REPORT No.：SZ17110018S01

SAR TEST REPORT

APPLICANT	:	Shenzhen Chainway Information Technology Co., Ltd.
PRODUCT NAME	:	Mobile Data Terminal
MODEL NAME	:	C71
BRAND NAME	:	CHAINWAY
FCC ID	:	2AC6AC71
STANDARD(S)	:	47CFR 2.1093 IEEE 1528-2013
TEST DATE	:	2017-11-15 to 2017-12-01
ISSUE DATE	:	2017-12-04

Tested by: Peng Fuwei

Peng Fuwei (Test engineer)

Approved by:

Peng Huarui (Supervisor)

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DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2017-12-04	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:	C71
Brand Name:	CHAINWAY
Hardware Version:	C70SEA_mb_v12
Software Version:	C71A_MT6735_V1.1_AM_GITD00F0C3
Frequency Bands:	GSM850: 824.2 MHz ~ 848.8MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6MHz WCDMA Band II: 1852.4 MHz ~ 1907.6MHz LTE Band 2: 1860 MHz ~ 1900 MHz LTE Band 4: 1720 MHz ~ 1745 MHz LTE Band 7: 2510 MHz ~ 2560 MHz LTE Band 12: 704 MHz ~ 711 MHz LTE Band 17: 709 MHz ~ 711 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5725 MHz ~ 5875 MHz; Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Modulation Mode:	GSM / GPRS: GMSK EDGE: 8PSK WCDMA: AMR/RMC 12.2Kbps/HSDPA/HSUPA/HSPA+ LTE: QPSK / 16QAM (Uplink) Bluetooth 4.0 - LE: GFSK WLAN 2.4GHz: 802.11b/g//n HT-20/ HT-40

	WLAN 5GHz: 802.11a/n HT-20/ HT-40 NFC: ASK		
Multi-slot Class:	GPRS: Multi-slot Class 12; EDGE: Multi-slot Class 12;		
Operation mode:	Class B		
Hotspot function:	2.4GHz support hotspot mode. 5GHz does not support hotspot mode		
Antenna type:	WWAN : Fixed Internal Antenna WLAN : Fixed Internal Antenna Bluetooth : Fixed Internal Antenna		
SIMcards description:	For dual SIM card version, SIM 1 and SIM 2 are the same chipset unit and testedas a single chipset, the SIM 1 is chosen for test.		
Max Scaled SAR-1g(W/Kg)	Head	0.452W/kg	Limit(W/kg): 1.6W/kg
	Body	0.694W/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

Mode/Band	Test Position	Measurement SAR-1g(W/kg)	Reported SAR-1g(W/Kg)	Plot
GSM850	Head	0.024	0.027	1#
	Body(10mm Gap)	0.259	0.298	3#
GSM1900	Head	0.140	0.148	2#
	Body(10mm Gap)	0.650	0.689	4#
WCDMA Band V	Head	0.045	0.052	9#
	Body(10mm Gap)	0.058	0.067	10#
WCDMA Band IV	Head	0.171	0.200	7#
	Body(10mm Gap)	0.479	0.560	8#
WCDMA Band II	Head	0.397	**0.452**	5#
	Body(10mm Gap)	0.610	**0.694**	6#
FDD-LTE Band 2	Head	0.215	0.249	11#
	Body(10mm Gap)	0.302	0.350	12#
FDD-LTE Band 4	Head	0.175	0.181	13#
	Body(10mm Gap)	0.426	0.440	14#
FDD-LTE Band 7	Head	0.133	0.135	15#
	Body(10mm Gap)	0.475	0.484	16#
FDD-LTE Band 12	Head	0.036	0.038	17#
	Body(10mm Gap)	0.109	0.117	18#
FDD-LTE Band 17	Head	0.065	0.077	19#
	Body(10mm Gap)	0.066	0.078	20#
WLAN 2.4GHZ	Head	0.152	**0.162**	21#
	Body(10mm Gap)	0.075	0.080	22#
WLAN 5.2GHz	Head	0.071	0.084	23#
	Body(10mm Gap)	0.124	**0.147**	24#
WLAN 5.3GHz	Head	0.070	0.085	25#
	Body(10mm Gap)	0.120	0.146	26#
WLAN 5.8GHz	Head	0.072	0.087	27#
	Body(10mm Gap)	0.096	0.116	28#

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 typically applied.

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

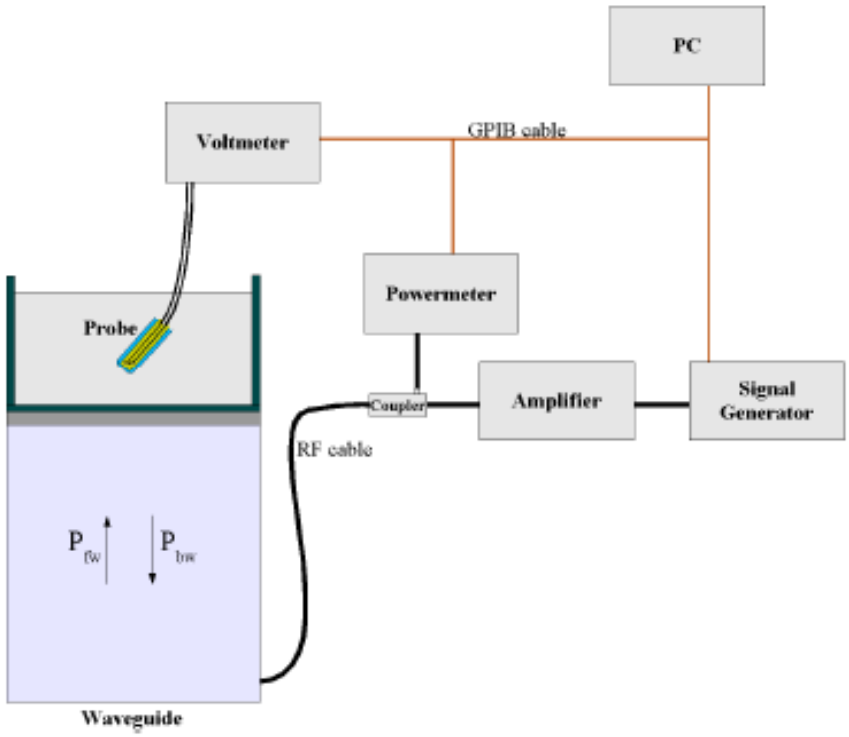
For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with Following specifications is used

- 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.



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

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,

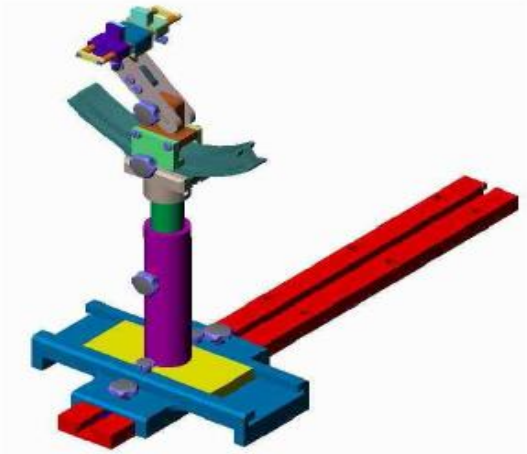
ρ = Tissue density (1.25 g/cm³ for brain tissue)

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 than 15cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm. 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 1: Dielectric Performance of Tissue Simulating Liquid

Temperature: 22.0~23.8°C, humidity: 54~60%.							
Date	**Freq.(MHz)**	**Liquid Parameters**	**Liquid Temp. (℃)**	**Meas.**	**Target**	**Delta(%)**	**Limit ±(%)**
2017/12/01	Head750	Relative Permittivity(εr):	22.3	41.5	41.9	-0.95	5
		Conductivity(σ):	22.3	0.85	0.89	-4.49	5
2017/12/01	Body750	Relative Permittivity(εr):	22.3	55.23	55.5	-0.49	5
		Conductivity(σ):	22.3	0.95	0.96	-1.04	5
2017/11/15	Head835	Relative Permittivity(εr):	22.7	41.18	41.5	-0.77	5
		Conductivity(σ):	22.7	0.89	0.90	-1.11	5
2017/11/15	Body835	Relative Permittivity(εr):	22.7	55.28	55.2	0.14	5
		Conductivity(σ):	22.7	0.97	0.97	0.00	5
2017/11/16	Head1800	Relative Permittivity(εr):	22.7	40.10	40.0	0.25	5
		Conductivity(σ):	22.7	1.37	1.40	-2.14	5
2017/11/16	Body 1800	Relative Permittivity(εr):	22.7	53.30	53.3	0.00	5
		Conductivity(σ):	22.7	1.52	1.52	0.00	5
2017/11/15	Head2000	Relative Permittivity(εr):	22.6	39.92	39.90	0.20	5
		Conductivity(σ):	22.6	1.43	1.42	-0.70	5
2017/11/15	Body2000	Relative Permittivity(εr):	22.6	53.24	53.3	-0.02	5
		Conductivity(σ):	22.6	1.54	1.52	0.00	5
2017/11/27	Head 2450	Relative Permittivity(εr):	22.7	39.28	39.20	0.20	5
		Conductivity(σ):	22.7	1.83	1.80	1.67	5

