM	25	0	21.73	21.85	21.94		
5	64QAM	1	0	21.70	21.85	21.90	22	2
5	64QAM	1	12	21.71	21.82	21.90		
5	64QAM	1	24	21.44	21.52	21.60		
5	64QAM	12	0	20.51	20.61	20.69	21	3
5	64QAM	12	7	20.53	20.63	20.68		
5	64QAM	12	13	20.49	20.58	20.62		
5	64QAM	25	0	20.47	20.55	20.61		

Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	23.32	23.49	23.55	24	0
3	QPSK	1	8	23.48	23.67	23.71		
3	QPSK	1	14	23.34	23.48	23.50		
3	QPSK	8	0	22.39	22.57	22.61	23	1
3	QPSK	8	4	22.42	22.59	22.63		
3	QPSK	8	7	22.37	22.54	22.60		
3	QPSK	15	0	22.42	22.56	22.63		
3	16QAM	1	0	22.57	22.73	22.79	23	1
3	16QAM	1	8	22.67	22.84	22.94		
3	16QAM	1	14	22.61	22.71	22.75		
3	16QAM	8	0	21.44	21.59	21.66	22	2
3	16QAM	8	4	21.46	21.61	21.69		
3	16QAM	8	7	21.44	21.57	21.62		
3	16QAM	15	0	21.38	21.54	21.59		
3	64QAM	1	0	21.51	21.62	21.74	22	2
3	64QAM	1	8	21.66	21.73	21.88		
3	64QAM	1	14	21.57	21.64	21.73		
3	64QAM	8	0	20.52	20.61	20.66	21	3
3	64QAM	8	4	20.52	20.60	20.66		
3	64QAM	8	7	20.46	20.57	20.63		
3	64QAM	15	0	20.44	20.52	20.61		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	23.25	23.43	23.49	24	0
1.4	QPSK	1	3	23.40	23.55	23.61		
1.4	QPSK	1	5	23.27	23.43	23.47		
1.4	QPSK	3	0	23.37	23.54	23.60		
1.4	QPSK	3	1	23.42	23.58	23.64		
1.4	QPSK	3	3	23.41	23.56	23.61		
1.4	QPSK	6	0	22.41	22.58	22.63	23	1
1.4	16QAM	1	0	22.49	22.65	22.72	23	1
1.4	16QAM	1	3	22.64	22.76	22.83		
1.4	16QAM	1	5	22.53	22.66	22.71		
1.4	16QAM	3	0	22.32	22.49	22.55		
1.4	16QAM	3	1	22.40	22.54	22.62		
1.4	16QAM	3	3	22.39	22.54	22.58		
1.4	16QAM	6	0	21.45	21.62	21.69	22	2
1.4	64QAM	1	0	21.45	21.59	21.70	22	2
1.4	64QAM	1	3	21.56	21.70	21.80		
1.4	64QAM	1	5	21.46	21.56	21.70		
1.4	64QAM	3	0	21.45	21.63	21.70		
1.4	64QAM	3	1	21.53	21.67	21.73		
1.4	64QAM	3	3	21.49	21.67	21.72		
1.4	64QAM	6	0	20.44	20.53	20.59	21	3

<Reduced Power Mode>

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	19.48	19.25	19.06	20	0
20	QPSK	1	49	19.40	19.20	19.06		
20	QPSK	1	99	19.06	18.99	18.68		
20	QPSK	50	0	19.53	19.38	18.92	20	0
20	QPSK	50	24	19.44	19.31	18.98		
20	QPSK	50	50	19.44	19.07	18.67		
20	QPSK	100	0	19.46	19.24	18.79		
20	16QAM	1	0	19.73	19.51	19.29	20	0
20	16QAM	1	49	19.86	19.67	19.35		
20	16QAM	1	99	19.41	19.28	19.03		
20	16QAM	50	0	19.54	19.40	18.96	20	0
20	16QAM	50	24	19.48	19.32	18.99		
20	16QAM	50	50	19.48	19.09	18.68		
20	16QAM	100	0	19.50	19.23	18.79		
20	64QAM	1	0	19.59	19.44	19.13	20	0
20	64QAM	1	49	19.68	19.56	19.22		
20	64QAM	1	99	19.26	19.21	18.88		
20	64QAM	50	0	19.54	19.40	18.92	20	0
20	64QAM	50	24	19.49	19.30	18.99		
20	64QAM	50	50	19.48	19.09	18.64		
20	64QAM	100	0	19.50	19.22	18.77		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	19.47	19.23	18.94	20	0
15	QPSK	1	37	19.62	19.40	19.07		
15	QPSK	1	74	19.23	19.06	18.76		
15	QPSK	36	0	19.59	19.35	18.92	20	0
15	QPSK	36	20	19.51	19.32	18.95		
15	QPSK	36	39	19.48	19.20	18.81		
15	QPSK	75	0	19.49	19.24	18.85		
15	16QAM	1	0	19.81	19.58	19.23	20	0
15	16QAM	1	37	19.80	19.76	19.39		
15	16QAM	1	74	19.51	19.42	19.12		
15	16QAM	36	0	19.59	19.32	18.92	20	0
15	16QAM	36	20	19.49	19.30	18.93		
15	16QAM	36	39	19.46	19.18	18.78		
15	16QAM	75	0	19.51	19.25	18.86		
15	64QAM	1	0	19.62	19.39	19.12	20	0
15	64QAM	1	37	19.82	19.57	19.28		
15	64QAM	1	74	19.37	19.27	18.96		
15	64QAM	36	0	19.59	19.35	18.93	20	0
15	64QAM	36	20	19.52	19.32	18.92		
15	64QAM	36	39	19.50	19.20	18.80		
15	64QAM	75	0	19.49	19.23	18.84		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	19.48	19.25	18.86	20	0
10	QPSK	1	25	19.56	19.31	18.91		
10	QPSK	1	49	19.34	19.13	18.81		
10	QPSK	25	0	19.59	19.34	18.97	20	0
10	QPSK	25	12	19.52	19.28	18.92		
10	QPSK	25	25	19.46	19.20	18.75		
10	QPSK	50	0	19.53	19.24	18.87		
10	16QAM	1	0	19.84	19.55	19.21	20	0
10	16QAM	1	25	19.72	19.63	19.22		
10	16QAM	1	49	19.72	19.48	19.16		
10	16QAM	25	0	19.59	19.36	18.96	20	0
10	16QAM	25	12	19.54	19.29	18.91		
10	16QAM	25	25	19.50	19.17	18.76		
10	16QAM	50	0	19.55	19.25	18.86		
10	64QAM	1	0	19.64	19.37	19.06	20	0
10	64QAM	1	25	19.73	19.51	19.14		
10	64QAM	1	49	19.50	19.36	19.02		
10	64QAM	25	0	19.59	19.34	18.97	20	0
10	64QAM	25	12	19.53	19.27	18.91		
10	64QAM	25	25	19.49	19.18	18.78		
10	64QAM	50	0	19.55	19.24	18.88		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	19.35	19.12	18.72	20	0
5	QPSK	1	12	19.61	19.39	19.01		
5	QPSK	1	24	19.29	19.05	18.70		
5	QPSK	12	0	19.52	19.28	18.94	20	0
5	QPSK	12	7	19.55	19.29	18.91		
5	QPSK	12	13	19.47	19.25	18.85		
5	QPSK	25	0	19.49	19.20	18.85		
5	16QAM	1	0	19.72	19.45	19.03	20	0
5	16QAM	1	12	19.77	19.71	19.30		
5	16QAM	1	24	19.60	19.39	19.01		
5	16QAM	12	0	19.54	19.27	18.95	20	0
5	16QAM	12	7	19.58	19.27	18.92		
5	16QAM	12	13	19.49	19.23	18.85		
5	16QAM	25	0	19.51	19.22	18.90		
5	64QAM	1	0	19.55	19.30	18.91	20	0
5	64QAM	1	12	19.76	19.57	19.23		
5	64QAM	1	24	19.51	19.24	18.92		
5	64QAM	12	0	19.55	19.27	18.97	20	0
5	64QAM	12	7	19.58	19.29	18.95		
5	64QAM	12	13	19.51	19.28	18.90		
5	64QAM	25	0	19.51	19.19	18.87		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	19.47	19.21	18.82	20	0
3	QPSK	1	8	19.62	19.34	18.95		
3	QPSK	1	14	19.39	19.18	18.83		
3	QPSK	8	0	19.49	19.24	18.87	20	0
3	QPSK	8	4	19.53	19.27	18.90		
3	QPSK	8	7	19.49	19.23	18.83		
3	QPSK	15	0	19.50	19.20	18.84		
3	16QAM	1	0	19.78	19.53	19.17	20	0
3	16QAM	1	8	19.70	19.71	19.34		
3	16QAM	1	14	19.77	19.52	19.14		
3	16QAM	8	0	19.56	19.32	18.98	20	0
3	16QAM	8	4	19.58	19.33	18.95		
3	16QAM	8	7	19.53	19.27	18.92		
3	16QAM	15	0	19.48	19.24	18.89		
3	64QAM	1	0	19.62	19.38	19.04	20	0
3	64QAM	1	8	19.77	19.64	19.21		
3	64QAM	1	14	19.59	19.38	19.04		
3	64QAM	8	0	19.54	19.28	18.94	20	0
3	64QAM	8	4	19.58	19.33	18.94		
3	64QAM	8	7	19.53	19.27	18.91		
3	64QAM	15	0	19.47	19.24	18.86		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	19.44	19.19	18.80	20	0
1.4	QPSK	1	3	19.61	19.35	18.96		
1.4	QPSK	1	5	19.46	19.20	18.80		
1.4	QPSK	3	0	19.58	19.29	18.94		
1.4	QPSK	3	1	19.62	19.35	18.98		
1.4	QPSK	3	3	19.62	19.33	18.93		
1.4	QPSK	6	0	19.57	19.30	18.91	20	0
1.4	16QAM	1	0	19.79	19.53	19.11	20	0
1.4	16QAM	1	3	19.72	19.68	19.32		
1.4	16QAM	1	5	19.79	19.55	19.17		
1.4	16QAM	3	0	19.58	19.31	18.94		
1.4	16QAM	3	1	19.63	19.39	19.02		
1.4	16QAM	3	3	19.59	19.40	19.00		
1.4	16QAM	6	0	19.64	19.40	19.02	20	0
1.4	64QAM	1	0	19.59	19.40	19.00	20	0
1.4	64QAM	1	3	19.78	19.56	19.15		
1.4	64QAM	1	5	19.60	19.42	19.02		
1.4	64QAM	3	0	19.69	19.41	19.08		
1.4	64QAM	3	1	19.74	19.45	19.12		
1.4	64QAM	3	3	19.73	19.45	19.11		
1.4	64QAM	6	0	19.56	19.29	18.92	20	0

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	21.70	21.81	21.78	22	0
20	QPSK	1	49	21.88	21.88	21.93		
20	QPSK	1	99	21.53	21.60	21.56		
20	QPSK	50	0	21.76	21.82	21.95	22	0
20	QPSK	50	24	21.85	21.86	21.92		
20	QPSK	50	50	21.92	21.65	21.79		
20	QPSK	100	0	21.87	21.70	21.96		
20	16QAM	1	0	21.99	21.99	21.96	22	0
20	16QAM	1	49	21.26	21.86	21.96		
20	16QAM	1	99	21.84	21.84	21.93		
20	16QAM	50	0	21.78	21.81	21.95	22	0
20	16QAM	50	24	21.86	21.82	21.90		
20	16QAM	50	50	21.90	21.60	21.84		
20	16QAM	100	0	21.87	21.66	21.94		
20	64QAM	1	0	21.87	21.90	21.85	22	0
20	64QAM	1	49	21.86	21.99	21.86		
20	64QAM	1	99	21.70	21.75	21.79		
20	64QAM	50	0	20.77	20.77	21.08	22	0
20	64QAM	50	24	20.82	20.80	20.88		
20	64QAM	50	50	20.93	20.59	20.75		
20	64QAM	100	0	20.87	20.65	20.94		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	21.71	21.76	21.82	22	0
15	QPSK	1	37	21.93	21.91	21.97		
15	QPSK	1	74	21.65	21.66	21.65		
15	QPSK	36	0	21.82	21.85	21.97	22	0
15	QPSK	36	20	21.86	21.84	21.89		
15	QPSK	36	39	21.90	21.76	21.86		
15	QPSK	75	0	21.84	21.79	21.90		
15	16QAM	1	0	21.97	21.95	21.96	22	0
15	16QAM	1	37	21.99	21.92	21.95		
15	16QAM	1	74	21.93	21.88	21.95		
15	16QAM	36	0	21.80	21.81	21.93	22	0
15	16QAM	36	20	21.84	21.78	21.88		
15	16QAM	36	39	21.88	21.72	21.84		
15	16QAM	75	0	21.81	21.76	21.89		
15	64QAM	1	0	21.86	21.91	21.95	22	0
15	64QAM	1	37	21.89	21.95	21.89		
15	64QAM	1	74	21.80	21.80	21.88		
15	64QAM	36	0	20.84	20.82	20.95	22	0
15	64QAM	36	20	20.88	20.79	20.89		
15	64QAM	36	39	20.90	20.73	20.87		
15	64QAM	75	0	20.81	20.74	20.87		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	21.72	21.78	21.81	22	0
10	QPSK	1	25	21.90	21.85	21.90		
10	QPSK	1	49	21.69	21.67	21.72		
10	QPSK	25	0	21.82	21.90	21.93	22	0
10	QPSK	25	12	21.82	21.85	21.87		
10	QPSK	25	25	21.88	21.73	21.88		
10	QPSK	50	0	21.88	21.83	21.91		
10	16QAM	1	0	21.99	22.00	21.96	22	0
10	16QAM	1	25	21.86	21.94	21.92		
10	16QAM	1	49	21.90	21.93	21.90		
10	16QAM	25	0	21.83	21.86	21.94	22	0
10	16QAM	25	12	21.83	21.80	21.88		
10	16QAM	25	25	21.90	21.69	21.91		
10	16QAM	50	0	21.88	21.77	21.95		
10	64QAM	1	0	21.84	21.92	21.95	22	0
10	64QAM	1	25	21.93	21.96	21.92		
10	64QAM	1	49	21.89	21.83	21.91		
10	64QAM	25	0	20.88	20.84	20.92	22	0
10	64QAM	25	12	20.82	20.79	20.88		
10	64QAM	25	25	20.88	20.69	20.87		
10	64QAM	50	0	20.87	20.76	20.89		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	21.62	21.66	21.71	22	0
5	QPSK	1	12	21.81	21.88	21.93		
5	QPSK	1	24	21.62	21.64	21.67		
5	QPSK	12	0	21.76	21.81	21.82	22	0
5	QPSK	12	7	21.77	21.80	21.86		
5	QPSK	12	13	21.78	21.77	21.83		
5	QPSK	25	0	21.73	21.79	21.82		
5	16QAM	1	0	21.91	21.90	21.89	22	0
5	16QAM	1	12	21.90	21.86	21.95		
5	16QAM	1	24	21.94	21.86	21.98		
5	16QAM	12	0	21.71	21.76	21.80	22	0
5	16QAM	12	7	21.73	21.77	21.87		
5	16QAM	12	13	21.79	21.71	21.85		
5	16QAM	25	0	21.76	21.74	21.84		
5	64QAM	1	0	21.78	21.81	21.90	22	0
5	64QAM	1	12	21.99	21.95	21.95		
5	64QAM	1	24	21.80	21.76	21.87		
5	64QAM	12	0	20.81	20.79	20.84	22	0
5	64QAM	12	7	20.84	20.78	20.87		
5	64QAM	12	13	20.80	20.72	20.86		
5	64QAM	25	0	20.80	20.74	20.81		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	21.71	21.77	21.79	22	0
3	QPSK	1	8	21.82	21.89	21.91		
3	QPSK	1	14	21.72	21.75	21.75		
3	QPSK	8	0	21.73	21.76	21.79	22	0
3	QPSK	8	4	21.73	21.81	21.83		
3	QPSK	8	7	21.70	21.75	21.80		
3	QPSK	15	0	21.71	21.77	21.78		
3	16QAM	1	0	21.96	21.76	21.86	22	0
3	16QAM	1	8	21.96	21.86	21.95		
3	16QAM	1	14	21.95	21.97	21.99		
3	16QAM	8	0	21.76	21.79	21.90	22	0
3	16QAM	8	4	21.78	21.81	21.90		
3	16QAM	8	7	21.75	21.76	21.86		
3	16QAM	15	0	21.72	21.75	21.82		
3	64QAM	1	0	21.84	21.87	21.97	22	0
3	64QAM	1	8	21.86	21.94	21.95		
3	64QAM	1	14	21.90	21.85	21.98		
3	64QAM	8	0	20.80	20.76	20.87	22	0
3	64QAM	8	4	20.80	20.77	20.89		
3	64QAM	8	7	20.80	20.73	20.84		
3	64QAM	15	0	20.78	20.72	20.83		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	21.62	21.71	21.76	22	0
1.4	QPSK	1	3	21.77	21.87	21.89		
1.4	QPSK	1	5	21.62	21.71	21.76		
1.4	QPSK	3	0	21.75	21.81	21.85		
1.4	QPSK	3	1	21.80	21.86	21.90		
1.4	QPSK	3	3	21.78	21.85	21.85		
1.4	QPSK	6	0	21.76	21.82	21.85	22	0
1.4	16QAM	1	0	21.94	21.95	21.90	22	0
1.4	16QAM	1	3	21.86	21.90	21.86		
1.4	16QAM	1	5	21.96	21.94	21.90		
1.4	16QAM	3	0	21.71	21.79	21.87		
1.4	16QAM	3	1	21.75	21.84	21.91		
1.4	16QAM	3	3	21.74	21.81	21.91		
1.4	16QAM	6	0	21.83	21.84	21.96	22	0
1.4	64QAM	1	0	21.74	21.81	21.91	22	0
1.4	64QAM	1	3	21.86	21.97	21.80		
1.4	64QAM	1	5	21.74	21.82	21.92		
1.4	64QAM	3	0	21.82	21.85	21.96		
1.4	64QAM	3	1	21.86	21.93	21.86		
1.4	64QAM	3	3	21.86	21.91	21.98		
1.4	64QAM	6	0	20.79	20.76	20.86	22	0

