REPORT No. : SZ17120080S01

SAR TEST REPORT

APPLICANT	:	Shenzhen Chainway Information Technology Co.,Ltd.
PRODUCT NAME	:	Mobile Data Terminal
MODEL NAME	:	C6000
BRAND NAME	:	CHAINWAY
FCC ID	:	2AC6AC6000
STANDARD(S)	:	47CFR 2.1093 IEEE 1528-2013
TEST DATE	:	2018-01-12 to 2018-02-08
ISSUE DATE	:	2018-03-07

Tested by: Gan Yueming

Gan Yueming(Test engineer)

Approved by: Peng Hu

Peng Huarui(Supervisor)

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Change History		
Issue	**Date**	**Reason for change**
1.0	2018-03-07	First edition

1. Technical Information

Note: Provide by manufacturer.

1.1. Applicant and Manufacturer Information

Applicant:	Shenzhen Chainway Information Technology Co.,Ltd.
Applicant Address:	9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67, Bao'an, Shenzhen, China
Manufacturer:	Shenzhen Chainway Information Technology Co., Ltd.
Manufacturer Address:	9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67, Bao'an, Shenzhen, China

1.2. Equipment Under Test (EUT) Description

Model Name:	C6000
Brand Name:	CHAINWAY
Hardware Version:	C6000EA_MB_10
Software Version:	C6000A_MT6735_V3_AM_GITe978618_20180315
Frequency Bands:	GSM850: 824.2 MHz ~ 848.8MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band II: 1852.4 MHz ~ 1907.6MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6MHz WCDMA Band V: 826.4 MHz ~ 846.6MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 17: 704 MHz ~ 716 MHz WLAN 2.4GHz: 2412 MHz ~ 2462 MHz WLAN 5GHz Band 1: 5150 MHz ~ 5250 MHz; WLAN 5GHz Band 2: 5250 MHz ~ 5350 MHz; WLAN 5GHz Band 3: 5470 MHz ~ 5725 MHz; WLAN 5GHz Band 4: 5725 MHz ~ 5850 MHz; Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz GPS:1575.42MHz
Modulation Mode:	GSM / GPRS: GMSK EDGE: 8PSK WCDMA: AMR/RMC12.2Kbps

	HSDPA/HSUPA HSPA+ LTE: QPSK / 16QAM 802.11b/g/n HT20/n HT40 802.11a/n HT20/HT40 Bluetooth 2.1 BDR (1Mbps) : GFSK Bluetooth 2.1 EDR (2Mbps) :π/4-DQPSK Bluetooth 2.1 EDR (3Mbps) : 8-DPSK Bluetooth 4.0 - LE (1Mbps): GFSK GPS NFC: ASK		
Multi-slot Class:	GPRS: Multi-slot Class 12; EDGE: Multi-slot Class 12;DTM:Not support		
Operation mode:	Class B		
Hotspot function:	Not support		
Antenna type:	WWAN : Fixed Internal Antenna WLAN : Fixed Internal Antenna Bluetooth : Fixed Internal Antenna		
Battery Model:	IS743		
Battery specification:	4000mAh 3.8V		
SIM cards description:	Single SIM card		
Max Scaled SAR-1g(W/Kg)	Head	0.320 W/kg	Limit(W/kg): 1.6W/kg
	Body-worn	0.322 W/kg	

Note: For a more detailed description, please refer to specification or user's manual supplied by the applicant and/or manufacturer.

1.3. Summary of Maximum SAR Value

Equipment Class	Frequency Band	Highest SAR Summary	
		Head (Separation 0mm)	Body-worn (Separation 10mm)
		1g SAR (W/kg)	
WWAN	GSM850	**0.320**	**0.322**
	GSM1900	0.082	0.175
	WCDMA Band II	0.167	0.200
	WCDMA Band IV	0.171	0.283
	WCDMA Band V	0.139	0.097
	LTE Band 2	0.167	0.204
	LTE Band 4	0.117	0.157
	LTE Band 7	0.036	0.238
	LTE Band 12	0.092	0.159
	LTE Band 17	0.100	0.059
WLAN	WLAN 2.4GHz	0.030	0.110
WLAN	WLAN 5GHz	0.106	0.140
BT	Bluetooth	0.094	0.047

Highest Simultaneous Transmission SAR	Head	Body-worn
WWAN+WLAN 2.4GHz	0.350	0.432
WWAN+WLAN 5GHz	0.426	0.462
WWAN+Bluetooth	0.106	0.14

Note:

1、The summary maximum simultaneous transmission SAR is combined at the same exposure position.

2、Bluetooth is not required for SAR testing.

1.4. Photographs of the EUT

Please refer to the External Photos for the Photos of the EUT

1.5. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	**47 CFR§2.1093**	Radiofrequency Radiation Exposure Evaluation: Portable Devices
2	**IEEE 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
3	**KDB 447498 D01v06**	General RF Exposure Guidance
4	**KDB 248227 D01v02r02**	SAR Measurement Procedures for 802.11 Transmitters
5	**KDB 865664 D01v01r04**	SAR Measurement 100 MHz to 6 GHz
6	**KDB 865664 D02v01r02**	RF Exposure Reporting
7	**KDB 648474 D04v01r03**	Handset SAR
8	**KDB 941225 D01v03r01**	3G SAR Measurement Procedures
9	**KDB 941225 D05v02r05**	SAR Evaluation Consideration for LTE Devices
10	**KDB 941225 D06v02r01**	SAR Evaluation Procedures For Portable Devices With Wireless Router Capabilities

2. Device Category and SAR Limits

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.

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

Note: This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

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 Middle 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:

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

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by,

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

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

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

Where σ is the conductivity of the tissue, ρ is the mass density of the tissue and $|E|$ is the rmselectrical field strength.

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

4. SAR Measurement Setup

4.1. The Measurement System

Como SAR is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The Como SAR 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

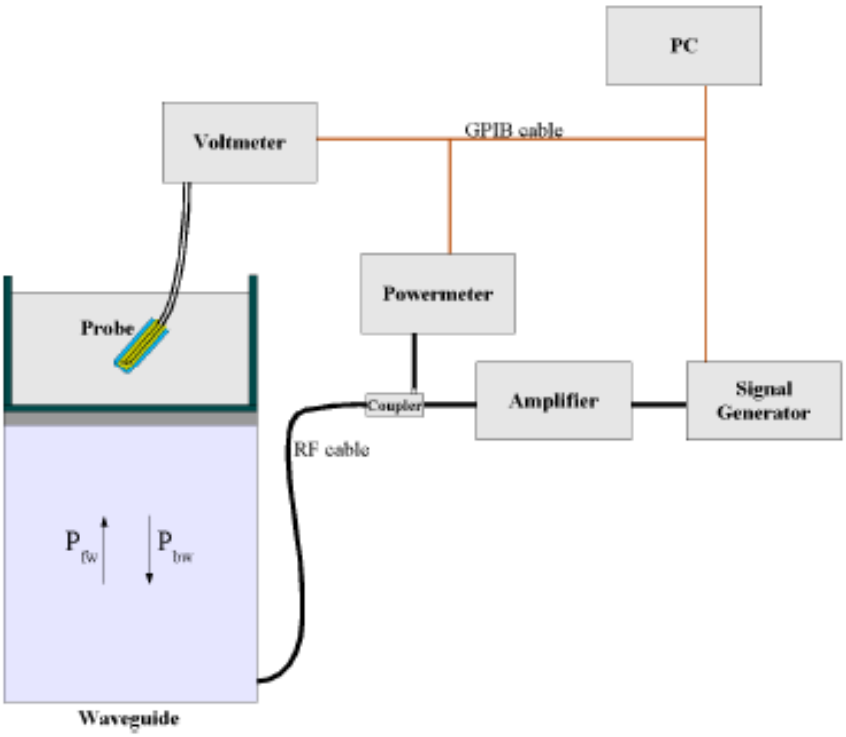
For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with Following specifications is used

- Dynamic range: 0.01-100 W/kg

- Tip Diameter: 6.5 mm
- Distance between probe tip and sensor center: 2.5mm
- Distance between sensor center and the inner phantom surface: 4 mm (repeatability better than +/- 1mm)
- Probe linearity: <0.25 dB
- Axial Isotropy: <0.25 dB
- Spherical Isotropy: <0.25 dB
- Calibration range: 835to 2500MHz 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 CENELEC EN 62209 and IEEE 1528 std, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the EN 622091 annex technique using reference guide at the five frequencies.



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

Where :

Pfw = Forward Power

Pbw = Backward Power

a and b = Waveguide dimensions

ı = 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 aNPL calibrated probe, to verify it.

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

$$CF(N)=SAR(N)/Vlin(N) \qquad (N=1,2,3)$$

The linearised output voltage Vlin(N) is obtained from the displayed output voltage V(N) using

$$Vlin(N)=V(N)*(1+V(N)/DCP(N)) \qquad (N=1,2,3)$$

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/cm^2) 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 1 mW/cm^2.

Temperature Assessment Procedure

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulating 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:

δt = exposure time (30 seconds),

C = heat capacity of tissue (brainor muscle),

δT = temperature increase due to RF exposure.

SAR is proportional to ΔT/Δt, 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.

Where:

σ = simulated tissue conductivity,

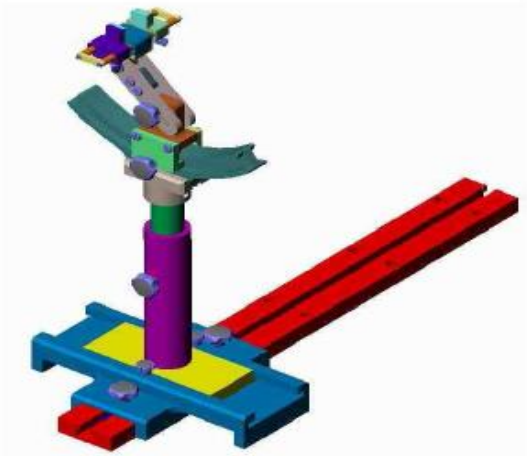
ρ = Tissue density (1.25 g/cm³ for brain tissue)

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 Middle than 1°.



Device holder

System Material	Permittivity	Loss Tangent
Delrin	3.7	0.005

5. Tissue Simulating Liquids

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with Homogeneous tissue simulating liquid to a depth of at least 15cm. For head SAR testing, the liquid height from the ear reference point(ERP) of the phantom to the liquid top surface is larger than15cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than15cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in below table.

Liquid Level

The following table gives the recipes for tissue simulating liquids

Frequency Band (MHz)	900		1800	2000		2450	2600	5200-5800	
Tissue Type	Head	Body	Body	Head	Body	Body	Body	Head	Body
Ingredients(% by weight)									
Deionised Water	50.36	50.20	68.80	54.90	40.40	73.20	68.1	65.53	78.60
Salt(NaCl)	1.25	0.90	0.20	0.18	0.50	0.10	0.10	0.00	0.00
Sugar	0.00	48.50	0.00	0.00	58.00	0.00	0.00	0.00	0.00
Tween 20	48.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HEC	0.00	0.20	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Bactericide	0.00	0.20	0.00	0.00	0.10	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.24	10.70

DGBE	0.00	0.00	31.00	44.92	0.00	26.70	31.8	0.00	0.00
Diethylenglycol monohexylether	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.24	10.70
Target dielectric parameters									
Dielectric Constant	41.50	56.10	53.40	39.90	53.30	52.70	52.5	35.3	48.7
Conductivity (S/m)	0.90	0.95	1.49	1.42	1.52	1.95	2.16	5.07	5.53

Note: Please refer to the validation results for dielectric parameters of each frequency band.

