

FCC SAR Measurement and Test Report

For

Guizhou Fortuneship Technology Co., Ltd

No. 4 Plant, High-tech Industrial Park, Xipu Economic Development Zone,

Zunyi, China

FCC ID: 2ALQJ-WILDFIREE

Test Standards:	FCC Part 2.1093 ANSI / IEEE C95.1 ::2005+A1:2010 ANSI / IEEE C95.3 : 2002(R2008) <u>IEEE 1528 :2013</u>
Product Description:	<u>4G Smart Phone</u>
Tested Model:	<u>Wildfire E</u>
Report No.:	<u>WTX19X09062799W</u>
Sample Received Date:	<u>2019-09-09</u>
Tested Date:	<u>2019-09-09 to 2019-10-14</u>
Issued Date:	<u>2019-10-14</u>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM. Test Technology Co., Ltd.

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1. General Information

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Guizhou Fortuneship Technology Co., Ltd
Address of applicant: No. 4 Plant, High-tech Industrial Park, Xipu Economic Development Zone, Zunyi, China

Manufacturer: Guizhou Fortuneship Technology Co., Ltd
Address of manufacturer: No. 4 Plant, High-tech Industrial Park, Xipu Economic Development Zone, Zunyi, China

General Description of EUT:	
Product Name:	4G Smart Phone
Brand Name:	HTC
Model No.:	Wildfire E
Adding Model(s):	/
Rated Voltage:	3.85V
Battery:	/
Software Version:	/
Hardware Version:	/
Device Category:	/
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT:	
2G	
Support Networks:	GSM, GPRS, EDGE
Support Band:	GSM850/PCS1900
Uplink Frequency:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz
Downlink Frequency:	GSM/GPRS/EDGE 850: 869~894MHz GSM/GPRS/EDGE 1900: 1930~1990MHz
Max RF Output Power:	GSM850: 32.93dBm, GSM1900: 30.12dBm EDGE850: 24.13dBm, EDGE1900: 25.38dBm
Type of Modulation:	GMSK, 8PSK
Type of Antenna:	Integral Antenna
Antenna Gain:	GSM850: 0.6dBi; GSM1900: 1.1dBi
GPRS/EDGE Class:	Class 12
3G	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Band:	WCDMA Band 2, WCDMA Band 5, WCDMA Band 4
Uplink Frequency:	WCDMA Band 2: 1850~1910MHz WCDMA Band 5: 824~849MHz WCDMA Band 4: 1710~1755MHz
Downlink Frequency:	WCDMA Band 2: 1930~1990MHz WCDMA Band 5: 869~894MHz WCDMA Band 4: 2110~2155MHz
RF Output Power:	WCDMA Band 2: 22.18dBm, WCDMA Band 4: 22.42dBm WCDMA Band 5: 22.27dBm
Type of Modulation:	BPSK
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 2: 1.1dBi, WCDMA Band 4: 1.2dBi, WCDMA Band 5: 0.6dBi
4G	
Support Networks:	FDD-LTE
Support Band:	FDD-LTE Band 2, 4, 5, 7, 17
Uplink Frequency:	FDD-LTE Band 2: Tx: 1850-1910MHz, FDD-LTE Band 4: Tx: 1710-1755MHz, FDD-LTE Band 5: Tx: 824-849MHz, FDD-LTE Band 7: Tx: 2500-2570MHz, FDD-LTE Band 17: Tx: 704-716MHz
Downlink Frequency:	FDD-LTE Band 2: Rx: 1930-1990MHz, FDD-LTE Band 4: Rx: 2110-2155MHz, FDD-LTE Band 5: Rx: 869-894MHz,

	FDD-LTE Band 7: Rx: 2620-2690MHz, FDD-LTE Band 17: Rx: 734-746MHz
RF Output Power:	FDD-LTE Band 2: 23.16dBm, FDD-LTE Band 4: 22.99dBm, FDD-LTE Band 5: 23.35dBm, FDD-LTE Band 7: 22.99dBm, FDD-LTE Band 17: 22.70dBm
Type of Modulation:	QPSK, 16QAM
Antenna Type:	Integral Antenna
Antenna Gain:	FDD-LTE Band 2: 1.1dBi, FDD-LTE Band 4: 1.2dBi, FDD-LTE Band 5: 0.6dBi, FDD-LTE Band 7: 1.2Bi, FDD-LTE Band 17: 0.5dBi,
WIFI	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 11b/g/n(HT20)
RF Output Power:	17.84dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	11 for 802.11b/g/n-HT20
Channel Separation:	5MHz
Antenna Type:	Integral Antenna
Antenna Gain:	1.4dBi
Bluetooth	
Bluetooth Version:	V4.2
Frequency Range:	2402-2480MHz
RF Output Power:	7.054dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps
Modulation:	GFSK, Pi/4 QDPSK, 8DPSK
Quantity of Channels:	79/40
Channel Separation:	1MHz/2MHz
Antenna Type:	Integral Antenna
Antenna Gain:	1.4dBi

1.2 Test Standards

The following report is prepared on behalf of the Guizhou Fortuneship Technology Co., Ltd in accordance with FCC 47 CFR Part 2.1093, ANSI/IEEE C95.1-2005, ANSI / IEEE C95.3 :2002, IEEE 1528-2013, KDB 447498 D01 v06, KDB 648474 D04 v01r03, KDB 248227 D01 v02r02, KDB 941225 D01 v03r01, KDB 941225 D05 v02r05 ,KDB 941225 D06 v02r01, and KDB 865664 D01 v01r04 and KDB 865664 D02 v01r02.

The objective is to determine compliance with FCC Part 2.1093 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with KDB 865664 D01 v01r04 and KDB 865664 D02 v01r02. The public notice KDB 447498 D01 v06 for Mobile and Portable Devices RF Exposure Procedure also.

1.4 Test Facility

Address of the test laboratory

Laboratory: Shenzhen SEM Test Technology Co., Ltd.

Address: 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C. (518101)

FCC – Registration No.: 125990

Shenzhen SEM Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

2. Summary of Test Results

The maximum results of Specific Absorption Rate (SAR) have found during testing are as follows:

Frequency Band	Head SAR	Body-worn (10mm Gap)	Hotspot (10mm Gap)	SAR _{lg} Limit (W/kg)
	Maximum SAR _{lg} (W/kg)	Maximum SAR _{lg} (W/kg)	Maximum SAR _{lg} (W/kg)	
GSM	0.652	0.331	0.398	1.6
WCDMA	0.381	0.527	0.527	1.6
FDD-LTE	0.444	0.524	0.524	1.6
WLAN 2.4G	0.807	0.374	0.383	1.6
Simultaneous Transmission	1.429	0.898	0.898	1.6

Remark:

*The highest reported SAR values for head, body-worn accessory, wireless router(hotspot) and simultaneous transmission conditions are **0.807W/kg**, **0.527W/kg**, **0.527W/kg**, **1.427W/kg** respectively.*

The 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 2.1093 and ANSI/IEEE C95.1-2005, and had been tested in accordance with the measurement methods and procedure specified in IEEE 1528-2013 and KDB 865664 D01 v01r04 and KDB 865664 D02 v01r02

3. Specific Absorption Rate (SAR)

3.1 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.

3.2 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:

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

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

SAR measurement can be either related to the temperature elevation in tissue by

$$\text{SAR} = C \left(\frac{\delta T}{\delta t} \right)$$

Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

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

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

4. SAR Measurement System

4.1 The Measurement System

Comosar is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The Comosar system consists of the following items:

- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

The following figure shows the system.



The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The OpenSAR software computes the results to give a SAR value in a 1g or 10g mass.

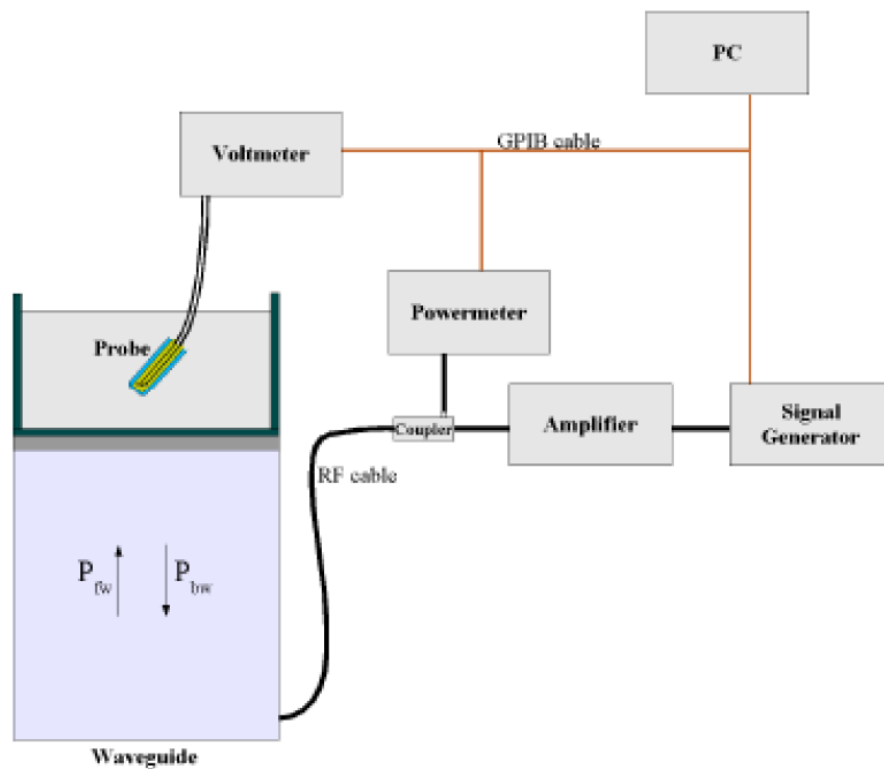
4.2 Probe

For the measurements the Specific Dosimetric E-Field Probe SSE5 SN 09/13 EP168 with following specifications is used

- Dynamic range: 0.01-100 W/kg
- Probe Length: 330 mm
- Length of Individual Dipoles: 4.5 mm
- Maximum external diameter: 8 mm
- Probe Tip External Diameter : 5 mm
- Distance between dipoles / probe extremity: 2.7mm

- Probe linearity: <0.25 dB
 - Axial Isotropy: <0.25 dB
 - Spherical Isotropy: <0.50 dB
 - Calibration range: 700 to 3000MHz for head & body simulating liquid.
- Angle between probe axis (evaluation axis) and surface normal line: less than 30°

Probe calibration is realized, in compliance with EN 62209-1 and IEEE 1528 STD, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the EN 62209-1 annex technique using reference guide at the five frequencies.



$$SAR = \frac{4(P_{fw} - P_{bw})}{ab\delta} \cos^2\left(\pi \frac{y}{a}\right) e^{-(2z/\delta)}$$

Where :

P_{fw} = Forward Power

P_{bw} = Backward Power

a and b = Waveguide dimensions

l = Skin depth

Keithley configuration:

Rate = Medium; Filter = ON; RDGS = 10; Filter type = Moving Average; Range auto after each calibration, a SAR measurement is performed on a validation dipole and compared with a NPL calibrated probe, to verify it.