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BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	21.44	21.43	21.47	21.5	0
20	QPSK	1	49	21.40	21.42	21.46		
20	QPSK	1	99	21.36	21.37	21.39		
20	QPSK	50	0	21.45	21.41	21.46	21.5	0
20	QPSK	50	24	21.39	21.36	21.35		
20	QPSK	50	50	21.34	21.33	21.33		
20	QPSK	100	0	21.35	21.37	21.38		
20	16QAM	1	0	21.38	21.26	21.15	21.5	0
20	16QAM	1	49	21.36	21.39	21.33		
20	16QAM	1	99	21.35	21.35	21.37		
20	16QAM	50	0	21.34	21.30	21.36	21.5	0
20	16QAM	50	24	21.35	21.39	21.32		
20	16QAM	50	50	21.35	21.36	21.31		
20	16QAM	100	0	21.33	21.40	21.39		
20	64QAM	1	0	21.46	21.46	21.39	21.5	0
20	64QAM	1	49	21.32	21.35	21.34		
20	64QAM	1	99	21.37	21.45	21.37		
20	64QAM	50	0	20.56	20.57	20.52	21.5	0
20	64QAM	50	24	20.66	20.55	20.37		
20	64QAM	50	50	20.69	20.68	20.45		
20	64QAM	100	0	20.68	20.62	20.42		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	21.24	21.05	21.06	21.5	0
15	QPSK	1	37	21.30	21.37	21.36		
15	QPSK	1	74	21.25	21.27	21.20		
15	QPSK	36	0	21.41	21.29	21.20	21.5	0
15	QPSK	36	20	21.44	21.39	21.39		
15	QPSK	36	39	21.39	21.31	21.37		
15	QPSK	75	0	21.32	21.31	21.40		
15	16QAM	1	0	21.40	21.21	21.08	21.5	0
15	16QAM	1	37	21.36	21.38	21.39		
15	16QAM	1	74	21.31	21.33	21.40		
15	16QAM	36	0	21.40	21.30	21.30	21.5	0
15	16QAM	36	20	21.34	21.41	21.24		
15	16QAM	36	39	21.36	21.36	21.36		
15	16QAM	75	0	21.32	21.44	21.37		
15	64QAM	1	0	21.40	21.41	21.35	21.5	0
15	64QAM	1	37	21.36	21.35	21.32		
15	64QAM	1	74	21.43	21.36	21.31		
15	64QAM	36	0	20.58	20.59	20.53	21.5	0
15	64QAM	36	20	20.58	20.49	20.36		
15	64QAM	36	39	20.60	20.63	20.37		
15	64QAM	75	0	20.58	20.61	20.33		

Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	21.23	20.98	21.05	21.5	0
10	QPSK	1	25	21.32	21.31	21.46		
10	QPSK	1	49	21.15	21.17	21.11		
10	QPSK	25	0	21.32	21.24	21.14	21.5	0
10	QPSK	25	12	21.38	21.37	21.35		
10	QPSK	25	25	21.35	21.46	21.34		
10	QPSK	50	0	21.42	21.41	21.31		
10	16QAM	1	0	21.43	21.11	21.06	21.5	0
10	16QAM	1	25	21.31	21.39	21.38		
10	16QAM	1	49	21.34	21.37	21.38		
10	16QAM	25	0	21.39	21.23	21.26	21.5	0
10	16QAM	25	12	21.34	21.33	21.17		
10	16QAM	25	25	21.35	21.34	21.32		
10	16QAM	50	0	21.38	21.35	21.38		
10	64QAM	1	0	21.35	21.32	21.29	21.5	0
10	64QAM	1	25	21.38	21.35	21.34		
10	64QAM	1	49	21.38	21.34	21.28		
10	64QAM	25	0	20.58	20.57	20.51	21.5	0
10	64QAM	25	12	20.53	20.43	20.32		
10	64QAM	25	25	20.59	20.62	20.35		
10	64QAM	50	0	20.58	20.54	20.26		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	21.21	20.91	21.01	21.5	0
5	QPSK	1	12	21.39	21.31	21.43		
5	QPSK	1	24	21.10	21.08	21.06		
5	QPSK	12	0	21.29	21.16	21.07	21.5	0
5	QPSK	12	7	21.28	21.29	21.25		
5	QPSK	12	13	21.37	21.46	21.45		
5	QPSK	25	0	21.37	21.31	21.22		
5	16QAM	1	0	21.36	21.09	21.02	21.5	0
5	16QAM	1	12	21.34	21.39	21.33		
5	16QAM	1	24	21.44	21.35	21.38		
5	16QAM	12	0	21.46	21.20	21.24	21.5	0
5	16QAM	12	7	21.32	21.23	21.14		
5	16QAM	12	13	21.40	21.32	21.43		
5	16QAM	25	0	21.36	21.29	21.40		
5	64QAM	1	0	21.32	21.26	21.29	21.5	0
5	64QAM	1	12	21.35	21.31	21.46		
5	64QAM	1	24	21.35	21.24	21.18		
5	64QAM	12	0	20.58	20.59	20.52	21.5	0
5	64QAM	12	7	20.52	20.37	20.32		
5	64QAM	12	13	20.50	20.58	20.28		
5	64QAM	25	0	20.55	20.46	20.16		

Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	21.13	20.87	20.97	21.5	0
3	QPSK	1	8	21.40	21.39	21.41		
3	QPSK	1	14	21.10	21.03	21.06		
3	QPSK	8	0	21.27	21.06	21.06	21.5	0
3	QPSK	8	4	21.20	21.29	21.22		
3	QPSK	8	7	21.43	21.43	21.44		
3	QPSK	15	0	21.33	21.24	21.18		
3	16QAM	1	0	21.32	21.06	20.93	21.5	0
3	16QAM	1	8	21.32	21.41	21.38		
3	16QAM	1	14	21.37	21.45	21.46		
3	16QAM	8	0	21.41	21.11	21.22	21.5	0
3	16QAM	8	4	21.37	21.13	21.08		
3	16QAM	8	7	21.43	21.42	21.42		
3	16QAM	15	0	21.36	21.29	21.34		
3	64QAM	1	0	21.29	21.18	21.28	21.5	0
3	64QAM	1	8	21.39	21.38	21.45		
3	64QAM	1	14	21.32	21.20	21.08		
3	64QAM	8	0	20.57	20.60	20.50	21.5	0
3	64QAM	8	4	20.52	20.35	20.31		
3	64QAM	8	7	20.47	20.54	20.24		
3	64QAM	15	0	20.54	20.38	20.08		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	21.10	20.83	20.87	21.5	0
1.4	QPSK	1	3	21.33	21.39	21.37		
1.4	QPSK	1	5	21.05	21.00	21.01		
1.4	QPSK	3	0	21.24	21.03	21.03		
1.4	QPSK	3	1	21.16	21.20	21.18		
1.4	QPSK	3	3	21.40	21.41	21.37		
1.4	QPSK	6	0	21.28	21.21	21.10	21.5	0
1.4	16QAM	1	0	21.28	21.05	20.85	21.5	0
1.4	16QAM	1	3	21.42	21.31	21.40		
1.4	16QAM	1	5	21.29	21.40	21.44		
1.4	16QAM	3	0	21.35	21.04	21.12		
1.4	16QAM	3	1	21.45	21.07	21.07		
1.4	16QAM	3	3	21.33	21.39	21.32		
1.4	16QAM	6	0	21.45	21.25	21.28	21.5	0
1.4	64QAM	1	0	21.23	21.14	21.22	21.5	0
1.4	64QAM	1	3	21.39	21.40	21.44		
1.4	64QAM	1	5	21.29	21.16	21.03		
1.4	64QAM	3	0	20.61	20.55	20.50		
1.4	64QAM	3	1	20.56	20.52	20.51		
1.4	64QAM	3	3	20.57	20.58	20.54		
1.4	64QAM	6	0	20.54	20.53	20.52	21.5	0

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
b. "special subframe S" contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS
c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.

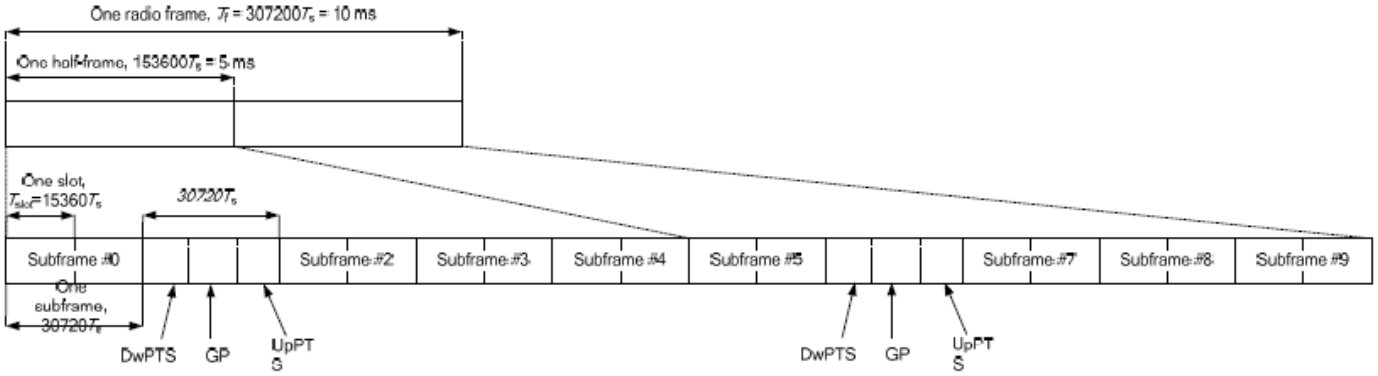


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Special subframe (30720·T_s): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~4**	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe(30720·T_s): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~3**	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, uplink operation is in 3 uplink subframes and 1 special subframe.

ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink

iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.167)/5 = 63.3%

iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.143)/5 = 62.9%

v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

<Default Power Mode>

<LTE Band 38>

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				37850	38000	38150		
Frequency (MHz)				2580	2595	2610		
20	QPSK	1	0	23.25	23.26	23.31	24	0
20	QPSK	1	49	23.53	23.59	23.63		
20	QPSK	1	99	23.24	23.28	23.27		
20	QPSK	50	0	22.52	22.55	22.60	23	1
20	QPSK	50	24	22.53	22.61	22.61		
20	QPSK	50	50	22.53	22.58	22.56		
20	QPSK	100	0	22.40	22.46	22.46		
20	16QAM	1	0	22.43	22.44	22.50	23	1
20	16QAM	1	49	22.71	22.77	22.77		
20	16QAM	1	99	22.40	22.44	22.43		
20	16QAM	50	0	21.63	21.65	21.71	22	2
20	16QAM	50	24	21.64	21.71	21.72		
20	16QAM	50	50	21.66	21.70	21.68		
20	16QAM	100	0	21.57	21.57	21.61		
20	64QAM	1	0	21.16	21.17	21.24	22	2
20	64QAM	1	49	21.41	21.49	21.55		
20	64QAM	1	99	21.14	21.15	21.17		
20	64QAM	50	0	20.66	20.68	20.74	21	3
20	64QAM	50	24	20.66	20.72	20.75		
20	64QAM	50	50	20.66	20.72	20.68		
20	64QAM	100	0	20.57	20.61	20.63		
Channel				37825	38000	38175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2577.5	2595	2612.5		
15	QPSK	1	0	23.31	23.33	23.38	24	0
15	QPSK	1	37	23.46	23.54	23.53		
15	QPSK	1	74	23.31	23.36	23.36		
15	QPSK	36	0	22.43	22.45	22.52	23	1
15	QPSK	36	20	22.43	22.49	22.52		
15	QPSK	36	39	22.42	22.48	22.51		
15	QPSK	75	0	22.48	22.54	22.60		
15	16QAM	1	0	22.46	22.49	22.54	23	1
15	16QAM	1	37	22.60	22.70	22.76		
15	16QAM	1	74	22.45	22.53	22.55		
15	16QAM	36	0	21.44	21.43	21.46	22	2
15	16QAM	36	20	21.47	21.49	21.49		
15	16QAM	36	39	21.38	21.46	21.48		
15	16QAM	75	0	21.60	21.67	21.62		
15	64QAM	1	0	21.21	21.23	21.31	22	2
15	64QAM	1	37	21.38	21.45	21.45		
15	64QAM	1	74	21.21	21.28	21.25		
15	64QAM	36	0	20.45	20.50	20.55	21	3
15	64QAM	36	20	20.48	20.55	20.59		
15	64QAM	36	39	20.46	20.54	20.55		
15	64QAM	75	0	20.61	20.65	20.64		