The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using an Agilent 85033E Dielectric Probe Kit and an Agilent Network Analyzer.

Table : Dielectric Performance of Tissue Simulating Liquid

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Conductivity Target (σ)	Delta (σ) (%)	Limit (%)	Date
750	HSL	21.2	0.890	0.89	0.00	±5	2018.01.12
750	MSL	21.2	1.000	0.96	4.17	±5	2018.01.12
835	HSL	21.2	0.892	0.90	-0.89	±5	2018.01.19
835	MSL	21.2	0.972	0.97	0.21	±5	2018.02.01
1800	HSL	22.6	1.365	1.40	-2.50	±5	2018.01.31
1800	MSL	22.6	1.515	1.52	-0.33	±5	2018.02.02
2000	HSL	22.4	1.414	1.40	1.00	±5	2018.01.17
2000	MSL	22.4	1.515	1.52	-0.33	±5	2018.01.22
2450	HSL	21.8	1.836	1.80	2.00	±5	2018.02.06
2450	MSL	21.8	1.966	1.95	0.82	±5	2018.02.08
2600	HSL	21.8	1.975	1.96	0.77	±5	2018.01.17
2600	MSL	21.8	2.105	2.16	-2.55	±5	2018.01.22
5200	HSL	22.1	4.665	4.66	0.11	±5	2018.02.02
5200	MSL	22.1	5.543	5.30	4.58	±5	2018.02.02
5600	HSL	22.1	5.100	5.07	0.59	±5	2018.02.02
5600	MSL	22.1	5.743	5.77	-0.47	±5	2018.02.02
5800	HSL	22.1	5.310	5.27	0.76	±5	2018.02.02
5800	MSL	22.1	5.931	6.00	-1.15	±5	2018.02.02

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Permittivity (ε_r)	Permittivity Target (ε_r)	Delta (ε_r) (%)	Limit (%)	Date
750	HSL	21.2	41.350	41.90	-1.31	±5	2018.01.12
750	MSL	21.2	53.520	55.50	-3.57	±5	2018.01.12
835	HSL	21.2	41.182	41.50	-0.77	±5	2018.01.19
835	MSL	21.2	55.282	55.20	0.15	±5	2018.02.01
1800	HSL	22.6	40.095	40.00	0.24	±5	2018.01.31
1800	MSL	22.6	53.295	53.30	-0.01	±5	2018.02.02
2000	HSL	22.4	39.984	40.00	-0.04	±5	2018.01.17
2000	MSL	22.4	53.285	53.30	-0.03	±5	2018.01.22
2450	HSL	21.8	39.284	39.20	0.21	±5	2018.02.06
2450	MSL	21.8	52.884	52.70	0.35	±5	2018.02.08
2600	HSL	21.8	39.025	39.00	0.06	±5	2018.01.17
2600	MSL	21.8	52.363	52.50	-0.26	±5	2018.01.22
5200	HSL	22.1	36.123	36.00	0.34	±5	2018.02.02
5200	MSL	22.1	48.273	49.00	-1.48	±5	2018.02.02
5600	HSL	22.1	35.562	35.50	0.17	±5	2018.02.02
5600	MSL	22.1	48.394	48.50	-0.22	±5	2018.02.02
5800	HSL	22.1	35.335	35.30	0.10	±5	2018.02.02
5800	MSL	22.1	48.093	48.20	-0.22	±5	2018.02.02

6. Uncertainty Assessment

The Following table includes the uncertainty table of the IEEE 1528. The values are determined by Antennessa.

6.1. Uncertainty Evaluation For EUT SAR Test

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+- %)	Prob . Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
Measurement System									
Probe calibration	E.2.1	5.83	N	1	1	1	5.83	5.83	∞
Axial Isotropy	E.2.2	3.5	R	$\sqrt{3}$	1	1	2.02	2.02	∞
Hemispherical Isotropy	E.2.2	5.9	R	$\sqrt{3}$	1	1	3.41	3.41	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	E.2.4	4.7	R	$\sqrt{3}$	1	1	2.71	2.71	∞
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Readout Electronics	E.2.6	0.5	N	1	1	1	0.5	0.5	∞
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	3.0	3.0	∞
Integration Time	E.2.8	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
RF ambient Conditions	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner Mechanical Tolerance	E.6.2	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Probe positioning with respect to Phantom Shell	E.6.3	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	E.5.2	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	∞
Test sample Related									
Test sample positioning	E.4.2.1	2.6	N	1	1	1	2.6	2.6	N-1
Device Holder Uncertainty	E.4.1.1	3.0	N	1	1	1	3.0	3.0	N-1
Output power Power drift -	6.6.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞

SAR drift measurement									
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	4.0	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Liquid conductivity - deviation from target value	E.3.2	2.0	R	$\sqrt{3}$	0.64	0.43	1.69	1.13	∞
Liquid conductivity - measurement uncertainty	E.3.3	2.5	N	1	0.64	0.43	3.20	2.15	M
Liquid permittivity - deviation from target value	E.3.2	2.5	R	$\sqrt{3}$	0.6	0.49	1.28	1.04	∞
Liquid permittivity - measurement uncertainty	E.3.3	5.0	N	1	0.6	0.49	6.00	4.90	M
Liquid conductivity–temperature uncertainty	E.3.4		R	$\sqrt{3}$	0.78	0.41			∞
Liquidpermittivity–temperature uncertainty	E.3.4		R	$\sqrt{3}$	0.23	0.26			∞
Combined Standard Uncertainty			RSS				11.55	12.07	
Expanded Uncertainty (95% Confidence interval)			K=2				± 23.20	± 24.17	

6.2. Uncertainty For System Performance Check

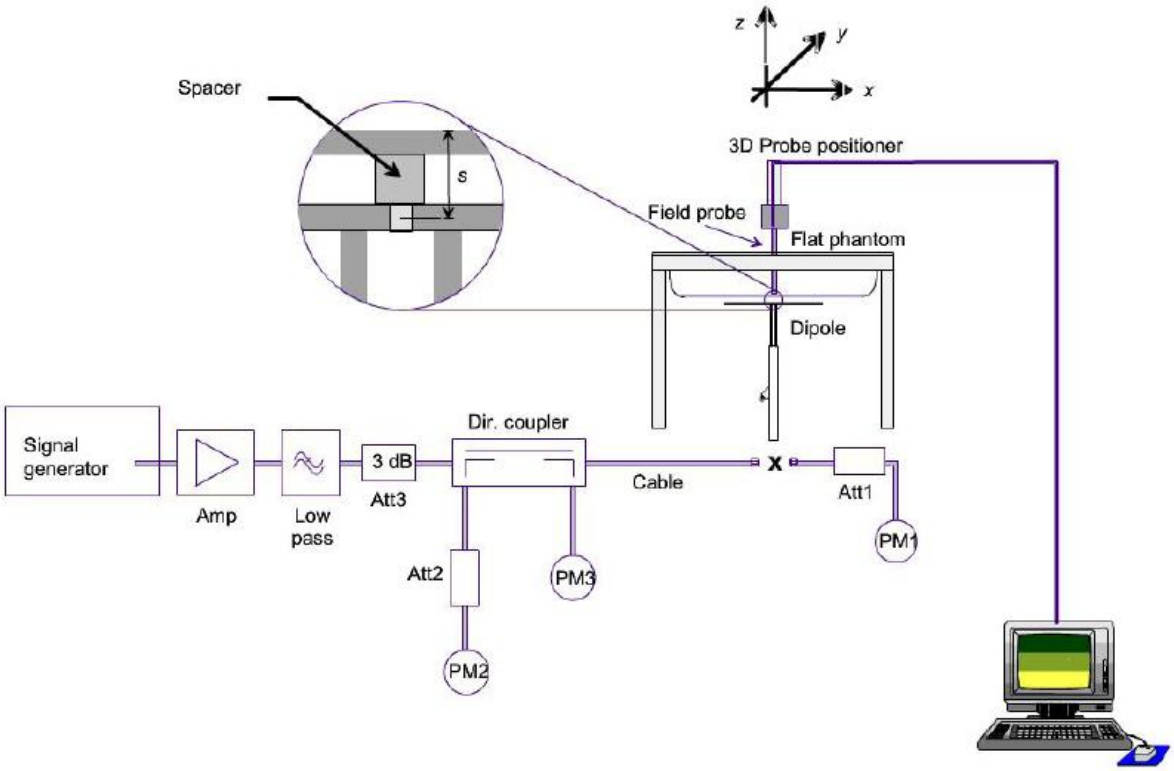
a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+-%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
Measurement System									
Probe calibration	E.2.1	4.76	N	1	1	1	4.76	4.7	∞
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	0.7	0.7	1.01	1.0	∞
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	0.7	0.7	1.62	1.6	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.5	∞

Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.8	∞
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.5	∞
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.0	∞
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.7	∞
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.1	∞
RF ambient Conditions	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.7	∞
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Dipole									
Dipole axis to liquid Distance	8,E.4.2	1.00	N	$\sqrt{3}$	1	1	0.58	0.58	∞
Input power and SAR drift measurement	8,6.6.2	4.04	R	$\sqrt{3}$	1	1	2.33	2.33	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Liquid conductivity - deviation from target value	E.3.2	4.57	R	$\sqrt{3}$	0.64	0.43	1.69	1.13	∞
Liquid conductivity - measurement uncertainty	E.3.3	5.00	N	$\sqrt{3}$	0.64	0.43	1.85	1.24	M
Liquid permittivity - deviation from target value	E.3.2	3.69	R	$\sqrt{3}$	0.6	0.49	1.28	1.04	∞
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	$\sqrt{3}$	0.6	0.49	3.46	2.83	M
Combined Standard Uncertainty			RSS				8.83	8.37	
Expanded Uncertainty (95% Confidence interval)			K=2				17.66	16.73	

7. SAR Measurement Evaluation

7.1. System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator. 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. The system check verifies that the system operates within its specifications. It is performed daily or before every SAR measurement. The system check uses normal SAR measurements in the flat section of the phantom with a matched dipole at a specified distance. The system verification setup is shown as below



The validation dipole is placed beneath the flat phantom with the specifics pacer in place. The distances pacer is touch the phantom surface with alight pressure at the reference marking and be oriented parallel to the long side of the phantom. The power meter PM1 measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (250mWisusedfor700MHzto3GHz, 100mWisusedfor3.5GHzto6 GHz)at the dipole connector and the power meter PM2 is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter.