The calibration factors, CF(N), for the 3 sensors corresponding to dipole 1, dipole 2 and dipole 3 are:

$$CF(N)=SAR(N)/V_{lin}(N) \quad (N=1,2,3)$$

The linearised output voltage $V_{lin}(N)$ is obtained from the displayed output voltage $V(N)$ using

$$V_{lin}(N)=V(N)*(1+V(N)/DCP(N)) \quad (N=1,2,3)$$

where DCP is the diode compression point in mV.

4.3 Probe Calibration Process

Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. SATIMO Probe calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm²) using an with CALISAR, Antenna proprietary calibration system.

Free Space Assessment Procedure

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1mW/cm².

Temperature Assessment Procedure

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated head tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

Where:

$$SAR = C \frac{\Delta T}{\Delta t}$$

Δt = exposure time (30 seconds),

C = heat capacity of tissue (brain or muscle),

ΔT = temperature increase due to RF exposure.

SAR is proportional to $\Delta T / \Delta t$, the initial rate of tissue heating, before thermal diffusion takes place. The electric field in the simulated tissue can be used to estimate SAR by equating the thermally derived SAR to that with the E- field component.

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

Where:

σ = simulated tissue conductivity,

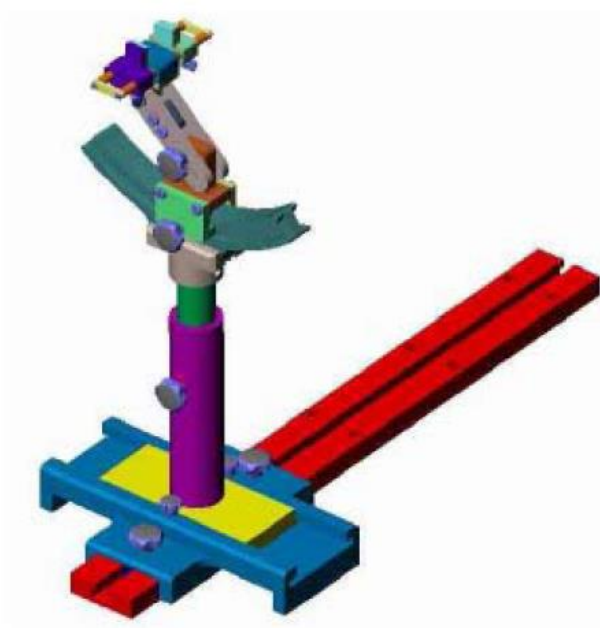
ρ = Tissue density (1.25 g/cm³ for brain tissue)

4.4 Phantom

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.

4.5 Device Holder

The positioning system allows obtaining cheek and tilting position with a very good accuracy. In compliance with CENELEC, the tilt angle uncertainty is lower than 1 °.



System Material	Permittivity	Loss Tangent
Delrin	3.7	0.005

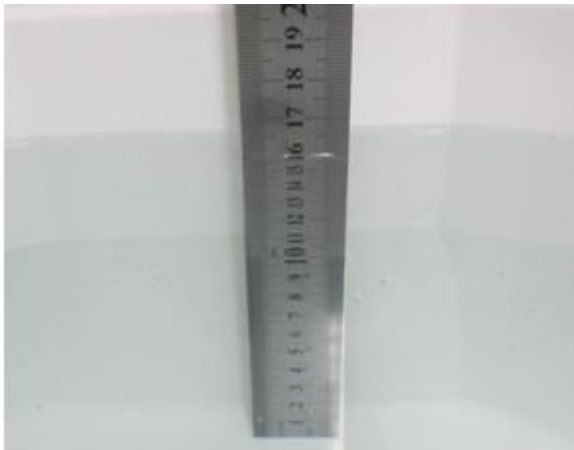
4.6 Test Equipment List

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
E-Field Probe	SATIMO	SSE5	SN 09/13 EP168	2019-05-22	2020-05-21
750MHz Dipole	MVG	SID750	SN 47/12 DIP 0G750-203	2019-03-16	2020-03-15
835MHz Dipole	SATIMO	SID835	SN 47/12 DIP 0G835-204	2019-03-16	2020-03-15
1800MHz Dipole	SATIMO	SID1800	SN 47/12 DIP 1G800-206	2019-03-16	2020-03-15
1900MHz Dipole	SATIMO	SID1900	SN 47/12 DIP 1G900-207	2019-03-16	2020-03-15
2450MHz Dipole	SATIMO	SID2450	SN 13/15 DIP 2G450-364	2019-03-16	2020-03-15
2600MHz Dipole	SATIMO	SID2600	SN 13/15 DIP 2G600-365	2019-03-16	2020-03-15
Dielectric Probe Kit	SATIMO	SCLMP	SN 47/12 OCPG49	2019-03-16	2020-03-15
SAM Phantom	SATIMO	SAM	SN/ 47/12 SAM95	N/A	N/A
MULTIMETER	KEITHLEY	Keithley 2000	4006367	2019-04-30	2020-04-29
Signal Generator	Rohde & Schwarz	SMR20	100047	2019-04-30	2020-04-29
Universal Tester	Rohde & Schwarz	CMU200	112012	2019-04-30	2020-04-29
Communications Tester	Rohde & Schwarz	CMW500	148650	2019-04-30	2020-04-29
Network Analyzer	HP	8753C	2901A00831	2019-04-30	2020-04-29
Directional Couplers	Agilent	778D	20160	2019-04-30	2020-04-29

5. Tissue Simulating Liquids

5.1 Composition of Tissue Simulating Liquid

For the measurement of the field distribution inside the SAM phantom with SMTIMO, 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. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. Please see the following photos for the liquid height.



Liquid Height for Head SAR



Liquid Height for Body SAR

The Composition of Tissue Simulating Liquid

Frequency (MHz)	Water (%)	Salt (%)	Sugar (%)	HEC (%)	Preventol (%)	DGBE (%)
Head						
750	41.1	1.4	57.0	0.2	0.3	0
835	40.3	1.4	57.9	0.2	0.2	0
1800-1900	55.2	0.3	0	0	0	44.5
2450	55.0	0.1	0	0	0	44.9
2600	54.9	0.1	0	0	0	45.0
Body						
750	50.0	0.8	48.8	0.2	0.2	0
835	50.8	0.9	48.1	0.1	0.1	0
1800-1900	70.2	0.4	0	0	0	29.4
2450	68.6	0.1	0	0	0	31.3
2600	68.2	0.1	0	0	0	31.7

5.2 Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Target Frequency (MHz)	Head		Body	
	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity (σ)	Permittivity (ϵ_r)
150	0.76	52.3	0.80	61.9
300	0.87	45.3	0.92	58.2
450	0.87	43.5	0.94	56.7
750	0.89	41.9	0.96	55.5
835	0.90	41.5	0.97	55.2
900	0.97	41.5	1.05	55.0
915	0.98	41.5	1.06	55.0
1450	1.20	40.5	1.30	54.0
1610	1.29	40.3	1.40	53.8
1750	1.37	40.1	1.49	53.4
1800-2000	1.40	40.0	1.52	53.3
2450	1.80	39.2	1.95	52.7
3000	2.40	38.5	2.73	52.0
5800	5.27	35.3	6.00	48.2

5.3 Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using COMOSAR Dielectric Probe Kit and an Agilent Network Analyzer.

Calibration Result for Dielectric Parameters of Tissue Simulating Liquid

Head Tissue Simulating Liquid									
Freq. MHz.	Temp. (°C)	Conductivity			Permittivity			Limit (%)	Date
		Reading (σ)	Target (σ)	Delta (%)	Reading (ϵ_r)	Target (ϵ_r)	Delta (%)		
750	21.2	0.86	0.89	-3.37	41.32	41.90	-1.38	±5	2019-09-23
835	21.2	0.87	0.90	-3.33	41.11	41.50	-0.94	±5	2019-09-23
1750	21.3	1.37	1.37	0.00	39.02	40.1	-2.69	±5	2019-09-24
1800	21.3	1.37	1.40	-2.14	39.02	40.0	-2.45	±5	2019-09-24
1900	21.3	1.38	1.40	-1.43	38.56	40.00	-3.60	±5	2019-09-24
2450	21.3	1.74	1.80	-3.33	38.15	39.20	-2.68	±5	2019-09-25
2600	21.3	1.93	1.96	-1.53	38.63	39.0	-0.95	±5	2019-09-25

Body Tissue Simulating Liquid									
Freq. MHz.	Temp. (°C)	Conductivity			Permittivity			Limit (%)	Date
		Reading (σ)	Target (σ)	Delta (%)	Reading (ϵ_r)	Target (ϵ_r)	Delta (%)		
750	21.2	0.93	0.96	-3.12	54.96	55.50	-0.97	±5	2019-09-23
835	21.2	0.95	0.97	-2.06	54.85	55.20	-0.63	±5	2019-09-23
1750	21.3	1.46	1.49	-2.01	51.22	53.40	-4.08	±5	2019-09-24
1800	21.3	1.46	1.52	-3.95	51.22	53.30	-3.90	±5	2019-09-24
1900	21.3	1.50	1.52	-1.32	52.42	53.30	-1.65	±5	2019-09-24
2450	21.3	1.91	1.95	-2.05	52.01	52.70	-1.31	±5	2019-09-25
2600	21.3	2.12	2.16	-1.85	52.24	52.50	-0.50	±5	2019-09-25