Channel				37800	38000	38200	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2575	2595	2615		
10	QPSK	1	0	23.42	23.45	23.48	24	0
10	QPSK	1	25	23.34	23.40	23.42		
10	QPSK	1	49	23.39	23.46	23.45		
10	QPSK	25	0	22.54	22.54	22.62	23	1
10	QPSK	25	12	22.48	22.58	22.61		
10	QPSK	25	25	22.51	22.56	22.56		
10	QPSK	50	0	22.63	22.65	22.72		
10	16QAM	1	0	22.57	22.60	22.64	23	1
10	16QAM	1	25	22.53	22.58	22.57		
10	16QAM	1	49	22.54	22.62	22.62		
10	16QAM	25	0	21.61	21.64	21.69	22	2
10	16QAM	25	12	21.61	21.67	21.67		
10	16QAM	25	25	21.60	21.66	21.63		
10	16QAM	50	0	21.76	21.78	21.79		
10	64QAM	1	0	21.30	21.34	21.38	22	2
10	64QAM	1	25	21.26	21.34	21.33		
10	64QAM	1	49	21.27	21.35	21.34		
10	64QAM	25	0	20.67	20.73	20.77	21	3
10	64QAM	25	12	20.71	20.76	20.74		
10	64QAM	25	25	20.67	20.70	20.75		
10	64QAM	50	0	20.79	20.80	20.83		
Channel				37775	38000	38225	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2572.5	2595	2617.5		
5	QPSK	1	0	23.25	23.31	23.33	24	0
5	QPSK	1	12	23.47	23.56	23.62		
5	QPSK	1	24	23.28	23.34	23.34		
5	QPSK	12	0	22.44	22.50	22.52	23	1
5	QPSK	12	7	22.50	22.60	22.58		
5	QPSK	12	13	22.47	22.52	22.51		
5	QPSK	25	0	22.45	22.48	22.49		
5	16QAM	1	0	22.44	22.52	22.54	23	1
5	16QAM	1	12	22.66	22.76	22.79		
5	16QAM	1	24	22.45	22.52	22.54		
5	16QAM	12	0	21.46	21.53	21.54	22	2
5	16QAM	12	7	21.50	21.57	21.61		
5	16QAM	12	13	21.49	21.52	21.52		
5	16QAM	25	0	21.53	21.62	21.62		
5	64QAM	1	0	21.20	21.25	21.30	22	2
5	64QAM	1	12	21.42	21.50	21.55		
5	64QAM	1	24	21.20	21.26	21.27		
5	64QAM	12	0	20.54	20.58	20.64	21	3
5	64QAM	12	7	20.58	20.63	20.62		
5	64QAM	12	13	20.55	20.59	20.58		
5	64QAM	25	0	20.63	20.65	20.68		

<WLAN Conducted Power>

General Note:

1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
2. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
3. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
4. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<2.4GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	18.98	19.00	100.00
		6	2437	18.99	19.00	
		11	2462	18.74	19.00	
	802.11g 6Mbps	1	2412	15.62	16.00	97.22
		6	2437	15.88	16.00	
		11	2462	15.66	16.00	
	802.11n-HT20 MCS0	1	2412	13.51	15.00	97.01
		6	2437	13.76	15.00	
		11	2462	13.99	15.00	
	802.11n-HT40 MCS0	3	2422	14.97	15.00	94.19
		6	2437	14.88	15.00	
		9	2452	14.82	15.00	

<5GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	13.95	14.00	97.20
		40	5200	13.77	14.00	
		44	5220	13.82	14.00	
		48	5240	13.99	14.00	
	802.11n-HT20 MCS0	36	5180	13.90	14.00	97.01
		40	5200	13.82	14.00	
		44	5220	13.74	14.00	
		48	5240	13.76	14.00	
	802.11n-HT40 MCS0	38	5190	13.95	14.00	93.86
		46	5230	13.80	14.00	
	802.11ac-VHT20 MCS0	36	5180	11.96	12.00	97.04
		40	5200	11.85	12.00	
		44	5220	11.73	12.00	
		48	5240	11.90	12.00	
	802.11ac-VHT40 MCS0	38	5190	11.88	12.00	93.91
		46	5230	11.80	12.00	
	802.11ac-VHT80 MCS0	42	5210	11.83	12.00	90.00

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	13.65	14.00	97.20
		56	5280	13.75	14.00	
		60	5300	13.59	14.00	
		64	5320	13.57	14.00	
	802.11n-HT20 MCS0	52	5260	13.99	14.00	97.01
		56	5280	13.61	14.00	
		60	5300	13.89	14.00	
		64	5320	13.87	14.00	
	802.11n-HT40 MCS0	54	5270	13.65	14.00	93.86
		62	5310	13.91	14.00	
	802.11ac-VHT20 MCS0	52	5260	11.93	12.00	97.04
		56	5280	11.59	12.00	
		60	5300	11.99	12.00	
		64	5320	11.64	12.00	
	802.11ac-VHT40 MCS0	54	5270	11.97	12.00	93.91
		62	5310	11.64	12.00	
	802.11ac-VHT80 MCS0	58	5290	9.36	12.00	90.00

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	13.68	14.00	97.20
		116	5580	13.93	14.00	
		124	5620	13.66	14.00	
		132	5660	13.70	14.00	
		140	5700	13.96	14.00	
	802.11n-HT20 MCS0	100	5500	13.97	14.00	97.01
		116	5580	13.76	14.00	
		124	5620	13.94	14.00	
		132	5660	13.91	14.00	
		140	5700	13.79	14.00	
	802.11n-HT40 MCS0	102	5510	13.86	14.00	93.86
		110	5550	13.69	14.00	
		126	5630	13.85	14.00	
		134	5670	13.92	14.00	
	802.11ac-VHT20 MCS0	100	5500	11.72	12.00	97.04
		116	5580	11.97	12.00	
		124	5620	11.91	12.00	
		132	5660	11.71	12.00	
		140	5700	11.94	12.00	
	802.11ac-VHT40 MCS0	102	5510	11.61	12.00	93.91
		110	5550	11.60	12.00	
		126	5630	11.66	12.00	
		134	5670	11.95	12.00	
	802.11ac-VHT80 MCS0	106	5530	8.02	12.00	90.00
		122	5610	11.68	12.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a MCS0	149	5745	13.83	14.00	97.20
		157	5785	13.98	14.00	
		165	5825	13.62	14.00	
	802.11n-HT20 MCS0	149	5745	13.74	14.00	97.01
		157	5785	13.96	14.00	
		165	5825	13.90	14.00	
	802.11n-HT40 MCS0	151	5755	13.92	14.00	93.86
		159	5795	13.88	14.00	
	802.11ac-VHT20 MCS0	149	5745	11.63	12.00	97.04
		157	5785	11.99	12.00	
		165	5825	11.96	12.00	
	802.11ac-VHT40 MCS0	151	5755	11.67	12.00	93.91
		159	5795	11.87	12.00	
	802.11ac-VHT80 MCS0	155	5775	11.70	12.00	90.00

12. Bluetooth Exclusions Applied

Mode Band	Max Average power(dBm)	
	BR/EDR	LE
2.4GHz Bluetooth	8	1

Note:

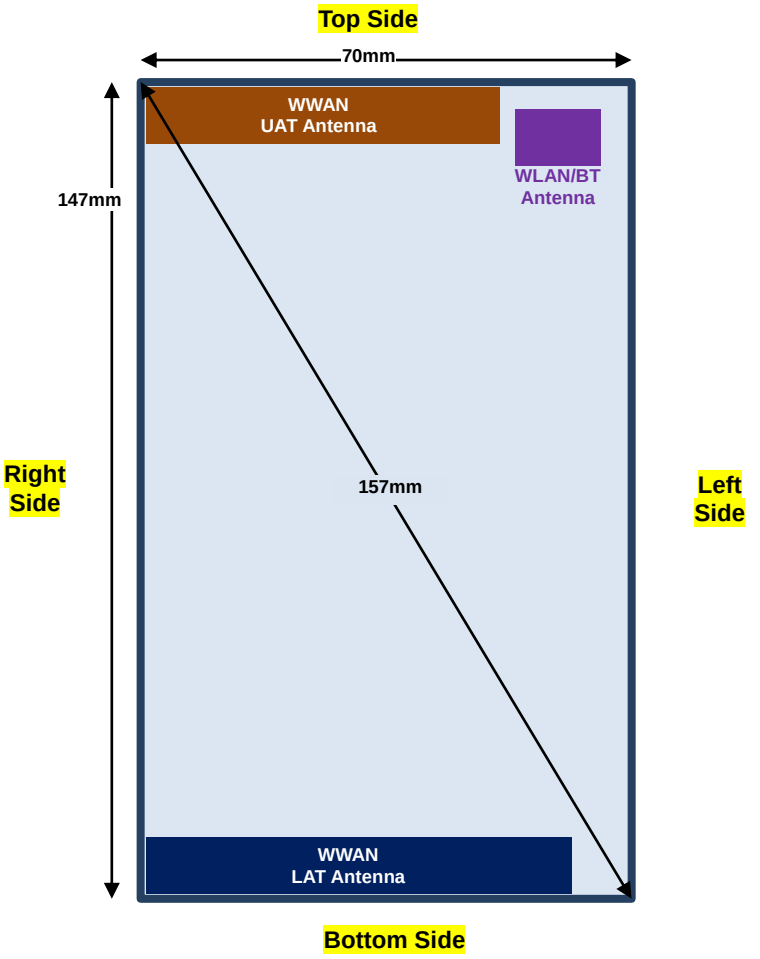
1. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g 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
8	< 5	2.48	1.99

Note:
Per KDB 447498 D01v06, 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 1.99 which is <= 3, SAR testing is not required.

13. Antenna Location

<Mobile Phone>



Back View

WWAN antenna supports bands	
WWAN UAT	GSM850, WCDMA V, LTE B5 / B12 / B13 / B17
WWAN LAT	GSM850 / 1900, WCDMA II / IV / V, LTE B2 / B4 / B5 / B7 / B12 / B13 / B17 / B38 / B66

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN UAT	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm
WWAN LAT	≤ 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 UAT	Yes	Yes	Yes	No	Yes	Yes
WWAN LAT	Yes	Yes	No	Yes	Yes	Yes
BT&WLAN	Yes	Yes	Yes	No	No	Yes

General Note:

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

14. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. When hotspot mode is enabled, power reduction will be activated to limit the maximum power of GSM1900, WCDMA B2 / B4 and LTE B2 / B4 / B66.
5. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.

GSM Note:

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

UMTS Note:

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

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B5 / B12 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 4 / 17 SAR test was covered by Band 12 / 66; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. The maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion.
   b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

WLAN Note:

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

14.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850_UAT	GPRS (1 Tx slot)	Right Cheek	0mm	189	836.4	33.66	34.00	1.081	-0.19	0.125	0.135
	GSM850_UAT	GPRS (1 Tx slot)	Right Tilted	0mm	189	836.4	33.66	34.00	1.081	-0.18	0.097	0.105
	GSM850_UAT	GPRS (1 Tx slot)	Left Cheek	0mm	189	836.4	33.66	34.00	1.081	0.12	0.120	0.130
	GSM850_UAT	GPRS (1 Tx slot)	Left Tilted	0mm	189	836.4	33.66	34.00	1.081	-0.16	0.091	0.098
	GSM850_LAT	GPRS (1 Tx slot)	Right Cheek	0mm	189	836.4	33.66	34.00	1.081	0.03	0.288	0.311
	GSM850_LAT	GPRS (1 Tx slot)	Right Tilted	0mm	189	836.4	33.66	34.00	1.081	-0.03	0.193	0.209
01	GSM850_LAT	GPRS (1 Tx slot)	Left Cheek	0mm	189	836.4	33.66	34.00	1.081	-0.05	0.343	0.371
	GSM850_LAT	GPRS (1 Tx slot)	Left Tilted	0mm	189	836.4	33.66	34.00	1.081	0.04	0.201	0.217
02	GSM1900_LAT	GPRS (1 Tx slot)	Right Cheek	0mm	512	1850.2	30.87	31.00	1.030	-0.18	0.058	0.060
	GSM1900_LAT	GPRS (1 Tx slot)	Right Tilted	0mm	512	1850.2	30.87	31.00	1.030	0.02	0.023	0.024
	GSM1900_LAT	GPRS (1 Tx slot)	Left Cheek	0mm	512	1850.2	30.87	31.00	1.030	0.13	0.043	0.044
	GSM1900_LAT	GPRS (1 Tx slot)	Left Tilted	0mm	512	1850.2	30.87	31.00	1.030	0.07	0.026	0.027

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
03	WCDMA II_LAT	RMC12.2Kbps	Right Cheek	0mm	9262	1852.4	24.70	25.00	1.072	0.11	0.127	0.136
	WCDMA II_LAT	RMC12.2Kbps	Right Tilted	0mm	9262	1852.4	24.70	25.00	1.072	-0.01	0.042	0.045
	WCDMA II_LAT	RMC12.2Kbps	Left Cheek	0mm	9262	1852.4	24.70	25.00	1.072	0.05	0.055	0.059
	WCDMA II_LAT	RMC12.2Kbps	Left Tilted	0mm	9262	1852.4	24.70	25.00	1.072	0.04	0.057	0.061
04	WCDMA IV_LAT	RMC12.2Kbps	Right Cheek	0mm	1513	1752.6	25.00	25.00	1.000	0.05	0.402	0.402
	WCDMA IV_LAT	RMC12.2Kbps	Right Tilted	0mm	1513	1752.6	25.00	25.00	1.000	0.05	0.192	0.192
	WCDMA IV_LAT	RMC12.2Kbps	Left Cheek	0mm	1513	1752.6	25.00	25.00	1.000	0.06	0.258	0.258
	WCDMA IV_LAT	RMC12.2Kbps	Left Tilted	0mm	1513	1752.6	25.00	25.00	1.000	0.03	0.239	0.239
	WCDMA V_UAT	RMC12.2Kbps	Right Cheek	0mm	4132	826.4	24.02	25.00	1.253	0.07	0.704	0.882
	WCDMA V_UAT	RMC12.2Kbps	Right Cheek	0mm	4182	836.4	23.95	25.00	1.274	0.02	0.790	1.006
	WCDMA V_UAT	RMC12.2Kbps	Right Cheek	0mm	4233	846.6	23.86	25.00	1.300	0.03	0.797	1.036
	WCDMA V_UAT	RMC12.2Kbps	Right Tilted	0mm	4132	826.4	24.02	25.00	1.253	0.1	0.492	0.617
	WCDMA V_UAT	RMC12.2Kbps	Left Cheek	0mm	4132	826.4	24.02	25.00	1.253	-0.08	0.795	0.996
	WCDMA V_UAT	RMC12.2Kbps	Left Cheek	0mm	4182	836.4	23.95	25.00	1.274	-0.07	0.844	1.075
05	WCDMA V_UAT	RMC12.2Kbps	Left Cheek	0mm	4233	846.6	23.86	25.00	1.300	-0.05	0.843	1.096
	WCDMA V_UAT	RMC12.2Kbps	Left Tilted	0mm	4132	826.4	24.02	25.00	1.253	-0.12	0.533	0.668
	WCDMA V_LAT	RMC12.2Kbps	Right Cheek	0mm	4132	826.4	24.02	25.00	1.253	0.02	0.264	0.331
	WCDMA V_LAT	RMC12.2Kbps	Right Tilted	0mm	4132	826.4	24.02	25.00	1.253	-0.04	0.180	0.226
	WCDMA V_LAT	RMC12.2Kbps	Left Cheek	0mm	4132	826.4	24.02	25.00	1.253	0.02	0.327	0.410
	WCDMA V_LAT	RMC12.2Kbps	Left Tilted	0mm	4132	826.4	24.02	25.00	1.253	0.03	0.169	0.212