7.2. Validation Results

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

<1g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2018.01.12	750	HSL	100	0.78	8.27	7.84	-5.20
2018.01.12	750	MSL	100	0.91	8.71	9.054	3.95
2018.01.19	835	HSL	100	0.97	9.46	9.68	2.33
2018.02.01	835	MSL	100	0.99	9.56	9.87	3.24
2018.01.31	1800	HSL	100	3.70	39.20	36.98	-5.66
2018.02.02	1800	MSL	100	3.75	39.60	37.53	-5.23
2018.01.17	2000	HSL	100	4.26	42.70	42.56	-0.33
2018.01.22	2000	MSL	100	4.12	41.43	41.2	-0.56
2018.02.06	2450	HSL	100	5.33	52.50	53.26	1.45
2018.02.08	2450	MSL	100	5.08	52.50	50.81	-3.22
2018.01.17	2600	HSL	100	5.68	53.30	56.81	6.59
2018.01.22	2600	MSL	100	5.39	50.80	53.86	6.02
2018.02.02	5200	HSL	100	16.40	164.05	163.99	-0.04
2018.02.02	5200	MSL	100	16.28	163.36	162.84	-0.32
2018.02.02	5600	HSL	100	17.14	177.81	171.44	-3.58
2018.02.02	5600	MSL	100	17.20	172.11	171.96	-0.09
2018.02.02	5800	HSL	100	17.71	185.02	177.11	-4.28
2018.02.02	5800	MSL	100	17.70	177.10	176.95	-0.08

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2018.01.12	750	HSL	100	0.54	5.39	5.37	-0.37
2018.01.12	750	MSL	100	0.61	5.79	6.10	5.30
2018.01.19	835	HSL	100	0.62	6.11	6.22	1.80
2018.02.01	835	MSL	100	0.63	6.28	6.29	0.16
2018.01.31	1800	HSL	100	2.05	20.50	20.48	-0.10
2018.02.02	1800	MSL	100	2.04	21.00	20.38	-2.95

2018.01.17	2000	HSL	100	1.99	21.39	19.93	-6.83
2018.01.22	2000	MSL	100	2.09	20.86	20.93	0.34
2018.02.06	2450	HSL	100	2.38	24.70	23.77	-3.77
2018.02.08	2450	MSL	100	2.38	24.50	23.77	-2.98
2018.01.17	2600	HSL	100	2.50	24.40	24.98	2.38
2018.01.22	2600	MSL	100	2.37	22.90	23.70	3.49
2018.02.02	5200	HSL	100	5.65	57.03	56.51	-0.91
2018.02.02	5200	MSL	100	5.62	57.09	56.24	-1.49
2018.02.02	5600	HSL	100	6.06	60.90	60.54	-0.59
2018.02.02	5600	MSL	100	5.91	58.61	59.07	0.78
2018.02.02	5800	HSL	100	5.99	62.43	59.94	-3.99
2018.02.02	5800	MSL	100	5.98	59.95	59.83	-0.20

Note: System checks the specific test data please see Annex C

8. Operational Conditions During Test

8.1. Information on the testing

The mobile phone antenna and battery are those specified by the manufacturer. The battery is fully charged before each measurement. The output power and frequency are controlled using a base station simulator. The mobile phone is set to transmit at its highest output peak power level.

The mobile phone is test in the “cheek” and “tilted” positions on the left and right sides of the phantom. The mobile phone is placed with the vertical centre line of the body of the mobile phone and the horizontal line crossing the centre of the earpiece in a plane parallel to the sagittal plane of the phantom.

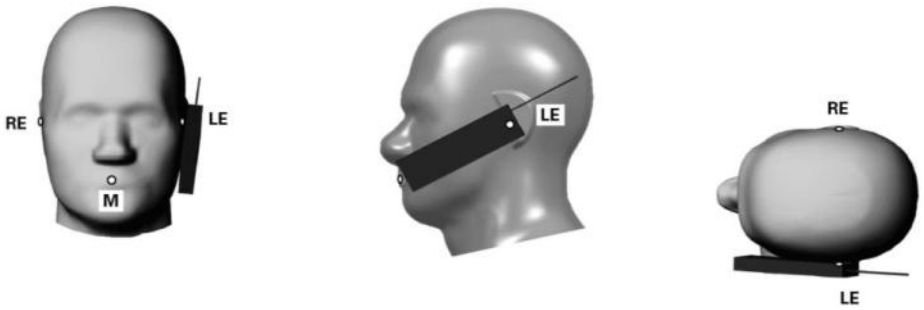


Illustration for Cheek Position

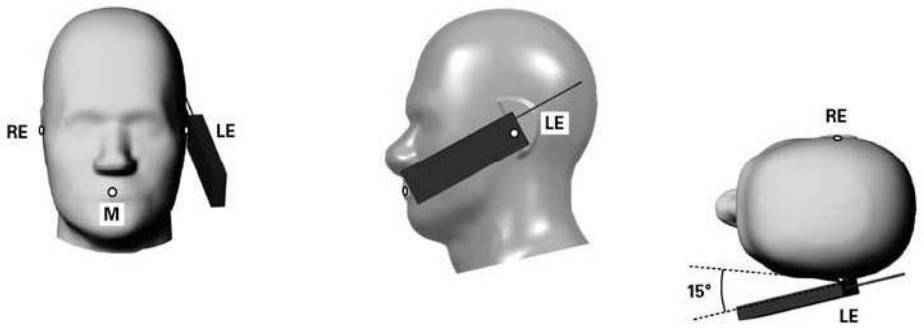


Illustration for Tilted Position

Description of the “cheek” position:
The mobile phone is well placed in the reference plane and the earpiece is in contact with the ear. Then the mobile phone is moved until any point on the front side get in contact with the cheek of the phantom or until contact with the ear is lost.

Description of the “tilted” position:
The mobile phone is well placed in the “cheek” position as described above. Then the mobile

phone is moved outward away from the month by an angle of 15 degrees or until contact with the ear lost.

Remark: Please refer to Appendix B for the test setup photos.

8.2. Body-worn Configurations

The body-worn configurations shall be tested with the supplied accessories (belt-clips, holsters, etc.) attached to the device in normal use configuration.

For body-worn and other configurations a flat phantom shall be used which is comprised of material with electrical properties similar to the corresponding tissues.

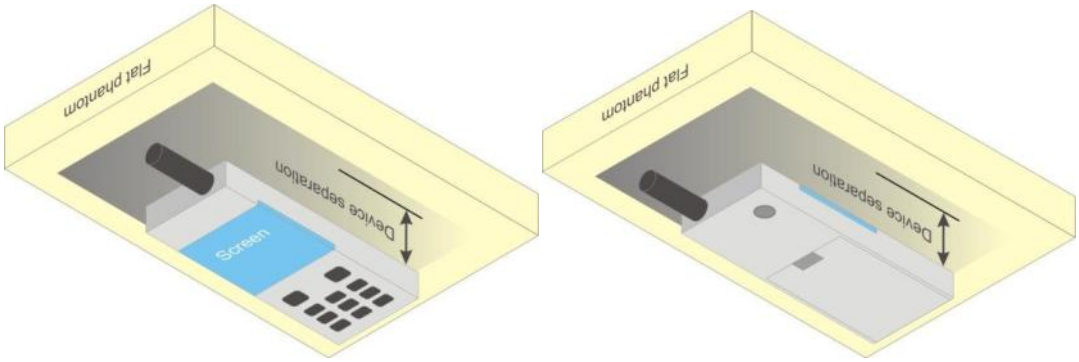


Illustration for Body-Worn Position

8.3. Measurement procedure

The Following steps are used for each test position

1. Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface.
2. Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
3. Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.

4. Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

8.4. Description of interpolation/extrapolation scheme

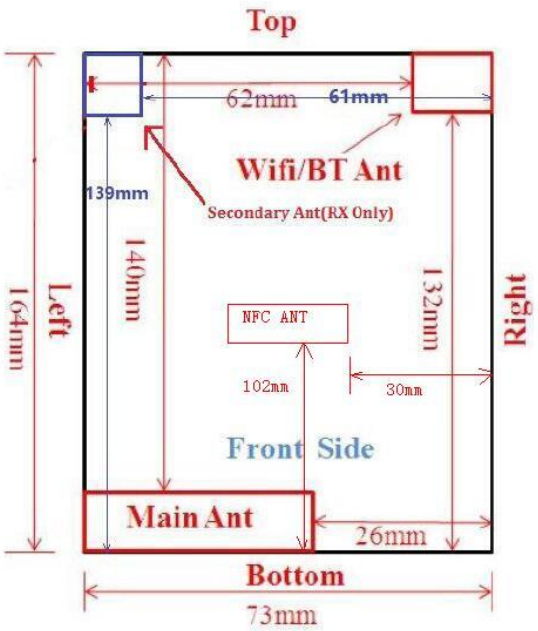
The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimize measurements errors, but the highest local SAR will occur at the surface of the phantom.

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 10 grams and 1 gram requires a very fine resolution in the three dimensional scanned data array.

9. Body Evaluation Procedure

Antenna position :



Assessment						
						Test distance: 10mm
Antennas	**Back**	**Front**	**Top**	**Left**	**Right**	**Bottom**
LTE/WCDMA/GSM	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**
WLAN&BT	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**

Note:

The SAR evaluation procedures for Portable Devices with Wireless Router function is according to KDB 941225 D06 Hotspot SAR v02r01.

1. Head/Body-worn SAR assessments are required.
2. Referring to KDB 941225 D06, 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.
3. For Main antenna, SAR measurements at Top side and Right Side are not required since the distance between DUT and flat phantom > 25mm.
4. For WLAN&BT antenna, SAR measurements Top side and Right side are not required since the distance between DUT and flat phantom > 25mm.
5.For the secondary antenna, it supports RX only, SAR is not required.

10. Information Related to LTE Test parameter (Per 941225 D05v02r05)

<table>
<tr><td>1</td><td>Identify the operating frequency range of each LTE transmission FCC band used by the device</td><td colspan="6">Band 2
Tx:1850-1910MHz
Band 4
Tx:1710-1755MHz
Band 7
Tx:2500-2570MHz
Band 12
Tx:699-716MHz
Band 17
Tx:704-716MHz</td></tr>
<tr><td rowspan="15">2</td><td rowspan="15">Identify the high, middle and low (L, M, H) channel numbers and frequencies tested in each LTE frequency band</td><td rowspan="2">Band2</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20Mhz</td><td>15MHz</td><td>10MHz</td><td>5MHz</td><td>3MHz</td><td>1.4MHz</td></tr>
<tr><td>Low</td><td>20050/ 1720</td><td>20025/ 1717.5</td><td>20000/ 1715</td><td>19975/ 1712.5</td><td>19965/ 1711.5</td><td>19957/ 1710.7</td></tr>
<tr><td>Middle</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td></tr>
<tr><td>High</td><td>20300/ 1745</td><td>20325/ 1747.5</td><td>20350/ 1750</td><td>20375/ 1752.5</td><td>20384/ 1753.5</td><td>20392/ 1754.2</td></tr>
<tr><td rowspan="2">Band4</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20Mhz</td><td>15MHz</td><td>10MHz</td><td>5MHz</td><td>3MHz</td><td>1.4MHz</td></tr>
<tr><td>Low</td><td>20050/ 1720</td><td>20025/ 1717.5</td><td>20000/ 1715</td><td>19975/ 1712.5</td><td>19965/ 1711.5</td><td>19957/ 1710.7</td></tr>
<tr><td>Middle</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td></tr>
<tr><td>High</td><td>20300/ 1745</td><td>20325/ 1747.5</td><td>20350/ 1750</td><td>20375/ 1752.5</td><td>20384/ 1753.5</td><td>20392/ 1754.2</td></tr>
<tr><td rowspan="2">Band7</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20Mhz</td><td>15MHz</td><td>10MHz</td><td>5MHz</td><td>3MHz</td><td>1.4MHz</td></tr>
<tr><td>Low</td><td>20850/ 2510</td><td>20825/ 2507.2</td><td>20800/ 2505</td><td>20775/ 2502.5</td><td>/</td><td>/</td></tr>
<tr><td>Middle</td><td>21100/ 2535</td><td>21100/ 2535</td><td>21100/ 2535</td><td>21100/ 2535</td><td>/</td><td>/</td></tr>
<tr><td>High</td><td>21350/ 2560</td><td>21375/ 2562.5</td><td>21400/ 2565</td><td>21425/ 2567.5</td><td>/</td><td>/</td></tr>
</table>

		Band 12	**Channel Bandwidth**					
			10MHz	**5MHz**	**3MHz**	**1.4MHz**	/	/
		Low	23060/ 704	23035/ 701.5	23025/ 700.5	23017/ 699.7	/	/
		Middle	23095/ 707.5	23095/ 707.5	23095/ 707.5	23095/ 707.5	/	/
		High	23130/ 711	23155/ 713.5	23165/ 714.5	23173/ 715.3	/	/
		Band 17	**Channel Bandwidth**					
			10MHz	**5MHz**	/	/	/	/
		Low	23780/ 709	23755/ 706.5	/	/	/	/
		Middle	23790/ 710	23790/ 710	/	/	/	/
		High	23800/ 711	23825/ 713.5	/	/	/	/
3	Specify the UE category and uplink modulations used	The UE Category is 4 and the uplink modulations used are QPSK and 16QAM.						
4	Descriptions of the LTE transmitter and antenna implementation & identify whether it is a standalone transmitter operating independently of other wireless transmitters in the device or sharing hardware components and/or antenna(s) with other transmitters etc.	The module has a primary antenna for all LTE&UMTS bands, a Wi-Fi Tx/Rx antenna.						
5	Identify the LTE Band Voice/data requirements in each operating mode and exposure condition with respect to head and body test configurations, antenna locations, handset flip-cover or slide positions, antenna diversity conditions, etc.	Mobile Hotspot Mode will be tested according to Section 9 of this report.						

