Report No.:SZ13060036S01

SAR TEST REPORT

TESTING
CNAS L3572

Issued to

TCT Mobile Limited

For

LTE USB Modem/LTE AP

Model Name	:	One Touch W800O
Trade Name	:	Alcatel
Brand Name	:	Alcatel
FCC ID	:	RAD403
Standard	:	FCC Oet65 Supplement C Jun.2001 47CFR 2.1093 ANSI C95.1-1999 IEEE 1528-2003
MAX SAR	:	Body: 0.915 W/kg
Test date	:	2013-7-8 to 2013-7-12
Issue date	:	2013-7-15

by

Shenzhen MORLAB Communication Technology Co., Ltd.

Tested by Zou Jian	*Approved by* Zeng Dexin	*Review by* Zhu Zhan
Zou Jian	Zeng Dexin	Zhu Zhan
(Test Engineer)	*(Department Manager)*	(SAR *Manager*)
Date 2013.7.15	*Date* 2013.7.15	*Date* 2013.7.15

CTIA Authorized Test Lab LAB CODE 20081222-00 IEEE 1725 OTA

OFTA 電訊管理局

ilac-MRA

TAF Testing Laboratory

GCF Official Observer of Global Certification Forum

Bluetooth BQTF

FCC Reg. No. 695796

DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2013-7-15	First edition
2.0		

1. Testing Laboratory

1.1. Identification of the Responsible Testing Location

Name: Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory

Address: FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China 51810

1.2. Accreditation Certificate

Accredited Testing Laboratory: No. CNAS L3572

1.3. List of Test Equipments

No.	Instrument	Type	Cal. Date	Cal. Due
1	PC	Dell (Pentium IV 2.4GHz, SN:X10-23533)	(n.a)	(n.a)
2	Network Emulator	Rohde&Schwarz (CMU200, SN:105894)	2012-9-26	1year
3	Voltmeter	Keithley (2000, SN:1000572)	2012-9-24	1year
4	Signal Generator	Rohde&Schwarz (SMP_02)	2012-9-24	1year
5	Amplifier	PRANA (Ap32 SV125AZ)	2012-9-24	1year
6	Power Meter	Rohde&Schwarz (NRVD, SN:101066)	2012-9-24	1year
7	Directional coupler	Giga-tronics(SN:1829112)	2012-9-24	1year
8	Probe	Satimo (SN:SN_3708_EP80)	2012-10-4	1year
9	Dielectric Probe Kit	Agilent (85033E)	2012-9-24	1year
10	Phantom	Satimo (SN:SN_36_08_SAM62)	2012-9-24	1year
11	Liquid	Satimo (Last Calibration: 2013-7-8 to 2013-7-12)	N/A	N.A
12	Dipole 750MHz	Satimo (SN 36/08 DIPC 98)	2012-10-5	1year
13	Dipole 835MHz	Satimo (SN 36/08 DIPC 99)	2012-10-5	1year
14	Dipole 1750MHz	Satimo (SN 36/08 DIPC 101)	2012-10-5	1year
15	Dipole 1900MHz	Satimo (SN 36/08 DIPF 102)	2012-10-5	1year
16	Dipole 2450MHz	Satimo (SN 36/08 DIPJ 103)	2012-10-5	1year

2. Technical Information

Note: the following data is based on the information by the applicant.

2.1. Identification of Applicant

Company Name:	TCT Mobile Limited
Address:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203

2.2. Identification of Manufacturer

Company Name:	TCL COMMUNICATION TECHNOLOGY HOLDINGS LIMITED
Address:	70 Huifeng 4rd, ZhongKai Hi-tech Development District, Huizhou, Guangdong 516006 P.R.China

2.3. Equipment Under Test (EUT)

Model Name:	One Touch W800O
Trade Name:	Alcatel
Brand Name:	Alcatel
Hardware Version:	V2.0
Software Version:	S1_B15001S_1110000_B10001S
Tx Frequency Bands:	GSM 850: 824-849 MHz; GSM 1900: 1850-1910 MHz; WCDMA Band II : 1850-1910; WCDMA Band IV: 1710-1755 MHz WCDMA Band V: 824-849 MHz; LTE Band 2: 1850-1910MHz; LTE Band 4:1710-1755 MHz LTE Band 5: 824-849 MHz; LTE Band 17: 704-716MHz 802.11 b/g/n: 2412-2462 MHz
Uplink Modulations :	GSM/GPRS: GSMK; EDGE: GMSK/8PSK WiFi: DBPSK/CCK; WCDMA/HSDPA/HSUPA/HSPA+:QPSK FDD LTE: QPSK/16QAM
GPRS Multi-Slot Class	GPRS: Multislot Class 12; EDGE: Multislot Class 12
GPRS operation mode:	Class B
DTM Class:	Not supported
3GPP release:	Rel-8
Antenna type:	Fixed Internal Antenna
Development Stage:	Identical prototype

2.3.1. Photographs of the EUT

Please see for photographs of the EUT.

2.3.2. Identification of all used EUTs

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	V2.0	S1_B15001S_1110000_B10001S

2.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	**47 CFR § 2. 1093**	Radiofrequency Radiation Exposure Evaluation: Portable Devices
2	**FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)**	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
3	**ANSI C95.1-1999**	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz
4	**IEEE 1528-2003**	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate(SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.
5	**KDB 447498 D1**	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies v04
6	**KDB 447498 D2**	SAR Procedures for Dongle Xmtr v02
7	**KDB 450824 D1**	SAR Probe Calibration and System Verification Considerations for Measurements at 150MHz-3GHz
8	**KDB 450824 D2**	Dipole SAR Validation Verification v01r01
9	**KDB 941225 D1**	SAR Measurement Procedures for 3G Devices
10	**KDB 941225 D5**	SAR for LTE Devices v02
11	**KDB 248227**	SAR Measurement Procedures for 802.11 a/b/g Transmitters

2.5. Device Category and SAR Limits

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 tissu

3. Specific Absorption Rate (SAR)

3.1. Introduction

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

3.2. SAR Definition

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

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

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

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

, where C is the specific head capacity, δ T is the temperature rise and δ t the exposure duration, or related to the electrical field in the tissue by

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

, where σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the rms electrical field strength.

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

4. SAR Measurement Setup

4.1. The Measurement System

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

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

The following figure shows the system.