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
06	LTE Band 2_LAT	20M	QPSK	1	49	Right Cheek	0mm	18700	1860	23.51	24.00	1.119	0.02	0.135	0.151
	LTE Band 2_LAT	20M	QPSK	50	0	Right Cheek	0mm	18700	1860	22.52	23.00	1.117	0.06	0.116	0.130
	LTE Band 2_LAT	20M	QPSK	1	49	Right Tilted	0mm	18700	1860	23.51	24.00	1.119	-0.19	0.038	0.043
	LTE Band 2_LAT	20M	QPSK	50	0	Right Tilted	0mm	18700	1860	22.52	23.00	1.117	-0.1	0.032	0.036
	LTE Band 2_LAT	20M	QPSK	1	49	Left Cheek	0mm	18700	1860	23.51	24.00	1.119	0.08	0.044	0.049
	LTE Band 2_LAT	20M	QPSK	50	0	Left Cheek	0mm	18700	1860	22.52	23.00	1.117	0.04	0.037	0.041
	LTE Band 2_LAT	20M	QPSK	1	49	Left Tilted	0mm	18700	1860	23.51	24.00	1.119	0.17	0.043	0.048
	LTE Band 2_LAT	20M	QPSK	50	0	Left Tilted	0mm	18700	1860	22.52	23.00	1.117	-0.09	0.031	0.035
07	LTE Band 5_UAT	10M	QPSK	1	25	Right Cheek	0mm	20525	836.5	23.73	24.00	1.064	0.01	0.676	0.719
	LTE Band 5_UAT	10M	QPSK	25	0	Right Cheek	0mm	20525	836.5	22.83	23.00	1.040	0.01	0.545	0.567
	LTE Band 5_UAT	10M	QPSK	1	25	Right Tilted	0mm	20525	836.5	23.73	24.00	1.064	0.02	0.659	0.701
	LTE Band 5_UAT	10M	QPSK	25	0	Right Tilted	0mm	20525	836.5	22.83	23.00	1.040	0.04	0.535	0.556
	LTE Band 5_UAT	10M	QPSK	1	25	Left Cheek	0mm	20525	836.5	23.73	24.00	1.064	-0.06	0.609	0.648
	LTE Band 5_UAT	10M	QPSK	25	0	Left Cheek	0mm	20525	836.5	22.83	23.00	1.040	-0.01	0.583	0.606
	LTE Band 5_UAT	10M	QPSK	1	25	Left Tilted	0mm	20525	836.5	23.73	24.00	1.064	0.01	0.569	0.605
	LTE Band 5_UAT	10M	QPSK	25	0	Left Tilted	0mm	20525	836.5	22.83	23.00	1.040	-0.08	0.439	0.457
	LTE Band 5_LAT	10M	QPSK	1	25	Right Cheek	0mm	20525	836.5	23.73	24.00	1.064	-0.01	0.299	0.318
	LTE Band 5_LAT	10M	QPSK	25	0	Right Cheek	0mm	20525	836.5	22.83	23.00	1.040	0.01	0.229	0.238
	LTE Band 5_LAT	10M	QPSK	1	25	Right Tilted	0mm	20525	836.5	23.73	24.00	1.064	0.06	0.161	0.171
	LTE Band 5_LAT	10M	QPSK	25	0	Right Tilted	0mm	20525	836.5	22.83	23.00	1.040	0.02	0.124	0.129
	LTE Band 5_LAT	10M	QPSK	1	25	Left Cheek	0mm	20525	836.5	23.73	24.00	1.064	-0.05	0.288	0.306
	LTE Band 5_LAT	10M	QPSK	25	0	Left Cheek	0mm	20525	836.5	22.83	23.00	1.040	0.11	0.224	0.233
	LTE Band 5_LAT	10M	QPSK	1	25	Left Tilted	0mm	20525	836.5	23.73	24.00	1.064	0.13	0.133	0.142
	LTE Band 5_LAT	10M	QPSK	25	0	Left Tilted	0mm	20525	836.5	22.83	23.00	1.040	0.02	0.105	0.109
	LTE Band 7_LAT	20M	QPSK	1	49	Right Cheek	0mm	21350	2560	23.96	24.00	1.009	0.02	0.193	0.195
	LTE Band 7_LAT	20M	QPSK	50	24	Right Cheek	0mm	21350	2560	22.94	23.00	1.014	0.08	0.153	0.155
	LTE Band 7_LAT	20M	QPSK	1	49	Right Tilted	0mm	21350	2560	23.96	24.00	1.009	0.03	0.116	0.117
	LTE Band 7_LAT	20M	QPSK	50	24	Right Tilted	0mm	21350	2560	22.94	23.00	1.014	0.03	0.096	0.097
08	LTE Band 7_LAT	20M	QPSK	1	49	Left Cheek	0mm	21350	2560	23.96	24.00	1.009	0.02	0.286	0.289
	LTE Band 7_LAT	20M	QPSK	50	24	Left Cheek	0mm	21350	2560	22.94	23.00	1.014	0.19	0.223	0.226
	LTE Band 7_LAT	20M	QPSK	1	49	Left Tilted	0mm	21350	2560	23.96	24.00	1.009	0.04	0.127	0.128
	LTE Band 7_LAT	20M	QPSK	50	24	Left Tilted	0mm	21350	2560	22.94	23.00	1.014	0.11	0.098	0.099
09	LTE Band 12_UAT	10M	QPSK	1	25	Right Cheek	0mm	23095	707.5	23.41	24.00	1.146	0.08	0.381	0.436
	LTE Band 12_UAT	10M	QPSK	25	25	Right Cheek	0mm	23095	707.5	22.50	23.00	1.122	0.02	0.328	0.368
	LTE Band 12_UAT	10M	QPSK	1	25	Right Tilted	0mm	23095	707.5	23.41	24.00	1.146	-0.01	0.312	0.357
	LTE Band 12_UAT	10M	QPSK	25	25	Right Tilted	0mm	23095	707.5	22.50	23.00	1.122	-0.01	0.240	0.269
	LTE Band 12_UAT	10M	QPSK	1	25	Left Cheek	0mm	23095	707.5	23.41	24.00	1.146	-0.06	0.365	0.418
	LTE Band 12_UAT	10M	QPSK	25	25	Left Cheek	0mm	23095	707.5	22.50	23.00	1.122	0.03	0.375	0.421
	LTE Band 12_UAT	10M	QPSK	1	25	Left Tilted	0mm	23095	707.5	23.41	24.00	1.146	-0.13	0.355	0.407
	LTE Band 12_UAT	10M	QPSK	25	25	Left Tilted	0mm	23095	707.5	22.50	23.00	1.122	-0.03	0.310	0.348
	LTE Band 12_LAT	10M	QPSK	1	25	Right Cheek	0mm	23095	707.5	23.41	24.00	1.146	0.12	0.181	0.207
	LTE Band 12_LAT	10M	QPSK	25	25	Right Cheek	0mm	23095	707.5	22.50	23.00	1.122	0.04	0.151	0.169
	LTE Band 12_LAT	10M	QPSK	1	25	Right Tilted	0mm	23095	707.5	23.41	24.00	1.146	0.11	0.119	0.136
	LTE Band 12_LAT	10M	QPSK	25	25	Right Tilted	0mm	23095	707.5	22.50	23.00	1.122	-0.05	0.104	0.117
	LTE Band 12_LAT	10M	QPSK	1	25	Left Cheek	0mm	23095	707.5	23.41	24.00	1.146	0.01	0.192	0.220
	LTE Band 12_LAT	10M	QPSK	25	25	Left Cheek	0mm	23095	707.5	22.50	23.00	1.122	0.1	0.159	0.178
	LTE Band 12_LAT	10M	QPSK	1	25	Left Tilted	0mm	23095	707.5	23.41	24.00	1.146	-0.03	0.099	0.113
	LTE Band 12_LAT	10M	QPSK	25	25	Left Tilted	0mm	23095	707.5	22.50	23.00	1.122	-0.01	0.083	0.093

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
10	LTE Band 13_UAT	10M	QPSK	1	25	Right Cheek	0mm	23230	782	23.66	24.00	1.081	0.02	0.581	0.628
	LTE Band 13_UAT	10M	QPSK	25	25	Right Cheek	0mm	23230	782	22.70	23.00	1.072	-0.01	0.453	0.485
	LTE Band 13_UAT	10M	QPSK	1	25	Right Tilted	0mm	23230	782	23.66	24.00	1.081	0.03	0.449	0.486
	LTE Band 13_UAT	10M	QPSK	25	25	Right Tilted	0mm	23230	782	22.70	23.00	1.072	-0.12	0.346	0.371
	LTE Band 13_UAT	10M	QPSK	1	25	Left Cheek	0mm	23230	782	23.66	24.00	1.081	-0.03	0.508	0.549
	LTE Band 13_UAT	10M	QPSK	25	25	Left Cheek	0mm	23230	782	22.70	23.00	1.072	-0.03	0.455	0.488
	LTE Band 13_UAT	10M	QPSK	1	25	Left Tilted	0mm	23230	782	23.66	24.00	1.081	-0.02	0.492	0.532
	LTE Band 13_UAT	10M	QPSK	25	25	Left Tilted	0mm	23230	782	22.70	23.00	1.072	-0.04	0.380	0.407
	LTE Band 13_LAT	10M	QPSK	1	25	Right Cheek	0mm	23230	782	23.66	24.00	1.081	0.06	0.218	0.236
	LTE Band 13_LAT	10M	QPSK	25	25	Right Cheek	0mm	23230	782	22.70	23.00	1.072	0.08	0.172	0.184
	LTE Band 13_LAT	10M	QPSK	1	25	Right Tilted	0mm	23230	782	23.66	24.00	1.081	0.06	0.134	0.145
	LTE Band 13_LAT	10M	QPSK	25	25	Right Tilted	0mm	23230	782	22.70	23.00	1.072	0.15	0.099	0.106
	LTE Band 13_LAT	10M	QPSK	1	25	Left Cheek	0mm	23230	782	23.66	24.00	1.081	0.05	0.230	0.249
	LTE Band 13_LAT	10M	QPSK	25	25	Left Cheek	0mm	23230	782	22.70	23.00	1.072	0.09	0.176	0.189
	LTE Band 13_LAT	10M	QPSK	1	25	Left Tilted	0mm	23230	782	23.66	24.00	1.081	0.05	0.099	0.107
	LTE Band 13_LAT	10M	QPSK	25	25	Left Tilted	0mm	23230	782	22.70	23.00	1.072	-0.09	0.072	0.077
11	LTE Band 66_LAT	20M	QPSK	1	49	Right Cheek	0mm	132572	1770	23.90	24.00	1.023	0.06	0.337	0.345
	LTE Band 66_LAT	20M	QPSK	50	24	Right Cheek	0mm	132572	1770	22.94	23.00	1.014	0.09	0.254	0.258
	LTE Band 66_LAT	20M	QPSK	1	49	Right Tilted	0mm	132572	1770	23.90	24.00	1.023	-0.07	0.151	0.155
	LTE Band 66_LAT	20M	QPSK	50	24	Right Tilted	0mm	132572	1770	22.94	23.00	1.014	-0.06	0.118	0.120
	LTE Band 66_LAT	20M	QPSK	1	49	Left Cheek	0mm	132572	1770	23.90	24.00	1.023	0.05	0.179	0.183
	LTE Band 66_LAT	20M	QPSK	50	24	Left Cheek	0mm	132572	1770	22.94	23.00	1.014	0.01	0.137	0.139
	LTE Band 66_LAT	20M	QPSK	1	49	Left Tilted	0mm	132572	1770	23.90	24.00	1.023	-0.05	0.140	0.143
	LTE Band 66_LAT	20M	QPSK	50	24	Left Tilted	0mm	132572	1770	22.94	23.00	1.014	0.05	0.110	0.112

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
12	LTE Band 38_LAT	20M	QPSK	1	49	Right Cheek	0mm	38150	2610	23.63	24.00	1.089	62.9	1.006	0.13	0.154	0.169
	LTE Band 38_LAT	20M	QPSK	50	24	Right Cheek	0mm	38150	2610	22.61	23.00	1.094	62.9	1.006	0.16	0.121	0.133
	LTE Band 38_LAT	20M	QPSK	1	49	Right Tilted	0mm	38150	2610	23.63	24.00	1.089	62.9	1.006	0.07	0.068	0.074
	LTE Band 38_LAT	20M	QPSK	50	24	Right Tilted	0mm	38150	2610	22.61	23.00	1.094	62.9	1.006	0.05	0.048	0.053
	LTE Band 38_LAT	20M	QPSK	1	49	Left Cheek	0mm	38150	2610	23.63	24.00	1.089	62.9	1.006	0.06	0.137	0.150
	LTE Band 38_LAT	20M	QPSK	50	24	Left Cheek	0mm	38150	2610	22.61	23.00	1.094	62.9	1.006	0.05	0.107	0.118
	LTE Band 38_LAT	20M	QPSK	1	49	Left Tilted	0mm	38150	2610	23.63	24.00	1.089	62.9	1.006	0.06	0.074	0.081
	LTE Band 38_LAT	20M	QPSK	50	24	Left Tilted	0mm	38150	2610	22.61	23.00	1.094	62.9	1.006	0.02	0.054	0.059

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	6	2437	18.99	19.00	1.002	100	1.000	-0.13	0.290	0.291
13	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	6	2437	18.99	19.00	1.002	100	1.000	-0.06	0.342	0.343
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	6	2437	18.99	19.00	1.002	100	1.000	0	0.205	0.205
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	6	2437	18.99	19.00	1.002	100	1.000	-0.11	0.285	0.286
14	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	62	5310	13.91	14.00	1.022	93.86	1.065	-0.1	0.206	0.224
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	62	5310	13.91	14.00	1.022	93.86	1.065	-0.16	0.203	0.221
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	62	5310	13.91	14.00	1.022	93.86	1.065	-0.02	0.110	0.120
	WLAN5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	62	5310	13.91	14.00	1.022	93.86	1.065	-0.07	0.112	0.122
15	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	134	5670	13.92	14.00	1.020	93.86	1.065	-0.17	0.093	0.101
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	134	5670	13.92	14.00	1.020	93.86	1.065	-0.1	0.083	0.090
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	134	5670	13.92	14.00	1.020	93.86	1.065	0.06	0.044	0.048
	WLAN5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	134	5670	13.92	14.00	1.020	93.86	1.065	0.1	0.043	0.047
16	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	151	5755	13.92	14.00	1.020	93.86	1.065	-0.15	0.039	0.042
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	151	5755	13.92	14.00	1.020	93.86	1.065	-0.1	0.037	0.040
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	151	5755	13.92	14.00	1.020	93.86	1.065	-0.11	0.017	0.018
	WLAN5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	151	5755	13.92	14.00	1.020	93.86	1.065	-0.14	0.013	0.014

14.2 Hotspot SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850_UAT	GPRS (1 Tx slot)	Front	10mm	Off	189	836.4	33.66	34.00	1.081	0.02	0.024	0.026
	GSM850_UAT	GPRS (1 Tx slot)	Back	10mm	Off	189	836.4	33.66	34.00	1.081	-0.07	0.018	0.019
	GSM850_UAT	GPRS (1 Tx slot)	Left Side	10mm	Off	189	836.4	33.66	34.00	1.081	-0.01	0.019	0.021
	GSM850_UAT	GPRS (1 Tx slot)	Right Side	10mm	Off	189	836.4	33.66	34.00	1.081	0	0.009	0.009
	GSM850_UAT	GPRS (1 Tx slot)	Top Side	10mm	Off	189	836.4	33.66	34.00	1.081	-0.02	0.012	0.013
	GSM850_LAT	GPRS (1 Tx slot)	Front	10mm	Off	189	836.4	33.66	34.00	1.081	-0.04	0.416	0.450
	GSM850_LAT	GPRS (1 Tx slot)	Back	10mm	Off	189	836.4	33.66	34.00	1.081	-0.05	0.451	0.488
17	GSM850_LAT	GPRS (1 Tx slot)	Left Side	10mm	Off	189	836.4	33.66	34.00	1.081	-0.02	0.483	0.522
	GSM850_LAT	GPRS (1 Tx slot)	Right Side	10mm	Off	189	836.4	33.66	34.00	1.081	-0.04	0.352	0.381
	GSM850_LAT	GPRS (1 Tx slot)	Bottom Side	10mm	Off	189	836.4	33.66	34.00	1.081	0.07	0.197	0.213
	GSM1900_LAT	GPRS (3 Tx slots)	Front	10mm	On	810	1909.8	22.75	24.50	1.496	0.02	0.350	0.524
	GSM1900_LAT	GPRS (3 Tx slots)	Back	10mm	On	810	1909.8	22.75	24.50	1.496	0.18	0.504	0.754
	GSM1900_LAT	GPRS (3 Tx slots)	Left Side	10mm	On	810	1909.8	22.75	24.50	1.496	0.1	0.046	0.069
	GSM1900_LAT	GPRS (3 Tx slots)	Right Side	10mm	On	810	1909.8	22.75	24.50	1.496	0.13	0.074	0.111
18	GSM1900_LAT	GPRS (3 Tx slots)	Bottom Side	10mm	On	810	1909.8	22.75	24.50	1.496	-0.01	0.850	1.272
	GSM1900_LAT	GPRS (3 Tx slots)	Bottom Side	10mm	On	512	1850.2	22.50	24.50	1.585	0.04	0.778	1.233
	GSM1900_LAT	GPRS (3 Tx slots)	Bottom Side	10mm	On	661	1880	22.51	24.50	1.581	0.03	0.735	1.162