2017/11/27	Body 2450	Relative Permittivity(εr):	22.7	52.88	52.70	0.34	5
		Conductivity(σ):	22.7	1.97	1.95	1.03	5
2017/11/17	Head 2600	Relative Permittivity(εr):	22.4	39.02	39.0	0.05	5
		Conductivity(σ):	22.4	1.98	1.96	1.02	5
2017/11/17	Body 2600	Relative Permittivity(εr):	22.4	52.26	52.5	-0.27	5
		Conductivity(σ):	22.4	2.16	2.16	-2.31	5
2017/11/30	Head5200	Relative Permittivity(εr):	22.8	36.12	36.0	0.33	5
		Conductivity(σ):	22.8	4.67	4.66	0.21	5
2017/11/30	Body 5200	Relative Permittivity(εr):	22.8	49.27	49.0	0.55	5
		Conductivity(σ):	22.8	5.54	5.30	4.53	5
2017/11/30	Head5800	Relative Permittivity(εr):	22.8	35.33	35.3	0.08	5
		Conductivity(σ):	22.8	5.31	5.27	0.76	5
2017/11/30	Body 5800	Relative Permittivity(εr):	22.8	48.09	48.2	-0.23	5
		Conductivity(σ):	22.8	5.93	6.00	-1.17	5

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

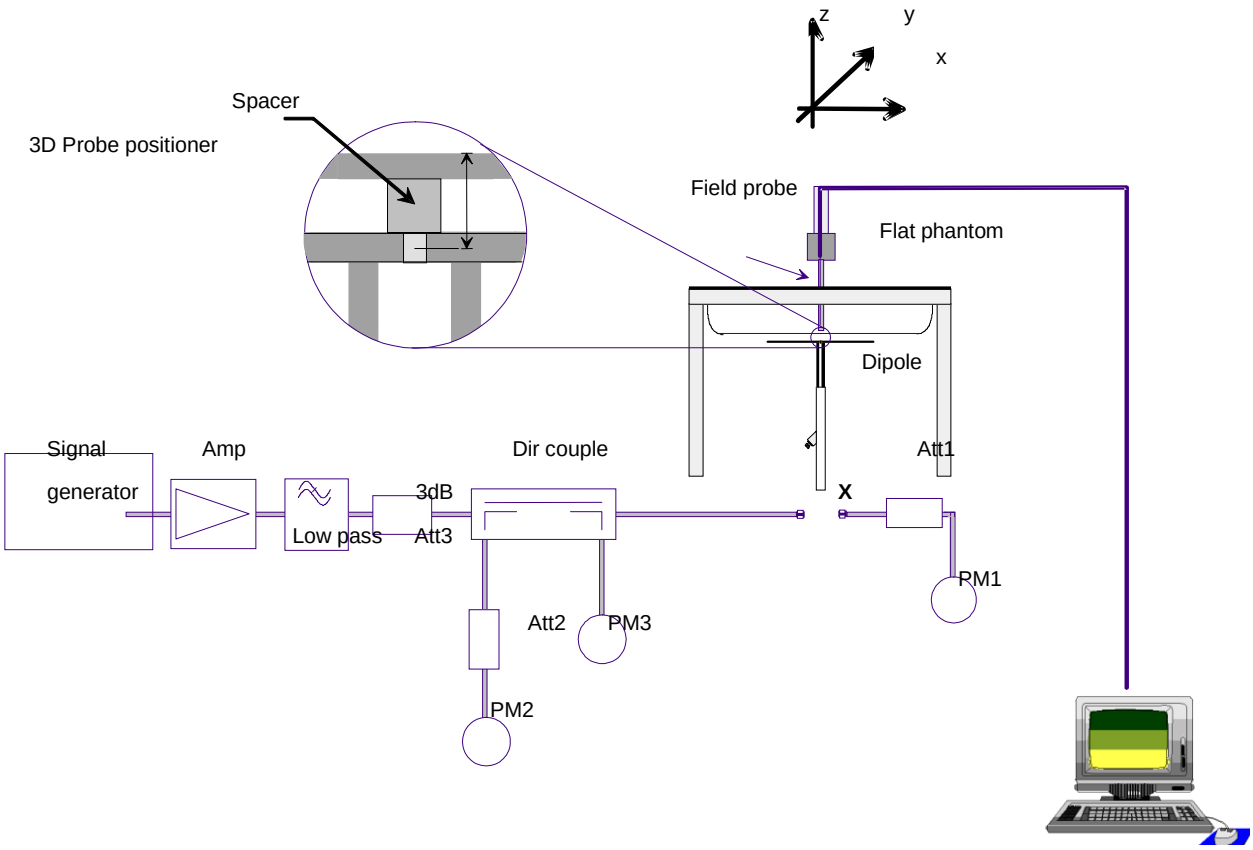
a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+-%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
Measurement System									
Probe calibration	E.2.1	4.76	N	1	1	1	4.76	4.7	∞
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	0.7	0.7	1.01	1.0	∞
Hemispherical Isotropy	E.2.2	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 specific spacer in place. The distance spacer is touch the phantom surface with a light 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 (250mW is used for 700MHz to 3GHz, 100mW is used for 3.5GHz to 6 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 %.

Frequency	750MHz(H)	750MHz(B)	835MHz(H)	835MHz(B)	1800MHz(H)	1800MHz(B)
Target value 1W (1g)	8.41 W/Kg	8.69 W/Kg	9.61W/Kg	9.88W/Kg	37.05W/Kg	37.78 W/Kg
Test value 1g (100 mW input power)	0.835 W/Kg	0.865 W/Kg	0.968W/Kg	0.975W/Kg	3.698 W/Kg	3.753 W/Kg
Normalized to 1W value(1g)	8.35 W/Kg	8.65 W/Kg	9.68 W/Kg	9.75 W/Kg	36.98 W/Kg	37.53 W/Kg
Deviation	0.71%	0.46%	0.81%	0.52%	0.19%	0.66%

Frequency	2000MHz(H)	2000MHz(B)	2450MHz(H)	2450MHz(B)	2600MHz(H)	2600MHz(B)
Target value 1W (1g)	42.70 W/Kg	41.43W/Kg	53.34W/Kg	50.93W/Kg	56.94W/Kg	54.07W/Kg
Test value 1g (100 mW input power)	4.256W/Kg	4.120 W/Kg	5.326 W/Kg	5.081 W/Kg	5.681W/Kg	5.386 W/Kg
Normalized to 1W value(1g)	42.56 W/Kg	41.20 W/Kg	53.26 W/Kg	50.81 W/Kg	56.81W/Kg	53.86W/Kg
Deviation	0.33%	0.56%	0.15%	0.24%	0.15%	0.24%

Frequency	5200MHz(H)	5200MHz(B)	5600MHz(H)	5600MHz(B)	5800MHz(H)	5800MHz(B)
Target value 1W (1g)	164.05W/Kg	163.36W/Kg	171.66W/Kg	172.11W/Kg	177.81W/Kg	177.10W/Kg
Test value 1g (100 mW input power)	16.399 W/Kg	16.284W/Kg	17.144 W/Kg	17.196W/Kg	17.711 W/Kg	17.695W/Kg
Normalized to 1W value(1g)	163.99W/Kg	162.84W/Kg	171.44W/Kg	171.96W/Kg	177.11 W/Kg	176.95W/Kg
Deviation	0.04%	0.32%	0.13%	0.09%	0.39%	0.08%

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.