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

4.2. Probe

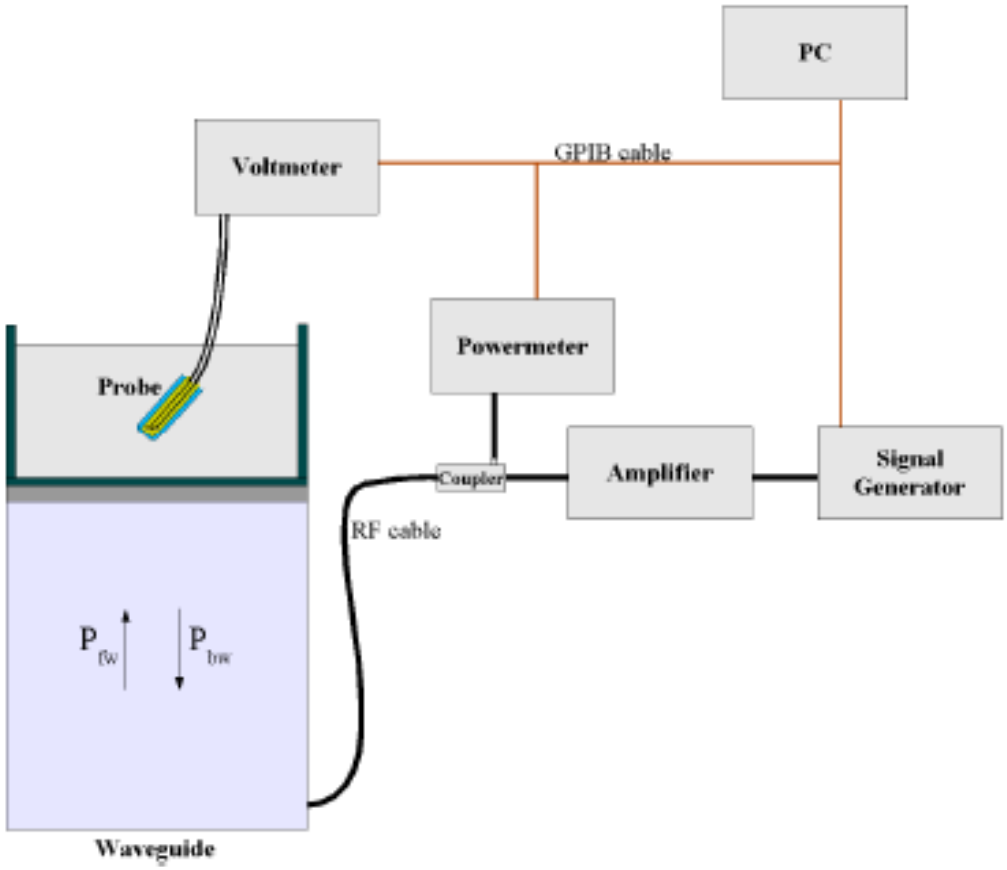
For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with following specifications is used

- 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 suface normal line:1ess 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 annexe 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 a NPL calibrated probe, to verify it.

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

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

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

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

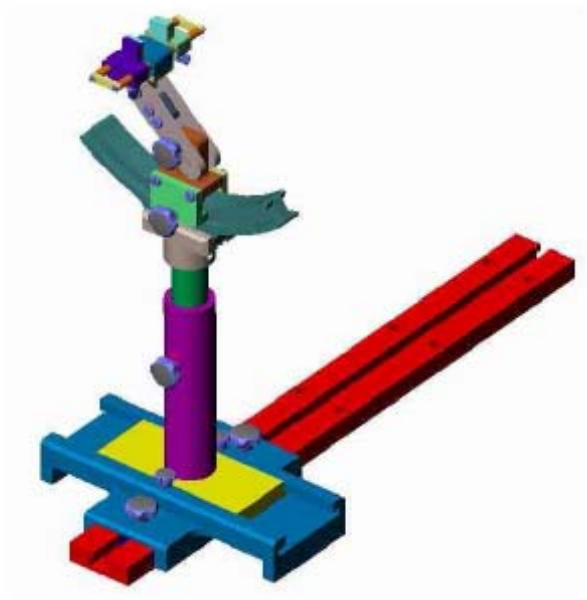
where DCP is the diode compression point in mV.

4.3. 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.

4.4. Device Holder

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



Device holder

System Material	Permittivity	Loss Tangent
Delrin	3.7	0.005

5. Tissue Simulating Liquids

FCC OET Bulletin 65 Supplement C 01-01

Target Frequency (MHz)	Head		Body	
	εr	σ (S/m)	εr	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5000	36.2	4.45	49.3	5.07
5100	36.1	4.55	49.1	5.18
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5400	35.8	4.86	48.7	5.53
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5700	35.4	5.17	48.3	5.88
5800	35.3	5.27	48.2	6.00

IEEE Std 1528-2003 Table 2

Target Frequency (MHz)	Head	
	εr	σ (S/m)
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
1450	40.5	1.20
1800 – 2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40

The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528 and FCC OET 65 Supplement C Appendix C. For the body tissue simulating liquids, the dielectric properties are defined in FCC OET 65 Supplement C Appendix C. 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.

The following table gives the recipes for tissue simulating liquids.

Ingredients (% by weight)	Frequency Band	Frequency Band	Frequency Band	Frequency Band	Frequency Band
	750MHz	835MHz	1750 MHz	1900MHz	2450MHz
Tissue Type	Body	Body	Body	Body	Body
Water	50.0	52.4	68.8	40.4	73.2
Salt(NaCl)	0.8	1.4	0.2	0.5	0.04
Sugar	48.8	45.0	45.0	58.0	0.0
HEC	0.2	1.0	1.0	1.0	0.0
Bactericide	0.2	0.1	0.1	0.1	0.0
Triton	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	31.0	0.0	0.0
Acticide SPX	0.0	0.0	0.0	0.0	26.7
Dielectric Constant	55.5	55.2	53.4	53.3	52.7
Conductivity (S/m)	0.96	0.97	1.49	1.52	1.95