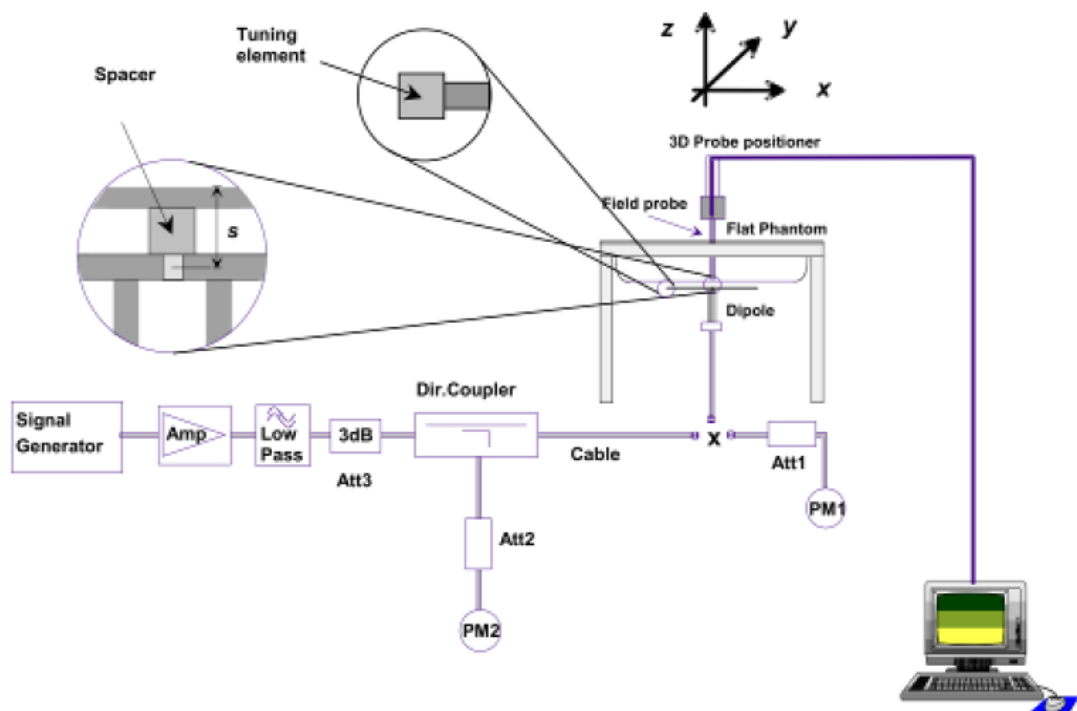
6. SAR Measurement Evaluation

6.1 Purpose of System Performance Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

6.2 System Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator at frequency 835 MHz and 1900MHz. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom.



System Verification Setup Block Diagram



Setup Photo of Dipole Antenna

The output power on dipole port must be calibrated to 24 dBm(250 mW) before dipole is connected.

6.3 Validation Results

Comparing to the original SAR value provided by SATIMO, the validation data should be within its specification of 10 %. Table 6.1 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.

Frequency	Targeted SAR _{1g}	Measured SAR _{1g}	Normalized SAR _{1g}	Tolerance
MHz	(W/kg)	(W/kg)	(W/kg)	(%)
Head				
750	8.40	2.16	8.64	2.86
835	9.67	2.41	9.64	-0.31
1800	38.51	9.61	38.44	-0.18
1900	39.58	9.91	39.64	0.15
2450	53.69	13.45	53.8	0.20
2600	55.13	13.67	54.68	-0.82
Body				
750	8.40	2.12	8.48	0.95
835	9.38	2.35	9.4	0.21
1800	38.31	9.58	38.32	0.03
1900	39.10	9.78	39.12	0.05
2450	50.41	12.59	50.36	-0.10
2600	53.89	13.43	53.72	-0.32

Remark: Referring to IEEE 1528-2013, Section 8.2, The system check shall be performed at a test frequency that

is within $\pm 10\%$ or ± 100 MHz of the compliance test mid-band frequency, so the 1750 MHz system verification is made of 1800MHz Dipole.

Targeted and Measurement SAR

Please refer to Annex A for the plots of system performance check.

7. EUT Testing Position

7.1 Define Two Imaginary Lines on The Handset

- (a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.
- (b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- (c) 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, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

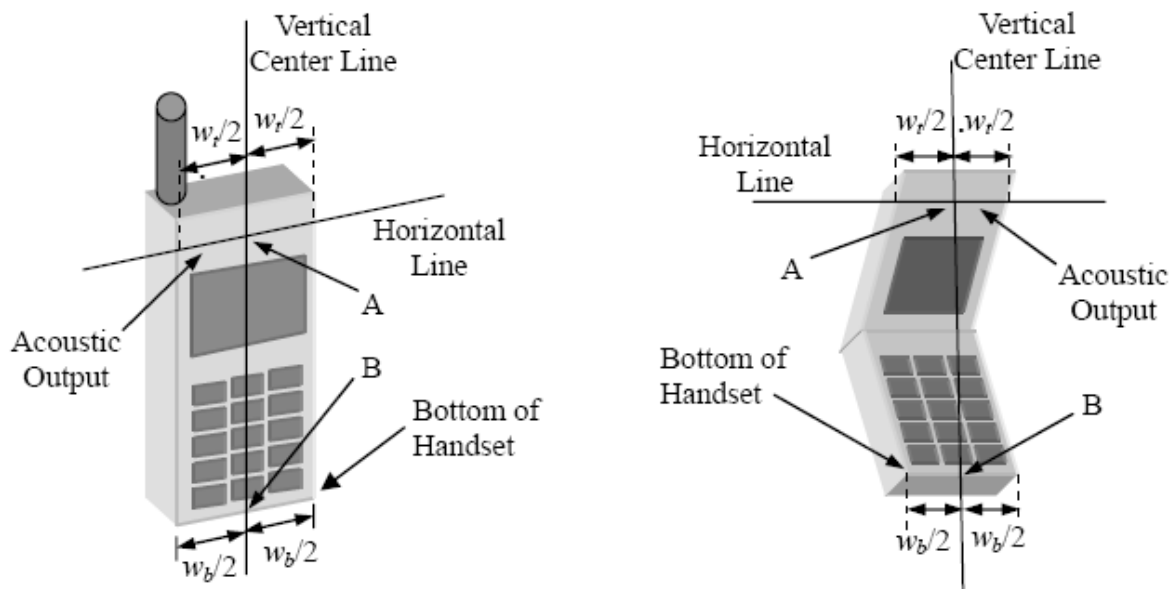


Illustration for Handset Vertical and Horizontal Reference Lines

7.2 Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig. 7.2).

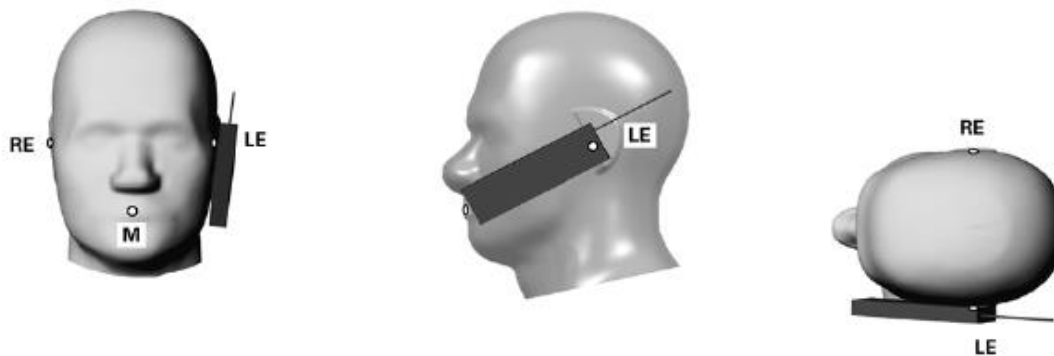


Illustration for Cheek Position

7.3 Tilted Position

(a) To position the device in the “cheek” position described above.

(b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig. 7.3).

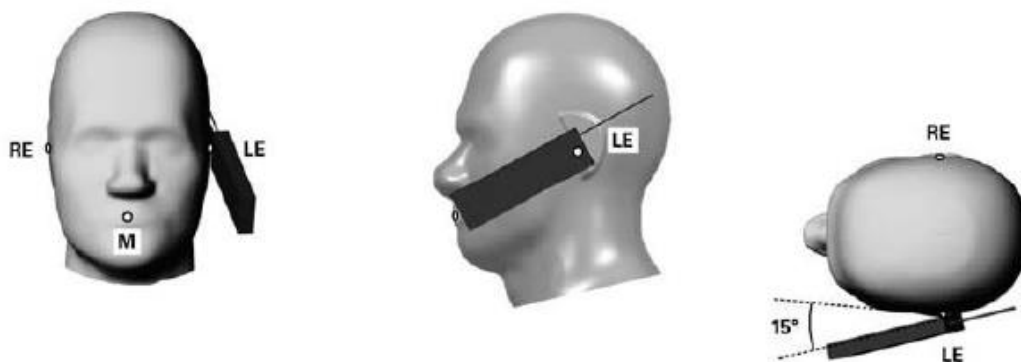


Illustration for Tilted Position

7.4 Body Worn Position

- To position the device parallel to the phantom surface with either keypad up or down.
- To adjust the device parallel to the flat phantom.
- To adjust the distance between the device surface and the flat phantom to 10mm.