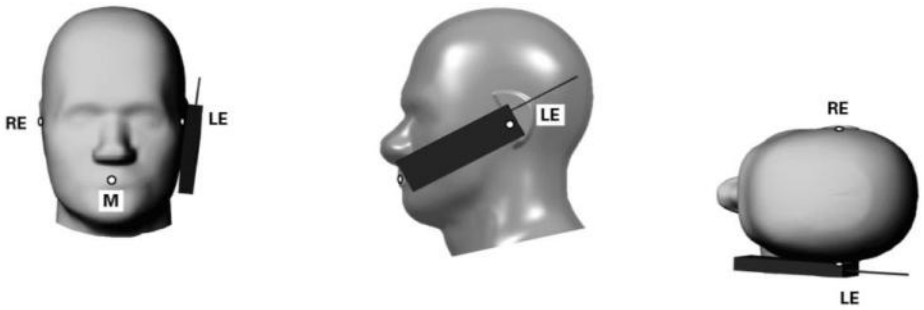


Illustration for Cheek Position

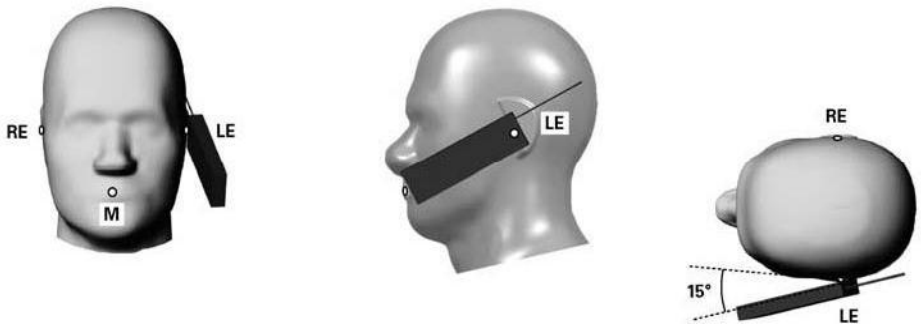


Illustration for Tilted Position

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.

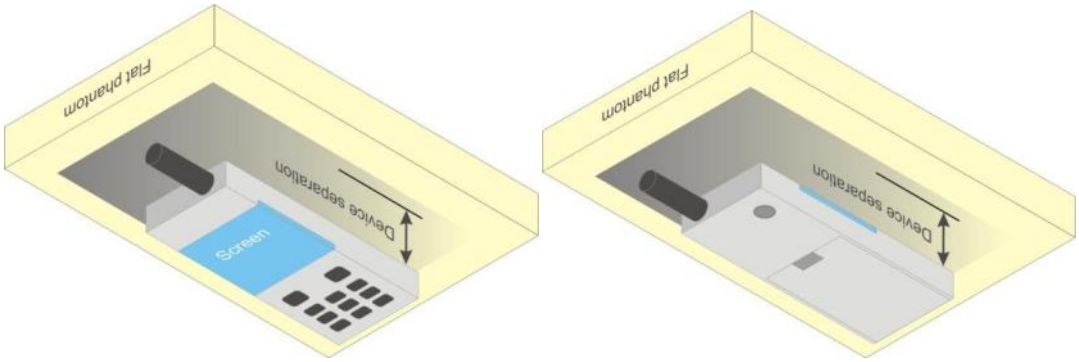


Illustration for Body-Worn Position

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.

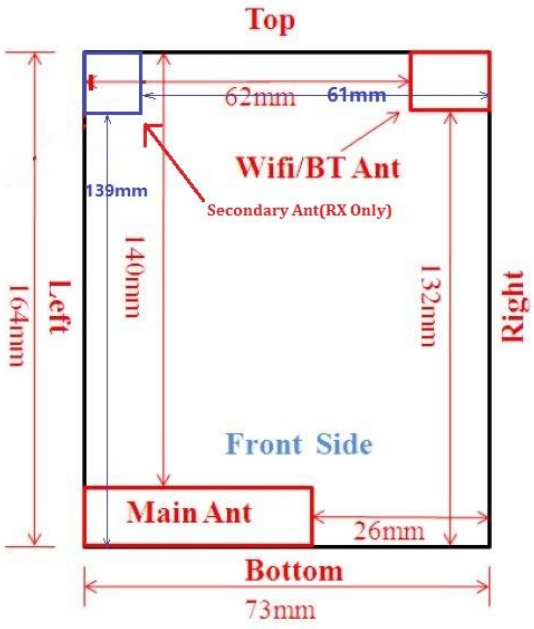
8.4. Description of interpolation/extrapolation scheme

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. Hot-spot Mode Evaluation Procedure



Assessment	Hotspot side for SAR				Test distance: 10mm	
Antennas	**Back**	**Front**	**Top**	**Left**	**Right**	**Bottom**
LTE/WCDMA/GSM	**Yes**	**Yes**	**No**	**Yes**	**No**	**Yes**
WLAN&BT	**Yes**	**Yes**	**Yes**	**No**	**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/Hotspot mode 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="7">Band 2
Tx:1850-1910MHz
Band 4
Tx:1710-1755MHz
Band 7
Tx:2510-2560MHz
Band 12
Tx:699-711MHz
Band 17
Tx:706.5-711MHz</td></tr>
<tr><td rowspan="14">2</td><td rowspan="14">Identify the high, middle and low (L, M, H) channel numbers and frequencies tested in each LTE frequency band</td><td>Band2</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td></td><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>Band4</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td></td><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>Band7</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td></td><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 r*equired 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.

Higher order modulations

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 bandwidth s 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)		
TX Channel	128	189	251		128	189	251
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8
GSM 1 Tx slot	32.44	32.43	**32.45**	33.00	23.44	23.43	23.45
GPRS 1 Tx slot	32.22	32.30	32.32	33.00	23.22	23.30	23.32
GPRS 2 Tx slots	32.00	32.02	32.03	32.50	26.00	26.02	26.03
GPRS 3 Tx slots	30.41	30.42	30.46	30.50	26.15	26.16	26.20
GPRS 4 Tx slots	29.33	29.34	**29.39**	30.00	26.33	26.34	26.39
EDGE 1 Tx slot	27.83	27.69	27.71	28.50	18.83	18.69	18.71
EDGE 2 Tx slots	27.66	27.46	27.24	28.00	21.66	21.46	21.24
EDGE 3 Tx slots	27.22	27.45	27.25	28.00	22.96	23.19	22.99
EDGE 4 Tx slots	26.62	26.94	26.88	27.50	23.62	23.94	23.88

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)		
TX Channel	512	661	810		512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8		1850.2	1880.0	1909.8
GSM 1 Tx slot	29.13	**29.20**	**29.19**	29.50	20.13	20.20	20.19
GPRS 1 Tx slot	29.10	29.17	29.11	29.50	20.10	20.17	20.11
GPRS 2 Tx slots	29.06	29.02	29.02	29.50	23.06	23.02	23.02
GPRS 3 Tx slots	27.39	27.62	27.77	28.00	23.13	23.36	23.51
GPRS 4 Tx slots	26.24	26.54	**26.75**	27.00	23.24	23.54	23.75
EDGE 1 Tx slot	26.03	26.01	26.12	26.50	17.03	17.01	17.12
EDGE 2 Tx slots	25.04	24.92	25.05	25.50	19.04	18.92	19.05
EDGE 3 Tx slots	25.07	24.89	24.81	25.50	20.81	20.63	20.55
EDGE 4 Tx slots	24.83	24.78	24.46	25.50	21.83	21.78	21.46

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		1313	1413	1512	
Rx Channel		9662	9800	9938		1537	1675	1738	
Frequency (MHz)		1852.4	1880	1907.6		1712.6	1732.6	1752.4	
3GPP Rel 99	AMR 12.2Kbps	22.82	22.92	22.91	23.50	22.16	22.30	22.20	23.00
3GPP Rel 99	RMC 12.2Kbps	22.85	**22.94**	22.92	23.50	22.18	**22.32**	22.23	23.00
3GPP Rel 6	HSDPA Subtest-1	21.94	22.05	22.16	22.50	21.30	21.20	21.35	21.50
3GPP Rel 6	HSDPA Subtest-2	21.98	22.04	22.21	22.50	21.27	21.20	21.38	21.50
3GPP Rel 6	HSDPA Subtest-3	21.50	21.59	21.72	22.00	20.82	20.71	20.92	21.00
3GPP Rel 6	HSDPA Subtest-4	21.47	21.55	21.69	22.00	20.79	20.71	20.91	21.00
3GPP Rel 6	HSUPA Subtest-1	19.95	20.05	20.09	20.50	19.33	19.16	19.38	20.00
3GPP Rel 6	HSUPA Subtest-2	19.88	19.93	20.10	20.50	19.31	19.19	19.38	20.00
3GPP Rel 6	HSUPA Subtest-3	20.93	20.97	21.11	21.50	20.30	20.20	20.42	20.50
3GPP Rel 6	HSUPA Subtest-4	19.48	19.49	19.61	20.00	18.78	18.66	18.93	19.00
3GPP Rel 6	HSUPA Subtest-5	21.87	21.94	22.07	22.50	21.28	21.18	21.36	21.50
3GPP Rel 7	HSPA+ (16QAM) Subtest-1	21.04	20.93	20.85	21.50	20.87	20.82	20.73	21.00