Recipes for Tissue Simulating Liquid

Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 22.0~23.8°C, humidity: 54~60%.						
Date	**Freq.(MHz)**	**Liquid Parameters**	**Meas.**	**Target**	**Delta(%)**	**Limit±(%)**
2013/7/8	Body 750	Relative Permittivity(εr):	54.61	55.55	-1.69	5
		Conductivity(σ):	0.97	0.96	+1.04	5
2013/7/9	Body 835	Relative Permittivity(εr):	55.14	55.2	-0.11	5
		Conductivity(σ):	0.96	0.97	-1.04	5
2013/7/10	Body 1750	Relative Permittivity(εr):	53.51	53.44	+0.13	5
		Conductivity(σ):	1.47	1.49	-1.34	5
2013/7/11	Body 1900	Relative Permittivity(εr):	53.21	53.3	-0.17	5
		Conductivity(σ):	1.51	1.52	-0.66	5
2013/7/12	Body 2450	Relative Permittivity(εr):	52.49	52.7	-0.40	5
		Conductivity(σ):	1.90	1.95	-2.56	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 (+-%)	V i
Measurement System									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	
Axial Isotropy	E.2.2	2.5	R	√3	0.7	0.7	1.01	1.01	
Hemispherical Isotropy	E.2.2	4.0	R	√3	0.7	0.7	1.62	1.62	
Boundary effect	E.2.3	1.0	R	√3	1	1	0.58	0.58	
Linearity	E.2.4	5.0	R	√3	1	1	2.89	2.89	
System detection limits	E.2.5	1.0	R	√3	1	1	0.58	0.58	
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	
Reponse Time	E.2.7	3.0	R	√3	1	1	1.73	1.73	
Integration Time	E.2.8	2.0	R	√3	1	1	1.15	1.15	
RF ambient Conditions	E.6.1	3.0	R	√3	1	1	1.73	1.73	
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	√3	1	1	1.15	1.15	
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	√3	1	1	0.03	0.03	
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	E.5.2	5.0	R	√3	1	1	2.89	2.89	
Test sample Related									
Test sample positioning	E.4.2.1	0.03	N	1	1	1	0.03	0.03	N - 1
Device Holder Uncertainty	E.4.1.1	5.00	N	1	1	1	5.00	5.00	
Output power Power drift - SAR drift measurement	6.6.2	2.74	R	√3	1	1	1.58	1.58	
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	√3	1	1	0.03	0.03	
Liquid conductivity - deviation from target value	E.3.2	4.57	R	√3	0.64	0.43	1.69	1.13	

Liquid conductivity - measurement uncertainty	E.3.3	5.00	N	1	0.64	0.43	3.20	2.15	M
Liquid permittivity - deviation from target value	E.3.2	3.69	R	√3	0.6	0.49	1.28	1.04	
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				12.52	11.71	
Expanded Uncertainty (95% Confidence interval)			k				25.05	23.42	

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	7.0	N	1	1	1	7.00	7.00	
Axial Isotropy	E.2.2	2.5	R	√3	0.7	0.7	1.01	1.01	
Hemispherical Isotropy	E.2.2	4.0	R	√3	0.7	0.7	1.62	1.62	
Boundary effect	E.2.3	1.0	R	√3	1	1	0.58	0.58	
Linearity	E.2.4	5.0	R	√3	1	1	2.89	2.89	
System detection limits	E.2.5	1.0	R	√3	1	1	0.58	0.58	
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	
Reponse Time	E.2.7	3.0	R	√3	1	1	1.73	1.73	
Integration Time	E.2.8	2.0	R	√3	1	1	1.15	1.15	
RF ambient Conditions	E.6.1	3.0	R	√3	1	1	1.73	1.73	
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	√3	1	1	1.15	1.15	
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	√3	1	1	0.03	0.03	
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	E.5.2	5.0	R	√3	1	1	2.89	2.89	
Dipole									
Dipole axis to liquid Distance	8,E.4.2	1.00	N	√3	1	1	0.58	0.58	N-1
Input power and SAR drift measurement	8,6.6.2	2.74	R	√3	1	1	1.58	1.58	

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	1	0.64	0.43	3.20	2.15	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	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				11.50	10.61	
Expanded Uncertainty (95% Confidence interval)			k				23.00	21.21	

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 at frequency 750MHz, 835 MHz, 1750MHz, 1900 MHz and 2450 MHz. 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.

Equipments :

name	Type and specification
Signal generator	Rohde&Schwarz (SMP_02)
Directional coupler	Giga-tronics(SN:1829112)
Amplifier	PRANA (Ap32 SV125AZ)
Reference dipole	750MHz:SN 36/08 DIPC 98 835MHz:SN 36/08 DIPC 99 1750MHz:SN 36/08 DIPF 101 1900MHz:SN 36/08 DIPF 102 2450MHz:SN 36/08 DIPJ 103

7.2. Validation Results

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

Frequency	750MHz	835MHz	1750MHz	1900MHz	2450MHz
Target value 1W (1g)	8.690 W/Kg	9.880 W/Kg	37.770 W/Kg	38.530 W/Kg	53.590 W/Kg
Test value 1g (250 mW input power)	2.207 W/Kg (2013.7.8)	2.361 W/Kg (2013.7.9)	9.340 W/Kg (2013.7.10)	9.736 W/Kg (2013.7.11)	12.787 W/Kg (2013.7.12)
Normalized to 1W value(1g)	8.828 W/Kg	9.444 W/Kg	37.360 W/Kg	38.944 W/Kg	51.148 W/Kg

Note: System checks the specific test data please see Annex D.

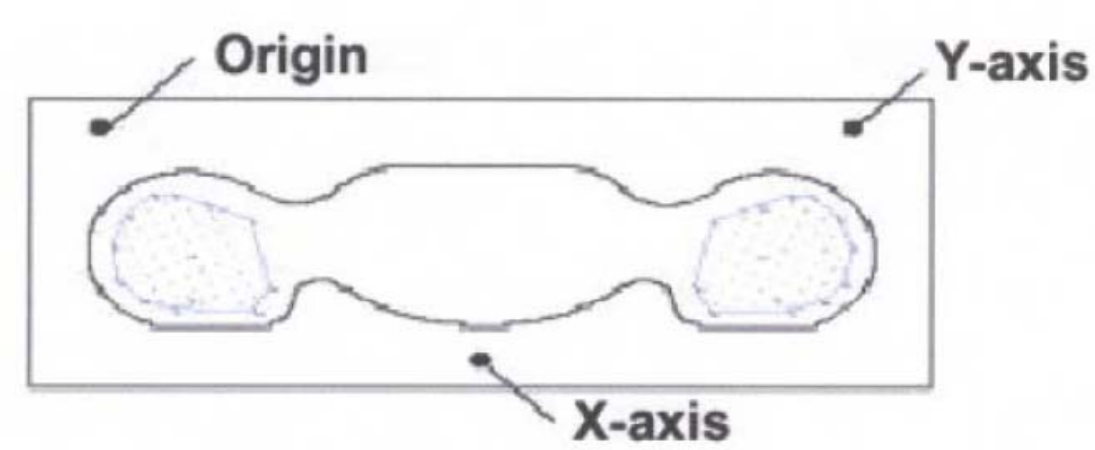
8. Operational Conditions During Test

8.1. 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.

The depth of the body tissue was 15.1cm. The distance between the back of the device and the bottom of the flat phantom is 5mm(taking into account of the IEEE 1528 and the place of the antenna)

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.



SAR Measurement Points in Area Scan

8.2. Measurement procedure

The following steps are used for each test position

- 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
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- 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 can not 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.
- 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.