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II_LAT	RMC12.2Kbps	Front	10mm	On	9262	1852.4	19.40	20.00	1.148	0.01	0.500	0.574
	WCDMA II_LAT	RMC12.2Kbps	Back	10mm	On	9262	1852.4	19.40	20.00	1.148	0.16	0.778	0.893
	WCDMA II_LAT	RMC12.2Kbps	Back	10mm	On	9400	1880	19.39	20.00	1.151	0.03	0.678	0.780
	WCDMA II_LAT	RMC12.2Kbps	Back	10mm	On	9538	1907.6	19.35	20.00	1.161	0.06	0.612	0.711
	WCDMA II_LAT	RMC12.2Kbps	Left Side	10mm	On	9262	1852.4	19.40	20.00	1.148	0.02	0.045	0.052
	WCDMA II_LAT	RMC12.2Kbps	Right Side	10mm	On	9262	1852.4	19.40	20.00	1.148	-0.02	0.071	0.082
19	WCDMA II_LAT	RMC12.2Kbps	Bottom Side	10mm	On	9262	1852.4	19.40	20.00	1.148	0.16	1.190	1.366
	WCDMA II_LAT	RMC12.2Kbps	Bottom Side	10mm	On	9400	1880	19.39	20.00	1.151	0.13	1.100	1.266
	WCDMA II_LAT	RMC12.2Kbps	Bottom Side	10mm	On	9538	1907.6	19.35	20.00	1.161	0.12	0.998	1.159
	WCDMA IV_LAT	RMC12.2Kbps	Front	10mm	On	1513	1752.6	22.00	22.00	1.000	0.09	0.817	0.817
	WCDMA IV_LAT	RMC12.2Kbps	Front	10mm	On	1312	1712.4	21.82	22.00	1.042	0.06	0.555	0.578
	WCDMA IV_LAT	RMC12.2Kbps	Front	10mm	On	1413	1732.6	21.94	22.00	1.014	-0.06	0.678	0.687
	WCDMA IV_LAT	RMC12.2Kbps	Back	10mm	On	1513	1752.6	22.00	22.00	1.000	0.06	1.000	1.000
	WCDMA IV_LAT	RMC12.2Kbps	Back	10mm	On	1312	1712.4	21.82	22.00	1.042	0.07	0.739	0.770
	WCDMA IV_LAT	RMC12.2Kbps	Back	10mm	On	1413	1732.6	21.94	22.00	1.014	0.05	0.901	0.914
	WCDMA IV_LAT	RMC12.2Kbps	Left Side	10mm	On	1513	1752.6	22.00	22.00	1.000	-0.04	0.055	0.055
	WCDMA IV_LAT	RMC12.2Kbps	Right Side	10mm	On	1513	1752.6	22.00	22.00	1.000	0.02	0.204	0.204
	WCDMA IV_LAT	RMC12.2Kbps	Bottom Side	10mm	On	1312	1712.4	21.82	22.00	1.042	0.09	0.800	0.834
	WCDMA IV_LAT	RMC12.2Kbps	Bottom Side	10mm	On	1413	1732.6	21.94	22.00	1.014	0.03	1.010	1.024
20	WCDMA IV_LAT	RMC12.2Kbps	Bottom Side	10mm	On	1513	1752.6	22.00	22.00	1.000	0.02	1.340	1.340
	WCDMA V_UAT	RMC12.2Kbps	Front	10mm	Off	4132	826.4	24.02	25.00	1.253	0.19	0.017	0.021
	WCDMA V_UAT	RMC12.2Kbps	Back	10mm	Off	4132	826.4	24.02	25.00	1.253	0.01	0.019	0.024
	WCDMA V_UAT	RMC12.2Kbps	Left Side	10mm	Off	4132	826.4	24.02	25.00	1.253	0.06	0.015	0.019
	WCDMA V_UAT	RMC12.2Kbps	Right Side	10mm	Off	4132	826.4	24.02	25.00	1.253	0.03	0.006	0.008
	WCDMA V_UAT	RMC12.2Kbps	Top Side	10mm	Off	4132	826.4	24.02	25.00	1.253	0.15	0.013	0.016
	WCDMA V_LAT	RMC12.2Kbps	Front	10mm	Off	4132	826.4	24.02	25.00	1.253	0.02	0.380	0.476
	WCDMA V_LAT	RMC12.2Kbps	Back	10mm	Off	4132	826.4	24.02	25.00	1.253	-0.04	0.365	0.457
21	WCDMA V_LAT	RMC12.2Kbps	Left Side	10mm	Off	4132	826.4	24.02	25.00	1.253	0.02	0.494	0.619
	WCDMA V_LAT	RMC12.2Kbps	Right Side	10mm	Off	4132	826.4	24.02	25.00	1.253	0.01	0.346	0.434
	WCDMA V_LAT	RMC12.2Kbps	Bottom Side	10mm	Off	4132	826.4	24.02	25.00	1.253	-0.04	0.192	0.241

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2_LAT	20M	QPSK	1	0	Front	10mm	On	18700	1860	19.48	20.00	1.127	0.07	0.450	0.507
	LTE Band 2_LAT	20M	QPSK	50	0	Front	10mm	On	18700	1860	19.53	20.00	1.114	0.06	0.479	0.534
	LTE Band 2_LAT	20M	QPSK	1	0	Back	10mm	On	18700	1860	19.48	20.00	1.127	0.17	0.659	0.743
	LTE Band 2_LAT	20M	QPSK	50	0	Back	10mm	On	18700	1860	19.53	20.00	1.114	0.04	0.768	0.856
	LTE Band 2_LAT	20M	QPSK	50	0	Back	10mm	On	18900	1880	19.38	20.00	1.153	0.02	0.678	0.782
	LTE Band 2_LAT	20M	QPSK	50	0	Back	10mm	On	19100	1900	18.92	20.00	1.282	0.01	0.566	0.726
	LTE Band 2_LAT	20M	QPSK	100	0	Back	10mm	On	18700	1860	19.46	20.00	1.132	0.05	0.720	0.815
	LTE Band 2_LAT	20M	QPSK	1	0	Left Side	10mm	On	18700	1860	19.48	20.00	1.127	0.05	0.043	0.048
	LTE Band 2_LAT	20M	QPSK	50	0	Left Side	10mm	On	18700	1860	19.53	20.00	1.114	0.09	0.047	0.052
	LTE Band 2_LAT	20M	QPSK	1	0	Right Side	10mm	On	18700	1860	19.48	20.00	1.127	-0.15	0.070	0.079
	LTE Band 2_LAT	20M	QPSK	50	0	Right Side	10mm	On	18700	1860	19.53	20.00	1.114	-0.1	0.076	0.085
	LTE Band 2_LAT	20M	QPSK	1	0	Bottom Side	10mm	On	18700	1860	19.48	20.00	1.127	0.05	1.010	1.138
	LTE Band 2_LAT	20M	QPSK	1	0	Bottom Side	10mm	On	18900	1880	19.25	20.00	1.189	0.06	0.918	1.091
	LTE Band 2_LAT	20M	QPSK	1	0	Bottom Side	10mm	On	19100	1900	19.06	20.00	1.242	0.04	0.854	1.060
22	LTE Band 2_LAT	20M	QPSK	50	0	Bottom Side	10mm	On	18700	1860	19.53	20.00	1.114	0.01	1.260	1.404
	LTE Band 2_LAT	20M	QPSK	50	0	Bottom Side	10mm	On	18900	1880	19.38	20.00	1.153	0.12	1.080	1.246
	LTE Band 2_LAT	20M	QPSK	50	0	Bottom Side	10mm	On	19100	1900	18.92	20.00	1.282	0.13	0.922	1.182
	LTE Band 2_LAT	20M	QPSK	100	0	Bottom Side	10mm	On	18700	1860	19.46	20.00	1.132	0.14	1.230	1.393

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 5_UAT	10M	QPSK	1	25	Front	10mm	Off	20525	836.5	23.73	24.00	1.064	-0.05	0.175	0.186
	LTE Band 5_UAT	10M	QPSK	25	0	Front	10mm	Off	20525	836.5	22.83	23.00	1.040	0.05	0.104	0.108
	LTE Band 5_UAT	10M	QPSK	1	25	Back	10mm	Off	20525	836.5	23.73	24.00	1.064	-0.07	0.148	0.157
	LTE Band 5_UAT	10M	QPSK	25	0	Back	10mm	Off	20525	836.5	22.83	23.00	1.040	-0.06	0.119	0.124
	LTE Band 5_UAT	10M	QPSK	1	25	Left Side	10mm	Off	20525	836.5	23.73	24.00	1.064	0.04	0.009	0.010
	LTE Band 5_UAT	10M	QPSK	25	0	Left Side	10mm	Off	20525	836.5	22.83	23.00	1.040	0.16	0.008	0.008
	LTE Band 5_UAT	10M	QPSK	1	25	Right Side	10mm	Off	20525	836.5	23.73	24.00	1.064	0.03	0.002	0.003
	LTE Band 5_UAT	10M	QPSK	25	0	Right Side	10mm	Off	20525	836.5	22.83	23.00	1.040	0.05	0.001	0.002
	LTE Band 5_UAT	10M	QPSK	1	25	Top Side	10mm	Off	20525	836.5	23.73	24.00	1.064	0.12	0.014	0.015
	LTE Band 5_UAT	10M	QPSK	25	0	Top Side	10mm	Off	20525	836.5	22.83	23.00	1.040	0.06	0.011	0.011
	LTE Band 5_LAT	10M	QPSK	1	25	Front	10mm	Off	20525	836.5	23.73	24.00	1.064	0.03	0.303	0.322
	LTE Band 5_LAT	10M	QPSK	25	0	Front	10mm	Off	20525	836.5	22.83	23.00	1.040	0.01	0.239	0.249
	LTE Band 5_LAT	10M	QPSK	1	25	Back	10mm	Off	20525	836.5	23.73	24.00	1.064	0.02	0.314	0.334
	LTE Band 5_LAT	10M	QPSK	25	0	Back	10mm	Off	20525	836.5	22.83	23.00	1.040	0.04	0.205	0.213
23	LTE Band 5_LAT	10M	QPSK	1	25	Left Side	10mm	Off	20525	836.5	23.73	24.00	1.064	-0.01	0.348	0.370
	LTE Band 5_LAT	10M	QPSK	25	0	Left Side	10mm	Off	20525	836.5	22.83	23.00	1.040	-0.06	0.267	0.278
	LTE Band 5_LAT	10M	QPSK	1	25	Right Side	10mm	Off	20525	836.5	23.73	24.00	1.064	0.03	0.192	0.204
	LTE Band 5_LAT	10M	QPSK	25	0	Right Side	10mm	Off	20525	836.5	22.83	23.00	1.040	0.02	0.152	0.158
	LTE Band 5_LAT	10M	QPSK	1	25	Bottom Side	10mm	Off	20525	836.5	23.73	24.00	1.064	0.01	0.194	0.206
	LTE Band 5_LAT	10M	QPSK	25	0	Bottom Side	10mm	Off	20525	836.5	22.83	23.00	1.040	-0.04	0.147	0.153
	LTE Band 7_LAT	20M	QPSK	1	49	Front	10mm	Off	21350	2560	23.96	24.00	1.009	-0.05	0.672	0.678
	LTE Band 7_LAT	20M	QPSK	50	24	Front	10mm	Off	21350	2560	22.94	23.00	1.014	-0.01	0.631	0.640
	LTE Band 7_LAT	20M	QPSK	1	49	Back	10mm	Off	21350	2560	23.96	24.00	1.009	0.05	0.898	0.906
24	LTE Band 7_LAT	20M	QPSK	1	49	Back	10mm	Off	20850	2510	23.29	24.00	1.178	0.02	1.060	1.248
	LTE Band 7_LAT	20M	QPSK	1	49	Back	10mm	Off	21100	2535	23.70	24.00	1.072	0.09	1.070	1.147
	LTE Band 7_LAT	20M	QPSK	50	24	Back	10mm	Off	21350	2560	22.94	23.00	1.014	0.02	0.895	0.907
	LTE Band 7_LAT	20M	QPSK	50	24	Back	10mm	Off	20850	2510	22.25	23.00	1.189	0.06	0.835	0.992
	LTE Band 7_LAT	20M	QPSK	50	24	Back	10mm	Off	21100	2535	22.67	23.00	1.079	0.06	0.850	0.917
	LTE Band 7_LAT	20M	QPSK	100	0	Back	10mm	Off	21350	2560	22.93	23.00	1.016	0.01	0.827	0.840
	LTE Band 7_LAT	20M	QPSK	1	49	Left Side	10mm	Off	21350	2560	23.96	24.00	1.009	0.05	0.146	0.147
	LTE Band 7_LAT	20M	QPSK	50	24	Left Side	10mm	Off	21350	2560	22.94	23.00	1.014	-0.05	0.114	0.116
	LTE Band 7_LAT	20M	QPSK	1	49	Right Side	10mm	Off	21350	2560	23.96	24.00	1.009	-0.03	0.264	0.266
	LTE Band 7_LAT	20M	QPSK	50	24	Right Side	10mm	Off	21350	2560	22.94	23.00	1.014	-0.03	0.206	0.209
	LTE Band 7_LAT	20M	QPSK	1	49	Bottom Side	10mm	Off	21350	2560	23.96	24.00	1.009	-0.05	0.647	0.653
	LTE Band 7_LAT	20M	QPSK	50	24	Bottom Side	10mm	Off	21350	2560	22.94	23.00	1.014	-0.15	0.405	0.411