<table>
<tr><td>6</td><td>Identify if Maximum Power Reduction (MPR) is optional or mandatory, i.e. built-in by design:
only mandatory MPR may be considered during SAR testing, when the maximum output power is permanently limited by the MPR implemented within the UE; and only for the applicable RB (resource block) configurations specified in LTE standards
b) A-MPR (additional MPR) must be disabled.</td><td>As per 3GPP TS 36.101 v11.0.0 (2012-03)
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
</table>
A-MPR is supported by design, but disable for SAR testing.</td></tr>
<tr><td>7</td><td>Include the maximum average conducted output power measured on the required test channels for each channel bandwidth and UL modulation used in each frequency band:
a) with 1 RB allocated at the low, centred, high end of a channel
b) using 50% RB allocation low, centered, high end within a channel
c) using 100% RB allocation</td><td>This is included in the section 11 of this report.</td></tr>
<tr><td>8</td><td>Include the maximum average conducted output power measured for the other wireless mode and frequency bands</td><td>This is included in the section 13 of this report.</td></tr>
</table>

10	Identify the simultaneous transmission conditions for the voice and data configurations supported by all wireless modes, device configurations and frequency bands, for the head and body exposure conditions and device operating configurations (handset flip or cover positions, antenna diversity conditions etc.)	This is included in Section 15
11	When power reduction is applied to certain wireless modes to satisfy SAR compliance for simultaneous transmission conditions, other equipment certification or operating requirements, include the maximum average conducted output power measured in each power reduction mode applicable to the simultaneous voice/data transmission configurations for such wireless configurations and frequency bands; and also include details of the power reduction implementation and measurement setup	Not applicable.

11. SAR Evaluation Procedures for LTE

1. QPSK with 1 RB allocation

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*. 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. QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 1. are applied to measure the SAR for QPSK with50% RB allocation.

3. QPSK with 100% RB allocation

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 1. and 2. are ≤ 0.8W/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.

<u>Higher order modulations</u>

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in sections 1. and 2.and 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 or the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the *reported* SAR for the QPSK configuration is > 1.45 W/kg.

4. Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 5.2 to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the *reported* SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

The equivalent channel configuration for the RB allocation, RB offset and modulation etc. Is determined for the smaller channel bandwidth according to the same number of RB allocated in

The largest channel bandwidth. For example, 50 RB in 10 MHz channel bandwidth does not apply to5MHz channel bandwidth; therefore, this cannot be tested in the smaller channel bandwidth. However, 50% RB allocation in 10 MHz channel bandwidths equivalent to 100% RB allocation in 5 MHz channel bandwidth; therefore, these are the equivalent configurations to be compared to determine the specific channel and configuration in the smaller channel bandwidth that need SAR testing."

12. Measurement of Conducted output power

1. GSM Conducted Average output power

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	190	251		128	190	251	
Frequency (MHz)	824.2	836.6	848.8		824.2	836.6	848.8	
GSM 1 Tx slot	32.64	32.76	32.68	33.00	23.64	23.76	23.68	24.00
GPRS 1 Tx slot	32.68	32.78	32.71	33.00	23.68	23.78	23.71	24.00
GPRS 2 Tx slots	31.76	31.83	31.78	32.00	25.76	25.83	25.78	26.00
GPRS 3 Tx slots	29.77	29.88	29.74	30.00	25.51	25.62	25.48	25.74
GPRS 4 Tx slots	28.72	28.84	28.68	29.00	25.72	25.84	25.68	26.00
EDGE 1 Tx slot	32.86	32.92	32.87	33.00	23.86	23.92	23.87	24.00
EDGE 2 Tx slots	31.91	32.00	31.95	33.00	25.91	26.00	25.95	27.00
EDGE 3 Tx slots	29.90	29.99	29.83	30.00	25.64	25.73	25.57	25.74
EDGE 4 Tx slots	28.79	28.89	28.76	29.00	25.79	25.89	25.76	26.00

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	27.16	27.00	26.72	27.50	18.16	18.00	17.72	18.50
GPRS 1 Tx slot	27.22	27.13	26.86	27.50	18.22	18.13	17.86	18.50
GPRS 2 Tx slots	26.61	26.49	26.35	27.00	20.61	20.49	20.35	21.00
GPRS 3 Tx slots	24.99	24.97	24.83	25.00	20.73	20.71	20.57	20.74
GPRS 4 Tx slots	23.87	23.96	23.83	24.00	20.87	20.96	20.83	21.00
EDGE 1 Tx slot	26.94	26.82	26.67	27.00	17.94	17.82	17.67	18.00
EDGE 2 Tx slots	26.24	26.24	26.15	26.50	20.24	20.24	20.15	20.50
EDGE 3 Tx slots	24.61	24.63	24.63	25.00	20.35	20.37	20.37	20.74
EDGE 4 Tx slots	23.85	23.67	23.61	24.00	20.85	20.67	20.61	21.00

Note: The Max Average Power at Slot 4, so it is used for test.

2. WCDMA Conducted Average output power

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	
AMR 12.2Kbps	22.96	22.84	22.76	23.00	22.74	22.84	22.90	23.00
RMC 12.2Kbps	22.79	22.73	22.57	23.00	22.64	22.71	22.73	23.00
HSDPA Subtest-1	21.03	21.11	21.06	21.50	21.72	21.68	21.80	22.00
HSDPA Subtest-2	21.16	21.16	21.09	21.50	21.73	21.71	21.82	22.00
HSDPA Subtest-3	20.71	20.71	20.64	21.00	21.29	21.24	21.34	21.50
HSDPA Subtest-4	20.73	20.69	20.57	21.00	21.25	21.26	21.32	21.50
HSUPA Subtest-1	18.71	18.31	18.71	19.00	19.72	19.74	19.76	20.00
HSUPA Subtest-2	18.65	18.53	18.78	19.00	19.71	19.75	19.79	20.00
HSUPA Subtest-3	19.67	19.70	19.84	20.00	20.77	20.79	20.83	21.00
HSUPA Subtest-4	18.23	18.10	18.24	19.00	19.21	19.25	19.26	20.00
HSUPA Subtest-5	20.62	20.76	20.78	21.00	21.70	21.74	21.77	22.00
HSPA+ (16QAM) Subtest-1	20.11	20.18	20.06	20.50	21.34	21.31	21.32	21.50

Band	WCDMA V			Tune-up Limit (dBm)
TX Channel	4132	4182	4233	
Rx Channel	4357	4407	4458	
Frequency (MHz)	826.4	836.4	846.6	
AMR 12.2Kbps	22.02	21.83	22.32	22.50
RMC 12.2Kbps	22.01	21.79	22.03	22.50
HSDPA Subtest-1	21.08	20.83	21.08	21.50
HSDPA Subtest-2	21.11	20.87	21.11	21.50
HSDPA Subtest-3	20.60	20.43	20.64	21.00
HSDPA Subtest-4	20.62	20.39	20.63	21.00
HSUPA Subtest-1	19.12	18.92	19.14	21.50
HSUPA Subtest-2	19.11	18.89	19.09	19.50
HSUPA Subtest-3	20.14	19.90	20.10	20.50
HSUPA Subtest-4	18.65	18.43	18.62	19.50
HSUPA Subtest-5	21.15	20.86	21.07	21.50
HSPA+ (16QAM) Subtest-1	20.34	20.10	20.29	20.50

3. LTE Conducted Average output power

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)
Channel				18700	18900	19100	
Frequency (MHz)				1860	1880	1900	
20	QPSK	1	0	**19.25**	19.21	18.83	19.5
20	QPSK	1	49	19.20	19.21	19.20	
20	QPSK	1	99	18.93	18.69	18.32	
20	QPSK	50	0	19.00	18.98	19.02	19.5
20	QPSK	50	24	19.18	19.06	19.20	
20	QPSK	50	50	19.17	**19.20**	19.04	
20	QPSK	100	0	19.17	19.23	19.24	
20	16QAM	1	0	18.40	18.48	18.11	18.5
20	16QAM	1	49	18.10	18.44	18.23	
20	16QAM	1	99	18.25	17.99	17.34	
20	16QAM	50	0	17.04	16.93	16.68	17.5
20	16QAM	50	24	16.88	16.80	16.57	
20	16QAM	50	50	16.93	16.74	16.47	
20	16QAM	100	0	16.96	16.85	16.56	
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	19.21	19.04	19.00	19.5
15	QPSK	1	37	19.22	19.22	19.21	
15	QPSK	1	74	19.16	19.21	19.07	
15	QPSK	36	0	19.23	19.20	19.14	18.5
15	QPSK	36	20	19.07	19.16	19.11	
15	QPSK	36	39	19.16	19.06	19.01	
15	QPSK	75	0	19.17	19.12	19.11	
15	16QAM	1	0	18.16	18.47	18.29	18.5
15	16QAM	1	37	18.43	18.13	17.93	
15	16QAM	1	74	18.03	18.01	17.33	
15	16QAM	36	0	16.95	16.82	16.58	17.5
15	16QAM	36	20	16.88	16.74	16.43	
15	16QAM	36	39	16.92	16.67	16.35	

15	16QAM	75	0	16.96	16.81	16.47	
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	18.87	18.76	18.35	19.5
10	QPSK	1	25	19.03	19.17	19.06	
10	QPSK	1	49	19.00	18.84	18.31	
10	QPSK	25	0	19.21	19.07	19.20	18.5
10	QPSK	25	12	19.22	19.13	19.23	
10	QPSK	25	25	19.02	19.04	19.23	
10	QPSK	50	0	19.04	19.23	19.18	
10	16QAM	1	0	19.14	19.00	19.23	19.5
10	16QAM	1	25	17.99	18.06	17.67	
10	16QAM	1	49	18.13	17.90	17.33	
10	16QAM	25	0	16.93	16.84	16.47	17.5
10	16QAM	25	12	16.80	16.72	16.30	
10	16QAM	25	25	16.83	16.73	16.24	
10	16QAM	50	0	16.85	16.78	16.41	
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	18.81	18.63	18.18	19.5
5	QPSK	1	12	19.20	19.08	19.15	
5	QPSK	1	24	18.51	18.43	17.88	
5	QPSK	12	0	19.15	19.18	19.08	18.5
5	QPSK	12	7	19.00	19.22	19.20	
5	QPSK	12	13	19.21	19.21	19.21	
5	QPSK	25	0	19.23	19.14	19.20	
5	16QAM	1	0	17.83	17.81	17.28	18.5
5	16QAM	1	12	18.40	17.84	17.40	
5	16QAM	1	24	17.71	17.57	16.95	
5	16QAM	12	0	16.95	16.73	16.37	17.5
5	16QAM	12	7	16.83	16.75	16.16	
5	16QAM	12	13	16.88	16.69	16.19	
5	16QAM	25	0	16.80	16.69	16.27	
Channel				18615	18900	19185	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1880	1908.5	