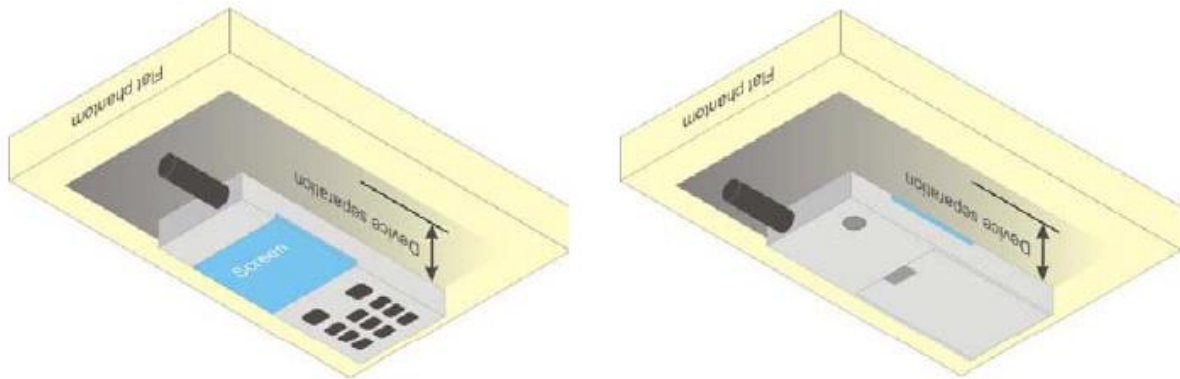


Illustration for Body Worn Position

7.5 EUT Antenna Position





Block Diagram for EUT Antenna Position

7.6 EUT Testing Position

Head/Body-worn/Hotspot/ Extremity mode SAR assessments are required for this device. This EUT was tested in different positions for different SAR test modes, more information as below:

Head SAR tests				
Antennas	Right Cheek	Left Cheek	Right Tilted	Left Tilted
WWAN	Yes	Yes	Yes	Yes
WLAN	Yes	Yes	Yes	Yes

Hotspot SAR tests, Test distance: 10mm						
Antennas	Front	Back	Right Side	Left Side	Top Side	Bottom Side
WWAN	Yes	Yes	Yes	Yes	No	Yes
WLAN	Yes	Yes	Yes	No	Yes	No

Body-worn SAR tests		
Antennas	Front	Back
WWAN	Yes	Yes
WLAN	Yes	Yes

Remark:

1. Referring to KDB 941225 D06, when the overall device length and width are $\geq 9\text{cm} \times 5\text{cm}$, the test separation distances is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.

Please refer to Annex D for the EUT test setup photos.

8. SAR Measurement Procedures

8.1 Measurement Procedures

The measurement procedures are as follows:

- (a) Use base station simulator (if applicable) or engineering software to transmit RF power continuously (continuous Tx) in the highest power channel.
- (b) Keep EUT to radiate maximum output power or 100% factor (if applicable)
- (c) Measure output power through RF cable and power meter.
- (d) Place the EUT in the positions as Annex D demonstrates.
- (e) Set scan area, grid size and other setting on the SATIMO software.
- (f) Measure SAR results for the highest power channel on each testing position.
- (g) Find out the largest SAR result on these testing positions of each band
- (h) Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg

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

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

8.2 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 SATIMO 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. 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
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values from the measurement grid to the high-resolution grid
- (e) Extrapolation of the entire 3D field distribution to the phantom surface over the distance from sensor to surface
- (f) Calculation of the averaged SAR within masses of 1g and 10g

8.3 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures 5x5x7 points with step size 8, 8 and 5 mm for 300 MHz to 3 GHz, and 8x8x8 points with step size 4, 4 and 2.5 mm for 3 GHz to 6 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

8.4 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 (step-size is 4, 4 and 2.5 mm). When all volume scan were completed, the software can combine and subsequently superpose these measurement data to calculating the multiband SAR.

8.5 SAR Averaged Methods

The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimize measurements errors, but the highest local SAR will occur at the surface of the phantom.

An extrapolation is using to determinate this highest local SAR values. The extrapolation is based on a fourth-order least-square polynomial fit of measured data. The local SAR value is then extrapolated from the liquid surface with a 1mm step.

The measurements have to be performed over a limited time (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8 mm. To obtain an accurate assessment of the maximum SAR averaged over 10g and 1 g requires a very fine resolution in the three dimensional scanned data array.

8.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In SATIMO 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 drift more than 5%, the SAR will be retested.

9. SAR Test Result

9.1 Conducted RF Output Power

GSM - Burst Average Power (dBm)								
Band	GSM850			Tune-up power (dBm)	PCS1900			Tune-up power (dBm)
Channel	128	190	251		512	661	810	
Frequency (MHz)	824.2	836.6	848.8		1850.2	1880	1909.8	
GSM	32.91	32.91	32.92	33.0	30.12	30.11	29.97	30.5
GPRS (1 slot)	32.93	32.9	32.9	33.0	30.12	30.09	29.96	30.5
GPRS (2 slots)	30.76	30.81	30.68	31.0	27.7	27.85	27.84	28.0
GPRS (3 slots)	28.73	28.89	28.9	29.0	26.28	26.31	26.15	26.5
GPRS (4 slots)	26.65	26.85	26.93	27.0	24.18	24.28	24.26	24.5
EDGE (1 slot)	23.59	24.13	24.13	24.5	25.22	25.21	25.38	25.5
EDGE (2 slots)	22.94	22.85	22.31	23.0	24.27	24.28	24.11	25.5
EDGE (3 slots)	20.03	20.6	20.67	21.0	22.53	22.51	22.57	23.0
EDGE (4 slots)	19.18	19.47	19.53	22.0	20.31	20.25	20.23	20.5

GSM - Source-Based Time-Average Power (dBm)								
Band	GSM850			Tune-up power (dBm)	PCS1900			Tune-up power (dBm)
Channel	128	190	251		512	661	810	
Frequency (MHz)	824.2	836.6	848.8		1850.2	1880	1909.8	
GSM	23.91	23.91	23.92	24.0	21.12	21.11	20.97	21.5
GPRS (1 slot)	23.93	23.90	23.90	24.0	21.12	21.09	20.96	21.5
GPRS (2 slots)	24.76	24.81	24.68	25.0	21.70	21.85	21.84	22.0
GPRS (3 slots)	24.48	24.64	24.65	25.0	22.03	22.06	21.90	22.5
GPRS (4 slots)	23.65	23.85	23.93	24.0	21.18	21.28	21.26	21.5
EDGE (1 slot)	14.59	15.13	15.13	15.5	16.22	16.21	16.38	16.5
EDGE (2 slots)	16.94	16.85	16.31	17.0	18.27	18.28	18.11	18.5
EDGE (3 slots)	15.78	16.35	16.42	16.5	18.28	18.26	18.32	18.5
EDGE (4 slots)	16.18	16.47	16.53	17.0	17.31	17.25	17.23	17.5

Note: The source-based time-averaged power is linearly scaled the maximum burst averaged power based on time slots. The calculated method are shown as below:

Source based time-average power = Burst averaged power - Duty cycle factor in dB

Duty cycle factor = 9 dB for 1 Tx slot, 6 dB for 2 Tx slots, 4.25 dB for 3 Tx slots, 3 dB for 4 Tx slots

Remark:

1. For Head SAR testing, GSM and GPRS (2TX slots for GSM850, 3TX slots for GSM1900) should be evaluated, therefore the EUT was set in GSM and GPRS (2TX slots) for GSM850, GSM and GPRS (3TX slots) for GSM1900 due to its highest source-based time-average power.
2. For Body SAR testing, GPRS should be evaluated, therefore the EUT was set in GPRS (2TX slots) for GSM850 and

GPRS (3TX slots) for GSM1900 due to its highest source-based time-average power.

3. Per KDB 447498 D01 v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.

4. The DUT do not support DTM function.

5. This device supports VOIP capability through 3rd party apps software.

WCDMA - Average Power (dBm)								
Band	WCDMA Band II				WCDMA Band V			
Channel	9262	9400	9538	Tune-up power (dBm)	4132	4182	4233	Tune-up power (dBm)
Frequency (MHz)	1852.4	1880.0	1907.6		826.4	836.6	846.6	
RMC 12.2k	22.10	22.18	22.07	22.5	22.25	22.18	22.27	22.5
HSDPA Subtest-1	22.09	22.03	22.01	22.5	22.16	22.17	22.15	22.5
HSDPA Subtest-2	22.07	22.00	21.96	22.5	21.15	22.15	22.13	22.5
HSDPA Subtest-3	22.05	22.01	21.97	22.5	21.14	22.13	22.13	22.5
HSDPA Subtest-4	22.04	22.01	21.98	22.5	21.14	22.14	22.14	22.5
HSUPA Subtest-1	21.85	21.77	21.80	22.0	22.11	22.15	22.18	22.5
HSUPA Subtest-2	21.82	21.73	21.76	22.0	22.08	22.13	22.16	22.5
HSUPA Subtest-3	21.82	21.75	21.76	22.0	22.08	22.12	22.15	22.5
HSUPA Subtest-4	21.84	21.75	21.77	22.0	22.09	22.12	22.15	22.5
HSUPA Subtest-5	21.83	21.75	21.77	22.0	22.07	22.12	22.15	22.5

WCDMA - Average Power (dBm)								
Band	WCDMA Band IV							
Channel	1312	1412	1513	Tune-up power (dBm)				
Frequency (MHz)	1712.4	1732.4	1752.6					
RMC 12.2k	21.45	21.99	22.42	22.5				
HSDPA Subtest-1	21.42	21.11	22.05	22.5				
HSDPA Subtest-2	21.41	21.08	22.03	22.5				
HSDPA Subtest-3	21.4	21.08	22.03	22.5				
HSDPA Subtest-4	21.4	21.09	22.03	22.5				
HSUPA Subtest-1	21.25	21.13	22.22	22.5				
HSUPA Subtest-2	21.21	21.11	22.19	22.5				
HSUPA Subtest-3	21.22	21.12	22.2	22.5				
HSUPA Subtest-4	21.22	21.12	22.21	22.5				
HSUPA Subtest-5	21.21	21.12	22.19	22.5				

Remark:

1. Per KDB 941225 D01 v03, The 12.2kbps RMC mode was selected for SAR testing(the primary mode).
2. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq 1/4$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR

measurement is not required for the secondary mode

FDD-LTE Band 2:

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.91	0
		1	3	22.91	0
		1	5	22.90	0
		3	0	22.27	0
		3	2	22.22	0
		3	3	22.27	0
		6	0	21.87	1
	MCH	1	0	21.74	0
		1	3	21.71	0
		1	5	21.77	0
		3	0	21.69	0
		3	2	21.68	0
		3	3	21.78	0
		6	0	20.64	1
	HCH	1	0	22.92	0
		1	3	22.90	0
		1	5	22.84	0
		3	0	22.23	0
		3	2	22.22	0
		3	3	22.22	0
		6	0	21.92	1
16QAM	LCH	1	0	22.41	1
		1	3	22.45	1
		1	5	22.46	1
		3	0	21.81	1
		3	2	21.85	1
		3	3	21.83	1
		6	0	20.98	2
	MCH	1	0	21.00	1
		1	3	20.99	1
		1	5	21.01	1
		3	0	20.78	1
		3	2	20.60	1
		3	3	20.64	1
		6	0	20.54	2
	HCH	1	0	22.23	1
		1	3	22.16	1