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 12_UAT	10M	QPSK	1	25	Front	10mm	Off	23095	707.5	23.41	24.00	1.146	-0.06	0.074	0.085
	LTE Band 12_UAT	10M	QPSK	25	25	Front	10mm	Off	23095	707.5	22.50	23.00	1.122	0.02	0.058	0.065
	LTE Band 12_UAT	10M	QPSK	1	25	Back	10mm	Off	23095	707.5	23.41	24.00	1.146	-0.04	0.083	0.095
	LTE Band 12_UAT	10M	QPSK	25	25	Back	10mm	Off	23095	707.5	22.50	23.00	1.122	0.04	0.065	0.073
	LTE Band 12_UAT	10M	QPSK	1	25	Left Side	10mm	Off	23095	707.5	23.41	24.00	1.146	-0.05	0.003	0.004
	LTE Band 12_UAT	10M	QPSK	25	25	Left Side	10mm	Off	23095	707.5	22.50	23.00	1.122	0.09	0.003	0.003
	LTE Band 12_UAT	10M	QPSK	1	25	Right Side	10mm	Off	23095	707.5	23.41	24.00	1.146	0.02	0.003	0.003
	LTE Band 12_UAT	10M	QPSK	25	25	Right Side	10mm	Off	23095	707.5	22.50	23.00	1.122	0.06	0.002	0.002
	LTE Band 12_UAT	10M	QPSK	1	25	Top Side	10mm	Off	23095	707.5	23.41	24.00	1.146	0.02	0.028	0.032
	LTE Band 12_UAT	10M	QPSK	25	25	Top Side	10mm	Off	23095	707.5	22.50	23.00	1.122	0.03	0.004	0.004
	LTE Band 12_LAT	10M	QPSK	1	25	Front	10mm	Off	23095	707.5	23.41	24.00	1.146	-0.15	0.220	0.252
	LTE Band 12_LAT	10M	QPSK	25	25	Front	10mm	Off	23095	707.5	22.50	23.00	1.122	0.02	0.208	0.233
	LTE Band 12_LAT	10M	QPSK	1	25	Back	10mm	Off	23095	707.5	23.41	24.00	1.146	-0.04	0.228	0.261
	LTE Band 12_LAT	10M	QPSK	25	25	Back	10mm	Off	23095	707.5	22.50	23.00	1.122	-0.01	0.208	0.233
25	LTE Band 12_LAT	10M	QPSK	1	25	Left Side	10mm	Off	23095	707.5	23.41	24.00	1.146	0.17	0.305	0.349
	LTE Band 12_LAT	10M	QPSK	25	25	Left Side	10mm	Off	23095	707.5	22.50	23.00	1.122	0.1	0.253	0.284
	LTE Band 12_LAT	10M	QPSK	1	25	Right Side	10mm	Off	23095	707.5	23.41	24.00	1.146	-0.05	0.190	0.218
	LTE Band 12_LAT	10M	QPSK	25	25	Right Side	10mm	Off	23095	707.5	22.50	23.00	1.122	0.02	0.153	0.172
	LTE Band 12_LAT	10M	QPSK	1	25	Bottom Side	10mm	Off	23095	707.5	23.41	24.00	1.146	0.06	0.082	0.094
	LTE Band 12_LAT	10M	QPSK	25	25	Bottom Side	10mm	Off	23095	707.5	22.50	23.00	1.122	0.09	0.097	0.109
	LTE Band 13_UAT	10M	QPSK	1	25	Front	10mm	Off	23230	782	23.66	24.00	1.081	-0.14	0.217	0.235
	LTE Band 13_UAT	10M	QPSK	25	25	Front	10mm	Off	23230	782	22.70	23.00	1.072	0.05	0.183	0.196
	LTE Band 13_UAT	10M	QPSK	1	25	Back	10mm	Off	23230	782	23.66	24.00	1.081	-0.02	0.216	0.234
	LTE Band 13_UAT	10M	QPSK	25	25	Back	10mm	Off	23230	782	22.70	23.00	1.072	0.01	0.204	0.219
	LTE Band 13_UAT	10M	QPSK	1	25	Left Side	10mm	Off	23230	782	23.66	24.00	1.081	0.11	0.015	0.017
	LTE Band 13_UAT	10M	QPSK	25	25	Left Side	10mm	Off	23230	782	22.70	23.00	1.072	0.1	0.006	0.007
	LTE Band 13_UAT	10M	QPSK	1	25	Right Side	10mm	Off	23230	782	23.66	24.00	1.081	0.18	0.006	0.007
	LTE Band 13_UAT	10M	QPSK	25	25	Right Side	10mm	Off	23230	782	22.70	23.00	1.072	0.06	0.004	0.005
	LTE Band 13_UAT	10M	QPSK	1	25	Top Side	10mm	Off	23230	782	23.66	24.00	1.081	0.09	0.006	0.007
	LTE Band 13_UAT	10M	QPSK	25	25	Top Side	10mm	Off	23230	782	22.70	23.00	1.072	0.12	0.004	0.005
	LTE Band 13_LAT	10M	QPSK	1	25	Front	10mm	Off	23230	782	23.66	24.00	1.081	-0.08	0.265	0.287
	LTE Band 13_LAT	10M	QPSK	25	25	Front	10mm	Off	23230	782	22.70	23.00	1.072	-0.01	0.221	0.237
	LTE Band 13_LAT	10M	QPSK	1	25	Back	10mm	Off	23230	782	23.66	24.00	1.081	-0.13	0.262	0.283
	LTE Band 13_LAT	10M	QPSK	25	25	Back	10mm	Off	23230	782	22.70	23.00	1.072	-0.01	0.224	0.240
26	LTE Band 13_LAT	10M	QPSK	1	25	Left Side	10mm	Off	23230	782	23.66	24.00	1.081	-0.01	0.498	0.539
	LTE Band 13_LAT	10M	QPSK	25	25	Left Side	10mm	Off	23230	782	22.70	23.00	1.072	0.02	0.380	0.407
	LTE Band 13_LAT	10M	QPSK	1	25	Right Side	10mm	Off	23230	782	23.66	24.00	1.081	0.06	0.210	0.227
	LTE Band 13_LAT	10M	QPSK	25	25	Right Side	10mm	Off	23230	782	22.70	23.00	1.072	0.02	0.192	0.206
	LTE Band 13_LAT	10M	QPSK	1	25	Bottom Side	10mm	Off	23230	782	23.66	24.00	1.081	0.18	0.159	0.172
	LTE Band 13_LAT	10M	QPSK	25	25	Bottom Side	10mm	Off	23230	782	22.70	23.00	1.072	0.02	0.149	0.160

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 66_LAT	20M	QPSK	1	0	Front	10mm	On	132572	1770	21.47	21.50	1.007	-0.07	0.655	0.660
	LTE Band 66_LAT	20M	QPSK	50	0	Front	10mm	On	132572	1770	21.46	21.50	1.009	-0.07	0.669	0.675
	LTE Band 66_LAT	20M	QPSK	1	0	Back	10mm	On	132572	1770	21.47	21.50	1.007	-0.14	1.010	1.017
	LTE Band 66_LAT	20M	QPSK	1	0	Back	10mm	On	132072	1720	21.44	21.50	1.014	-0.1	0.610	0.618
	LTE Band 66_LAT	20M	QPSK	1	0	Back	10mm	On	132322	1745	21.43	21.50	1.016	-0.1	0.782	0.795
	LTE Band 66_LAT	20M	QPSK	50	0	Back	10mm	On	132572	1770	21.46	21.50	1.009	-0.12	1.040	1.050
	LTE Band 66_LAT	20M	QPSK	50	0	Back	10mm	On	132072	1720	21.45	21.50	1.012	-0.11	0.668	0.676
	LTE Band 66_LAT	20M	QPSK	50	0	Back	10mm	On	132322	1745	21.41	21.50	1.021	-0.11	0.910	0.929
	LTE Band 66_LAT	20M	QPSK	100	0	Back	10mm	On	132572	1770	21.38	21.50	1.028	-0.13	1.070	1.100
	LTE Band 66_LAT	20M	QPSK	1	0	Left Side	10mm	On	132572	1770	21.47	21.50	1.007	0.01	0.048	0.048
	LTE Band 66_LAT	20M	QPSK	50	0	Left Side	10mm	On	132572	1770	21.46	21.50	1.009	0.04	0.046	0.046
	LTE Band 66_LAT	20M	QPSK	1	0	Right Side	10mm	On	132572	1770	21.47	21.50	1.007	0.08	0.131	0.132
	LTE Band 66_LAT	20M	QPSK	50	0	Right Side	10mm	On	132572	1770	21.46	21.50	1.009	0.11	0.123	0.124
	LTE Band 66_LAT	20M	QPSK	1	0	Bottom Side	10mm	On	132572	1770	21.47	21.50	1.007	0.16	1.350	1.359
	LTE Band 66_LAT	20M	QPSK	1	0	Bottom Side	10mm	On	132072	1720	21.44	21.50	1.014	0.13	0.722	0.732
	LTE Band 66_LAT	20M	QPSK	1	0	Bottom Side	10mm	On	132322	1745	21.43	21.50	1.016	0.12	0.963	0.979
	LTE Band 66_LAT	20M	QPSK	50	0	Bottom Side	10mm	On	132572	1770	21.46	21.50	1.009	0.16	1.410	1.423
	LTE Band 66_LAT	20M	QPSK	50	0	Bottom Side	10mm	On	132072	1720	21.45	21.50	1.012	0.12	0.796	0.805
	LTE Band 66_LAT	20M	QPSK	50	0	Bottom Side	10mm	On	132322	1745	21.41	21.50	1.021	0.15	1.140	1.164
27	LTE Band 66_LAT	20M	QPSK	100	0	Bottom Side	10mm	On	132572	1770	21.38	21.50	1.028	0.18	1.470	1.511

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 38_LAT	20M	QPSK	1	49	Front	10mm	Off	38150	2610	23.63	24.00	1.089	62.9	1.006	0.03	0.380	0.416
	LTE Band 38_LAT	20M	QPSK	50	24	Front	10mm	Off	38150	2610	22.61	23.00	1.094	62.9	1.006	0.02	0.302	0.332
28	LTE Band 38_LAT	20M	QPSK	1	49	Back	10mm	Off	38150	2610	23.63	24.00	1.089	62.9	1.006	0	0.392	0.429
	LTE Band 38_LAT	20M	QPSK	50	24	Back	10mm	Off	38150	2610	22.61	23.00	1.094	62.9	1.006	-0.03	0.327	0.360
	LTE Band 38_LAT	20M	QPSK	1	49	Left side	10mm	Off	38150	2610	23.63	24.00	1.089	62.9	1.006	0.1	0.058	0.064
	LTE Band 38_LAT	20M	QPSK	50	24	Left side	10mm	Off	38150	2610	22.61	23.00	1.094	62.9	1.006	-0.01	0.045	0.050
	LTE Band 38_LAT	20M	QPSK	1	49	Right Side	10mm	Off	38150	2610	23.63	24.00	1.089	62.9	1.006	-0.11	0.132	0.145
	LTE Band 38_LAT	20M	QPSK	50	24	Right side	10mm	Off	38150	2610	22.61	23.00	1.094	62.9	1.006	0.08	0.105	0.116
	LTE Band 38_LAT	20M	QPSK	1	49	Bottom side	10mm	Off	38150	2610	23.63	24.00	1.089	62.9	1.006	0.1	0.219	0.240
	LTE Band 38_LAT	20M	QPSK	50	24	Bottom side	10mm	Off	38150	2610	22.61	23.00	1.094	62.9	1.006	0.06	0.172	0.189

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	6	2437	18.99	19.00	1.002	100	1.000	0.03	0.075	0.075
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	6	2437	18.99	19.00	1.002	100	1.000	-0.06	0.107	0.107
	WLAN2.4GHz	802.11b 1Mbps	Left side	10mm	6	2437	18.99	19.00	1.002	100	1.000	0.12	0.025	0.025
29	WLAN2.4GHz	802.11b 1Mbps	Top side	10mm	6	2437	18.99	19.00	1.002	100	1.000	-0.08	0.118	0.118
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	38	5190	13.95	14.00	1.013	93.86	1.065	-0.13	0.009	0.010
	WLAN5GHz	802.11n-HT40 MCS0	Back	10mm	38	5190	13.95	14.00	1.013	93.86	1.065	0.16	0.007	0.007
	WLAN5GHz	802.11n-HT40 MCS0	Left Side	10mm	38	5190	13.95	14.00	1.013	93.86	1.065	0.11	0.005	0.005
30	WLAN5GHz	802.11n-HT40 MCS0	Top Side	10mm	38	5190	13.95	14.00	1.013	93.86	1.065	0	0.011	0.012
	WLAN5GHz	802.11n-HT40 MCS0	Front	10mm	151	5755	13.92	14.00	1.020	93.86	1.065	0	0.001	0.001
	WLAN5GHz	802.11n-HT40 MCS0	Back	10mm	151	5755	13.92	14.00	1.020	93.86	1.065	0	0.004	0.004
	WLAN5GHz	802.11n-HT40 MCS0	Left Side	10mm	151	5755	13.92	14.00	1.020	93.86	1.065	-0.12	0.001	0.001
31	WLAN5GHz	802.11n-HT40 MCS0	Top Side	10mm	151	5755	13.92	14.00	1.020	93.86	1.065	0.19	0.006	0.006

14.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850_UAT	GPRS (1 Tx slot)	Front	15mm	189	836.4	33.66	34.00	1.081	0.05	0.017	0.018
	GSM850_UAT	GPRS (1 Tx slot)	Back	15mm	189	836.4	33.66	34.00	1.081	-0.06	0.016	0.017
	GSM850_LAT	GPRS (1 Tx slot)	Front	15mm	189	836.4	33.66	34.00	1.081	-0.04	0.396	0.428
32	GSM850_LAT	GPRS (1 Tx slot)	Back	15mm	189	836.4	33.66	34.00	1.081	-0.04	0.406	0.439
	GSM1900_LAT	GPRS (1 Tx slot)	Front	15mm	512	1850.2	30.87	31.00	1.030	-0.01	0.331	0.341
33	GSM1900_LAT	GPRS (1 Tx slot)	Back	15mm	512	1850.2	30.87	31.00	1.030	0.07	0.514	0.530

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II_LAT	RMC12.2Kbps	Front	15mm	9262	1852.4	24.70	25.00	1.072	0.08	0.699	0.749
34	WCDMA II_LAT	RMC12.2Kbps	Back	15mm	9262	1852.4	24.70	25.00	1.072	-0.1	1.070	1.147
	WCDMA II_LAT	RMC12.2Kbps	Back	15mm	9400	1880	24.69	25.00	1.074	0.06	0.956	1.027
	WCDMA II_LAT	RMC12.2Kbps	Back	15mm	9538	1907.6	24.65	25.00	1.084	0.04	0.888	0.963
	WCDMA IV_LAT	RMC12.2Kbps	Front	15mm	1513	1752.6	25.00	25.00	1.000	0.03	0.600	0.600
35	WCDMA IV_LAT	RMC12.2Kbps	Back	15mm	1513	1752.6	25.00	25.00	1.000	0.06	0.752	0.752
	WCDMA V_UAT	RMC12.2Kbps	Front	15mm	4132	826.4	24.02	25.00	1.253	0.06	0.012	0.015
	WCDMA V_UAT	RMC12.2Kbps	Back	15mm	4132	826.4	24.02	25.00	1.253	0.07	0.013	0.016
	WCDMA V_LAT	RMC12.2Kbps	Front	15mm	4132	826.4	24.02	25.00	1.253	0.03	0.042	0.053
36	WCDMA V_LAT	RMC12.2Kbps	Back	15mm	4132	826.4	24.02	25.00	1.253	0.01	0.099	0.124