3	QPSK	1	0	19.16	19.21	19.20	19.5
3	QPSK	1	8	19.04	19.09	19.08	
3	QPSK	1	14	19.20	19.05	19.03	
3	QPSK	8	0	19.20	19.10	19.19	18.5
3	QPSK	8	4	19.08	19.19	19.03	
3	QPSK	8	7	19.04	19.13	19.22	
3	QPSK	15	0	19.22	19.20	19.08	
3	16QAM	1	0	18.20	18.06	17.45	18.5
3	16QAM	1	8	18.20	17.96	17.41	
3	16QAM	1	14	18.08	17.78	17.50	
3	16QAM	8	0	16.83	16.71	16.26	17.5
3	16QAM	8	4	16.74	16.72	16.14	
3	16QAM	8	7	16.85	16.66	16.33	
3	16QAM	15	0	16.77	16.79	16.16	
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	18.52	18.51	17.85	19.5
1.4	QPSK	1	3	19.22	19.16	19.03	
1.4	QPSK	1	5	19.23	19.15	19.01	
1.4	QPSK	3	0	19.03	18.76	19.00	
1.4	QPSK	3	1	19.19	19.21	19.16	
1.4	QPSK	3	3	19.18	19.10	19.21	
1.4	QPSK	6	0	19.04	19.04	19.22	19.5
1.4	16QAM	1	0	17.75	17.45	17.24	18.5
1.4	16QAM	1	3	18.18	17.99	17.26	
1.4	16QAM	1	5	17.70	17.69	16.89	
1.4	16QAM	3	0	17.99	17.65	17.14	
1.4	16QAM	3	1	17.90	17.80	17.28	
1.4	16QAM	3	3	17.95	17.87	17.10	
1.4	16QAM	6	0	16.90	16.65	16.16	17.5

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)
Channel				20050	20175	20300	
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	**19.39**	19.10	18.71	19.5
20	QPSK	1	49	19.11	19.29	19.16	
20	QPSK	1	99	19.17	19.05	19.22	
20	QPSK	50	0	19.17	**19.28**	18.81	19.5
20	QPSK	50	24	19.15	19.27	19.23	
20	QPSK	50	50	19.17	19.00	19.18	
20	QPSK	100	0	19.29	19.09	19.28	
20	16QAM	1	0	18.76	18.12	18.28	19
20	16QAM	1	49	18.16	18.20	18.68	
20	16QAM	1	99	17.72	17.92	17.83	
20	16QAM	50	0	17.14	17.00	17.10	17.5
20	16QAM	50	24	16.90	16.83	16.99	
20	16QAM	50	50	16.86	16.87	17.00	
20	16QAM	100	0	16.98	16.90	17.04	
Channel				20025	20175	20325	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	19.23	19.25	19.25	19.5
15	QPSK	1	37	19.22	19.26	19.24	
15	QPSK	1	74	19.01	19.13	19.12	
15	QPSK	36	0	19.09	19.29	19.16	18.5
15	QPSK	36	20	19.30	19.30	19.30	
15	QPSK	36	39	19.20	19.23	19.16	
15	QPSK	75	0	19.22	19.25	19.00	
15	16QAM	1	0	18.77	18.39	18.64	18.5
15	16QAM	1	37	18.50	18.22	18.42	
15	16QAM	1	74	17.82	18.03	17.72	
15	16QAM	36	0	17.03	16.87	17.05	17.5
15	16QAM	36	20	17.03	16.88	17.01	
15	16QAM	36	39	16.87	16.85	16.88	
15	16QAM	75	0	16.99	16.82	16.99	
Channel				20000	20175	20350	Tune-up

Frequency (MHz)				1715	1732.5	1750	limit (dBm)
10	QPSK	1	0	18.99	18.74	18.81	19.5
10	QPSK	1	25	19.17	19.04	19.18	
10	QPSK	1	49	19.19	19.27	19.22	
10	QPSK	25	0	19.16	18.93	18.81	18.5
10	QPSK	25	12	19.14	19.12	19.19	
10	QPSK	25	25	19.27	19.08	19.14	
10	QPSK	50	0	19.05	19.05	19.08	
10	16QAM	1	0	18.40	17.93	17.78	18.5
10	16QAM	1	25	17.91	17.93	18.31	
10	16QAM	1	49	18.18	17.82	17.86	
10	16QAM	25	0	17.05	16.84	16.94	17.5
10	16QAM	25	12	16.91	16.74	16.95	
10	16QAM	25	25	16.93	16.72	16.80	
10	16QAM	50	0	17.00	16.84	16.85	
Channel				19975	20175	20375	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1732.5	1752.5	
5	QPSK	1	0	18.95	18.64	18.14	19.5
5	QPSK	1	12	19.04	19.26	19.09	
5	QPSK	1	24	19.16	19.14	19.21	
5	QPSK	12	0	19.12	18.81	18.53	18.5
5	QPSK	12	7	19.03	19.24	19.10	
5	QPSK	12	13	19.28	19.25	19.12	
5	QPSK	25	0	19.12	19.12	19.24	
5	16QAM	1	0	18.20	17.54	17.99	18.5
5	16QAM	1	12	18.27	18.19	17.86	
5	16QAM	1	24	17.55	17.50	17.57	
5	16QAM	12	0	17.20	16.80	16.78	17.5
5	16QAM	12	7	16.95	16.70	16.69	
5	16QAM	12	13	16.97	16.63	16.54	
5	16QAM	25	0	16.97	16.70	16.60	
Channel				19965	20175	20385	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1732.5	1753.5	
3	QPSK	1	0	19.12	19.27	19.11	19.5
3	QPSK	1	8	19.14	19.13	19.21	

3	QPSK	1	14	19.17	19.08	19.09	
3	QPSK	8	0	19.02	19.17	19.05	18.5
3	QPSK	8	4	19.27	19.06	19.04	
3	QPSK	8	7	19.28	19.04	19.25	
3	QPSK	15	0	19.04	19.13	19.14	
3	16QAM	1	0	18.16	17.93	18.04	18.5
3	16QAM	1	8	18.45	17.94	17.57	
3	16QAM	1	14	18.29	17.80	17.89	
3	16QAM	8	0	17.12	16.75	16.70	17.5
3	16QAM	8	4	16.87	16.77	16.45	
3	16QAM	8	7	16.92	16.65	16.39	
3	16QAM	15	0	17.17	16.78	16.70	
Channel				19957	20175	20393	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1732.5	1754.3	
1.4	QPSK	1	0	18.73	18.38	18.31	19.5
1.4	QPSK	1	3	19.28	19.21	19.06	
1.4	QPSK	1	5	19.24	19.25	19.09	
1.4	QPSK	3	0	19.16	18.83	18.63	
1.4	QPSK	3	1	19.16	19.08	19.18	
1.4	QPSK	3	3	19.06	19.27	19.16	
1.4	QPSK	6	0	19.02	19.08	19.30	19.5
1.4	16QAM	1	0	17.97	17.50	17.32	19
1.4	16QAM	1	3	18.55	17.84	17.70	
1.4	16QAM	1	5	18.04	17.91	17.64	
1.4	16QAM	3	0	18.11	17.80	17.63	
1.4	16QAM	3	1	18.27	17.85	17.68	
1.4	16QAM	3	3	18.15	17.80	17.64	
1.4	16QAM	6	0	17.10	16.81	16.53	17.5

LTE Band 7

BW [MHz]	Modulation	RB Size	RB Offset	Measured Power			Tune-up limit (dBm)
Channel				20850	21100	21350	
Frequency (MHz)				2510	2535	2560	
20	QPSK	1	0	20.42	20.72	**21.25**	21.5
20	QPSK	1	49	20.02	20.52	20.68	
20	QPSK	1	99	20.17	20.57	20.36	
20	QPSK	50	0	20.18	20.42	21.12	21.5
20	QPSK	50	24	20.27	20.20	**20.59**	
20	QPSK	50	50	20.46	20.58	20.01	
20	QPSK	100	0	20.45	20.46	20.13	
20	16QAM	1	0	19.37	19.66	20.47	20.5
20	16QAM	1	49	19.39	19.80	20.26	
20	16QAM	1	99	19.34	19.82	19.13	
20	16QAM	50	0	18.22	18.61	18.98	19.5
20	16QAM	50	24	18.05	18.55	18.66	
20	16QAM	50	50	18.10	18.51	18.51	
20	16QAM	100	0	18.16	18.55	18.71	
Channel				20825	21100	21375	Tune-up limit (dBm)
Frequency (MHz)				2507.5	2535	2562.5	
15	QPSK	1	0	19.77	20.32	20.28	20.5
15	QPSK	1	37	20.00	19.15	19.98	
15	QPSK	1	74	19.95	19.03	19.10	
15	QPSK	36	0	20.49	19.56	20.44	20.5
15	QPSK	36	20	20.01	19.02	19.33	
15	QPSK	36	39	20.29	19.29	19.31	
15	QPSK	75	0	19.06	20.08	19.82	
15	16QAM	1	0	19.26	19.89	20.31	20
15	16QAM	1	37	19.43	19.80	19.84	
15	16QAM	1	74	19.26	19.49	19.24	
15	16QAM	36	0	18.18	18.56	18.72	19
15	16QAM	36	20	18.07	18.57	18.59	
15	16QAM	36	39	18.09	18.54	18.35	
15	16QAM	75	0	18.14	18.56	18.55	
Channel				20800	21100	21400	Tune-up limit
Frequency (MHz)				2505	2535	2565	

							(dBm)
10	QPSK	1	0	20.21	19.85	19.75	20.5
10	QPSK	1	25	19.54	20.36	20.48	
10	QPSK	1	49	20.58	19.32	19.52	
10	QPSK	25	0	19.10	20.25	19.93	21
10	QPSK	25	12	20.60	20.11	19.19	
10	QPSK	25	25	20.39	20.04	19.60	
10	QPSK	50	0	19.34	20.57	19.86	
10	16QAM	1	0	19.38	19.65	19.40	20
10	16QAM	1	25	19.36	19.55	19.79	
10	16QAM	1	49	19.27	19.82	19.39	
10	16QAM	25	0	18.21	18.54	18.55	19
10	16QAM	25	12	18.08	18.49	18.38	
10	16QAM	25	25	18.08	18.44	18.35	
10	16QAM	50	0	18.20	18.55	18.48	
Channel				20775	21100	21425	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	QPSK	1	0	20.09	20.40	20.35	21.5
5	QPSK	1	12	20.21	19.58	20.44	
5	QPSK	1	24	19.87	20.25	19.93	
5	QPSK	12	0	19.93	19.85	19.67	20.5
5	QPSK	12	7	20.32	19.47	19.26	
5	QPSK	12	13	20.53	19.06	19.34	
5	QPSK	25	0	20.33	20.51	19.08	
5	16QAM	1	0	19.27	19.50	19.36	20.5
5	16QAM	1	12	19.68	19.88	19.69	
5	16QAM	1	24	19.01	19.10	19.05	
5	16QAM	12	0	18.31	18.56	18.40	19.5
5	16QAM	12	7	18.25	18.50	18.29	
5	16QAM	12	13	18.20	18.49	18.27	
5	16QAM	25	0	18.17	18.51	18.29	