		1	5	22.21	1
		3	0	21.88	1
		3	2	21.89	1
		3	3	21.92	1
		6	0	21.19	2

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.84	0
		1	7	22.82	0
		1	14	22.75	0
		8	0	21.89	1
		8	4	21.98	1
		8	7	21.85	1
		15	0	21.83	1
	MCH	1	0	21.54	0
		1	7	21.60	0
		1	14	21.59	0
		8	0	20.71	1
		8	4	20.63	1
		8	7	20.70	1
		15	0	20.59	1
	HCH	1	0	22.85	0
		1	7	22.91	0
		1	14	22.90	0
		8	0	21.95	1
		8	4	21.86	1
		8	7	21.97	1
		15	0	21.97	1
16QAM	LCH	1	0	22.38	1
		1	7	22.39	1
		1	14	22.36	1
		8	0	20.98	2
		8	4	20.92	2
		8	7	20.91	2
		15	0	21.06	2
	MCH	1	0	20.75	1
		1	7	20.79	1
		1	14	20.87	1
		8	0	20.68	2
		8	4	20.72	2
		8	7	20.62	2

		15	0	20.83	2
	HCH	1	0	22.39	1
		1	7	22.32	1
		1	14	22.33	1
		8	0	21.15	2
		8	4	21.29	2
		8	7	21.27	2
		15	0	21.17	2

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.88	0
		1	12	22.85	0
		1	24	22.72	0
		12	0	21.87	1
		12	6	21.78	1
		12	13	21.89	1
		25	0	21.87	1
	MCH	1	0	21.65	0
		1	12	21.62	0
		1	24	21.57	0
		12	0	20.55	1
		12	6	20.65	1
		12	13	20.61	1
		25	0	20.63	1
	HCH	1	0	22.73	0
		1	12	22.75	0
		1	24	22.75	0
		12	0	21.91	1
		12	6	21.88	1
		12	13	21.86	1
		25	0	21.86	1
16QAM	LCH	1	0	22.05	1
		1	12	21.87	1
		1	24	21.89	1
		12	0	21.00	2
		12	6	20.89	2
		12	13	20.86	2
		25	0	21.01	2
	MCH	1	0	21.25	1
		1	12	21.27	1
		1	24	21.37	1

		12	0	20.87	2
		12	6	20.86	2
		12	13	20.83	2
		25	0	20.98	2
	HCH	1	0	22.47	1
		1	12	22.43	1
		1	24	22.44	1
		12	0	21.04	2
		12	6	21.00	2
		12	13	21.03	2
		25	0	21.17	2

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.81	0
		1	24	22.72	0
		1	49	22.47	0
		25	0	21.85	1
		25	12	21.72	1
		25	25	21.69	1
		50	0	21.64	1
	MCH	1	0	21.57	0
		1	24	21.54	0
		1	49	21.76	0
		25	0	20.68	1
		25	12	20.56	1
		25	25	20.64	1
		50	0	20.51	1
	HCH	1	0	22.68	0
		1	24	22.79	0
		1	49	22.86	0
		25	0	21.81	1
		25	12	21.88	1
		25	25	21.82	1
		50	0	21.80	1
16QAM	LCH	1	0	22.42	1
		1	24	22.44	1
		1	49	22.42	1
		25	0	20.90	2
		25	12	20.81	2
		25	25	20.63	2
		50	0	20.83	2

	MCH	1	0	21.20	1
		1	24	21.28	1
		1	49	21.33	1
		25	0	20.76	2
		25	12	20.72	2
		25	25	20.71	2
		50	0	20.70	2
	HCH	1	0	21.82	1
		1	24	22.09	1
		1	49	22.13	1
		25	0	20.84	2
		25	12	20.94	2
		25	25	20.99	2
		50	0	21.00	2

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.84	0
		1	37	22.54	0
		1	74	22.12	0
		37	0	21.79	1
		37	18	21.61	1
		37	38	21.43	1
		75	0	21.58	1
	MCH	1	0	21.78	0
		1	37	21.67	0
		1	74	21.83	0
		37	0	20.60	1
		37	18	20.58	1
		37	38	20.78	1
		75	0	20.61	1
	HCH	1	0	22.46	0
		1	37	22.81	0
		1	74	22.95	0
		37	0	21.55	1
		37	18	21.88	1
		37	38	21.83	1
		75	0	21.77	1
16QAM	LCH	1	0	22.34	1
		1	37	22.37	1
		1	74	22.24	1
		37	0	20.94	2

		37	18	20.67	2
		37	38	20.43	2
		75	0	20.73	2
	MCH	1	0	21.72	1
		1	37	21.56	1
		1	74	21.80	1
		37	0	20.81	2
		37	18	20.87	2
		37	38	20.86	2
		75	0	20.87	2
	HCH	1	0	21.62	1
		1	37	22.04	1
		1	74	22.12	1
		37	0	20.79	2
		37	18	21.00	2
		37	38	21.02	2
		75	0	20.94	2

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	23.16	0
		1	49	22.55	0
		1	99	22.06	0
		50	0	22.35	1
		50	25	22.34	1
		50	50	22.28	1
		100	0	22.38	1
	MCH	1	0	22.04	0
		1	49	21.83	0
		1	99	22.18	0
		50	0	20.62	1
		50	25	20.62	1
		50	50	20.85	1
		100	0	20.77	1
	HCH	1	0	21.99	0
		1	49	22.47	0
		1	99	22.77	0
		50	0	21.41	1
		50	25	21.73	1
		50	50	21.90	1
		100	0	21.59	1
16QAM	LCH	1	0	21.57	1

		1	49	21.10	1
		1	99	20.63	1
		50	0	20.94	2
		50	25	20.60	2
		50	50	20.79	2
		100	0	20.81	2
	MCH	1	0	20.90	1
		1	49	20.63	1
		1	99	20.67	1
		50	0	20.86	2
		50	25	20.81	2
		50	50	20.89	2
		100	0	20.89	2
	HCH	1	0	21.34	1
		1	49	21.91	1
		1	99	22.16	1
		50	0	20.48	2
		50	25	20.83	2
		50	50	20.89	2
		100	0	20.73	2

FDD-LTE Band 4:

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.13	0
		1	3	22.15	0
		1	5	22.11	0
		3	0	21.28	0
		3	2	21.27	0
		3	3	21.20	0
		6	0	21.69	1
	MCH	1	0	22.36	0
		1	3	22.28	0
		1	5	22.32	0
		3	0	21.37	0
		3	2	21.33	0
		3	3	21.33	0
		6	0	21.78	1
	HCH	1	0	22.40	0
		1	3	22.39	0

		1	5	22.45	0
		3	0	21.54	0
		3	2	21.59	0
		3	3	21.53	0
		6	0	21.96	1
16QAM	LCH	1	0	21.42	1
		1	3	21.42	1
		1	5	21.45	1
		3	0	21.61	1
		3	2	21.59	1
		3	3	21.56	1
		6	0	20.69	2
	MCH	1	0	21.91	1
		1	3	21.96	1
		1	5	21.93	1
		3	0	21.55	1
		3	2	21.52	1
		3	3	21.54	1
		6	0	20.80	2
	HCH	1	0	21.45	1
		1	3	21.46	1
		1	5	21.44	1
		3	0	21.54	1
		3	2	21.59	1
		3	3	21.55	1
		6	0	20.33	2

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.17	0
		1	7	22.18	0
		1	14	22.17	0
		8	0	21.67	1
		8	4	21.76	1
		8	7	21.70	1
		15	0	21.76	1
	MCH	1	0	22.29	0
		1	7	22.28	0
		1	14	22.27	0
		8	0	21.93	1
		8	4	21.76	1
		8	7	21.93	1

	HCH	15	0	21.77	1
		1	0	22.43	0
		1	7	22.38	0
		1	14	22.44	0
		8	0	21.42	1
		8	4	21.46	1
		8	7	21.42	1
		15	0	21.51	1
16QAM	LCH	1	0	21.82	1
		1	7	21.69	1
		1	14	21.72	1
		8	0	20.69	2
		8	4	20.76	2
		8	7	20.80	2
		15	0	20.85	2
	MCH	1	0	21.82	1
		1	7	21.75	1
		1	14	21.69	1
		8	0	20.53	1
		8	4	21.00	2
		8	7	20.41	2
		15	0	20.74	2
	HCH	1	0	21.85	2
		1	7	21.87	1
		1	14	21.91	1
		8	0	20.35	1
		8	4	20.33	1
		8	7	20.34	2
		15	0	20.33	2

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.19	0
		1	12	22.24	0
		1	24	22.22	0
		12	0	21.69	1
		12	6	21.67	1
		12	13	21.72	1
		25	0	21.69	1
	MCH	1	0	22.28	0
		1	12	22.22	0
		1	24	22.25	0

		12	0	21.83	1
		12	6	21.77	1
		12	13	21.82	1
		25	0	21.85	1
	HCH	1	0	22.67	0
		1	12	22.56	0
		1	24	22.58	0
		12	0	21.45	1
		12	6	21.41	1
		12	13	21.44	1
		25	0	21.15	1
16QAM	LCH	1	0	21.56	1
		1	12	21.57	1
		1	24	21.63	1
		12	0	20.83	2
		12	6	20.87	2
		12	13	20.87	2
		25	0	20.41	2
	MCH	1	0	21.52	1
		1	12	21.45	1
		1	24	21.49	1
		12	0	20.45	2
		12	6	20.41	2
		12	13	20.43	2
		25	0	20.47	2
	HCH	1	0	21.80	1
		1	12	21.73	1
		1	24	21.81	1
		12	0	20.53	2
		12	6	20.59	2
		12	13	20.55	2
		25	0	20.37	2

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.10	0
		1	24	22.14	0
		1	49	22.18	0
		25	0	21.65	1
		25	12	21.75	1
		25	25	21.70	1
		50	0	21.74	1
	MCH	1	0	22.35	0
		1	24	22.24	0
		1	49	22.37	0
		25	0	21.90	1
		25	12	21.78	1
		25	25	21.92	1
		50	0	21.81	1
	HCH	1	0	22.45	0
		1	24	22.50	0
		1	49	22.53	0
		25	0	21.55	1
		25	12	21.54	1
		25	25	21.13	1
		50	0	21.98	1
16QAM	LCH	1	0	21.70	1
		1	24	21.69	1
		1	49	21.74	1
		25	0	20.84	2
		25	12	20.47	2
		25	25	20.95	2
		50	0	20.38	2
	MCH	1	0	21.49	1
		1	24	21.50	1
		1	49	21.54	1
		25	0	20.58	2
		25	12	20.53	2
		25	25	20.54	2
		50	0	20.37	2
	HCH	1	0	21.13	1
		1	24	21.28	1
		1	49	21.27	1
		25	0	20.35	2