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	
3GPP Rel 99	AMR 12.2Kbps	22.35	22.35	22.30	23.00
3GPP Rel 99	RMC 12.2Kbps	22.37	**22.38**	22.34	23.00
3GPP Rel 6	HSDPA Subtest-1	21.35	21.18	21.36	21.50
3GPP Rel 6	HSDPA Subtest-2	21.36	21.24	21.40	21.50
3GPP Rel 6	HSDPA Subtest-3	20.92	20.72	20.91	21.00
3GPP Rel 6	HSDPA Subtest-4	20.91	20.75	20.88	21.00
3GPP Rel 6	HSUPA Subtest-1	19.44	19.25	19.38	21.50
3GPP Rel 6	HSUPA Subtest-2	19.36	19.24	19.32	19.50
3GPP Rel 6	HSUPA Subtest-3	20.37	20.23	20.37	20.50
3GPP Rel 6	HSUPA Subtest-4	18.87	18.67	18.81	19.50
3GPP Rel 6	HSUPA Subtest-5	21.36	21.18	21.32	21.50
3GPP Rel 7	HSPA+ (16QAM) Subtest-1	20.69	20.47	20.76	21.00

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	22.46	**22.86**	22.14	23.5
20	QPSK	1	49	22.73	22.57	21.91	
20	QPSK	1	99	22.77	22.23	21.58	
20	QPSK	50	0	**21.85**	21.61	21.08	22.5
20	QPSK	50	24	21.83	21.46	20.88	
20	QPSK	50	50	21.84	21.34	20.75	
20	QPSK	100	0	21.80	21.48	20.90	
20	16QAM	1	0	22.12	22.02	21.59	22.5
20	16QAM	1	49	22.07	21.69	21.26	
20	16QAM	1	99	22.02	21.46	20.98	
20	16QAM	50	0	20.81	20.63	20.15	21.5
20	16QAM	50	24	20.77	20.45	19.97	
20	16QAM	50	50	20.81	20.32	19.81	
20	16QAM	100	0	20.80	20.50	19.93	
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	22.74	22.65	21.91	23.5
15	QPSK	1	37	22.76	22.43	21.75	
15	QPSK	1	74	22.68	22.23	21.55	
15	QPSK	36	0	21.92	21.60	20.88	22.5
15	QPSK	36	20	21.94	21.53	20.83	
15	QPSK	36	39	21.77	21.29	20.67	
15	QPSK	75	0	21.79	21.42	20.78	
15	16QAM	1	0	21.94	22.00	21.29	22.5
15	16QAM	1	37	21.91	21.72	21.06	
15	16QAM	1	74	22.05	21.49	20.82	
15	16QAM	36	0	20.71	20.62	19.92	21.5
15	16QAM	36	20	20.73	20.55	19.83	

15	16QAM	36	39	20.75	20.41	19.69	
15	16QAM	75	0	20.70	20.46	19.78	
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	22.71	22.49	21.79	23.5
10	QPSK	1	25	22.75	22.29	21.69	
10	QPSK	1	49	22.76	22.14	21.58	
10	QPSK	25	0	21.77	21.52	20.78	22.5
10	QPSK	25	12	21.74	21.44	20.69	
10	QPSK	25	25	21.75	21.33	20.63	
10	QPSK	50	0	21.70	21.46	20.69	
10	16QAM	1	0	22.02	21.77	21.21	22.5
10	16QAM	1	25	21.95	21.54	21.08	
10	16QAM	1	49	22.00	21.52	20.96	
10	16QAM	25	0	20.77	20.55	19.83	21.5
10	16QAM	25	12	20.72	20.23	19.75	
10	16QAM	25	25	20.70	20.39	19.70	
10	16QAM	50	0	20.69	20.47	19.75	
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	22.39	22.43	21.32	23.5
5	QPSK	1	12	22.41	22.21	21.23	
5	QPSK	1	24	22.40	22.03	21.10	
5	QPSK	12	0	21.46	21.29	20.30	22.5
5	QPSK	12	7	21.45	21.34	20.27	
5	QPSK	12	13	21.51	21.40	20.25	
5	QPSK	25	0	21.49	21.26	20.21	
5	16QAM	1	0	21.87	21.77	20.34	22.5
5	16QAM	1	12	21.75	21.52	20.37	
5	16QAM	1	24	21.69	21.42	20.22	
5	16QAM	12	0	20.76	20.51	19.33	21.5
5	16QAM	12	7	20.57	20.39	19.32	
5	16QAM	12	13	20.62	20.31	19.32	
5	16QAM	25	0	20.53	20.23	19.25	
Channel				18615	18900	19185	Tune-up limit
Frequency (MHz)				1851.5	1880	1908.5	

							(dBm)
3	QPSK	1	0	22.61	22.10	21.10	23.5
3	QPSK	1	8	22.70	22.02	21.11	
3	QPSK	1	14	22.67	22.11	21.00	
3	QPSK	8	0	21.70	21.39	20.13	22.5
3	QPSK	8	4	21.66	21.37	20.12	
3	QPSK	8	7	21.66	21.42	20.11	
3	QPSK	15	0	21.50	21.44	20.15	
3	16QAM	1	0	21.96	21.52	20.51	22.5
3	16QAM	1	8	21.98	21.53	20.58	
3	16QAM	1	14	21.90	21.48	20.46	
3	16QAM	8	0	20.74	20.56	19.11	21.5
3	16QAM	8	4	20.75	20.54	19.13	
3	16QAM	8	7	20.69	20.49	19.13	
3	16QAM	15	0	20.53	20.37	19.14	
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	22.68	22.47	21.51	23.5
1.4	QPSK	1	3	22.71	22.50	21.59	
1.4	QPSK	1	5	22.68	22.44	21.50	
1.4	QPSK	3	0	22.81	22.54	21.64	
1.4	QPSK	3	1	22.81	22.47	21.58	
1.4	QPSK	3	3	22.84	22.52	21.58	
1.4	QPSK	6	0	21.80	21.51	20.52	22.5
1.4	16QAM	1	0	21.95	21.80	20.83	22.5
1.4	16QAM	1	3	22.10	21.89	20.88	
1.4	16QAM	1	5	21.97	21.78	20.82	
1.4	16QAM	3	0	21.97	21.49	20.71	
1.4	16QAM	3	1	21.92	21.47	20.65	
1.4	16QAM	3	3	21.93	21.50	20.70	
1.4	16QAM	6	0	20.80	20.44	19.71	21.5

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	22.32	22.77	**23.36**	23.5
20	QPSK	1	49	22.65	22.94	23.31	
20	QPSK	1	99	22.93	23.17	23.35	
20	QPSK	50	0	21.55	21.82	22.14	22.5
20	QPSK	50	24	21.62	21.88	22.20	
20	QPSK	50	50	21.71	22.05	**22.22**	
20	QPSK	100	0	21.54	21.88	22.13	
20	16QAM	1	0	21.55	21.98	22.43	22.5
20	16QAM	1	49	21.82	22.18	22.41	
20	16QAM	1	99	22.09	22.37	22.41	
20	16QAM	50	0	20.42	20.75	21.17	21.5
20	16QAM	50	24	20.52	20.80	21.19	
20	16QAM	50	50	20.59	21.00	21.23	
20	16QAM	100	0	20.49	20.82	21.11	
Channel				20025	20175	20325	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	22.28	22.79	23.05	23.5
15	QPSK	1	37	22.55	22.96	23.30	
15	QPSK	1	74	22.69	23.08	23.21	
15	QPSK	36	0	21.44	21.95	22.11	22.5
15	QPSK	36	20	21.55	21.96	22.18	
15	QPSK	36	39	21.71	22.09	22.18	
15	QPSK	75	0	21.67	21.94	22.20	
15	16QAM	1	0	21.52	22.07	22.38	22.5
15	16QAM	1	37	21.78	22.30	22.43	
15	16QAM	1	74	22.00	22.41	22.42	
15	16QAM	36	0	20.30	20.86	21.04	21.5
15	16QAM	36	20	20.38	20.92	21.09	
15	16QAM	36	39	20.59	21.00	21.06	
15	16QAM	75	0	20.57	20.87	21.06	