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2_LAT	20M	QPSK	1	49	Front	15mm	18700	1860	23.51	24.00	1.119	0.08	0.575	0.644
	LTE Band 2_LAT	20M	QPSK	50	0	Front	15mm	18700	1860	22.52	23.00	1.117	-0.03	0.479	0.535
37	LTE Band 2_LAT	20M	QPSK	1	49	Back	15mm	18700	1860	23.51	24.00	1.119	0.02	0.814	0.911
	LTE Band 2_LAT	20M	QPSK	1	49	Back	15mm	18900	1880	23.32	24.00	1.169	0.15	0.757	0.885
	LTE Band 2_LAT	20M	QPSK	1	49	Back	15mm	19100	1900	23.10	24.00	1.230	0.02	0.706	0.869
	LTE Band 2_LAT	20M	QPSK	50	0	Back	15mm	18700	1860	22.52	23.00	1.117	0.09	0.761	0.850
	LTE Band 2_LAT	20M	QPSK	50	0	Back	15mm	18900	1880	22.38	23.00	1.153	0.06	0.670	0.773
	LTE Band 2_LAT	20M	QPSK	50	0	Back	15mm	19100	1900	22.00	23.00	1.259	0.04	0.557	0.701
	LTE Band 2_LAT	20M	QPSK	100	0	Back	15mm	18700	1860	22.46	23.00	1.132	0.05	0.739	0.837
	LTE Band 5_UAT	10M	QPSK	1	25	Front	15mm	20525	836.5	23.73	24.00	1.064	0.05	0.011	0.012
	LTE Band 5_UAT	10M	QPSK	25	0	Front	15mm	20525	836.5	22.83	23.00	1.040	0.06	0.009	0.009
	LTE Band 5_UAT	10M	QPSK	1	25	Back	15mm	20525	836.5	23.73	24.00	1.064	0.01	0.013	0.014
	LTE Band 5_UAT	10M	QPSK	25	0	Back	15mm	20525	836.5	22.83	23.00	1.040	0.05	0.010	0.010
38	LTE Band 5_LAT	10M	QPSK	1	25	Front	15mm	20525	836.5	23.73	24.00	1.064	-0.02	0.344	0.366
	LTE Band 5_LAT	10M	QPSK	25	0	Front	15mm	20525	836.5	22.83	23.00	1.040	0	0.260	0.270
	LTE Band 5_LAT	10M	QPSK	1	25	Back	15mm	20525	836.5	23.73	24.00	1.064	0.01	0.332	0.353
	LTE Band 5_LAT	10M	QPSK	25	0	Back	15mm	20525	836.5	22.83	23.00	1.040	0.02	0.259	0.269
	LTE Band 7_LAT	20M	QPSK	1	49	Front	15mm	21350	2560	23.96	24.00	1.009	0.05	0.524	0.529
	LTE Band 7_LAT	20M	QPSK	50	24	Front	15mm	21350	2560	22.94	23.00	1.014	0.03	0.459	0.465
39	LTE Band 7_LAT	20M	QPSK	1	49	Back	15mm	21350	2560	23.96	24.00	1.009	0.02	0.546	0.551
	LTE Band 7_LAT	20M	QPSK	50	24	Back	15mm	21350	2560	22.94	23.00	1.014	0.05	0.469	0.476
	LTE Band 12_UAT	10M	QPSK	1	25	Front	15mm	23095	707.5	23.41	24.00	1.146	0.02	0.005	0.006
	LTE Band 12_UAT	10M	QPSK	25	25	Front	15mm	23095	707.5	22.50	23.00	1.122	0.05	0.004	0.005
	LTE Band 12_UAT	10M	QPSK	1	25	Back	15mm	23095	707.5	23.41	24.00	1.146	0.08	0.007	0.008
	LTE Band 12_UAT	10M	QPSK	25	25	Back	15mm	23095	707.5	22.50	23.00	1.122	0.05	0.005	0.005
	LTE Band 12_LAT	10M	QPSK	1	25	Front	15mm	23095	707.5	23.41	24.00	1.146	0.04	0.242	0.277
	LTE Band 12_LAT	10M	QPSK	25	25	Front	15mm	23095	707.5	22.50	23.00	1.122	-0.01	0.204	0.229
40	LTE Band 12_LAT	10M	QPSK	1	25	Back	15mm	23095	707.5	23.41	24.00	1.146	0.03	0.283	0.324
	LTE Band 12_LAT	10M	QPSK	25	25	Back	15mm	23095	707.5	22.50	23.00	1.122	0.02	0.276	0.310
	LTE Band 13_UAT	10M	QPSK	1	25	Front	15mm	23230	782	23.66	24.00	1.081	0.05	0.010	0.011
	LTE Band 13_UAT	10M	QPSK	25	25	Front	15mm	23230	782	22.70	23.00	1.072	0.04	0.007	0.007
	LTE Band 13_UAT	10M	QPSK	1	25	Back	15mm	23230	782	23.66	24.00	1.081	0.03	0.012	0.013
	LTE Band 13_UAT	10M	QPSK	25	25	Back	15mm	23230	782	22.70	23.00	1.072	0.05	0.008	0.008
	LTE Band 13_LAT	10M	QPSK	1	25	Front	15mm	23230	782	23.66	24.00	1.081	0.02	0.357	0.386
	LTE Band 13_LAT	10M	QPSK	25	25	Front	15mm	23230	782	22.70	23.00	1.072	0.02	0.289	0.310
41	LTE Band 13_LAT	10M	QPSK	1	25	Back	15mm	23230	782	23.66	24.00	1.081	0	0.391	0.423
	LTE Band 13_LAT	10M	QPSK	25	25	Back	15mm	23230	782	22.70	23.00	1.072	0.01	0.305	0.327
	LTE Band 66_LAT	20M	QPSK	1	49	Front	15mm	132572	1770	23.90	24.00	1.023	0.01	0.658	0.673
	LTE Band 66_LAT	20M	QPSK	50	24	Front	15mm	132572	1770	22.94	23.00	1.014	0.15	0.521	0.528
42	LTE Band 66_LAT	20M	QPSK	1	49	Back	15mm	132572	1770	23.90	24.00	1.023	0.16	0.831	0.850
	LTE Band 66_LAT	20M	QPSK	1	49	Back	15mm	132072	1720	23.84	24.00	1.038	0.01	0.565	0.586
	LTE Band 66_LAT	20M	QPSK	1	49	Back	15mm	132322	1745	23.89	24.00	1.026	0.09	0.706	0.724
	LTE Band 66_LAT	20M	QPSK	50	24	Back	15mm	132572	1770	22.94	23.00	1.014	0.03	0.710	0.720
	LTE Band 66_LAT	20M	QPSK	100	0	Back	15mm	132572	1770	22.95	23.00	1.012	0.04	0.610	0.617

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
43	LTE Band 38_LAT	20M	QPSK	1	49	Front	15mm	38150	2610	23.63	24.00	1.089	62.9	1.006	-0.04	0.200	0.219
	LTE Band 38_LAT	20M	QPSK	50	24	Front	15mm	38150	2610	22.61	23.00	1.094	62.9	1.006	0.01	0.171	0.188
	LTE Band 38_LAT	20M	QPSK	1	49	Back	15mm	38150	2610	23.63	24.00	1.089	62.9	1.006	0.03	0.199	0.218
	LTE Band 38_LAT	20M	QPSK	50	24	Back	15mm	38150	2610	22.61	23.00	1.094	62.9	1.006	0.02	0.157	0.173

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	6	2437	18.99	19.00	1.002	100	1.000	0.07	0.049	0.049
44	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	6	2437	18.99	19.00	1.002	100	1.000	-0.06	0.066	0.066
45	WLAN5GHz	802.11n-HT40 MCS0	Front	15mm	62	5310	13.91	14.00	1.022	93.86	1.065	-0.11	0.007	0.008
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	62	5310	13.91	14.00	1.022	93.86	1.065	-0.13	0.004	0.004
46	WLAN5GHz	802.11n-HT40 MCS0	Front	15mm	134	5670	13.92	14.00	1.020	93.86	1.065	-0.13	0.004	0.004
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	134	5670	13.92	14.00	1.020	93.86	1.065	-0.17	0.001	0.001
47	WLAN5GHz	802.11n-HT40 MCS0	Front	15mm	151	5755	13.92	14.00	1.020	93.86	1.065	-0.11	< 0.001	< 0.001
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	151	5755	13.92	14.00	1.020	93.86	1.065	0.18	< 0.001	< 0.001

14.4 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA V_UAT	RMC12.2Kbps	Left Cheek	0mm	-	4182	836.4	23.95	25.00	1.274	-0.07	0.844		1.075
2nd	WCDMA V_UAT	RMC12.2Kbps	Left Cheek	0mm	-	4182	836.4	23.95	25.00	1.274	-0.07	0.834	1.01	1.062
1st	GSM1900_LAT	GPRS (3 Tx slots)	Bottom Side	10mm	On	810	1909.8	22.75	24.50	1.496	-0.01	0.850		1.272
2nd	GSM1900_LAT	GPRS (3 Tx slots)	Bottom Side	10mm	On	810	1909.8	22.75	24.50	1.496	-0.06	0.844	1.01	1.263
1st	LTE Band 2_LAT	20M_QPSK_50_0	Bottom Side	10mm	On	18700	1860	19.53	20.00	1.114	0.01	1.260		1.404
2nd	LTE Band 2_LAT	20M_QPSK_50_0	Bottom Side	10mm	On	18700	1860	19.53	20.00	1.114	0.09	1.230	1.02	1.371
1st	LTE Band 7_LAT	20M_QPSK_1_49	Back	10mm	Off	21100	2535	23.70	24.00	1.072	0.09	1.070		1.147
2nd	LTE Band 7_LAT	20M_QPSK_1_49	Back	10mm	Off	21100	2535	23.70	24.00	1.072	0.08	1.020	1.05	1.093
1st	LTE Band 66_LAT	20M_QPSK_100_0	Bottom Side	10mm	On	132572	1770	21.38	21.50	1.028	0.18	1.470		1.511
2nd	LTE Band 66_LAT	20M_QPSK_100_0	Bottom Side	10mm	On	132572	1770	21.38	21.50	1.028	0.18	1.420	1.03	1.460

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. 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	Portable Handset		
		Head	Body-worn	Hotspot
1.	GSM Voice + WLAN2.4GHz	Yes	Yes	
2.	GPRS/EDGE + WLAN2.4GHz	Yes	Yes	Yes
3.	WCDMA + WLAN2.4GHz	Yes	Yes	Yes
4.	LTE + WLAN2.4GHz	Yes	Yes	Yes
5.	GSM Voice + Bluetooth	Yes	Yes	
6.	GPRS/EDGE + Bluetooth	Yes	Yes	Yes
7.	WCDMA+ Bluetooth	Yes	Yes	Yes
8.	LTE + Bluetooth	Yes	Yes	Yes
9.	GSM Voice + WLAN5GHz	Yes	Yes	
10.	GPRS/EDGE + WLAN5GHz	Yes	Yes	Yes
11.	WCDMA + WLAN5GHz	Yes	Yes	Yes
12.	LTE + WLAN5GHz	Yes	Yes	Yes

General Note:

1. This device WLAN 2.4GHz / 5.2GHz / 5.8GHz supports Hotspot operation and Bluetooth support tethering applications.
2. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
4. The Scaled SAR summation is calculated based on the same configuration and test position.
5. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
6. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v06 based on the formula below.
   i) (*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)]·[√f(GHz)/*x*] W/kg for *test separation distances* ≤ 50 mm; where *x* = 7.5 for 1-g SAR, and *x* = 18.75 for 10-g SAR.
   ii) When the minimum separation distance is < 5mm, the distance is used 5mm to determine SAR test exclusion.
   iii) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the *test separation distances* is > 50 mm.

Bluetooth Max Power	Exposure Position	Head	Hotspot	Body worn
	Test separation	0 mm	10 mm	15 mm
8.0dBm	Estimated SAR (W/kg)	0.265 W/kg	0.132 W/kg	0.088 W/kg

15.1 Head Exposure Conditions

WWAN Band		Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth			
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	Estimated 1g SAR (W/kg)			
GSM	GSM850_UAT	Right Cheek	0.135	0.291	0.224	0.265	**0.426**	**0.359**	**0.400**
		Right Tilted	0.105	0.343	0.221	0.265	**0.448**	**0.326**	**0.370**
		Left Cheek	0.130	0.205	0.120	0.265	**0.335**	**0.250**	**0.395**
		Left Tilted	0.098	0.286	0.122	0.265	**0.384**	**0.220**	**0.363**
	GSM850_LAT	Right Cheek	0.311	0.291	0.224	0.265	**0.602**	**0.535**	**0.576**
		Right Tilted	0.209	0.343	0.221	0.265	**0.552**	**0.430**	**0.474**
		Left Cheek	0.371	0.205	0.120	0.265	**0.576**	**0.491**	**0.636**
		Left Tilted	0.217	0.286	0.122	0.265	**0.503**	**0.339**	**0.482**
	GSM1900_LAT	Right Cheek	0.060	0.291	0.224	0.265	**0.351**	**0.284**	**0.325**
		Right Tilted	0.024	0.343	0.221	0.265	**0.367**	**0.245**	**0.289**
		Left Cheek	0.044	0.205	0.120	0.265	**0.249**	**0.164**	**0.309**
		Left Tilted	0.027	0.286	0.122	0.265	**0.313**	**0.149**	**0.292**
WCDMA	WCDMA II_LAT	Right Cheek	0.136	0.291	0.224	0.265	**0.427**	**0.360**	**0.401**
		Right Tilted	0.045	0.343	0.221	0.265	**0.388**	**0.266**	**0.310**
		Left Cheek	0.059	0.205	0.120	0.265	**0.264**	**0.179**	**0.324**
		Left Tilted	0.061	0.286	0.122	0.265	**0.347**	**0.183**	**0.326**
	WCDMA IV_LAT	Right Cheek	0.402	0.291	0.224	0.265	**0.693**	**0.626**	**0.667**
		Right Tilted	0.192	0.343	0.221	0.265	**0.535**	**0.413**	**0.457**
		Left Cheek	0.258	0.205	0.120	0.265	**0.463**	**0.378**	**0.523**
		Left Tilted	0.239	0.286	0.122	0.265	**0.525**	**0.361**	**0.504**
	WCDMA V_UAT	Right Cheek	1.036	0.291	0.224	0.265	**1.327**	**1.260**	**1.301**
		Right Tilted	0.617	0.343	0.221	0.265	**0.960**	**0.838**	**0.882**
		Left Cheek	1.096	0.205	0.120	0.265	**1.301**	**1.216**	**1.361**
		Left Tilted	0.668	0.286	0.122	0.265	**0.954**	**0.790**	**0.933**
	WCDMA V_LAT	Right Cheek	0.331	0.291	0.224	0.265	**0.622**	**0.555**	**0.596**
		Right Tilted	0.226	0.343	0.221	0.265	**0.569**	**0.447**	**0.491**
		Left Cheek	0.410	0.205	0.120	0.265	**0.615**	**0.530**	**0.675**
		Left Tilted	0.212	0.286	0.122	0.265	**0.498**	**0.334**	**0.477**