		25	12	20.36	2
		25	25	20.32	2
		50	0	20.33	2

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.14	0
		1	37	22.15	0
		1	74	22.25	0
		37	0	21.69	1
		37	18	21.81	1
		37	38	21.78	1
		75	0	21.81	1
	MCH	1	0	22.30	0
		1	37	22.31	0
		1	74	22.39	0
		37	0	21.44	1
		37	18	21.44	1
		37	38	21.45	1
		75	0	21.79	1
	HCH	1	0	22.40	0
		1	37	22.41	0
		1	74	22.56	0
		37	0	21.49	1
		37	18	21.49	1
		37	38	21.34	1
		75	0	21.92	1
16QAM	LCH	1	0	21.72	1
		1	37	21.70	1
		1	74	21.72	1
		37	0	20.38	2
		37	18	20.96	2
		37	38	20.88	2
		75	0	20.84	2
	MCH	1	0	21.72	1
		1	37	21.71	1
		1	74	21.79	1
		37	0	20.98	2
		37	18	20.31	2
		37	38	20.33	2
		75	0	20.38	2
	HCH	1	0	21.38	1

		1	37	21.35	1
		1	74	21.33	1
		37	0	20.32	2
		37	18	20.37	2
		37	38	20.38	2
		75	0	20.48	2

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.36	0
		1	49	22.56	0
		1	99	22.54	0
		50	0	21.76	1
		50	25	21.85	1
		50	50	21.85	1
		100	0	21.85	1
	MCH	1	0	22.38	0
		1	49	22.46	0
		1	99	22.55	0
		50	0	21.89	1
		50	25	21.93	1
		50	50	21.94	1
		100	0	21.93	1
	HCH	1	0	22.22	0
		1	49	22.36	0
		1	99	22.99	0
		50	0	21.84	1
		50	25	21.93	1
		50	50	21.98	1
		100	0	21.95	1
16QAM	LCH	1	0	21.88	1
		1	49	21.93	1
		1	99	21.53	1
		50	0	20.55	2
		50	25	20.93	2
		50	50	20.88	2
		100	0	20.95	2
	MCH	1	0	21.83	1
		1	49	21.93	1
		1	99	21.44	1
		50	0	21.00	2
		50	25	20.66	2

		50	50	20.97	2
		100	0	20.54	2
	HCH	1	0	21.46	1
		1	49	21.47	1
		1	99	21.99	1
		50	0	20.44	2
		50	25	20.54	2
		50	50	20.42	2
		100	0	20.36	2

FDD-LTE Band 5:

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.73	0
		1	3	22.70	0
		1	5	22.79	0
		3	0	22.47	0
		3	2	22.45	0
		3	3	22.47	0
		6	0	21.69	1
	MCH	1	0	22.66	0
		1	3	22.69	0
		1	5	22.72	0
		3	0	22.38	0
		3	2	22.34	0
		3	3	22.37	0
		6	0	21.85	1
	HCH	1	0	22.23	0
		1	3	22.07	0
		1	5	22.08	0
		3	0	22.06	0
		3	2	22.06	0
		3	3	22.17	0
		6	0	22.07	1
16QAM	LCH	1	0	22.23	1
		1	3	22.21	1
		1	5	22.24	1
		3	0	21.47	1
		3	2	21.45	1
		3	3	21.44	1
		6	0	20.43	2
	MCH	1	0	22.29	1
		1	3	22.24	1
		1	5	22.16	1
		3	0	22.13	1
		3	2	22.02	1
		3	3	22.12	1
		6	0	20.85	2
	HCH	1	0	22.23	1
		1	3	22.19	1

		1	5	22.20	1
		3	0	21.98	1
		3	2	21.87	1
		3	3	21.93	1
		6	0	21.31	2

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.43	0
		1	7	22.44	0
		1	14	22.55	0
		8	0	21.47	1
		8	4	21.65	1
		8	7	21.48	1
		15	0	21.66	1
	MCH	1	0	22.75	0
		1	7	22.81	0
		1	14	22.84	0
		8	0	21.60	1
		8	4	21.88	1
		8	7	21.91	1
		15	0	21.92	1
	HCH	1	0	23.14	0
		1	7	23.26	0
		1	14	23.13	0
		8	0	22.10	1
		8	4	22.00	1
		8	7	22.04	1
		15	0	22.08	1
16QAM	LCH	1	0	22.42	1
		1	7	22.45	1
		1	14	22.38	1
		8	0	20.55	2
		8	4	20.55	2
		8	7	20.44	2
		15	0	20.56	2
	MCH	1	0	22.41	1
		1	7	22.45	1
		1	14	22.49	1
		8	0	20.95	2
		8	4	20.85	2
		8	7	20.94	2

		15	0	20.88	2
	HCH	1	0	21.58	1
		1	7	21.73	1
		1	14	21.65	1
		8	0	21.33	2
		8	4	21.30	2
		8	7	21.20	2
		15	0	21.19	2

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.60	0
		1	12	22.73	0
		1	24	22.56	0
		12	0	21.67	1
		12	6	21.37	1
		12	13	21.47	1
		25	0	21.46	1
	MCH	1	0	22.68	0
		1	12	22.70	0
		1	24	22.72	0
		12	0	21.64	1
		12	6	21.83	1
		12	13	21.78	1
		25	0	21.92	1
	HCH	1	0	23.05	0
		1	12	23.32	0
		1	24	23.10	0
		12	0	22.06	1
		12	6	22.07	1
		12	13	22.02	1
		25	0	22.11	1
16QAM	LCH	1	0	21.62	1
		1	12	21.32	1
		1	24	21.70	1
		12	0	20.65	2
		12	6	20.54	2
		12	13	20.53	2
		25	0	20.69	2
	MCH	1	0	22.18	1
		1	12	22.47	1
		1	24	22.35	1

		12	0	21.04	2
		12	6	20.88	2
		12	13	20.93	2
		25	0	21.05	2
	HCH	1	0	21.67	1
		1	12	21.57	1
		1	24	21.65	1
		12	0	21.17	2
		12	6	21.14	2
		12	13	21.15	2
		25	0	21.29	2

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.62	0
		1	24	22.63	0
		1	49	22.87	0
		25	0	21.45	1
		25	12	21.96	1
		25	25	21.84	1
		50	0	21.97	1
	MCH	1	0	22.65	0
		1	24	22.84	0
		1	49	23.01	0
		25	0	21.81	1
		25	12	21.87	1
		25	25	21.71	1
		50	0	21.92	1
	HCH	1	0	23.04	0
		1	24	23.14	0
		1	49	23.35	0
		25	0	22.48	1
		25	12	22.43	1
		25	25	22.46	1
		50	0	21.94	1
16QAM	LCH	1	0	21.55	1
		1	24	21.82	1
		1	49	22.48	1
		25	0	20.55	2
		25	12	20.89	2
		25	25	20.71	2
		50	0	21.07	2
	MCH	1	0	22.47	1
		1	24	22.37	1
		1	49	22.31	1
		25	0	21.14	2
		25	12	20.97	2
		25	25	21.23	2
		50	0	21.12	2
	HCH	1	0	22.05	1
		1	24	22.12	1
		1	49	22.33	1
		25	0	21.14	2

		25	12	21.19	2
		25	25	21.23	2
		50	0	21.15	2

FDD-LTE Band 7:

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.43	0
		1	12	22.46	0
		1	24	22.47	0
		12	0	21.82	1
		12	6	21.75	1
		12	13	21.79	1
		25	0	21.67	1
	MCH	1	0	22.34	0
		1	12	22.25	0
		1	24	22.33	0
		12	0	21.89	1
		12	6	21.90	1
		12	13	21.91	1
		25	0	21.99	1
	HCH	1	0	22.73	0
		1	12	22.74	0
		1	24	22.72	0
		12	0	21.19	1
		12	6	21.17	1
		12	13	21.17	1
		25	0	21.13	1
16QAM	LCH	1	0	21.78	1
		1	12	21.82	1
		1	24	21.82	1
		12	0	20.89	2
		12	6	20.90	2
		12	13	20.91	2
		25	0	20.35	2
	MCH	1	0	21.79	1
		1	12	21.79	1
		1	24	21.77	1
		12	0	20.34	2
		12	6	20.37	2

		12	13	20.39	2
		25	0	20.30	2
	HCH	1	0	21.82	1
		1	12	21.87	1
		1	24	21.85	1
		12	0	20.33	2
		12	6	20.34	2
		12	13	20.32	2
		25	0	20.44	2

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.18	0
		1	24	22.17	0
		1	49	22.25	0
		25	0	21.69	1
		25	12	21.70	1
		25	25	21.71	1
		50	0	21.70	1
	MCH	1	0	22.60	0
		1	24	22.64	0
		1	49	22.72	0
		25	0	21.44	1
		25	12	21.41	1
		25	25	21.47	1
		50	0	21.42	1
	HCH	1	0	22.71	0
		1	24	22.64	0
		1	49	22.71	0
		25	0	21.39	1
		25	12	21.35	1
		25	25	21.34	1
		50	0	21.29	1
16QAM	LCH	1	0	21.79	1
		1	24	21.82	1
		1	49	21.86	1
		25	0	20.98	2
		25	12	20.91	2
		25	25	20.91	2
		50	0	20.99	2
	MCH	1	0	21.72	1
		1	24	21.80	1

		1	49	21.82	1
		25	0	20.54	2
		25	12	20.58	2
		25	25	20.51	2
		50	0	20.52	2
	HCH	1	0	21.51	1
		1	24	21.48	1
		1	49	21.49	1
		25	0	20.35	2
		25	12	20.34	2
		25	25	20.39	2
		50	0	20.36	2

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.29	0
		1	37	22.24	0
		1	74	22.30	0
		37	0	21.75	1
		37	18	21.78	1
		37	38	21.79	1
		75	0	21.78	2
	MCH	1	0	22.64	0
		1	37	22.66	0
		1	74	22.69	0
		37	0	21.94	1
		37	18	21.55	1
		37	38	21.51	1
		75	0	21.44	2
	HCH	1	0	22.69	0
		1	37	22.82	0
		1	74	22.73	0
		37	0	21.35	1
		37	18	21.38	1
		37	38	21.32	1
		75	0	21.37	2
16QAM	LCH	1	0	21.88	1
		1	37	21.91	1
		1	74	21.96	1
		37	0	20.98	2
		37	18	20.99	2
		37	38	20.56	2