- Isotropic E-Field Probe for Dosimetric Measurerments

Construction	The E-Field Probe detection probes are composed of three orthogonal dipoles linked to special Schottky diodes with low detection thresholds. The E-Field Probe allow the measurement of electric fields in liquids.
Calibration	In human tissue simulationg liquid at 835MHz and 1880MHz (accuracy ±5%; k=1) Calibration for other liquids and frequency upon request
Frequency	30MHz to 6GHz; Linearity: ± 0.25dB
Dynamic range	0.001-100W/Kg
Dimensions	Overall Length: 330mm; Tip diameter: 5mm; Distance between diobe and probe tip < 2.7mm
Application	General dosimetry up to 6GHz Compliance tests of mobile phones, or other portable devices

8.3. 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.

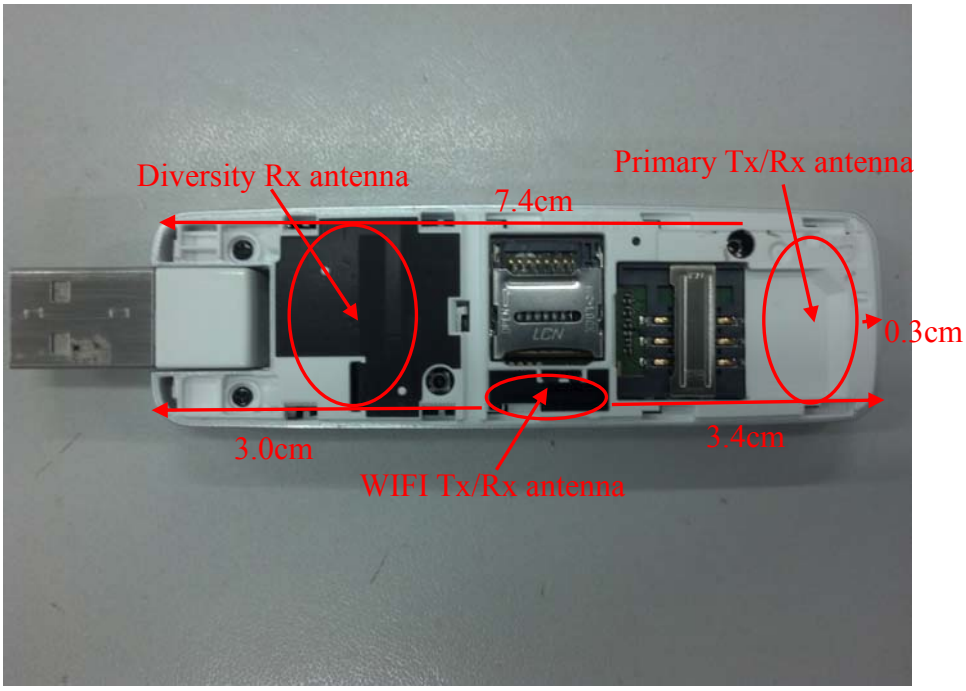
9. SAR Measurement Procedures for USB Dongle Transmitters

As per KDB 447498 D02v01:
Test all USB orientations [see figure below: (A) Horizontal-Up, (B) Horizontal-Down, (C) Vertical-Front, and (D) Vertical-Back] with a device-to-phantom separation distance of 5 mm or less, according to KDB 447498 requirements.

(A) Horizontal-Up **(B) Horizontal-Down** **(C) Vertical-Front** **(D) Vertical-Back**

If the antenna is within 1 cm from the tip of the dongle (the end without the USB connector), the tip of the dongle should also be tested at 5 mm perpendicular to the phantom. For antennas located within 2.5 cm from the USB connector and if the dongle can be positioned at 45° to 90° from the horizontal position [(A) or (B)], testing in one or more of these configurations may need to be considered. A KDB inquiry should be submitted to determine the applicable test configurations.

The module has a primary antenna for all LTE&WCDMA&GSM bands, a diversity antenna for all WCDMA bands, and a WIFI Tx/Rx antenna. The following is the picture of antenna location and the distance of Tx antenna to USB Rotating Connector, the antenna implementation are as below:



Tx antennas① / Distance of ① to ② / Section of dongle②	Primary Tx/Rx antenna	WIFI Tx/Rx antenna
Rotating Connector[1]	7.4cm	3.cm
Tip of USB dongle[2]	0.3cm	3.4cm

Note1: The distance of both Tx antennas to the Rotating Connector are larger than 2.5cm, so additional configuration and KDB inquiry are not required.

Note2: The distance of Primary Tx antenna to the Tip of USB dongle is less than 1.0cm, so test configuration for Tip of USB dongle is required for LTE/WCDMA/GSM, and WiFi is not required.

So test configuration for the USB Dongle Transmitters is required for all USB orientations((A) Horizontal-Up, (B) Horizontal-Down, (C) Vertical-Front, and (D) Vertical-Back) for LTE/WCDMA/GSM&WiFi 2450, and Dongle Tip for LTE/WCDMA/GSM.

10. 3G MEASUREMENT PROCEDURES

10.1. Procedures Used To Establish Test Signal

The handset was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and are recommended for evaluating SAR. SAR measurements were taken with a fully charged battery. In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. The SAR measurement software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more then 5% occurred, the tests were repeated.

10.2. SAR Measurement Conditions for WCDMA

These procedures were followed according to FCC KDB 941225, October, 2007.

10.3. Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC(transmit power control) set to all “1s”. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes) should be tabulated in the test report. All configurations that are not supported by the EUT or cannot be measured due to technical or equipment limitations should be clearly identified.

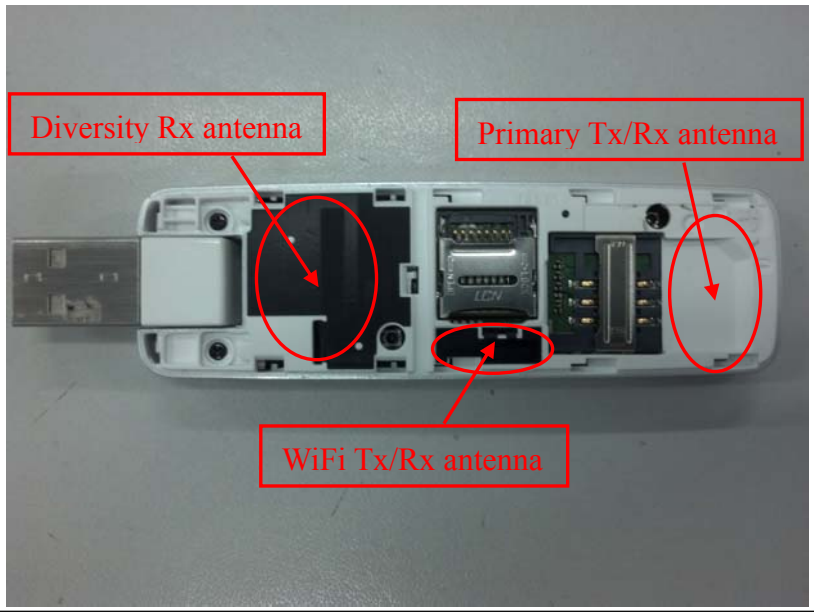
10.4. Test Procedure

When Maximum SAR for 12.2kbps RMC ≤ 75% of the SAR limit (i.e. 1.2W/Kg 1g) and maximum average output of each RF channel with HSUPA/HSDPA active is less than 1/4 dB higher than that measured without HSUPA/HSDPA using 12.2kbps RMC, according to KDB 941225D01v02, SAR is not required for this handset with HSPA capabilities.