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 5GHz WLAN 1g SAR (W/kg)	4 Bluetooth Estimated 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
LTE	LTE Band 2_LAT	Right Cheek	0.151	0.291	0.224	0.265	**0.442**	**0.375**	**0.416**
		Right Tilted	0.043	0.343	0.221	0.265	**0.386**	**0.264**	**0.308**
		Left Cheek	0.049	0.205	0.120	0.265	**0.254**	**0.169**	**0.314**
		Left Tilted	0.048	0.286	0.122	0.265	**0.334**	**0.170**	**0.313**
	LTE Band 5_UAT	Right Cheek	0.719	0.291	0.224	0.265	**1.010**	**0.943**	**0.984**
		Right Tilted	0.701	0.343	0.221	0.265	**1.044**	**0.922**	**0.966**
		Left Cheek	0.648	0.205	0.120	0.265	**0.853**	**0.768**	**0.913**
		Left Tilted	0.605	0.286	0.122	0.265	**0.891**	**0.727**	**0.870**
	LTE Band 5_LAT	Right Cheek	0.318	0.291	0.224	0.265	**0.609**	**0.542**	**0.583**
		Right Tilted	0.171	0.343	0.221	0.265	**0.514**	**0.392**	**0.436**
		Left Cheek	0.306	0.205	0.120	0.265	**0.511**	**0.426**	**0.571**
		Left Tilted	0.142	0.286	0.122	0.265	**0.428**	**0.264**	**0.407**
	LTE Band 7_LAT	Right Cheek	0.195	0.291	0.224	0.265	**0.486**	**0.419**	**0.460**
		Right Tilted	0.117	0.343	0.221	0.265	**0.460**	**0.338**	**0.382**
		Left Cheek	0.289	0.205	0.120	0.265	**0.494**	**0.409**	**0.554**
		Left Tilted	0.128	0.286	0.122	0.265	**0.414**	**0.250**	**0.393**
	LTE Band 12_UAT	Right Cheek	0.436	0.291	0.224	0.265	**0.727**	**0.660**	**0.701**
		Right Tilted	0.357	0.343	0.221	0.265	**0.700**	**0.578**	**0.622**
		Left Cheek	0.421	0.205	0.120	0.265	**0.626**	**0.541**	**0.686**
		Left Tilted	0.407	0.286	0.122	0.265	**0.693**	**0.529**	**0.672**
	LTE Band 12_LAT	Right Cheek	0.207	0.291	0.224	0.265	**0.498**	**0.431**	**0.472**
		Right Tilted	0.136	0.343	0.221	0.265	**0.479**	**0.357**	**0.401**
		Left Cheek	0.220	0.205	0.120	0.265	**0.425**	**0.340**	**0.485**
		Left Tilted	0.113	0.286	0.122	0.265	**0.399**	**0.235**	**0.378**
	LTE Band 13_UAT	Right Cheek	0.628	0.291	0.224	0.265	**0.919**	**0.852**	**0.893**
		Right Tilted	0.486	0.343	0.221	0.265	**0.829**	**0.707**	**0.751**
		Left Cheek	0.549	0.205	0.120	0.265	**0.754**	**0.669**	**0.814**
		Left Tilted	0.532	0.286	0.122	0.265	**0.818**	**0.654**	**0.797**
	LTE Band 13_LAT	Right Cheek	0.236	0.291	0.224	0.265	**0.527**	**0.460**	**0.501**
		Right Tilted	0.145	0.343	0.221	0.265	**0.488**	**0.366**	**0.410**
		Left Cheek	0.249	0.205	0.120	0.265	**0.454**	**0.369**	**0.514**
		Left Tilted	0.107	0.286	0.122	0.265	**0.393**	**0.229**	**0.372**
	LTE Band 38_LAT	Right Cheek	0.169	0.291	0.224	0.265	**0.460**	**0.393**	**0.434**
		Right Tilted	0.074	0.343	0.221	0.265	**0.417**	**0.295**	**0.339**
		Left Cheek	0.150	0.205	0.120	0.265	**0.355**	**0.270**	**0.415**
		Left Tilted	0.081	0.286	0.122	0.265	**0.367**	**0.203**	**0.346**
	LTE Band 66_LAT	Right Cheek	0.345	0.291	0.224	0.265	**0.636**	**0.569**	**0.610**
		Right Tilted	0.155	0.343	0.221	0.265	**0.498**	**0.376**	**0.420**
		Left Cheek	0.183	0.205	0.120	0.265	**0.388**	**0.303**	**0.448**
		Left Tilted	0.143	0.286	0.122	0.265	**0.429**	**0.265**	**0.408**

15.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 5GHz WLAN 1g SAR (W/kg)	4 Bluetooth Estimated 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
GSM	GSM850_UAT	Front	0.026	0.075	0.010	0.132	**0.101**	**0.036**	**0.158**
		Back	0.019	0.107	0.007	0.132	**0.126**	**0.026**	**0.151**
		Left side	0.021	0.025	0.005	0.132	**0.046**	**0.026**	**0.153**
		Right side	0.009				**0.009**	**0.009**	**0.009**
		Top side	0.013	0.118	0.012	0.132	**0.131**	**0.025**	**0.145**
		Bottom side					**0.000**	**0.000**	**0.000**
	GSM850_LAT	Front	0.450	0.075	0.010	0.132	**0.525**	**0.460**	**0.582**
		Back	0.488	0.107	0.007	0.132	**0.595**	**0.495**	**0.620**
		Left side	0.522	0.025	0.005	0.132	**0.547**	**0.527**	**0.654**
		Right side	0.381				**0.381**	**0.381**	**0.381**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	0.213				**0.213**	**0.213**	**0.213**
	GSM1900_LAT	Front	0.524	0.075	0.010	0.132	**0.599**	**0.534**	**0.656**
		Back	0.754	0.107	0.007	0.132	**0.861**	**0.761**	**0.886**
		Left side	0.069	0.025	0.005	0.132	**0.094**	**0.074**	**0.201**
		Right side	0.111				**0.111**	**0.111**	**0.111**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	1.272				**1.272**	**1.272**	**1.272**
WCDMA	WCDMA II_LAT	Front	0.574	0.075	0.010	0.132	**0.649**	**0.584**	**0.706**
		Back	0.893	0.107	0.007	0.132	**1.000**	**0.900**	**1.025**
		Left side	0.052	0.025	0.005	0.132	**0.077**	**0.057**	**0.184**
		Right side	0.082				**0.082**	**0.082**	**0.082**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	1.366				**1.366**	**1.366**	**1.366**
	WCDMA IV_LAT	Front	0.817	0.075	0.010	0.132	**0.892**	**0.827**	**0.949**
		Back	1.000	0.107	0.007	0.132	**1.107**	**1.007**	**1.132**
		Left side	0.055	0.025	0.005	0.132	**0.080**	**0.060**	**0.187**
		Right side	0.204				**0.204**	**0.204**	**0.204**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	1.340				**1.340**	**1.340**	**1.340**
	WCDMA V_UAT	Front	0.021	0.075	0.010	0.132	**0.096**	**0.031**	**0.153**
		Back	0.024	0.107	0.007	0.132	**0.131**	**0.031**	**0.156**
		Left side	0.019	0.025	0.005	0.132	**0.044**	**0.024**	**0.151**
		Right side	0.008				**0.008**	**0.008**	**0.008**
		Top side	0.016	0.118	0.012	0.132	**0.134**	**0.028**	**0.148**
		Bottom side					**0.000**	**0.000**	**0.000**
	WCDMA V_LAT	Front	0.476	0.075	0.010	0.132	**0.551**	**0.486**	**0.608**
		Back	0.457	0.107	0.007	0.132	**0.564**	**0.464**	**0.589**
		Left side	0.619	0.025	0.005	0.132	**0.644**	**0.624**	**0.751**
		Right side	0.434				**0.434**	**0.434**	**0.434**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	0.241				**0.241**	**0.241**	**0.241**

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 5GHz WLAN 1g SAR (W/kg)	4 Bluetooth Estimated 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
LTE	LTE Band 2_LAT	Front	0.534	0.075	0.010	0.132	**0.609**	**0.544**	**0.666**
		Back	0.856	0.107	0.007	0.132	**0.963**	**0.863**	**0.988**
		Left side	0.052	0.025	0.005	0.132	**0.077**	**0.057**	**0.184**
		Right side	0.085				**0.085**	**0.085**	**0.085**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	1.404				**1.404**	**1.404**	**1.404**
	LTE Band 5_UAT	Front	0.186	0.075	0.010	0.132	**0.261**	**0.196**	**0.318**
		Back	0.157	0.107	0.007	0.132	**0.264**	**0.164**	**0.289**
		Left side	0.010	0.025	0.005	0.132	**0.035**	**0.015**	**0.142**
		Right side	0.003				**0.003**	**0.003**	**0.003**
		Top side	0.015	0.118	0.012	0.132	**0.133**	**0.027**	**0.147**
		Bottom side					**0.000**	**0.000**	**0.000**
	LTE Band 5_LAT	Front	0.322	0.075	0.010	0.132	**0.397**	**0.332**	**0.454**
		Back	0.334	0.107	0.007	0.132	**0.441**	**0.341**	**0.466**
		Left side	0.370	0.025	0.005	0.132	**0.395**	**0.375**	**0.502**
		Right side	0.204				**0.204**	**0.204**	**0.204**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	0.206				**0.206**	**0.206**	**0.206**
	LTE Band 7_LAT	Front	0.678	0.075	0.010	0.132	**0.753**	**0.688**	**0.810**
		Back	1.248	0.107	0.007	0.132	**1.355**	**1.255**	**1.380**
		Left side	0.147	0.025	0.005	0.132	**0.172**	**0.152**	**0.279**
		Right side	0.266				**0.266**	**0.266**	**0.266**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	0.653				**0.653**	**0.653**	**0.653**
	LTE Band 12_UAT	Front	0.085	0.075	0.010	0.132	**0.160**	**0.095**	**0.217**
		Back	0.095	0.107	0.007	0.132	**0.202**	**0.102**	**0.227**
		Left side	0.004	0.025	0.005	0.132	**0.029**	**0.009**	**0.136**
		Right side	0.003				**0.003**	**0.003**	**0.003**
		Top side	0.032	0.118	0.012	0.132	**0.150**	**0.044**	**0.164**
		Bottom side					**0.000**	**0.000**	**0.000**
	LTE Band 12_LAT	Front	0.252	0.075	0.010	0.132	**0.327**	**0.262**	**0.384**
		Back	0.261	0.107	0.007	0.132	**0.368**	**0.268**	**0.393**
		Left side	0.349	0.025	0.005	0.132	**0.374**	**0.354**	**0.481**
		Right side	0.218				**0.218**	**0.218**	**0.218**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	0.109				**0.109**	**0.109**	**0.109**
	LTE Band 13_UAT	Front	0.235	0.075	0.010	0.132	**0.310**	**0.245**	**0.367**
		Back	0.234	0.107	0.007	0.132	**0.341**	**0.241**	**0.366**
		Left side	0.017	0.025	0.005	0.132	**0.042**	**0.022**	**0.149**
		Right side	0.007				**0.007**	**0.007**	**0.007**
		Top side	0.007	0.118	0.012	0.132	**0.125**	**0.019**	**0.139**
		Bottom side					**0.000**	**0.000**	**0.000**

WWAN Band		Exposure Position	1	2	3	4	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
			WWAN	2.4GHz WLAN	5GHz WLAN	Bluetooth			
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	Estimated 1g SAR (W/kg)			
LTE	LTE Band 13_LAT	Front	0.287	0.075	0.010	0.132	**0.362**	**0.297**	**0.419**
		Back	0.283	0.107	0.007	0.132	**0.390**	**0.290**	**0.415**
		Left side	0.539	0.025	0.005	0.132	**0.564**	**0.544**	**0.671**
		Right side	0.227				**0.227**	**0.227**	**0.227**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	0.172				**0.172**	**0.172**	**0.172**
	LTE Band 38_LAT	Front	0.416	0.075	0.010	0.132	**0.491**	**0.426**	**0.548**
		Back	0.429	0.107	0.007	0.132	**0.536**	**0.436**	**0.561**
		Left side	0.064	0.025	0.005	0.132	**0.089**	**0.069**	**0.196**
		Right side	0.145				**0.145**	**0.145**	**0.145**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	0.240				**0.240**	**0.240**	**0.240**
	LTE Band 66_LAT	Front	0.675	0.075	0.010	0.132	**0.750**	**0.685**	**0.807**
		Back	1.100	0.107	0.007	0.132	**1.207**	**1.107**	**1.232**
		Left side	0.048	0.025	0.005	0.132	**0.073**	**0.053**	**0.180**
		Right side	0.132				**0.132**	**0.132**	**0.132**
		Top side		0.118	0.012	0.132	**0.118**	**0.012**	**0.132**
		Bottom side	1.511				**1.511**	**1.511**	**1.511**

15.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	3 5GHz WLAN 1g SAR (W/kg)	4 Bluetooth Estimated 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
GSM	GSM850_UAT	Front	0.018	0.049	0.008	0.088	**0.067**	**0.026**	**0.106**
		Back	0.017	0.066	0.004	0.088	**0.083**	**0.021**	**0.105**
	GSM850_LAT	Front	0.428	0.049	0.008	0.088	**0.477**	**0.436**	**0.516**
		Back	0.439	0.066	0.004	0.088	**0.505**	**0.443**	**0.527**
	GSM1900_LAT	Front	0.341	0.049	0.008	0.088	**0.390**	**0.349**	**0.429**
		Back	0.530	0.066	0.004	0.088	**0.596**	**0.534**	**0.618**
WCDMA	WCDMA II_LAT	Front	0.749	0.049	0.008	0.088	**0.798**	**0.757**	**0.837**
		Back	1.147	0.066	0.004	0.088	**1.213**	**1.151**	**1.235**
	WCDMA IV_LAT	Front	0.600	0.049	0.008	0.088	**0.649**	**0.608**	**0.688**
		Back	0.752	0.066	0.004	0.088	**0.818**	**0.756**	**0.840**
	WCDMA V_UAT	Front	0.015	0.049	0.008	0.088	**0.064**	**0.023**	**0.103**
		Back	0.016	0.066	0.004	0.088	**0.082**	**0.020**	**0.104**
	WCDMA V_LAT	Front	0.053	0.049	0.008	0.088	**0.102**	**0.061**	**0.141**
		Back	0.124	0.066	0.004	0.088	**0.190**	**0.128**	**0.212**
LTE	LTE Band 2_LAT	Front	0.644	0.049	0.008	0.088	**0.693**	**0.652**	**0.732**
		Back	0.911	0.066	0.004	0.088	**0.977**	**0.915**	**0.999**
	LTE Band 5_UAT	Front	0.012	0.049	0.008	0.088	**0.061**	**0.020**	**0.100**
		Back	0.014	0.066	0.004	0.088	**0.080**	**0.018**	**0.102**
	LTE Band 5_LAT	Front	0.366	0.049	0.008	0.088	**0.415**	**0.374**	**0.454**
		Back	0.353	0.066	0.004	0.088	**0.419**	**0.357**	**0.441**
	LTE Band 7_LAT	Front	0.529	0.049	0.008	0.088	**0.578**	**0.537**	**0.617**
		Back	0.551	0.066	0.004	0.088	**0.617**	**0.555**	**0.639**
	LTE Band 12_UAT	Front	0.006	0.049	0.008	0.088	**0.055**	**0.014**	**0.094**
		Back	0.008	0.066	0.004	0.088	**0.074**	**0.012**	**0.096**
	LTE Band 12_LAT	Front	0.277	0.049	0.008	0.088	**0.326**	**0.285**	**0.365**
		Back	0.324	0.066	0.004	0.088	**0.390**	**0.328**	**0.412**
	LTE Band 13_UAT	Front	0.011	0.049	0.008	0.088	**0.060**	**0.019**	**0.099**
		Back	0.013	0.066	0.004	0.088	**0.079**	**0.017**	**0.101**
	LTE Band 13_LAT	Front	0.386	0.049	0.008	0.088	**0.435**	**0.394**	**0.474**
		Back	0.423	0.066	0.004	0.088	**0.489**	**0.427**	**0.511**
	LTE Band 38_LAT	Front	0.219	0.049	0.008	0.088	**0.268**	**0.227**	**0.307**
		Back	0.218	0.066	0.004	0.088	**0.284**	**0.222**	**0.306**
	LTE Band 66_LAT	Front	0.673	0.049	0.008	0.088	**0.722**	**0.681**	**0.761**
		Back	0.850	0.066	0.004	0.088	**0.916**	**0.854**	**0.938**

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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)]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(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	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.00	N	1	1	1	6.0	6.0
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	1.00	R	1.732	1	1	0.6	0.6
Linearity	4.70	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	2.90	R	1.732	1	1	1.7	1.7
Max. SAR Eval.	2.00	R	1.732	1	1	1.2	1.2
Test Sample Related							
Device Positioning	3.03	N	1	1	1	3.0	3.0
Device Holder	3.60	N	1	1	1	3.6	3.6
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.10	R	1.732	1	1	3.5	3.5
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.71	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.71	1.7	1.5
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						11.6%	11.6%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						23.2%	23.1%

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

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.55	N	1	1	1	6.6	6.6
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	2.00	R	1.732	1	1	1.2	1.2
Linearity	4.70	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	6.70	R	1.732	1	1	3.9	3.9
Max. SAR Eval.	4.00	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Positioning	3.03	N	1	1	1	3.0	3.0
Device Holder	3.60	N	1	1	1	3.6	3.6
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.60	R	1.732	1	1	3.8	3.8
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.71	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.71	1.7	1.5
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						12.7%	12.6%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						25.4%	25.3%

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

[4] SPEAG DASY System Handbook

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

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

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

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

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

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

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

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