	MCH	75	0	20.51	2
		1	0	21.31	1
		1	37	21.38	1
		1	74	21.36	1
		37	0	20.46	2
		37	18	20.34	2
		37	38	20.36	2
		75	0	20.32	2
	HCH	1	0	21.38	1
		1	37	21.41	1
		1	74	21.38	1
		37	0	20.48	2
		37	18	20.38	2
		37	38	20.37	2
		75	0	20.33	2

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.33	0
		1	49	22.31	0
		1	99	22.41	0
		50	0	21.73	1
		50	25	21.79	1
		50	50	21.72	1
		100	0	21.81	1
	MCH	1	0	22.57	0
		1	49	22.61	0
		1	99	22.63	0
		50	0	21.96	1
		50	25	21.88	1
		50	50	21.85	1
		100	0	21.96	1
	HCH	1	0	22.64	0
		1	49	22.75	0
		1	99	22.99	0
		50	0	21.94	1
		50	25	21.91	1
		50	50	21.97	1
		100	0	21.48	1
16QAM	LCH	1	0	21.59	1
		1	49	21.63	1
		1	99	21.72	1

		50	0	20.96	2
		50	25	20.91	2
		50	50	20.96	2
		100	0	20.99	2
	MCH	1	0	21.74	1
		1	49	21.78	1
		1	99	21.77	1
		50	0	20.33	2
		50	25	20.33	2
		50	50	20.38	2
		100	0	20.36	2
	HCH	1	0	21.64	1
		1	49	21.72	1
		1	99	21.99	1
		50	0	20.36	2
		50	25	20.34	2
		50	50	20.33	2
		100	0	20.35	2

FDD-LTE Band 17:

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.60	0
		1	12	22.46	0
		1	24	22.39	0
		12	0	21.42	1
		12	6	21.44	1
		12	13	21.46	1
		25	0	21.94	1
	MCH	1	0	22.16	0
		1	12	22.15	0
		1	24	22.26	0
		12	0	21.89	1
		12	6	21.84	1
		12	13	21.67	1
		25	0	21.80	1
	HCH	1	0	22.30	0
		1	12	22.52	0
		1	24	22.37	0
		12	0	21.79	1
		12	6	21.88	1

		12	13	21.61	1
		25	0	21.82	1
16QAM	LCH	1	0	21.86	1
		1	12	21.79	1
		1	24	21.68	1
		12	0	20.98	2
		12	6	20.82	2
		12	13	20.76	2
		25	0	20.53	2
		25	0	20.53	2
	MCH	1	0	21.61	1
		1	12	21.42	1
		1	24	21.52	1
		12	0	20.41	2
		12	6	20.45	2
		12	13	20.68	2
		25	0	20.36	2
		25	0	20.36	2
	HCH	1	0	21.32	1
		1	12	21.50	1
		1	24	21.24	1
		12	0	20.73	2
		12	6	20.64	2
		12	13	20.64	2
		25	0	20.80	2
		25	0	20.80	2

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	MPR (dB)
		Size	Offset		
QPSK	LCH	1	0	22.70	0
		1	24	22.24	0
		1	49	22.27	0
		25	0	21.91	1
		25	12	21.71	1
		25	25	21.82	1
		50	0	21.91	1
		50	0	21.91	1
	MCH	1	0	22.57	0
		1	24	22.41	0
		1	49	22.37	0
		25	0	21.77	1
		25	12	21.77	1
		25	25	21.80	1
		50	0	21.82	1
		50	0	21.82	1
	HCH	1	0	22.31	0
		1	24	22.23	0

		1	49	22.17	0
		25	0	21.84	1
		25	12	21.71	1
		25	25	21.76	1
		50	0	21.72	1
16QAM	LCH	1	0	21.70	1
		1	24	21.50	1
		1	49	21.48	1
		25	0	20.89	2
		25	12	20.73	2
		25	25	20.78	2
		50	0	20.41	2
	MCH	1	0	21.48	1
		1	24	21.35	1
		1	49	21.30	1
		25	0	20.89	2
		25	12	20.51	2
		25	25	20.85	2
		50	0	20.87	2
	HCH	1	0	21.58	1
		1	24	21.93	1
		1	49	21.83	1
		25	0	20.53	2
		25	12	20.92	2
		25	25	20.78	2
		50	0	20.84	2

Remark:

1. Per KDB941225 D05 v02r05, Start with the largest channel bandwidth then measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle, and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. 6 When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.
2. Per KDB941225 D05 v02r05, The procedures required for 1 RB allocation in 5.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.
3. Per KDB941225 D05 v02r05, 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 in 5.2.1 and 5.2.2 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 KDB941225 D05 v02r05, For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in 5.2.1, 5.2.2, and 5.2.3 to determine the QAM configurations that may need SAR measurement. For each configuration

identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

WLAN - Maximum Average Power					
Test Mode	Data Rate	Channel	Frequency (MHz)	Average Power (dBm)	Tune-up power (dBm)
802.11b	1Mbps	CH 01	2412	16.87	18.0
		CH 06	2437	17.09	18.0
		CH 11	2462	17.84	18.0
802.11g	6Mbps	CH 01	2412	12.31	13.0
		CH 06	2437	12.54	13.0
		CH 11	2462	11.99	13.0
802.11n (20MHz)	MCS0	CH 01	2412	13.37	14.0
		CH 06	2437	13.79	14.0
		CH 11	2462	12.67	14.0

Remark:

1. Per KDB 248227 D01 v02r02, For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions.
2. Per KDB 248227 D01 v02r02, For 802.11b DSSS SAR measurements ,when the reported SAR of the highest measured maximum output power channel (see 3.1) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.
- 3 .For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is ≤ 1.2 W/kg.

Bluetooth - Maximum Average Power			
Test Mode	Data Rate	Average Power(dBm)	Tune-up power (dBm)
GFSK	1Mbps	6.891	7.5
Pi/4 QDPSK	2Mbps	6.823	7.5
8DPSK	3Mbps	7.054	7.5

Bluetooth - Maximum Average Power					
Test Mode	Data Rate	Channel	Frequency (MHz)	Average Power (dBm)	Tune-up power (dBm)
BLE	1Mbps	CH 00	2402	4.143	6.5
		CH 19	2440	6.329	6.5
		CH 39	2480	5.346	6.5

Remark:

Bluetooth maximum output power is 0.815dBm and -28.53dBm respectively, and Maximum Tune-Up output power is 1.0dBm and -25dBm respectively. Per KDB 447498 D01 V06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, } 4.87\text{mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for } 1\text{-g SAR and } \leq 7.5 \text{ for } 10\text{-g extremity SAR,16 where}$$

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation¹⁷
- The result is rounded to one decimal place for comparison

Tune-Up Power (dBm)	Max. Power (mW)	Distance (mm)	Frequency (GHz)	Result	Limit
7.5	5.62	5	2.480	1.77	3

The exclusion thresholds is $1.77 < 3$, therefore, the RF exposure evaluation is not required.

9.2 Test Results for Standalone SAR Test

Head SAR

GSM850 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
1.	GSM	Right Cheek	251	848.8	32.92	33.0	1.019	0.480	0.489
2.	GSM	Right Tilted	251	848.8	32.92	33.0	1.019	0.243	0.248
3.	GSM	Left Cheek	251	848.8	32.92	33.0	1.019	0.379	0.386
4.	GSM	Left Tilted	251	848.8	32.92	33.0	1.019	0.213	0.217

GSM1900 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	M Hz					
5.	GSM	Right Cheek	512	1850.2	30.12	30.5	1.091	0.145	0.158
6.	GSM	Right Tilted	512	1850.2	30.12	30.5	1.091	0.071	0.077
7.	GSM	Left Cheek	512	1850.2	30.12	30.5	1.091	0.165	0.180
8.	GSM	Left Tilted	512	1850.2	30.12	30.5	1.091	0.088	0.096

GPRS850 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
9.	GPRS_2TX	Right Cheek	190	836.6	30.81	31.0	1.045	0.624	0.652
10.	GPRS_2TX	Right Tilted	190	836.6	30.81	31.0	1.045	0.339	0.354
11.	GPRS_2TX	Left Cheek	190	836.6	30.81	31.0	1.045	0.498	0.520
12.	GPRS_2TX	Left Tilted	190	836.6	30.81	31.0	1.045	0.258	0.270

GPRS1900 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	M Hz					
13.	GPRS_3TX	Right Cheek	661	1880.0	26.31	26.5	1.045	0.230	0.240
14.	GPRS_3TX	Right Tilted	661	1880.0	26.31	26.5	1.045	0.137	0.143
15.	GPRS_3TX	Left Cheek	661	1880.0	26.31	26.5	1.045	0.191	0.200
16.	GPRS_3TX	Left Tilted	661	1880.0	26.31	26.5	1.045	0.119	0.124

WCDMA Band 2 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
17.	RMC	Right Cheek	9400	1880.0	22.18	22.5	1.076	0.354	0.381
18.	RMC	Right Tilted	9400	1880.0	22.18	22.5	1.076	0.198	0.213
19.	RMC	Left Cheek	9400	1880.0	22.18	22.5	1.076	0.281	0.302
20.	RMC	Left Tilted	9400	1880.0	22.18	22.5	1.076	0.149	0.160

WCDMA Band 5 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
21.	RMC	Right Cheek	4233	846.6	22.27	22.5	1.054	0.261	0.275
22.	RMC	Right Tilted	4233	846.6	22.27	22.5	1.054	0.133	0.140
23.	RMC	Left Cheek	4233	846.6	22.27	22.5	1.054	0.205	0.216
24.	RMC	Left Tilted	4233	846.6	22.27	22.5	1.054	0.117	0.123

WCDMA Band 4 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
25.	RMC	Right Cheek	1513	1752.6	22.42	22.5	1.019	0.368	0.375
26.	RMC	Right Tilted	1513	1752.6	22.42	22.5	1.019	0.169	0.172
27.	RMC	Left Cheek	1513	1752.6	22.42	22.5	1.019	0.235	0.239
28.	RMC	Left Tilted	1513	1752.6	22.42	22.5	1.019	0.137	0.140