11. Information Related to LTE Test parameter(Per 941225 D05v02)

1	Identify the operating frequency range of each LTE transmission FCC band used by the device	Band 2 Tx: 1850-1910 MHz Rx:1930-1990 MHz Band 4 Tx:1710-1755 MHz Rx:2100-2155 MHz Band 5 Tx:824-849 MHz Rx:869-894 MHz Band 17 Tx:704-716 MHz Rx:734-746 MHz

2	Identify the high, middle and low (L, M, H) channel numbers and frequencies tested in each LTE frequency band	**Band2**	**Channel Bandwidth**				
			20Mhz	**15MHz**	**10MHz**	**5MHz**	**3MHz**	**1.4MHz**
		Low	18700/ 1860	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
		Middle	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880
		High	19100/ 1900	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19184/ 1908.4	19192/ 1909.2
		Band4	**Channel Bandwidth**				
			20Mhz	**15MHz**	**10MHz**	**5MHz**	**3MHz**	**1.4MHz**
		Low	20050/ 1720	20025/ 1717.5	20000/ 1715	19975/ 1712.5	19965/ 1711.5	19957/ 1710.7
		Middle	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5
		High	20300/ 1745	20325/ 1747.5	20350/ 1750	20375/ 1752.5	20384/ 1753.4	20392/ 1754.2
		Band5	**Channel Bandwidth**				
			20Mhz	**15MHz**	**10MHz**	**5MHz**	**3MHz**	**1.4MHz**
		Low			20450/ 829	20425/ 826.5	20415/ 825.5	20407/ 824.7
		Middle			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5
		High			20600/ 844	20625/ 846.5	20634/ 847.4	20642/ 848.2
		Band17	**Channel Bandwidth**				
			20Mhz	**15MHz**	**10MHz**	**5MHz**	**3MHz**	**1.4MHz**
		Low			23780/ 709	23755/ 706.5		
		Middle			20790/ 710	23790/ 710		
		High			23800/ 711	23825/ 713.5		
		(LTE power test please refer to section12)						

<table>
<tr><td>4</td><td>Specify the UE category and uplink modulations used</td><td>The UE Category is 3 and the uplink modulations used are QPSK and 16QAM.</td></tr>
<tr><td>5</td><td>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.</td><td>The module has a primary antenna for all LTE&WCDMA&GSM bands, and a diversity antenna for all WCDMA bands, and a WIFI Tx/Rx antenna.
 
</td></tr>
<tr><td>6</td><td>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.</td><td>Mobile Hotspot Mode will be tested by positioning the USB Modern within 5mm separation distance for Horizontal-Up, Horizontal-Down, Vertical-Front, Vertical-Back, Dongle-Tail position. (please refer to Section11)</td></tr>
<tr><td>7</td><td>Identify if Maximum Power Reduction (MPR) is optional or mandatory, i.e. built-in by design:
a) Only mandatory MPR may be considered during SAR testing, when the maximum output power is permanently limited by the MPR</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></td></tr>
</table>

	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.	A-MPR is supported by design, but disable for SAR testing.
8	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	This is included in the section 12 of this report.
9	Identify all other U.S. wireless operating modes (3G, Wi-Fi, WiMax, Bluetooth etc), device/exposure configurations (head and body, antenna and handset flip-cover or slide positions, antenna diversity conditions etc.) and frequency bands used for these modes	The following bands are supported for the exposure conditions 1) GSM (850/1900) and WCDMA FDD (850/ 1700/ 1900) -Exposure conditions: Body SAR(Horizontal-Up, Horizontal-Down, Vertical-Front, Vertical-Back, Dongle-Tail) required for GSM/ WCDMA FDD and wireless personal hotspot. DTM is not supported. 2) WiFi 2.4GHz -Exposure conditions: (Horizontal-Up, Horizontal-Down, Vertical-Front, Vertical-Back) required for WiFi 2.4GHz. (please refer to Section11) No power reduction.
10	Include the maximum average conducted output power measured for the other wireless mode and frequency bands	This is included in the section 13 of this report.

<table>
<tr><td>11</td><td>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.)</td><td>
<table>
<tr><td rowspan="2">#</td><td colspan="4">Simultaneous transmission conditions</td></tr>
<tr><td colspan="3">WWAN</td><td>WLAN</td><td>Sum of WWAN& WLAN</td></tr>
<tr><td></td><td>LTE Data</td><td>GSM Data</td><td>WCDMA Data</td><td>Wi-Fi 802.11a/b/g/n</td><td></td></tr>
<tr><td>1</td><td>×</td><td></td><td></td><td>×</td><td>×</td></tr>
<tr><td>2</td><td></td><td>×</td><td></td><td>×</td><td>×</td></tr>
<tr><td>3</td><td></td><td></td><td>×</td><td>×</td><td>×</td></tr>
</table>
</td></tr>
<tr><td>12</td><td>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</td><td>Not applicable.</td></tr>
</table>

12. SAR Evaluation Procedures&Power measurement 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 with 50% 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 ≤ 0.8 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.

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 for 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 to 5MHz channel bandwidth; therefore, this cannot be tested in the smaller channel bandwidth. However, 50% RB allocation in 10 MHz channel bandwidth is 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."