Channel				20000	20175	20350	Tune-up limit (dBm)
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	22.26	22.81	23.11	23.5
10	QPSK	1	25	22.41	22.90	23.14	
10	QPSK	1	49	22.62	23.02	23.10	
10	QPSK	25	0	21.32	21.89	22.08	22.5
10	QPSK	25	12	21.41	21.92	22.11	
10	QPSK	25	25	21.48	22.00	22.07	
10	QPSK	50	0	21.36	21.88	22.03	
10	16QAM	1	0	21.52	22.09	22.47	22.5
10	16QAM	1	25	21.67	22.23	22.41	
10	16QAM	1	49	21.77	22.39	22.43	
10	16QAM	25	0	20.31	20.83	21.07	21.5
10	16QAM	25	12	20.32	20.85	21.11	
10	16QAM	25	25	20.40	21.01	21.02	
10	16QAM	50	0	20.30	20.86	21.04	
Channel				19975	20175	20375	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1732.5	1752.5	
5	QPSK	1	0	22.23	22.96	23.25	23.5
5	QPSK	1	12	22.37	23.02	23.35	
5	QPSK	1	24	22.42	23.03	23.23	
5	QPSK	12	0	21.27	22.00	22.16	22.5
5	QPSK	12	7	21.31	21.97	22.14	
5	QPSK	12	13	21.44	22.07	22.14	
5	QPSK	25	0	21.41	21.93	22.06	
5	16QAM	1	0	21.62	22.33	22.21	22.5
5	16QAM	1	12	21.74	22.40	22.27	
5	16QAM	1	24	21.75	22.44	22.13	
5	16QAM	12	0	20.43	21.12	21.13	21.5
5	16QAM	12	7	20.44	21.14	21.14	
5	16QAM	12	13	20.45	21.25	21.11	
5	16QAM	25	0	20.32	20.94	21.09	
Channel				19965	20175	20385	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1732.5	1753.5	
3	QPSK	1	0	22.10	22.78	23.11	23.5

3	QPSK	1	8	22.29	22.86	23.16	
3	QPSK	1	14	22.22	22.85	23.04	
3	QPSK	8	0	21.27	21.85	22.17	22.5
3	QPSK	8	4	21.29	21.83	22.18	
3	QPSK	8	7	21.29	21.84	22.17	
3	QPSK	15	0	21.20	21.82	22.11	
3	16QAM	1	0	21.40	22.07	22.41	22.5
3	16QAM	1	8	21.59	22.19	22.46	
3	16QAM	1	14	21.50	22.14	22.38	
3	16QAM	8	0	20.27	20.87	21.11	21.5
3	16QAM	8	4	20.29	20.86	21.12	
3	16QAM	8	7	20.28	20.87	21.10	
3	16QAM	15	0	20.20	20.78	21.09	
Channel				19957	20175	20393	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1732.5	1754.3	
1.4	QPSK	1	0	22.79	22.89	23.06	23.5
1.4	QPSK	1	3	22.85	22.98	23.12	
1.4	QPSK	1	5	22.86	22.91	23.06	
1.4	QPSK	3	0	22.93	23.02	23.18	
1.4	QPSK	3	1	22.96	22.94	23.15	
1.4	QPSK	3	3	22.96	23.01	23.14	
1.4	QPSK	6	0	21.84	21.96	22.14	22.5
1.4	16QAM	1	0	21.69	22.32	22.30	22.5
1.4	16QAM	1	3	21.85	22.45	22.39	
1.4	16QAM	1	5	21.65	22.32	22.27	
1.4	16QAM	3	0	22.08	22.02	22.16	
1.4	16QAM	3	1	22.08	21.98	22.17	
1.4	16QAM	3	3	22.08	22.03	22.18	
1.4	16QAM	6	0	20.39	20.90	21.20	21.5

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	21.46	**22.42**	21.21	22.5
20	QPSK	1	49	21.81	22.26	20.92	
20	QPSK	1	99	22.09	22.11	20.83	
20	QPSK	50	0	20.56	**20.77**	20.54	21.5
20	QPSK	50	24	20.71	20.66	20.54	
20	QPSK	50	50	20.16	20.54	20.55	
20	QPSK	100	0	20.68	20.62	20.52	
20	16QAM	1	0	20.60	21.11	21.01	21.5
20	16QAM	1	49	20.98	20.95	20.74	
20	16QAM	1	99	21.10	20.59	20.74	
20	16QAM	50	0	19.55	19.70	19.53	20.5
20	16QAM	50	24	19.65	19.64	19.56	
20	16QAM	50	50	19.78	19.50	19.57	
20	16QAM	100	0	19.63	19.60	19.67	
Channel				20825	21100	21375	Tune-up limit (dBm)
Frequency (MHz)				2507.5	2535	2562.5	
15	QPSK	1	0	21.18	21.72	20.83	22.5
15	QPSK	1	37	21.56	21.65	20.74	
15	QPSK	1	74	21.71	21.28	20.64	
15	QPSK	36	0	20.36	20.73	19.79	21.5
15	QPSK	36	20	20.48	20.64	19.72	
15	QPSK	36	39	20.69	20.51	19.66	
15	QPSK	75	0	20.59	20.61	19.71	
15	16QAM	1	0	20.40	20.88	20.03	21.5
15	16QAM	1	37	20.80	20.88	19.91	
15	16QAM	1	74	20.92	20.59	19.83	
15	16QAM	36	0	19.30	19.63	18.70	20.5
15	16QAM	36	20	19.38	19.58	18.65	
15	16QAM	36	39	19.55	19.44	18.63	
15	16QAM	75	0	19.55	19.57	18.64	
Channel				20800	21100	21400	Tune-up limit
Frequency (MHz)				2505	2535	2565	

							(dBm)
10	QPSK	1	0	21.96	22.15	20.75	22.5
10	QPSK	1	25	22.09	22.06	20.64	
10	QPSK	1	49	22.21	21.80	20.60	
10	QPSK	25	0	20.94	21.00	19.63	21.5
10	QPSK	25	12	21.03	20.96	19.58	
10	QPSK	25	25	21.13	20.96	19.58	
10	QPSK	50	0	21.14	20.77	19.57	
10	16QAM	1	0	21.03	21.38	20.00	21.5
10	16QAM	1	25	21.30	21.28	19.94	
10	16QAM	1	49	21.42	21.02	19.93	
10	16QAM	25	0	20.01	20.06	18.60	20.5
10	16QAM	25	12	20.13	20.08	18.57	
10	16QAM	25	25	20.26	19.95	18.58	
10	16QAM	50	0	20.07	19.79	18.58	
Channel				20775	21100	21425	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	QPSK	1	0	22.04	22.23	21.29	22.5
5	QPSK	1	12	22.14	22.23	21.30	
5	QPSK	1	24	22.16	22.04	21.25	
5	QPSK	12	0	21.11	21.28	20.30	21.5
5	QPSK	12	7	21.16	21.24	20.27	
5	QPSK	12	13	21.19	21.18	20.27	
5	QPSK	25	0	21.08	21.18	20.25	
5	16QAM	1	0	21.34	21.45	20.29	21.5
5	16QAM	1	12	21.47	21.44	20.28	
5	16QAM	1	24	21.50	21.40	20.22	
5	16QAM	12	0	20.24	20.40	19.32	20.5
5	16QAM	12	7	20.30	20.40	19.32	
5	16QAM	12	13	20.35	20.33	19.31	
5	16QAM	25	0	20.12	20.23	19.29	

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	22.10	**22.71**	22.55	23
10	QPSK	1	25	22.37	22.50	22.45	
10	QPSK	1	49	22.51	22.34	22.25	
10	QPSK	25	0	21.20	21.42	**21.44**	22
10	QPSK	25	12	21.33	21.43	21.36	
10	QPSK	25	25	**21.44**	21.41	21.22	
10	QPSK	50	0	21.33	21.40	21.25	
10	16QAM	1	0	21.23	21.52	21.96	22
10	16QAM	1	25	21.66	21.93	21.74	
10	16QAM	1	49	21.76	21.52	21.56	
10	16QAM	25	0	20.20	20.45	20.42	21
10	16QAM	25	12	20.30	20.50	20.34	
10	16QAM	25	25	20.51	20.44	20.17	
10	16QAM	50	0	20.31	20.38	20.30	
Channel				23035	23095	23155	Tune-up limit (dBm)
Frequency (MHz)				701.5	707.5	713.5	
5	QPSK	1	0	22.06	22.43	22.36	23
5	QPSK	1	12	22.24	22.62	22.29	
5	QPSK	1	24	22.35	22.51	22.15	
5	QPSK	12	0	21.11	21.49	21.14	22
5	QPSK	12	7	21.15	21.51	21.03	
5	QPSK	12	13	21.24	21.49	21.06	
5	QPSK	25	0	21.09	21.40	21.04	
5	16QAM	1	0	21.23	21.80	21.18	22
5	16QAM	1	12	21.45	22.00	21.01	
5	16QAM	1	24	21.65	21.83	21.04	
5	16QAM	12	0	20.11	20.70	20.13	21
5	16QAM	12	7	20.17	20.67	20.03	
5	16QAM	12	13	20.30	20.66	20.05	