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)
Channel				23060	23095	23130	
Frequency (MHz)				704	707.5	711	
10	QPSK	1	0	**21.89**	21.82	21.57	22
10	QPSK	1	25	21.87	21.79	21.86	
10	QPSK	1	49	21.73	21.67	21.81	
10	QPSK	25	0	21.85	**21.97**	21.86	22
10	QPSK	25	12	21.75	21.63	21.12	
10	QPSK	25	25	21.82	21.54	21.02	
10	QPSK	50	0	21.69	21.55	21.81	
10	16QAM	1	0	20.92	20.74	20.52	21.5
10	16QAM	1	25	21.20	21.07	20.70	
10	16QAM	1	49	20.95	20.50	20.91	
10	16QAM	25	0	19.99	19.89	19.60	20
10	16QAM	25	12	19.84	19.68	19.64	
10	16QAM	25	25	19.73	19.59	19.48	
10	16QAM	50	0	19.88	19.75	19.59	
Channel				23035	23095	23155	Tune-up limit (dBm)
Frequency (MHz)				701.5	707.5	713.5	
5	QPSK	1	0	21.88	21.67	21.18	22
5	QPSK	1	12	21.23	21.85	21.65	
5	QPSK	1	24	21.70	21.31	21.24	
5	QPSK	12	0	21.68	21.87	21.52	21
5	QPSK	12	7	21.27	21.39	21.53	
5	QPSK	12	13	21.43	21.48	21.75	
5	QPSK	25	0	21.74	21.11	21.86	
5	16QAM	1	0	20.88	20.90	20.42	21
5	16QAM	1	12	21.38	21.04	20.83	
5	16QAM	1	24	21.01	20.58	20.31	
5	16QAM	12	0	20.04	19.95	19.46	20.5
5	16QAM	12	7	20.01	19.69	19.47	
5	16QAM	12	13	19.95	19.65	19.47	
5	16QAM	25	0	19.92	19.63	19.39	

Channel				23025	23095	23165	Tune-up limit (dBm)
Frequency (MHz)				700.5	707.5	714.5	
3	QPSK	1	0	21.76	21.50	21.42	22
3	QPSK	1	8	21.37	21.30	21.43	
3	QPSK	1	14	21.34	21.69	21.08	
3	QPSK	8	0	21.59	21.15	21.40	21
3	QPSK	8	4	21.18	21.61	21.43	
3	QPSK	8	7	21.22	21.87	21.38	
3	QPSK	15	0	21.22	21.32	21.55	
3	16QAM	1	0	21.41	21.13	20.65	21
3	16QAM	1	8	21.15	20.90	20.57	
3	16QAM	1	14	21.37	21.01	20.99	
3	16QAM	8	0	19.91	19.86	19.45	20.5
3	16QAM	8	4	19.88	19.75	19.34	
3	16QAM	8	7	19.83	19.79	19.60	
3	16QAM	15	0	20.01	19.74	19.51	
Channel				23017	23095	23173	Tune-up limit (dBm)
Frequency (MHz)				699.7	707.5	715.3	
1.4	QPSK	1	0	21.75	21.54	21.25	22
1.4	QPSK	1	3	21.59	21.62	21.66	
1.4	QPSK	1	5	21.68	21.77	21.63	
1.4	QPSK	3	0	21.14	21.43	21.73	
1.4	QPSK	3	1	21.62	21.58	21.24	
1.4	QPSK	3	3	21.40	21.04	21.01	
1.4	QPSK	6	0	21.81	21.01	21.14	21
1.4	16QAM	1	0	20.72	20.60	20.29	21.5
1.4	16QAM	1	3	21.33	21.07	21.09	
1.4	16QAM	1	5	20.74	20.68	20.46	
1.4	16QAM	3	0	21.02	20.76	20.62	
1.4	16QAM	3	1	20.97	20.80	20.58	
1.4	16QAM	3	3	20.87	20.62	20.64	
1.4	16QAM	6	0	19.89	19.75	19.57	20

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)
Channel				23780	23790	23800	
Frequency (MHz)				709	710	711	
10	QPSK	1	0	21.07	21.04	21.01	21.5
10	QPSK	1	25	21.22	21.23	21.03	
10	QPSK	1	49	**21.28**	21.25	21.21	
10	QPSK	25	0	21.20	21.23	20.75	21.5
10	QPSK	25	12	21.13	21.01	21.22	
10	QPSK	25	25	21.04	**21.24**	21.22	
10	QPSK	50	0	21.15	21.14	21.01	
10	16QAM	1	0	20.42	20.23	20.31	20.5
10	16QAM	1	25	20.38	20.41	20.17	
10	16QAM	1	49	19.79	19.68	20.12	
10	16QAM	25	0	19.12	19.11	19.05	19.5
10	16QAM	25	12	19.08	18.99	18.87	
10	16QAM	25	25	18.99	19.01	18.73	
10	16QAM	50	0	19.15	19.10	19.06	
Channel				23755	23790	23825	Tune-up limit (dBm)
Frequency (MHz)				706.5	710	713.5	
5	QPSK	1	0	21.03	21.04	21.03	21.5
5	QPSK	1	12	21.22	21.07	21.23	
5	QPSK	1	24	21.23	21.21	21.20	
5	QPSK	12	0	20.99	21.03	20.59	20.5
5	QPSK	12	7	21.06	21.20	20.65	
5	QPSK	12	13	21.04	21.18	21.23	
5	QPSK	25	0	21.12	21.17	21.03	
5	16QAM	1	0	20.19	19.87	19.86	20.5
5	16QAM	1	12	20.22	20.43	19.84	
5	16QAM	1	24	19.81	19.91	19.91	
5	16QAM	12	0	19.06	19.04	18.85	19.5
5	16QAM	12	7	19.03	19.07	18.56	
5	16QAM	12	13	19.02	18.95	18.59	
5	16QAM	25	0	19.01	19.06	18.67	

4. 2.4GHz Wi-Fi Average output power

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle (%)
2.4GHz WLAN	802.11b 1Mbps	CH 1	2412	**15.86**	16.00	100
		CH 6	2437	15.70	16.00	100
		CH 11	2462	13.29	13.50	100
	802.11g 6Mbps	CH 1	2412	19.02	19.50	100
		CH 6	2437	17.99	18.00	100
		CH 11	2462	17.74	18.00	100
	802.11n-HT20 MCS0	CH 1	2412	19.05	19.50	100
		CH 6	2437	18.01	18.50	100
		CH 11	2462	**19.82**	20.00	100
	802.11n-HT40 MCS0	CH 3	2422	17.07	17.50	100
		CH 6	2437	17.89	18.00	100
		CH 9	2452	16.40	16.50	100

5. 5GHz Wi-Fi Average output power

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle (%)
5.2GHz WLAN	802.11a 6Mbps	CH 36	5180	8.24	8.50	100
		CH 44	5220	8.86	9.00	100
		CH 48	5240	**9.80**	10.00	100
	802.11n-HT20 MCS0	CH 36	5180	8.56	9.00	100
		CH 44	5220	9.23	10.0	100
		CH 48	5240	9.14	10.0	100
	802.11n-HT40 MCS0	CH 38	5190	8.27	8.50	100
		CH 46	5230	9.34	10.0	100

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle (%)
5.3GHz WLAN	802.11a 6Mbps	CH 52	5260	9.54	10.00	100
		CH 60	5300	9.64	10.00	100
		CH 64	5320	**10.19**	10.50	100
	802.11n-HT20 MCS0	CH 52	5260	9.28	9.50	100
		CH 60	5300	9.79	10.00	100
		CH 64	5320	**10.19**	10.50	100
	802.11n-HT40 MCS0	CH 54	5270	9.59	10.00	100
		CH 62	5310	10.07	10.50	100

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	CH 100	5500	10.25	10.50	100
		CH 120	5600	11.42	12.00	
		CH 140	5700	10.89	11.50	
	802.11n-HT20 MCS0	CH 100	5500	9.91	10.50	100
		CH 120	5600	10.97	11.50	
		CH 140	5700	11.10	11.50	
	802.11n-HT40 MCS0	CH 102	5510	9.87	10.50	100
		CH 126	5630	10.98	11.50	
		CH 134	5670	11.56	12.00	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle (%)
5.8GHz WLAN	802.11a MCS0	CH 149	5745	13.67	14.00	100
		CH 157	5785	13.02	13.50	100
		CH 165	5825	13.02	13.50	100
	802.11n-HT20 MCS0	CH 149	5745	**13.69**	14.00	100
		CH 157	5785	13.01	13.50	100
		CH 165	5825	13.04	13.50	100
	802.11n-HT40 MCS0	CH 151	5755	13.55	14.00	100
		CH 159	5795	12.95	13.00	100

6. BT average output power

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
2.1 / EDR	CH 00	2402	1.71	1.04	1.09
	CH 39	2441	**3.04**	1.89	1.98
	CH 78	2480	-1.05	-1.70	-1.65

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
LE	CH 00	2402	-4.53
	CH 19	2440	-4.05
	CH 39	2480	-5.14

Note：

1、The maximum power Tune-up tolerance see Annex F.

13. Test Results List

Test Guidance:

<GSM>

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 (4Tx slots) for GSM850/GSM1900 is considered as the primary mode.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes.

<WCDMA>

1. 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.
2. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
3. 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.
4. For HSPA+ devices supporting 16 QAM in the uplink, power measurements procedure is according to the configurations in Table C.11.1.4 of 3GPP TS 34.121-1.
5. 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 / HSPA+ 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 / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA / HSPA+) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

<LTE>

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. 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.

<WLAN>

1. SAR is measured for 2.4 GHz 802.11b DSSS using either the fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:
   1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ⩽ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
   2) When the reported SAR is > 0.8 W/kg, SAR is required for that position 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.
2. 2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for
3. 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is >

1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed.

4. For held-to-ear and hotspot operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured. Justification for test configurations for WLAN per KDB Publication 248227 D02DR02-41929 for 2.4 GHz WI-FI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR.