LTE BAND 2

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
20MHz	L 18700	1860.0	QPSK	1	0	21.78
				1	49	21.65
				1	99	21.25
				50	0	20.54
				50	25	20.49
				50	49	20.46
				100	0	20.55
			16-QAM	1	0	20.50
				1	49	20.31
				1	99	20.12
				50	0	19.60
				50	25	19.47
				50	49	19.52
				100	0	19.66
	M 18900	1880.0	QPSK	1	0	21.17
				1	49	21.19
				1	99	21.24
				50	0	20.22
				50	25	20.21
				50	49	20.20
				100	0	20.18
			16-QAM	1	0	20.27
				1	49	20.50
				1	99	20.69
				50	0	19.42
				50	25	19.30
				50	49	19.17
				100	0	19.15
	H 19100	1900.0	QPSK	1	0	21.58
				1	49	21.42
				1	99	21.67
				50	0	20.52
				50	25	20.34
				50	49	20.42
				100	0	20.44
			16-QAM	1	0	20.37
				1	49	20.40
				1	99	20.45
				50	0	19.20
				50	25	19.18
				50	49	19.12
				100	0	19.22

LTE BAND 2 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
15MHz	L 18675	1857.5	QPSK	1	0	21.72
				1	37	21.78
				1	74	21.60
				36	0	20.69
				36	18	20.70
				36	35	20.68
				75	0	20.80
			16-QAM	1	0	20.40
				1	37	20.41
				1	74	20.37
				36	0	19.02
				36	18	18.91
				36	35	19.17
				75	0	19.12
	M 18900	1880.0	QPSK	1	0	21.08
				1	37	21.10
				1	74	21.17
				36	0	20.08
				36	18	20.03
				36	35	20.10
				75	0	20.06
			16-QAM	1	0	20.32
				1	37	20.41
				1	74	20.29
				36	0	19.28
				36	18	19.12
				36	35	19.15
				75	0	19.04
	H 19125	1902.5	QPSK	1	0	21.72
				1	37	21.65
				1	74	21.65
				36	0	20.35
				36	18	20.55
				36	35	20.41
				75	0	20.45
			16-QAM	1	0	20.59
				1	37	20.32
				1	74	19.70
				36	0	19.15
				36	18	19.21
				36	35	19.20
				75	0	19.41

LTE BAND 2 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
10MHz	L 18650	1855.0	QPSK	1	0	21.84
				1	24	21.80
				1	49	21.73
				25	0	20.42
				25	12	20.37
				25	24	20.51
				50	0	20.90
			16-QAM	1	0	21.78
				1	24	21.61
				1	49	21.21
				25	0	20.17
				25	12	20.15
				25	24	20.12
				50	0	19.86
	M 18900	1880.0	QPSK	1	0	21.21
				1	24	21.17
				1	49	21.14
				25	12	20.12
				25	12	20.07
				25	12	20.09
				50	0	20.12
			16-QAM	1	0	19.87
				1	24	19.92
				1	49	19.88
				25	12	19.01
				25	12	19.11
				25	12	19.07
				50	0	19.07
	H 19150	1905.0	QPSK	1	0	21.71
				1	24	21.52
				1	49	21.47
				25	0	20.23
				25	12	20.14
				25	24	20.15
				50	0	20.18
			16-QAM	1	0	20.23
				1	24	20.21
				1	49	19.97
				25	0	19.17
				25	12	19.23
				25	24	19.41
				50	0	19.21

LTE BAND 2 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
5MHz	L 18625	1852.5	QPSK	1	0	21.50
				1	12	21.43
				1	24	21.41
				12	0	20.42
				12	6	20.35
				12	11	20.41
				25	0	20.92
			16-QAM	1	0	20.48
				1	12	20.46
				1	24	20.32
				12	0	19.60
				12	6	19.41
				12	11	19.32
				25	0	19.46
	M 18900	1880.0	QPSK	1	0	21.23
				1	12	21.28
				1	24	21.30
				12	0	20.14
				12	6	20.07
				12	11	20.05
				25	0	20.09
			16-QAM	1	0	20.01
				1	12	20.11
				1	24	20.12
				12	0	19.11
				12	6	19.06
				12	11	19.03
				25	0	19.15
	H 19175	1907.5	QPSK	1	0	21.45
				1	12	21.42
				1	24	20.81
				12	0	20.13
				12	6	20.21
				12	11	20.14
				25	0	19.97
			16-QAM	1	0	20.65
				1	12	20.45
				1	24	20.38
				12	0	19.01
				12	6	19.12
				12	11	19.05
				25	0	18.95

LTE BAND 2 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
3MHz	L 18615	1851.5	QPSK	1	0	21.61
				1	7	21.60
				1	14	21.64
				8	0	21.03
				8	4	21.06
				8	7	21.02
				15	0	21.05
			16-QAM	1	0	21.42
				1	7	21.40
				1	14	21.43
				8	0	20.32
				8	4	20.35
				8	7	20.41
				15	0	20.14
	M 18900	1880.0	QPSK	1	0	21.08
				1	7	21.13
				1	14	21.24
				8	0	20.05
				8	4	20.12
				8	7	20.07
				15	0	20.22
			16-QAM	1	0	19.97
				1	7	20.04
				1	14	20.05
				8	0	19.98
				8	4	19.82
				8	7	19.90
				15	0	19.30
	H 19184	1908.4	QPSK	1	0	21.25
				1	7	21.20
				1	14	21.17
				8	0	20.06
				8	4	20.02
				8	7	19.92
				15	0	19.76
			16-QAM	1	0	19.87
				1	7	19.91
				1	14	19.83
				8	0	19.21
				8	4	19.12
				8	7	19.11
				15	0	18.84

LTE BAND 2 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
1.4MHz	L 18607	1850.7	QPSK	1	0	21.63
				1	2	21.60
				1	5	21.69
				3	0	20.52
				3	1	20.50
				3	2	20.49
				6	0	20.80
			16-QAM	1	0	20.59
				1	2	20.52
				1	5	20.65
				3	0	19.42
				3	1	19.60
				3	2	19.51
				6	0	19.51
	M 18900	1880.0	QPSK	1	0	21.19
				1	2	21.17
				1	5	21.11
				3	0	20.16
				3	1	20.06
				3	2	20.09
				6	0	20.18
			16-QAM	1	0	20.08
				1	2	20.05
				1	5	19.99
				3	0	19.13
				3	2	19.05
				3	5	19.10
				6	0	19.22
	H 19192	1909.2	QPSK	1	0	20.83
				1	2	20.92
				1	5	20.85
				3	0	19.96
				3	1	19.85
				3	2	19.90
				6	0	19.60
			16-QAM	1	0	19.73
				1	2	19.80
				1	5	19.53
				3	0	18.80
				3	1	18.90
				3	2	18.85
				6	0	18.74

LTE BAND 4

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
20MHz	L 20050	1720.0	QPSK	1	0	22.57
				1	49	22.23
				1	99	21.91
				50	0	21.02
				50	25	21.00
				50	49	21.05
				100	0	21.05
			16-QAM	1	0	21.26
				1	49	21.27
				1	99	21.16
				50	0	20.11
				50	25	20.12
				50	49	20.08
				100	0	20.09
	M 20175	1732.5	QPSK	1	0	21.81
				1	49	22.11
				1	99	22.21
				50	0	21.12
				50	25	21.05
				50	49	21.01
				100	0	20.69
			16-QAM	1	0	21.01
				1	49	21.12
				1	99	21.17
				50	0	19.91
				50	25	19.89
				50	49	20.05
				100	0	19.67
	H 20300	1745.0	QPSK	1	0	22.24
				1	49	22.12
				1	99	21.90
				50	0	21.02
				50	25	21.00
				50	49	21.03
				100	0	21.03
			16-QAM	1	0	21.26
				1	49	21.17
				1	99	21.39
				50	0	19.83
				50	25	19.80
				50	49	19.82
				100	0	20.03