5	16QAM	25	0	20.06	20.43	20.04	
Channel				23025	23095	23165	Tune-up limit (dBm)
Frequency (MHz)				700.5	707.5	714.5	
3	QPSK	1	0	21.75	22.47	22.12	23
3	QPSK	1	8	21.89	22.62	22.17	
3	QPSK	1	14	21.95	22.44	22.03	
3	QPSK	8	0	21.01	21.48	21.07	22
3	QPSK	8	4	21.02	21.46	21.05	
3	QPSK	8	7	21.05	21.43	21.08	
3	QPSK	15	0	20.90	21.44	21.01	
3	16QAM	1	0	20.91	21.72	21.19	22
3	16QAM	1	8	21.11	21.85	21.24	
3	16QAM	1	14	21.20	21.63	21.20	
3	16QAM	8	0	19.99	20.51	20.08	21
3	16QAM	8	4	20.04	20.51	20.08	
3	16QAM	8	7	20.03	20.48	20.04	
3	16QAM	15	0	19.79	20.45	19.93	
Channel				23017	23095	23173	Tune-up limit (dBm)
Frequency (MHz)				699.7	707.5	715.3	
1.4	QPSK	1	0	22.08	22.54	22.17	23
1.4	QPSK	1	3	22.17	22.56	22.24	
1.4	QPSK	1	5	22.11	22.51	22.14	
1.4	QPSK	3	0	22.05	22.58	22.21	
1.4	QPSK	3	1	22.07	22.59	22.10	
1.4	QPSK	3	3	22.11	22.55	22.14	
1.4	QPSK	6	0	21.03	21.51	20.95	22
1.4	16QAM	1	0	21.01	21.92	21.22	22
1.4	16QAM	1	3	21.21	21.96	21.37	
1.4	16QAM	1	5	21.12	21.86	21.29	
1.4	16QAM	3	0	20.99	21.60	20.96	
1.4	16QAM	3	1	20.99	21.62	20.94	
1.4	16QAM	3	3	21.03	21.66	21.06	
1.4	16QAM	6	0	19.85	20.47	19.96	21

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	22.53	22.75	**22.76**	23.5
10	QPSK	1	25	22.54	22.49	22.47	
10	QPSK	1	49	22.30	22.24	22.18	
10	QPSK	25	0	**21.53**	21.41	21.43	22.5
10	QPSK	25	12	21.47	21.35	21.37	
10	QPSK	25	25	21.36	21.18	21.15	
10	QPSK	50	0	21.37	21.26	21.31	
10	16QAM	1	0	21.78	21.72	22.04	22.5
10	16QAM	1	25	21.81	21.68	21.77	
10	16QAM	1	49	21.44	21.35	21.56	
10	16QAM	25	0	20.51	20.51	20.49	21.5
10	16QAM	25	12	20.54	20.42	20.33	
10	16QAM	25	25	20.36	20.18	20.12	
10	16QAM	50	0	20.38	20.19	20.27	
Channel				23755	23790	23825	Tune-up limit (dBm)
Frequency (MHz)				706.5	710	713.5	
5	QPSK	1	0	22.69	22.63	22.63	23.5
5	QPSK	1	12	22.69	22.71	22.71	
5	QPSK	1	24	22.65	22.45	22.45	
5	QPSK	12	0	21.58	21.52	21.52	22.5
5	QPSK	12	7	21.61	21.45	21.45	
5	QPSK	12	13	21.68	21.33	21.33	
5	QPSK	25	0	21.52	21.34	21.34	
5	16QAM	1	0	22.08	21.71	21.71	22.5
5	16QAM	1	12	22.07	21.65	21.65	
5	16QAM	1	24	22.01	21.36	21.36	
5	16QAM	12	0	20.70	20.53	20.53	21.5
5	16QAM	12	7	20.76	20.46	20.46	
5	16QAM	12	13	20.81	20.31	20.31	
5	16QAM	25	0	20.51	20.45	20.45	

4. 2.4GHz Wi-Fi Average output power

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	CH 1	2412	16.82	17.00	19	99.64
		CH 6	2437	**17.75**	**18.00**	19	
		CH 11	2462	16.22	16.50	19	
	802.11g 6Mbps	CH 1	2412	12.78	13.50	17	97.34
		CH 6	2437	14.73	15.50	17	
		CH 11	2462	13.72	14.00	17	
	802.11n-HT20 MCS0	CH 1	2412	12.83	14.50	17	97.15
		CH 6	2437	14.79	15.00	17	
		CH 11	2462	13.97	14.50	17	
	802.11n-HT40 MCS0	CH 3	2422	13.87	14.50	16.5	94.73
		CH 6	2437	14.13	14.50	16.5	
		CH 9	2452	13.73	14.50	16.5	

5. 5GHz Wi-Fi Average output power

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	CH 36	5180	16.17	17.00	17	97.19
		CH 44	5220	16.37	17.00	17	
		CH 48	5240	15.92	17.00	17	
	802.11n-HT20 MCS0	CH 36	5180	16.36	17.00	17	97.00
		CH 44	5220	16.07	17.00	17	
		CH 48	5240	16.08	17.00	17	
	802.11n-HT40 MCS0	CH 38	5190	**16.51**	**17.00**	17	94.30
		CH 46	5230	16.10	17.00	17	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	CH 52	5260	15.71	16.50	17	97.19
		CH 60	5300	16.28	17.00	17	
		CH 64	5320	15.68	16.50	17	
	802.11n-HT20 MCS0	CH 52	5260	15.67	16.00	17	97.00
		CH 60	5300	15.82	16.50	17	
		CH 64	5320	15.83	16.50	17	
	802.11n-HT40 MCS0	CH 54	5270	**15.98**	**16.50**	17	94.30
		CH 62	5310	15.87	16.50	17	

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
5.8GHz WLAN	802.11a MCS0	CH 149	5745	15.12	16.00	17	97.19
		CH 157	5785	15.84	16.50	17	
		CH 165	5825	15.35	16.00	17	
	802.11n-HT20 MCS0	CH 149	5745	15.76	16.50	17	97.00
		CH 157	5785	15.23	16.00	17	
		CH 165	5825	**15.85**	**16.50**	17	
	802.11n-HT40 MCS0	CH 151	5755	15.93	16.00	17	94.30
		CH 159	5795	15.42	16.00	17	

6. BT average output power

Band	Channel	Frequency (MHz)	Output Power(dBm)
			GFSK
BT4.0	0	2402	-0.86
	19	2441	-0.77
	39	2480	-1.33

13. Test Results List

Summary of Measurement Results (GSM 850MHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Measurement SAR(W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
GSM	Right Cheek	0mm	251	1.135	0.024	**0.027**
	Right Tilt	0mm	251	1.135	0.012	0.014
	Left Cheek	0mm	251	1.135	0.015	0.017
	Left Tilt	0mm	251	1.135	0.011	0.012
	Back upward	10mm	251	1.135	0.041	0.047
	Face upward	10mm	251	1.135	0.019	0.022
GPRS(4 TX slots)	Back upward	10mm	251	1.151	0.259	**0.298**
	Face upward	10mm	251	1.151	0.056	0.064
	Left Edge	10mm	251	1.151	0.047	0.054
	Bottom Edge	10mm	251	1.151	0.067	0.077

Summary of Measurement Results (GSM 1900MHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Measurement SAR(W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
GSM	Right Cheek	0mm	661	1.072	0.140	**0.150**
	Right Tilt	0mm	661	1.072	0.047	0.050
	Left Cheek	0mm	661	1.072	0.083	0.089
	Left Tilt	0mm	661	1.072	0.016	0.017
	Back upward	10mm	661	1.072	0.402	0.431
	Face upward	10mm	661	1.072	0.243	0.260
GPRS(4 TX slots)	Back upward	10mm	810	1.059	0.650	**0.689**
	Face upward	10mm	810	1.059	0.353	0.374
	Left Edge	10mm	810	1.059	0.160	0.169
	Bottom Edge	10mm	810	1.059	0.200	0.212