SAR Test List:

Summary of Measurement Results for Head

<GSM850 & GSM1900>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Tune-up Scaling Factor	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS(4 TX slots)	Right Cheek	0mm	190	836.6	1.040	0.281	0.292
	GSM850	GPRS(4 TX slots)	Right Tilt	0mm	190	836.6	1.040	0.157	0.163
25#	GSM850	GPRS(4 TX slots)	Left Cheek	0mm	190	836.6	1.040	0.308	**0.320**
	GSM850	GPRS(4 TX slots)	Left Tilt	0mm	190	836.6	1.040	0.164	0.170
	GSM1900	GPRS(4 TX slots)	Right Cheek	0mm	661	1880	1.009	0.056	0.057
	GSM1900	GPRS(4 TX slots)	Right Tilt	0mm	661	1880	1.009	0.025	0.025
27#	GSM1900	GPRS(4 TX slots)	Left Cheek	0mm	661	1880	1.009	0.137	**0.138**
	GSM1900	GPRS(4 TX slots)	Left Tilt	0mm	661	1880	1.009	0.039	0.039

<WCDMA Band II/IV/V>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Tune-up Scaling Factor	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
1#	WCDMA Band II	RMC 12.2Kbps	Right Cheek	0mm	9262	1852.4	1.050	0.159	**0.167**
	WCDMA Band II	RMC 12.2Kbps	Right Tilt	0mm	9262	1852.4	1.050	0.031	0.033
	WCDMA Band II	RMC 12.2Kbps	Left Cheek	0mm	9262	1852.4	1.050	0.063	0.066
	WCDMA Band II	RMC 12.2Kbps	Left Tilt	0mm	9262	1852.4	1.050	0.037	0.039
3#	WCDMA Band IV	RMC 12.2Kbps	Right Cheek	0mm	1513	1752.6	1.064	0.161	**0.171**
	WCDMA Band IV	RMC 12.2Kbps	Right Tilt	0mm	1513	1752.6	1.064	0.024	0.026
	WCDMA Band IV	RMC 12.2Kbps	Left Cheek	0mm	1513	1752.6	1.064	0.107	0.114
	WCDMA Band IV	RMC 12.2Kbps	Left Tilt	0mm	1513	1752.6	1.064	0.043	0.046
5#	WCDMA Band V	RMC 12.2Kbps	Right Cheek	0mm	4233	846.6	1.042	0.138	**0.142**
	WCDMA Band V	RMC 12.2Kbps	Right Tilt	0mm	4233	846.6	1.042	0.051	0.053
	WCDMA Band V	RMC 12.2Kbps	Left Cheek	0mm	4233	846.6	1.042	0.097	0.101
	WCDMA Band V	RMC 12.2Kbps	Left Tilt	0mm	4233	846.6	1.042	0.052	0.054

<LTE Band 2/4/7/12/17>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Tune-up Scaling Factor	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
15#	LTE Band 2	20Mhz	QPSK	1	0	Right Cheek	0mm	18700	1860	1.059	0.158	**0.167**
	LTE Band 2	20Mhz	QPSK	1	0	Right Tilt	0mm	18700	1860	1.059	0.066	0.070
	LTE Band 2	20Mhz	QPSK	1	0	Left Cheek	0mm	18700	1860	1.059	0.126	0.133
	LTE Band 2	20Mhz	QPSK	1	0	Left Tilt	0mm	18700	1860	1.059	0.073	0.077
	LTE Band 2	20Mhz	QPSK	50	50	Right Cheek	0mm	18900	1880	1.127	0.110	0.124
	LTE Band 2	20Mhz	QPSK	50	50	Right Tilt	0mm	18900	1880	1.127	0.042	0.047
	LTE Band 2	20Mhz	QPSK	50	50	Left Cheek	0mm	18900	1880	1.127	0.098	0.110
	LTE Band 2	20Mhz	QPSK	50	50	Left Tilt	0mm	18900	1880	1.127	0.044	0.050
	LTE Band 4	20Mhz	QPSK	1	0	Right Cheek	0mm	20050	1720	1.026	0.091	0.093
	LTE Band 4	20Mhz	QPSK	1	0	Right Tilt	0mm	20050	1720	1.026	0.066	0.068
17#	LTE Band 4	20Mhz	QPSK	1	0	Left Cheek	0mm	20050	1720	1.026	0.114	**0.117**
	LTE Band 4	20Mhz	QPSK	1	0	Left Tilt	0mm	20050	1720	1.026	0.096	0.098

	LTE Band 4	20Mhz	QPSK	50	0	Right Cheek	0mm	20175	1732.5	1.052	0.085	0.089
	LTE Band 4	20Mhz	QPSK	50	0	Right Tilt	0mm	20175	1732.5	1.052	0.038	0.040
	LTE Band 4	20Mhz	QPSK	50	0	Left Cheek	0mm	20175	1732.5	1.052	0.098	0.103
	LTE Band 4	20Mhz	QPSK	50	0	Left Tilt	0mm	20175	1732.5	1.052	0.057	0.060
	LTE Band 7	20Mhz	QPSK	1	0	Right Cheek	0mm	21350	2560	1.059	0.021	0.022
	LTE Band 7	20Mhz	QPSK	1	0	Right Tilt	0mm	21350	2560	1.059	0.009	0.010
	LTE Band 7	20Mhz	QPSK	1	0	Left Cheek	0mm	21350	2560	1.059	0.009	0.010
	LTE Band 7	20Mhz	QPSK	1	0	Left Tilt	0mm	21350	2560	1.059	0.007	0.007
	LTE Band 7	20Mhz	QPSK	50	24	Right Cheek	0mm	21350	2560	1.091	0.019	0.021
19#	LTE Band 7	20Mhz	QPSK	50	24	Right Tilt	0mm	21350	2560	1.091	0.033	**0.036**
	LTE Band 7	20Mhz	QPSK	50	24	Left Cheek	0mm	21350	2560	1.091	0.010	0.011
	LTE Band 7	20Mhz	QPSK	50	24	Left Tilt	0mm	21350	2560	1.091	0.008	0.009
21#	LTE Band 12	10Mhz	QPSK	1	0	Right Cheek	0mm	23060	704	1.026	0.090	**0.092**
	LTE Band 12	10Mhz	QPSK	1	0	Right Tilt	0mm	23060	704	1.026	0.019	0.019
	LTE Band 12	10Mhz	QPSK	1	0	Left Cheek	0mm	23060	704	1.026	0.083	0.085
	LTE Band 12	10Mhz	QPSK	1	0	Left Tilt	0mm	23060	704	1.026	0.040	0.041
	LTE Band 12	10Mhz	QPSK	25	0	Right Cheek	0mm	23095	707.5	1.007	0.085	0.086
	LTE Band 12	10Mhz	QPSK	25	0	Right Tilt	0mm	23095	707.5	1.007	0.018	0.018
	LTE Band 12	10Mhz	QPSK	25	0	Left Cheek	0mm	23095	707.5	1.007	0.070	0.070
	LTE Band 12	10Mhz	QPSK	25	0	Left Tilt	0mm	23095	707.5	1.007	0.019	0.019
23#	LTE Band 17	10Mhz	QPSK	1	49	Right Cheek	0mm	23780	709	1.104	0.091	**0.100**
	LTE Band 17	10Mhz	QPSK	1	49	Right Tilt	0mm	23780	709	1.104	0.028	0.031
	LTE Band 17	10Mhz	QPSK	1	49	Left Cheek	0mm	23780	709	1.104	0.089	0.098
	LTE Band 17	10Mhz	QPSK	1	49	Left Tilt	0mm	23780	709	1.104	0.024	0.026
	LTE Band 17	10Mhz	QPSK	25	25	Right Cheek	0mm	23790	710	1.059	0.075	0.079
	LTE Band 17	10Mhz	QPSK	25	25	Right Tilt	0mm	23790	710	1.059	0.029	0.031
	LTE Band 17	10Mhz	QPSK	25	25	Left Cheek	0mm	23790	710	1.059	0.075	0.079
	LTE Band 17	10Mhz	QPSK	25	25	Left Tilt	0mm	23790	710	1.059	0.020	0.021

<WLAN2.4GHz &WLAN 5GHz >

Plot No.	Band	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Tune-up Scaling Factor	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
13#	WLAN2.4GHz	Right Cheek	0mm	11	2462	1.042	0.029	**0.030**
	WLAN2.4GHz	Right Tilt	0mm	11	2462	1.042	0.023	0.024
	WLAN2.4GHz	Left Cheek	0mm	11	2462	1.042	0.025	0.026
	WLAN2.4GHz	Left Tilt	0mm	11	2462	1.042	0.021	0.022
7#	WLAN5GHz	Right Cheek	0mm	64	5320	1.074	0.072	**0.077**
	WLAN5GHz	Right Tilt	0mm	64	5320	1.074	0.056	0.060
	WLAN5GHz	Left Cheek	0mm	64	5320	1.074	0.069	0.074
	WLAN5GHz	Left Tilt	0mm	64	5320	1.074	0.059	0.063
	WLAN5GHz	Right Cheek	0mm	120	5600	1.107	0.056	0.057
	WLAN5GHz	Right Tilt	0mm	120	5600	1.107	0.043	0.044
10#	WLAN5GHz	Left Cheek	0mm	120	5600	1.107	0.074	**0.075**
	WLAN5GHz	Left Tilt	0mm	120	5600	1.107	0.055	0.056
	WLAN5GHz	Right Cheek	0mm	149	5745	1.074	0.056	0.060
	WLAN5GHz	Right Tilt	0mm	149	5745	1.074	0.081	0.087
	WLAN5GHz	Left Cheek	0mm	149	5745	1.074	0.050	0.054
8#	WLAN5GHz	Left Tilt	0mm	149	5745	1.074	0.099	**0.106**

Summary of Measurement Results for Body

< GSM850&GSM1900>

Plot No.	Band	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Tune-up Scaling Factor	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	Front Side	10mm	190	836.6	1.040	0.205	0.213
	GSM850	Back Side	10mm	190	836.6	1.040	0.310	0.322
	GSM850	Bottom Side	10mm	190	836.6	1.040	0.062	0.064
	GSM850	Right Side	10mm	190	836.6	1.040	0.274	0.285
26#	GSM850	Left Side	10mm	190	836.6	1.040	0.342	**0.356**
	GSM1900	Front Side	10mm	661	1880	1.009	0.173	0.175
	GSM1900	Back Side	10mm	661	1880	1.009	0.158	0.159

28#	GSM1900	Bottom Side	10mm	661	1880	1.009	0.272	**0.275**
	GSM1900	Right Side	10mm	661	1880	1.009	0.093	0.094
	GSM1900	Left Side	10mm	661	1880	1.009	0.143	0.144

<WCDMA Band II/IV/V>

Plot No.	Band	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Tune-up Scaling Factor	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA Band II	Front Side	10mm	9262	1852.4	1.050	0.153	0.161
	WCDMA Band II	Back Side	10mm	9262	1852.4	1.050	0.191	0.200
2#	WCDMA Band II	Bottom Side	10mm	9262	1852.4	1.050	0.237	**0.249**
	WCDMA Band II	Right Side	10mm	9262	1852.4	1.050	0.091	0.096
	WCDMA Band II	Left Side	10mm	9262	1852.4	1.050	0.199	0.209
4#	WCDMA Band IV	Front Side	10mm	1513	1752.6	1.064	0.266	**0.283**
	WCDMA Band IV	Back Side	10mm	1513	1752.6	1.064	0.175	0.186
	WCDMA Band IV	Bottom Side	10mm	1513	1752.6	1.064	0.250	0.266
	WCDMA Band IV	Right Side	10mm	1513	1752.6	1.064	0.106	0.113
	WCDMA Band IV	Left Side	10mm	1513	1752.6	1.064	0.178	0.189
	WCDMA Band V	Front Side	10mm	4233	846.6	1.042	0.060	0.063
	WCDMA Band V	Back Side	10mm	4233	846.6	1.042	0.093	0.097
	WCDMA Band V	Bottom Side	10mm	4233	846.6	1.042	0.022	0.023
6#	WCDMA Band V	Right Side	10mm	4233	846.6	1.042	0.103	**0.107**
	WCDMA Band V	Left Side	10mm	4233	846.6	1.042	0.090	0.094

<LTE Band 2/4/7/12/17>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Tune-up Scaling Factor	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20Mhz	QPSK	1	0	Front Side	10mm	18700	1860	1.059	0.193	0.204
	LTE Band 2	20Mhz	QPSK	1	0	Back Side	10mm	18700	1860	1.059	0.100	0.106
	LTE Band 2	20Mhz	QPSK	1	0	Bottom Side	10mm	18700	1860	1.059	0.164	0.174
	LTE Band 2	20Mhz	QPSK	1	0	Right Side	10mm	18700	1860	1.059	0.093	0.099
16#	LTE Band 2	20Mhz	QPSK	1	0	Left Side	10mm	18700	1860	1.059	0.286	**0.303**
	LTE Band 2	20Mhz	QPSK	50	50	Front Side	10mm	18900	1880	1.127	0.148	0.167