LTE BAND 4 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
15MHz	L 20025	1717.5	QPSK	1	0	22.66
				1	37	22.21
				1	74	22.01
				36	0	21.12
				36	18	21.20
				36	35	21.15
				75	0	21.12
			16-QAM	1	0	21.20
				1	37	21.34
				1	74	21.44
				36	0	20.23
				36	18	20.21
				36	35	20.16
				75	0	20.24
	M 20175	1732.5	QPSK	1	0	21.96
				1	37	21.70
				1	74	21.80
				36	0	20.64
				36	18	20.60
				36	35	20.52
				75	0	20.63
			16-QAM	1	0	21.05
				1	37	21.02
				1	74	21.06
				36	0	20.13
				36	18	20.10
				36	35	20.08
				75	0	20.16
	H 20325	1747.5	QPSK	1	0	22.19
				1	37	22.08
				1	74	21.95
				36	0	21.02
				36	18	21.05
				36	35	21.01
				75	0	20.98
			16-QAM	1	0	20.69
				1	37	20.70
				1	74	20.55
				36	0	20.05
				36	18	20.03
				36	35	20.05
				75	0	20.11

LTE BAND 4 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
10MHz	L 20000	1715.0	QPSK	1	0	22.38
				1	24	22.50
				1	49	22.25
				25	0	21.25
				25	12	21.32
				25	24	21.33
				50	0	21.49
			16-QAM	1	0	20.94
				1	24	20.82
				1	49	20.83
				25	0	20.31
				25	12	20.25
				25	24	20.21
				50	0	20.15
	M 20175	1732.5	QPSK	1	0	21.68
				1	24	21.87
				1	49	22.01
				25	0	21.12
				25	12	21.09
				25	24	21.17
				50	0	21.25
			16-QAM	1	0	21.32
				1	24	21.34
				1	49	21.54
				25	0	19.81
				25	12	20.02
				25	24	19.90
				50	0	19.82
	H 20350	1750.0	QPSK	1	0	22.10
				1	24	22.07
				1	49	21.91
				25	0	21.06
				25	12	21.11
				25	24	21.02
				50	0	21.03
			16-QAM	1	0	20.86
				1	24	20.91
				1	49	20.90
				25	0	20.01
				25	12	20.04
				25	24	20.03
				50	0	20.02

LTE BAND 4 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
5MHz	L 19975	1712.5	QPSK	1	0	22.58
				1	12	22.42
				1	24	22.50
				12	0	21.12
				12	6	21.18
				12	11	21.11
				25	0	21.61
			16-QAM	1	0	21.73
				1	12	21.71
				1	24	21.69
				12	0	20.62
				12	6	20.61
				12	11	20.58
				25	0	20.63
	M 20175	1732.5	QPSK	1	0	21.67
				1	12	21.70
				1	24	21.67
				12	0	20.41
				12	6	20.37
				12	11	20.42
				25	0	20.50
			16-QAM	1	0	20.57
				1	12	20.63
				1	24	20.74
				12	0	19.51
				12	6	19.62
				12	11	19.54
				25	0	19.67
	H 20375	1752.5	QPSK	1	0	22.19
				1	12	22.16
				1	24	22.01
				12	0	21.04
				12	6	21.05
				12	11	21.03
				25	0	21.01
			16-QAM	1	0	21.18
				1	12	21.27
				1	24	21.26
				12	0	20.31
				12	6	20.21
				12	11	20.25
				25	0	20.06

LTE BAND 4 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
3MHz	L 19965	1711.5	QPSK	1	0	22.63
				1	7	22.60
				1	14	22.64
				8	0	21.70
				8	4	21.68
				8	7	21.62
				15	0	21.73
			16-QAM	1	0	21.36
				1	7	21.30
				1	14	21.26
				8	0	20.52
				8	4	20.58
				8	7	20.62
				15	0	20.73
	M 20175	1732.5	QPSK	1	0	22.29
				1	7	22.31
				1	14	22.36
				8	0	21.29
				8	4	21.32
				8	7	21.25
				15	0	21.33
			16-QAM	1	0	21.01
				1	7	20.93
				1	14	20.97
				8	0	19.87
				8	4	19.83
				8	7	19.90
				15	0	19.82
	H 20384	1753.4	QPSK	1	0	22.37
				1	7	22.05
				1	14	21.82
				8	0	21.05
				8	4	21.02
				8	7	21.04
				15	0	20.99
			16-QAM	1	0	21.12
				1	7	21.10
				1	14	20.86
				8	0	20.03
				8	4	20.07
				8	7	20.05
				15	0	20.11

LTE BAND 4 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
1.4MHz	L 19957	1710.7	QPSK	1	0	22.49
				1	2	22.45
				1	5	22.51
				3	0	21.36
				3	1	21.42
				3	2	21.41
				6	0	21.66
			16-QAM	1	0	21.28
				1	2	21.25
				1	5	21.34
				3	0	20.09
				3	1	20.12
				3	2	20.23
				6	0	20.13
	M 20175	1732.5	QPSK	1	0	21.70
				1	2	21.79
				1	5	21.88
				3	0	20.72
				3	1	20.71
				3	2	20.67
				6	0	20.68
			16-QAM	1	0	21.12
				1	2	21.14
				1	5	21.22
				3	0	19.98
				3	2	20.02
				3	5	19.91
				6	0	19.82
	H 20392	1754.2	QPSK	1	0	21.91
				1	2	21.88
				1	5	21.84
				3	0	20.81
				3	1	20.89
				3	2	20.93
				6	0	20.98
			16-QAM	1	0	20.98
				1	2	20.95
				1	5	20.93
				3	0	19.94
				3	1	19.91
				3	2	19.92
				6	0	19.88

LTE BAND 5

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
10MHz	L 20450	829.0	QPSK	1	0	22.32
				1	24	22.41
				1	49	22.40
				25	0	21.28
				25	12	21.23
				25	24	21.30
				50	0	21.27
			16-QAM	1	0	21.27
				1	24	21.28
				1	49	21.19
				25	0	20.07
				25	12	20.09
				25	24	20.15
				50	0	20.15
	M 20525	836.5	QPSK	1	0	22.19
				1	24	22.14
				1	49	22.09
				25	0	21.06
				25	12	21.04
				25	24	21.01
				50	0	20.99
			16-QAM	1	0	21.01
				1	24	21.12
				1	49	20.87
				25	0	20.08
				25	12	20.11
				25	24	20.05
				50	0	20.01
	H 20600	844.0	QPSK	1	0	22.38
				1	24	22.02
				1	49	22.07
				25	0	21.10
				25	12	21.09
				25	24	21.10
				50	0	21.09
			16-QAM	1	0	21.53
				1	24	21.52
				1	49	21.62
				25	0	20.25
				25	12	20.17
				25	24	20.29
				50	0	20.32