Note:

1. GPRS/EDGE test Scenario(Based on the Max. Time-based Average Power)

Band	Slots	Power level	Duty Cycle
GPRS850	4	5	2.08
GPRS1900	4	0	2.08

2. SAR is not required for EDGE mode because its output power is less than that of GPRS mode.

Summary of Measurement Results (WCDMA 850MHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Band Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Measurement SAR(W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
WCDMA Band V RMC 12.2Kbps	Right Cheek	0mm	4182	1.153	0.045	**0.052**
	Right Tilt	0mm	4182	1.153	0.017	0.020
	Left Cheek	0mm	4182	1.153	0.030	0.035
	Left Tilt	0mm	4182	1.153	0.015	0.017
	Back upward	10mm	4182	1.153	0.058	**0.067**
	Face upward	10mm	4182	1.153	0.017	0.020
	Left Edge	10mm	4182	1.153	0.025	0.029
	Bottom Edge	10mm	4182	1.153	0.034	0.039

Summary of Measurement Results (WCDMA 1700Hz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Band Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Measurement SAR(W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
WCDMA Band IV RMC 12.2Kbps	Right Cheek	0mm	1413	1.169	0.169	0.198
	Right Tilt	0mm	1413	1.169	0.071	0.083
	Left Cheek	0mm	1413	1.169	0.171	**0.200**
	Left Tilt	0mm	1413	1.169	0.071	0.083
	Back upward	10mm	1413	1.169	0.479	**0.560**
	Face upward	10mm	1413	1.169	0.260	0.304
	Left Edge	10mm	1413	1.169	0.303	0.354
	Bottom Edge	10mm	1413	1.169	0.302	0.353

Summary of Measurement Results (WCDMA 1900Hz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Band Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Measurement SAR(W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
WCDMA Band II RMC 12.2Kbps	Right Cheek	0mm	9400	1.138	0.126	0.143
	Right Tilt	0mm	9400	1.138	0.077	0.088
	Left Cheek	0mm	9400	1.138	0.309	0.352
	Left Tilt	0mm	9400	1.138	0.397	**0.452**
	Back upward	10mm	9400	1.138	0.610	**0.694**
	Face upward	10mm	9400	1.138	0.563	0.640
	Left Edge	10mm	9400	1.138	0.142	0.162
	Bottom Edge	10mm	9400	1.138	0.192	0.218

Note:

1. When the 1-g SAR for the mid-band channel or the channel with the highest output power satisfy the following conditions, testing of the other channels in the band is not required. (Per KDB 447498 D01 General RF Exposure Guidance v06)
   ≤ 0.8 W/kg and transmission band ≤ 100 MHz
   ≤ 0.6 W/kg and, 100 MHz < transmission bandwidth ≤ 200 MHz
   ≤ 0.4 W/kg and transmission band > 200 MHz
2. The WCDMA mode is test with 12.2kbps RMC and TPC set to all "1", if maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit (i.e. 1.2W/Kg 1g) and maximum average output of each RF channel with HSDPA/HSUPA active is less than 1/4 dB Middle than that measured without HSDPA/HSUPA using 12.2kbps RMC, according to KDB 941225D01v03, SAR is not required for this handset with HSPA capabilities.

Summary of Measurement Results (LTE Band 2 bandwidth 20MHz with QPSK)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak							
Band	Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Meas.SAR (W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
LTE B2 (QPSK)	1RB 0Offset	Right Cheek	0mm	18900	1.159	0.215	**0.249**
		Right Tilt	0mm	18900	1.159	0.097	0.112
		Left Cheek	0mm	18900	1.159	0.118	0.137
		Left Tilt	0mm	18900	1.159	0.054	0.063
		Back upward	10mm	18900	1.159	0.302	**0.350**
		Face upward	10mm	18900	1.159	0.177	0.205
		Left Edge	10mm	18900	1.159	0.140	0.162
		Bottom Edge	10mm	18900	1.159	0.213	0.247
	50RB 0Offset	Right Cheek	0mm	18700	1.161	0.156	0.181
		Right Tilt	0mm	18700	1.161	0.085	0.099
		Left Cheek	0mm	18700	1.161	0.104	0.121
		Left Tilt	0mm	18700	1.161	0.047	0.055
		Back upward	10mm	18700	1.161	0.201	0.233
		Face upward	10mm	18700	1.161	0.118	0.137
		Left Edge	10mm	18700	1.161	0.093	0.108
		Bottom Edge	10mm	18700	1.161	0.142	0.165

Summary of Measurement Results (LTE Band 4 bandwidth 20MHz with QPSK)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak							
Band	Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Meas.SAR (W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
LTE B4 (QPSK)	1RB 0Offset	Right Cheek	0mm	20300	1.033	0.175	**0.181**
		Right Tilt	0mm	20300	1.033	0.055	0.057
		Left Cheek	0mm	20300	1.033	0.157	0.162
		Left Tilt	0mm	20300	1.033	0.073	0.075
		Back upward	10mm	20300	1.033	0.426	**0.440**
		Face upward	10mm	20300	1.033	0.280	0.289
		Left Edge	10mm	20300	1.033	0.279	0.288
		Bottom Edge	10mm	20300	1.033	0.204	0.211

	50RB 50Offset	Right Cheek	0mm	20300	1.086	0.145	0.158
		Right Tilt	0mm	20300	1.086	0.046	0.05
		Left Cheek	0mm	20300	1.086	0.13	0.142
		Left Tilt	0mm	20300	1.086	0.061	0.066
		Back upward	10mm	20300	1.086	0.381	0.414
		Face upward	10mm	20300	1.086	0.25	0.276
		Left Edge	10mm	20300	1.086	0.231	0.25
		Bottom Edge	10mm	20300	1.086	0.184	0.2

Summary of Measurement Results (LTE Band 7 bandwidth 20MHz with QPSK)

Temperature: 21.0~23.8°C, humidity: 54~60%.

Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak

Band	Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Meas.SAR (W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
LTE B7 (QPSK)	1RB 0Offset	Right Cheek	0mm	21100	1.019	0.133	**0.135**
		Right Tilt	0mm	21100	1.019	0.125	0.127
		Left Cheek	0mm	21100	1.019	0.122	0.124
		Left Tilt	0mm	21100	1.019	0.046	0.047
		Back upward	10mm	21100	1.019	0.436	0.444
		Face upward	10mm	21100	1.019	0.272	0.277
		Left Edge	10mm	21100	1.019	0.436	0.444
		Bottom Edge	10mm	21100	1.019	0.475	**0.484**
	50RB 0Offset	Right Cheek	0mm	21100	1.183	0.108	0.128
		Right Tilt	0mm	21100	1.183	0.106	0.12
		Left Cheek	0mm	21100	1.183	0.091	0.108
		Left Tilt	0mm	21100	1.183	0.038	0.045
		Bottom Edge	10mm	21100	1.183	0.366	0.433
		Face upward	10mm	21100	1.183	0.221	0.058
		Left Edge	10mm	21100	1.183	0.368	0.435
		Bottom Edge	10mm	21100	1.183	0.387	0.458

Summary of Measurement Results (LTE Band 12 bandwidth 10MHz with QPSK 1RB)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak							
Band	Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Meas.SAR (W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
LTE B12 (QPSK)	1RB 0Offset	Right Cheek	0mm	23095	1.069	0.036	**0.038**
		Right Tilt	0mm	23095	1.069	0.018	0.019
		Left Cheek	0mm	23095	1.069	0.034	0.036
		Left Tilt	0mm	23095	1.069	0.022	0.024
		Back upward	10mm	23095	1.069	0.109	**0.117**
		Face upward	10mm	23095	1.069	0.043	0.046
		Left Edge	10mm	23095	1.069	0.021	0.022
		Bottom Edge	10mm	23095	1.069	0.013	0.014
	25RB 0Offset	Right Cheek	0mm	23130	1.138	0.025	0.028
		Right Tilt	0mm	23130	1.138	0.013	0.015
		Left Cheek	0mm	23130	1.138	0.021	0.024
		Left Tilt	0mm	23130	1.138	0.015	0.017
		Back upward	10mm	23130	1.138	0.092	0.105
		Face upward	10mm	23130	1.138	0.038	0.043
		Left Edge	10mm	23130	1.138	0.019	0.022
		Bottom Edge	10mm	23130	1.138	0.011	0.013