	LTE Band 2	20Mhz	QPSK	50	50	Back Side	10mm	18900	1880	1.127	0.123	0.139
	LTE Band 2	20Mhz	QPSK	50	50	Bottom Side	10mm	18900	1880	1.127	0.202	0.228
	LTE Band 2	20Mhz	QPSK	50	50	Right Side	10mm	18900	1880	1.127	0.071	0.080
	LTE Band 2	20Mhz	QPSK	50	50	Left Side	10mm	18900	1880	1.127	0.103	0.116
	LTE Band 4	20Mhz	QPSK	1	0	Front Side	10mm	20050	1720	1.026	0.130	0.133
18#	LTE Band 4	20Mhz	QPSK	1	0	Back Side	10mm	20050	1720	1.026	0.246	**0.25**
	LTE Band 4	20Mhz	QPSK	1	0	Bottom Side	10mm	20050	1720	1.026	0.142	0.146
	LTE Band 4	20Mhz	QPSK	1	0	Right Side	10mm	20050	1720	1.026	0.064	0.066
	LTE Band 4	20Mhz	QPSK	1	0	Left Side	10mm	20050	1720	1.026	0.079	0.081
	LTE Band 4	20Mhz	QPSK	50	0	Front Side	10mm	20175	1732.5	1.052	0.111	0.117
	LTE Band 4	20Mhz	QPSK	50	0	Back Side	10mm	20175	1732.5	1.052	0.104	0.109
	LTE Band 4	20Mhz	QPSK	50	0	Bottom Side	10mm	20175	1732.5	1.052	0.106	0.112
	LTE Band 4	20Mhz	QPSK	50	0	Right Side	10mm	20175	1732.5	1.052	0.056	0.059
	LTE Band 4	20Mhz	QPSK	50	0	Left Side	10mm	20175	1732.5	1.052	0.066	0.069
	LTE Band 7	20Mhz	QPSK	1	0	Front Side	10mm	21350	2560	1.059	0.054	0.057
20#	LTE Band 7	20Mhz	QPSK	1	0	Back Side	10mm	21350	2560	1.059	0.225	**0.238**
	LTE Band 7	20Mhz	QPSK	1	0	Bottom Side	10mm	21350	2560	1.059	0.089	0.094
	LTE Band 7	20Mhz	QPSK	1	0	Right Side	10mm	21350	2560	1.059	0.013	0.014
	LTE Band 7	20Mhz	QPSK	1	0	Left Side	10mm	21350	2560	1.059	0.107	0.113
	LTE Band 7	20Mhz	QPSK	50	0	Front Side	10mm	21350	2560	1.091	0.044	0.048
	LTE Band 7	20Mhz	QPSK	50	0	Back Side	10mm	21350	2560	1.091	0.199	0.217
	LTE Band 7	20Mhz	QPSK	50	0	Bottom Side	10mm	21350	2560	1.091	0.077	0.084
	LTE Band 7	20Mhz	QPSK	50	0	Right Side	10mm	21350	2560	1.091	0.011	0.012
	LTE Band 7	20Mhz	QPSK	50	0	Left Side	10mm	21350	2560	1.091	0.099	0.108
	LTE Band 12	10Mhz	QPSK	1	0	Front Side	10mm	23060	704	1.026	0.107	0.110
	LTE Band 12	10Mhz	QPSK	1	0	Back Side	10mm	23060	704	1.026	0.155	0.159
	LTE Band 12	10Mhz	QPSK	1	0	Bottom Side	10mm	23060	704	1.026	0.011	0.011
22#	LTE Band 12	10Mhz	QPSK	1	0	Right Side	10mm	23060	704	1.026	0.172	**0.176**
	LTE Band 12	10Mhz	QPSK	1	0	Left Side	10mm	23060	704	1.026	0.113	0.116
	LTE Band 12	10Mhz	QPSK	25	0	Front Side	10mm	23095	707.5	1.007	0.091	0.092
	LTE Band 12	10Mhz	QPSK	25	0	Back Side	10mm	23095	707.5	1.007	0.129	0.130
	LTE Band 12	10Mhz	QPSK	25	0	Bottom Side	10mm	23095	707.5	1.007	0.010	0.010
	LTE Band 12	10Mhz	QPSK	25	0	Right Side	10mm	23095	707.5	1.007	0.141	0.142
	LTE Band 12	10Mhz	QPSK	25	0	Left Side	10mm	23095	707.5	1.007	0.088	0.089

	LTE Band 17	10Mhz	QPSK	1	49	Front Side	10mm	23780	709	1.104	0.049	0.054
	LTE Band 17	10Mhz	QPSK	1	49	Back Side	10mm	23780	709	1.104	0.002	0.002
	LTE Band 17	10Mhz	QPSK	1	49	Bottom Side	10mm	23780	709	1.104	0.015	0.017
	LTE Band 17	10Mhz	QPSK	1	49	Right Side	10mm	23780	709	1.104	0.023	0.025
24#	LTE Band 17	10Mhz	QPSK	1	49	Left Side	10mm	23780	709	1.104	0.039	0.043
	LTE Band 17	10Mhz	QPSK	25	25	Front Side	10mm	23790	710	1.059	0.056	**0.059**
	LTE Band 17	10Mhz	QPSK	25	25	Back Side	10mm	23790	710	1.059	0.006	0.006
	LTE Band 17	10Mhz	QPSK	25	25	Bottom Side	10mm	23790	710	1.059	0.020	0.021
	LTE Band 17	10Mhz	QPSK	25	25	Right Side	10mm	23790	710	1.059	0.024	0.025
	LTE Band 17	10Mhz	QPSK	25	25	Left Side	10mm	23790	710	1.059	0.039	0.041

<WLAN2.4GHz &WLAN 5GHz >

Plot No.	Band	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Tune-up Scaling Factor	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	Front Side	10mm	11	2462	0.010	0.028	0.029
14#	WLAN2.4GHz	Back Side	10mm	11	2462	1.042	0.106	**0.110**
	WLAN2.4GHz	Top Side	10mm	11	2462	1.042	0.014	0.015
	WLAN2.4GHz	Right Side	10mm	11	2462	1.042	0.006	0.006
	WLAN2.4GHz	Left Side	10mm	11	2462	1.042	0.040	0.042
	WLAN5GHz	Front Side	10mm	64	5320	1.074	0.078	0.084
	WLAN5GHz	Back Side	10mm	64	5320	1.074	0.082	0.088
	WLAN5GHz	Bottom Side	10mm	64	5320	1.074	0.071	0.076
	WLAN5GHz	Right Side	10mm	64	5320	1.074	0.093	0.100
12#	WLAN5GHz	Left Side	10mm	64	5320	1.074	0.130	**0.140**
	WLAN5GHz	Front Side	10mm	120	5600	1.019	0.114	0.116
11#	WLAN5GHz	Back Side	10mm	120	5600	1.019	0.139	**0.142**
	WLAN5GHz	Bottom Side	10mm	120	5600	1.019	0.079	0.080
	WLAN5GHz	Right Side	10mm	120	5600	1.019	0.083	0.085
	WLAN5GHz	Left Side	10mm	120	5600	1.019	0.072	0.073
9#	WLAN5GHz	Front Side	10mm	149	5745	1.074	0.130	**0.140**
	WLAN5GHz	Back Side	10mm	149	5745	1.074	0.081	0.087
	WLAN5GHz	Bottom Side	10mm	149	5745	1.074	0.059	0.063
	WLAN5GHz	Right Side	10mm	149	5745	1.074	0.052	0.056
	WLAN5GHz	Left Side	10mm	149	5745	1.074	0.064	0.068

14. Repeated SAR Measurement

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

15. Multiple Transmitters Evaluation

Stand-alone SAR

Test distance: 10mm			
Band	**Highest power(mW) per tune up**	**1-g SAR test threshold**	**Test required?**
Wi-Fi (2.4G)	100.00	[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√f(GHz)] ≤ 3.0 for 1-g SAR	Yes
Wi-Fi (5.2G&5.3GHz)	11.22		Yes
Wi-Fi (5.8G)	25.12		Yes
Bluetooth	2.24		No

The SAR test for BT is not required.

The BT stand-alone SAR is not required, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
(*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.
(Max power=2.24 mW; *min. test separation distance*= 5mm for Head; *f*=2.4GHz)
BT estimated Head SAR =0.094W/Kg (1g)
(Max power=2.24 mW; *min. test separation distance*= 10mm for Body; *f*=2.4GHz)
BT estimated Body SAR =0.047W/Kg (1g)

Simultaneous Evaluation:

No.	Simultaneous transmission Condition	Head	Body-worn
	GSM/GPRS/EDGE + WLAN 2.4GHz	Yes	Yes
	WCDMA + WLAN 2.4GHz	Yes	Yes
	LTE + WLAN 2.4GHz	Yes	Yes
	GSM/GPRS/EDGE + WLAN 5GHz	Yes	Yes
	WCDMA + WLAN 5GHz	Yes	Yes
	LTE + WLAN 5GHz	Yes	Yes
	GSM/GPRS/EDGE + Bluetooth	Yes	Yes
	WCDMA + Bluetooth	Yes	Yes
	LTE + Bluetooth	Yes	Yes

Note:

1. When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the Wi-Fi transmitter and another WWAN transmitter. Both transmitter often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. The "Portable Hotspot" feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

2. The hotspot SAR result may overlap with the body-worn accessory SAR requirements, per KDB 941225 D06, the more conservative configurations can be considered, thus excluding some unnecessary body-worn accessory SAR tests.

3. GSM supports voice and data transmission, though not simultaneously. WCDMA supports voice and data transmission simultaneously.

4. Simultaneous Transmission SAR evaluation is not required for BT and Wi-Fi , because the software mechanism have been incorporated to guarantee that the WLAN and Bluetooth transmitters would not simultaneously operate.

5. Per KDB 447498D01v06, Simultaneous Transmission SAR Evaluation procedures is as followed:

   Step 1: If sum of 1 g SAR < 1.6 W/kg, Simultaneous SAR measurement is not required.

   Step 2: If sum of 1 g SAR > 1.6 W/kg, ratio of SAR to peak separation distance for pair of transmitters calculated.

   Step 3: If the ratio of SAR to peak separation distance is ≤ 0.04, Simultaneous SAR measurement is not required.

Step 4: If the ratio of SAR to peak separation distance is > 0.04, Simultaneous SAR measurement is required and simultaneous transmission SAR value is calculated.
(The ratio is determined by: (SAR1 + SAR2) ^ 1.5/Ri ≤ 0.04,
Ri is the separation distance between the peak SAR locations for the antenna pair in mm)

Applicable Multiple Scenario Evaluation

Test Position	Main Ant. SAR_{Max} (W/Kg)	Bluetooth SAR(W/Kg)	Wi-Fi SAR_{Max}(W/Kg)	∑1-g SAR_{Max} (W/Kg)	
				BT&Main Ant	Wi-Fi &Main Ant
Head	0.320	0.094	0.106	0.414	0.426
Hotspot	0.322	0.047	0.140	0.369	0.462
Body-worn	0.322	0.047	0.140	0.369	0.462

Simultaneous Transmission SAR evaluation is not required for Wi-Fi and WCDMA&GSM&LTE, because the sum of 1g SAR_{Max} is **0.462** W/Kg < 1.6W/Kg for Wi-Fi and WCDMA&GSM&LTE.
Simultaneous Transmission SAR evaluation is not required for BT and WCDMA&GSM&LTE, because the sum of 1g SAR_{Max} is **0.369**W/Kg < 1.6W/Kg for BT and WCDMA&GSM&LTE.
(According to KDB 447498D01v06, the sum of the Highest *reported* SAR of each antenna does not exceed the limit, simultaneous transmission SAR evaluation is not required.)

END OF REPORT