LTE Band 2– Head SAR Test								
Plot No.	Mode	Test Position Head	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
29.	RMC QPSK 20MHz 1RB	Right Cheek	1860.0	23.16	23.5	1.081	0.275	0.297
30.	RMC QPSK 20MHz 1RB	Right Tilted	1860.0	23.16	23.5	1.081	0.158	0.171
31.	RMC QPSK 20MHz 1RB	Left Cheek	1860.0	23.16	23.5	1.081	0.411	0.444
32.	RMC QPSK 20MHz 1RB	Left Tilted	1860.0	23.16	23.5	1.081	0.202	0.218
33.	RMC QPSK 20MHz 50%RB	Right Cheek	1860.0	23.16	23.5	1.081	0.144	0.156
34.	RMC QPSK 20MHz 50%RB	Right Tilted	1860.0	23.16	23.5	1.081	0.081	0.088
35.	RMC QPSK 20MHz 50%RB	Left Cheek	1860.0	23.16	23.5	1.081	0.211	0.228
36.	RMC QPSK 20MHz 50%RB	Left Tilted	1860.0	23.16	23.5	1.081	0.122	0.132

LTE Band 4– Head SAR Test								
Plot No.	Mode	Test Position Head	Freque ncy	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
37.	RMC QPSK 20MHz 1RB	Right Cheek	1745.0	22.99	23.0	1.002	0.294	0.295
38.	RMC QPSK 20MHz 1RB	Right Tilted	1745.0	22.99	23.0	1.002	0.161	0.161
39.	RMC QPSK 20MHz 1RB	Left Cheek	1745.0	22.99	23.0	1.002	0.261	0.262
40.	RMC QPSK 20MHz 1RB	Left Tilted	1745.0	22.99	23.0	1.002	0.134	0.134
41.	RMC QPSK 20MHz 50%RB	Right Cheek	1745.0	22.99	23.0	1.002	0.154	0.154
42.	RMC QPSK 20MHz 50%RB	Right Tilted	1745.0	22.99	23.0	1.002	0.089	0.089
43.	RMC QPSK 20MHz 50%RB	Left Cheek	1745.0	22.99	23.0	1.002	0.121	0.121
44.	RMC QPSK 20MHz 50%RB	Left Tilted	1745.0	22.99	23.0	1.002	0.071	0.071

LTE Band 5– Head SAR Test								
Plot No.	Mode	Test Position Head	Freque ncy	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
45.	RMC QPSK 10MHz 1RB	Right Cheek	844.0	23.35	23.5	1.035	0.260	0.269
46.	RMC QPSK 10MHz 1RB	Right Tilted	844.0	23.35	23.5	1.035	0.133	0.138
47.	RMC QPSK 10MHz 1RB	Left Cheek	844.0	23.35	23.5	1.035	0.205	0.212
48.	RMC QPSK 10MHz 1RB	Left Tilted	844.0	23.35	23.5	1.035	0.107	0.111
49.	RMC QPSK 10MHz 50%RB	Right Cheek	844.0	23.35	23.5	1.035	0.129	0.134
50.	RMC QPSK 10MHz 50%RB	Right Tilted	844.0	23.35	23.5	1.035	0.081	0.084
51.	RMC QPSK 10MHz 50%RB	Left Cheek	844.0	23.35	23.5	1.035	0.112	0.116
52.	RMC QPSK 10MHz 50%RB	Left Tilted	844.0	23.35	23.5	1.035	0.061	0.063

LTE Band 7– Head SAR Test								
Plot No.	Mode	Test Position Head	Freque ncy	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth		MHz					
53.	RMC QPSK 20MHz 1RB	Right Cheek	2560.0	22.99	23.0	1.002	0.355	0.356
54.	RMC QPSK 20MHz 1RB	Right Tilted	2560.0	22.99	23.0	1.002	0.177	0.177
55.	RMC QPSK 20MHz 1RB	Left Cheek	2560.0	22.99	23.0	1.002	0.114	0.114
56.	RMC QPSK 20MHz 1RB	Left Tilted	2560.0	22.99	23.0	1.002	0.065	0.065
57.	RMC QPSK 20MHz 50%RB	Right Cheek	2560.0	22.99	23.0	1.002	0.198	0.198
58.	RMC QPSK 20MHz 50%RB	Right Tilted	2560.0	22.99	23.0	1.002	0.081	0.081
59.	RMC QPSK 20MHz 50%RB	Left Cheek	2560.0	22.99	23.0	1.002	0.066	0.066
60.	RMC QPSK 20MHz 50%RB	Left Tilted	2560.0	22.99	23.0	1.002	0.037	0.037

LTE Band 17– Head SAR Test								
Plot No.	Mode	Test Position Head	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
61.	RMC QPSK 10MHz 1RB	Right Cheek	709.0	22.7	23.0	1.072	0.228	0.244
62.	RMC QPSK 10MHz 1RB	Right Tilted	709.0	22.7	23.0	1.072	0.127	0.136
63.	RMC QPSK 10MHz 1RB	Left Cheek	709.0	22.7	23.0	1.072	0.212	0.227
64.	RMC QPSK 10MHz 1RB	Left Tilted	709.0	22.7	23.0	1.072	0.121	0.130
65.	RMC QPSK 10MHz 50%RB	Right Cheek	709.0	22.7	23.0	1.072	0.131	0.140
66.	RMC QPSK 10MHz 50%RB	Right Tilted	709.0	22.7	23.0	1.072	0.071	0.076
67.	RMC QPSK 10MHz 50%RB	Left Cheek	709.0	22.7	23.0	1.072	0.109	0.117
68.	RMC QPSK 10MHz 50%RB	Left Tilted	709.0	22.7	23.0	1.072	0.066	0.071

WLAN 2.4GHz – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
69.	802.11b	Right Cheek	11	2462	17.84	18.0	1.038	0.749	0.777
70.	802.11b	Right Tilted	11	2462	17.84	18.0	1.038	0.351	0.364
71.	802.11b	Left Cheek	11	2462	17.84	18.0	1.038	0.778	0.807
72.	802.11b	Left Tilted	11	2462	17.84	18.0	1.038	0.362	0.376

Remark: Per KDB 447498 D01 v06, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

Body-worn SAR

GSM850 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
73.	GSM	Back	251	848.8	32.92	33.0	1.019	0.273	0.278
74.	GSM	Front	251	848.8	32.92	33.0	1.019	0.325	0.331

GSM1900 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
75.	GSM	Back	512	1850.2	30.12	30.5	1.091	0.247	0.270
76.	GSM	Front	512	1850.2	30.12	30.5	1.091	0.247	0.270

WCDMA Band 2 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
85	RMC 12.2k	Back Side	9400	1880.0	22.18	22.5	1.076	0.478	0.515
86	RMC 12.2k	Front Side	9400	1880.0	22.18	22.5	1.076	0.475	0.511

WCDMA Band 5 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
89	RMC 12.2k	Back Side	4233	846.6	22.27	22.5	1.054	0.187	0.197
90	RMC 12.2k	Front Side	4233	846.6	22.27	22.5	1.054	0.202	0.213

WCDMA Band 4 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
93	RMC 12.2k	Back Side	1513	1752.6	22.42	22.5	1.019	0.480	0.489
94	RMC 12.2k	Front Side	1513	1752.6	22.42	22.5	1.019	0.517	0.527

LTE Band 2–Body SAR Test (Gap: 10mm)								
Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
97	RMC QPSK 20MHz 1RB	Back Side	1860.0	23.16	23.5	1.081	0.485	0.524
98	RMC QPSK 20MHz 1RB	Front Side	1860.0	23.16	23.5	1.081	0.471	0.509
101	RMC QPSK 20MHz 50%RB	Back Side	1860.0	23.16	23.5	1.081	0.241	0.261
102	RMC QPSK 20MHz 50%RB	Front Side	1860.0	23.16	23.5	1.081	0.221	0.239

LTE Band 4–Body SAR Test (Gap: 10mm)								
Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
105	RMC QPSK 20MHz 1RB	Back Side	1745.0	22.99	23.0	1.002	0.441	0.442
106	RMC QPSK 20MHz 1RB	Front Side	1745.0	22.99	23.0	1.002	0.456	0.457
109	RMC QPSK 20MHz 50%RB	Back Side	1745.0	22.99	23.0	1.002	0.223	0.224
110	RMC QPSK 20MHz 50%RB	Front Side	1745.0	22.99	23.0	1.002	0.234	0.235

LTE Band 5–Body SAR Test (Gap: 10mm)								
Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
113	RMC QPSK 10MHz 1RB	Back Side	844.0	23.35	23.5	1.035	0.163	0.169
114	RMC QPSK 10MHz 1RB	Front Side	844.0	23.35	23.5	1.035	0.195	0.202
117	RMC QPSK 10MHz 50%RB	Back Side	844.0	23.35	23.5	1.035	0.088	0.091
118	RMC QPSK 10MHz 50%RB	Front Side	844.0	23.35	23.5	1.035	0.112	0.116

LTE Band 7–Body SAR Test (Gap: 10mm)								
Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
121	RMC QPSK 20MHz 1RB	Back Side	2560.0	22.99	23.0	1.002	0.377	0.378
124	RMC QPSK 20MHz 1RB	Front Side	2560.0	22.99	23.0	1.002	0.430	0.431
129	RMC QPSK 20MHz 50%RB	Back Side	2560.0	22.99	23.0	1.002	0.172	0.172
130	RMC QPSK 20MHz 50%RB	Front Side	2560.0	22.99	23.0	1.002	0.223	0.224

LTE Band 17–Body SAR Test (Gap: 10mm)								
Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
135	RMC QPSK 10MHz 1RB	Back Side	709.0	22.7	23.0	1.072	0.388	0.416
136	RMC QPSK 10MHz 1RB	Front Side	709.0	22.7	23.0	1.072	0.354	0.379
139	RMC QPSK 10MHz 50%RB	Back Side	709.0	22.7	23.0	1.072	0.169	0.181
140	RMC QPSK 10MHz 50%RB	Front Side	709.0	22.7	23.0	1.072	0.157	0.168

WLAN 2.4GHz –Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
143	802.11b	Back Side	11	2462	17.84	18.0	1.038	0.360	0.374
144	802.11b	Front Side	11	2462	17.84	18.0	1.038	0.347	0.360

Remark: Per KDB 447498 D01 v06, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.