Summary of Measurement Results (LTE Band 17 bandwidth 10MHz with QPSK)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak							
Band	Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Meas.SAR (W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
LTE B17 (QPSK)	1RB 0Offset	Right Cheek	0mm	23800	1.186	0.065	**0.077**
		Right Tilt	0mm	23800	1.186	0.016	0.019
		Left Cheek	0mm	23800	1.186	0.034	0.040
		Left Tilt	0mm	23800	1.186	0.017	0.020
		Back upward	10mm	23800	1.186	0.066	**0.078**
		Face upward	10mm	23800	1.186	0.033	0.039

		Left Edge	10mm	23800	1.186	0.012	0.014
		Bottom Edge	10mm	23800	1.186	0.008	0.009
	25RB 0Offset	Right Cheek	0mm	23780	1.114	0.044	0.049
		Right Tilt	0mm	23780	1.114	0.013	0.015
		Left Cheek	0mm	23780	1.114	0.023	0.026
		Left Tilt	0mm	23780	1.114	0.011	0.012
		Back upward	10mm	23780	1.114	0.050	0.056
		Face upward	10mm	23780	1.114	0.025	0.029
		Left Edge	10mm	23780	1.114	0.009	0.01
		Bottom Edge	10mm	23780	1.114	0.006	0.007

Note :

1. IEEE Std 1528-2013 require the middle channel to be tested first. This generally applies to wireless devices that are designed to operate in technologies with tight tolerances for maximum output power variations across channels in the band. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.

2. Per KDB 447498, when the SAR procedures require multiple channels to be tested and the 1-g SAR for the highest output channel is less than 0.8 W/kg and peak SAR is less than 1.6W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required.

3. The WCDMA mode is test with 12.2kbps RMC and TPC set to all "1", if maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit (i.e. 1.2W/Kg 1g) and maximum average output of each RF channel with HSDPA/HSUPA active is less than 1/4 dB higher than that measured without HSDPA/HSUPA using 12.2kbps RMC, according to KDB 941225D01v03r01, SAR is not required for this handset with HSPA capabilities. This module supports 3GPP release R7 HSPA+ using QPSK only without 16QAM in the uplink. So PBA is not required for HSPA+

4. R&S CMW500 base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.

1. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
2. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
3. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
4. Per KDB 941225 D05v02r05, for QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
5. Per KDB 941225 D05v02r05, 16QAM/64QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM/64QAM SAR testing is not required.

5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.

Summary of Measurement Results (WLAN 2.4GHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak								
Band Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Duty Cycle (%)	Scaling Factor (Duty Cycle)	Meas. SAR(W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
2.4GHz Wi-Fi 802.11b	Right Cheek	0mm	6	1.059	99.64	1.004	0.084	0.089
	Right Tilt	0mm	6	1.059	99.64	1.004	0.115	0.122
	Left Cheek	0mm	6	1.059	99.64	1.004	0.144	0.153
	Left Tilt	0mm	6	1.059	99.64	1.004	0.152	**0.162**
	Back upward	10mm	6	1.059	99.64	1.004	0.075	**0.080**
	Face upward	10mm	6	1.059	99.64	1.004	0.045	0.048
	Top Edge	10mm	6	1.059	99.64	1.004	0.026	0.028
	Right Edge	10mm	6	1.059	99.64	1.004	0.039	0.041

Summary of Measurement Results (WLAN 5GHz Band)

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak								
Band Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Duty Cycle (%)	Scaling Factor (Duty Cycle)	Meas. SAR(W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
5.2GHz Wi-Fi	Right Cheek	0mm	38	1.119	94.3	1.060	0.050	0.059
	Right Tilt	0mm	38	1.119	94.3	1.060	0.064	0.076
	Left Cheek	0mm	38	1.119	94.3	1.060	0.057	0.068
	Left Tilt	0mm	38	1.119	94.3	1.060	0.071	**0.084**
	Back upward	10mm	38	1.119	94.3	1.060	0.057	0.068
	Face upward	10mm	38	1.119	94.3	1.060	0.124	**0.147**

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak								
Band Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Duty Cycle (%)	Scaling Factor (Duty Cycle)	Meas. SAR(W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
5.3GHz Wi-Fi	Right Cheek	0mm	60	1.180	97.19	1.029	0.050	0.061
	Right Tilt	0mm	60	1.180	97.19	1.029	0.044	0.053
	Left Cheek	0mm	60	1.180	97.19	1.029	0.070	**0.085**
	Left Tilt	0mm	60	1.180	97.19	1.029	0.055	0.067
	Back upward	10mm	60	1.180	97.19	1.029	0.120	**0.146**
	Face upward	10mm	60	1.180	97.19	1.029	0.045	0.055

Temperature: 21.0~23.8°C, humidity: 54~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak								
Band Mode	Device Test Positions	Gap (mm)	Device Test channel	Scaling Factor	Duty Cycle (%)	Scaling Factor (Duty Cycle)	Meas. SAR(W/Kg), 1g	Reported Scaled SAR (W/Kg), 1g
5.8GHz Wi-Fi	Right Cheek	0mm	151	1.14	94.30	1.06	0.051	0.062
	Right Tilt	0mm	151	1.14	94.30	1.06	0.052	0.063
	Left Cheek	0mm	151	1.14	94.30	1.06	0.047	0.057
	Left Tilt	0mm	151	1.14	94.30	1.06	0.072	**0.087**
	Back upward	10mm	151	1.14	94.30	1.06	0.096	**0.116**
	Face upward	10mm	151	1.14	94.30	1.06	0.031	0.037

Notes:

1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be

applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.

2. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
3. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
4. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

Scaling Factor calculation

Band	Tune-up power tolerance(dBm)	SAR test channel Power (dBm)	Scaling Factor
GSM 850	PCL = 5, PWR =32.5+-0.5	32.45	1.135
GPRS 850	PCL = 5, PWR =29.5+-0.5(4 slot)	29.39	1.151
GSM 1900	PCL = 0, PWR =29.5+-0.5	29.19	1.072
GPRS1900	PCL = 0, PWR =26.5+-0.5(4 slot)	26.75	1.059
WCDMA Band V	Max output power =22 (+1/-2)	22.38	1.153
WCDMA Band IV	Max output power =22 (+1/-2)	22.32	1.169
WCDMA Band II	Max output power =22.5(+1/-2)	22.94	1.138
LTE Band 2 (QPSK)	Max output power =23+-0.5(1RB)	22.86	1.159
	Max output power =22+-0.5(50RB)	21.85	1.161
LTE Band 4 (QPSK)	Max output power =23.0+-0.5(1RB)	23.36	1.033
	Max output power =22.5+-0.5(50RB)	22.14	1.086
LTE Band 7 (QPSK)	Max output power =21+-0.5(1RB)	22.42	1.019
	Max output power =21+-0.5(50RB)	20.77	1.183
LTE Band 12 (QPSK)	Max output power =21+-0.5(1RB)	22.71	1.069
	Max output power =21.5+-0.5(25RB)	21.44	1.138
LTE Band 17 (QPSK)	Max output power =21+-0.5(1RB)	22.76	1.186
	Max output power =21.5+-0.5(25RB)	21.53	1.114
WLAN2.4GHz (802.11b)	Max output power =17.5+-0.5	17.75	1.059
WLAN5.2GHz (802.11nHT-40)	Max output power =16.5+-0.5	16.51	1.119
WLAN5.3GHz (802.11a)	Max output power =16+-0.5	16.28	1.18
WLAN5.8GHz (802.11nHT-40)	Max output power =16+-0.5	15.93	1.14

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)	63.1	[(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)	50.12		Yes
Wi-Fi (5.8G)	44.67		Yes
Bluetooth	0.84		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=5.27 mW; *min. test separation distance*= 5mm for Head; *f*=2.4GHz)
BT estimated Head SAR =0.035W/Kg (1g)
(Max power=5.01 mW; *min. test separation distance*= 10mm for Body; *f*=2.4GHz)
BT estimated Body SAR =0.017W/Kg (1g)

Simultaneous Evaluation:

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

3. 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.

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

5. 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.

6. 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 SARMax(W/Kg)	
				BT&Main Ant	Wi-Fi &Main Ant
Head	0.452	0.035	0.162	0.487	0.614
Hotspot	0.694	0.017	0.147	0.711	0.841
Body-worn	0.694	0.017	0.147	0.711	0.841

Simultaneous Transmission SAR evaluation is not required for Wi-Fi and WCDMA&GSM&LTE, because the sum of 1g SAR_{Max} is **0.841** 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 **0.711** 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 thelimit, simultaneous transmission SAR evaluation is not required.)

END OF REPORT