LTE BAND 5 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
5MHz	L 20425	826.5	QPSK	1	0	22.12
				1	12	22.27
				1	24	22.30
				12	0	21.20
				12	6	21.17
				12	11	21.18
				25	0	21.15
			16-QAM	1	0	21.36
				1	12	21.32
				1	24	21.40
				12	0	20.12
				12	6	20.01
				12	11	20.08
				25	0	20.10
	M 20525	836.5	QPSK	1	0	22.08
				1	12	22.05
				1	24	21.98
				12	0	21.08
				12	6	21.04
				12	11	21.10
				25	0	21.04
			16-QAM	1	0	21.09
				1	12	21.12
				1	24	21.26
				12	0	20.20
				12	6	20.17
				12	11	20.12
				25	0	20.18
	H 20625	846.5	QPSK	1	0	22.42
				1	12	22.30
				1	24	22.24
				12	0	21.32
				12	6	21.40
				12	11	21.45
				25	0	21.45
			16-QAM	1	0	21.38
				1	12	21.26
				1	24	21.38
				12	0	20.40
				12	6	20.11
				12	11	20.12
				25	0	20.28

LTE BAND 5 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
3MHz	L 20415	825.5	QPSK	1	0	22.08
				1	7	22.14
				1	14	22.27
				8	0	21.23
				8	4	21.30
				8	7	21.24
				15	0	21.26
			16-QAM	1	0	21.25
				1	7	21.31
				1	14	21.25
				8	0	20.21
				8	4	20.21
				8	7	20.17
				15	0	20.29
	M 20525	836.5	QPSK	1	0	22.14
				1	7	22.13
				1	14	22.14
				8	0	21.10
				8	4	21.05
				8	7	21.04
				15	0	20.98
			16-QAM	1	0	21.73
				1	7	21.61
				1	14	21.60
				8	0	20.25
				8	4	20.32
				8	7	20.64
				15	0	20.12
	H 20634	847.4	QPSK	1	0	22.27
				1	7	22.09
				1	14	21.91
				8	0	21.09
				8	4	21.18
				8	7	21.28
				15	0	21.21
			16-QAM	1	0	21.09
				1	7	21.05
				1	14	20.79
				8	0	20.06
				8	4	20.03
				8	7	20.05
				15	0	20.18

LTE BAND 5 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
1.4MHz	L 20407	824.7	QPSK	1	0	22.24
				1	2	22.20
				1	5	22.30
				3	0	21.21
				3	1	21.18
				3	2	21.19
				6	0	21.18
			16-QAM	1	0	21.17
				1	2	21.10
				1	5	21.21
				3	0	20.09
				3	1	20.11
				3	2	20.08
				6	0	20.18
	M 20525	836.5	QPSK	1	0	22.22
				1	2	22.24
				1	5	22.32
				3	0	21.26
				3	1	21.21
				3	2	21.23
				6	0	21.19
			16-QAM	1	0	21.08
				1	2	21.05
				1	5	21.07
				3	0	20.10
				3	1	20.09
				3	2	20.20
				6	0	20.30
	H 20642	848.2	QPSK	1	0	22.28
				1	2	22.26
				1	5	22.31
				3	0	21.17
				3	1	21.20
				3	2	21.23
				6	0	21.36
			16-QAM	1	0	21.25
				1	2	21.16
				1	5	21.14
				3	0	20.24
				3	1	20.15
				3	2	20.20
				6	0	20.32

LTE BAND 17

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
10MHz	L 23780	709.0	QPSK	1	0	22.28
				1	24	22.12
				1	49	22.07
				25	0	21.11
				25	12	21.06
				25	24	21.05
				50	0	21.19
			16-QAM	1	0	21.26
				1	24	21.32
				1	49	21.23
				25	0	20.08
				25	12	20.07
				25	24	20.05
				50	0	20.10
	M 23790	710.0	QPSK	1	0	22.20
				1	24	22.13
				1	49	22.19
				25	0	21.08
				25	12	21.06
				25	24	21.05
				50	0	21.08
			16-QAM	1	0	21.83
				1	24	21.80
				1	49	21.66
				25	0	20.09
				25	12	20.04
				25	24	20.15
				50	0	20.10
	H 23800	711.0	QPSK	1	0	22.45
				1	24	22.24
				1	49	21.83
				25	0	21.01
				25	12	21.04
				25	24	21.02
				50	0	21.03
			16-QAM	1	0	21.12
				1	24	21.05
				1	49	20.54
				25	0	20.02
				25	12	20.01
				25	24	20.05
				50	0	20.08

LTE BAND 17 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
5MHz	L 23755	706.5	QPSK	1	0	22.20
				1	12	22.24
				1	24	22.31
				12	0	21.20
				12	6	21.18
				12	11	21.16
				25	0	21.17
			16-QAM	1	0	21.49
				1	12	21.50
				1	24	21.77
				12	0	20.14
				12	6	20.13
				12	11	20.15
				25	0	20.16
	M 23790	710.0	QPSK	1	0	22.40
				1	12	22.21
				1	24	21.95
				12	0	21.15
				12	6	21.21
				12	11	21.23
				25	0	21.26
			16-QAM	1	0	21.56
				1	12	21.47
				1	24	21.13
				12	0	20.21
				12	6	20.24
				12	11	20.20
				25	0	20.23
	H 23825	713.5	QPSK	1	0	22.08
				1	12	21.76
				1	24	21.89
				12	0	20.80
				12	6	20.76
				12	11	20.89
				25	0	20.85
			16-QAM	1	0	20.69
				1	12	20.45
				1	24	20.40
				12	0	19.72
				12	6	19.80
				12	11	19.81
				25	0	19.92

13. Measurement Of Conducted output power

1. WCDMA mode conducted output power values

Item	band	WCDMA 850			WCDMA 1700			WCDMA 1900		
	ARFCN	4132	4175	4233	1312	1412	1513	9262	9400	9538
	subtest	dBm			dBm			dBm		
5.2(WCDMA)	non	22.07	22.83	22.81	23.71	23.67	23.65	23.68	23.65	23.59
HSDPA	1	22.05	22.79	22.75	23.69	23.64	23.62	23.67	23.63	23.55
	2	22.03	22.77	22.74	23.65	23.63	23.61	23.65	23.61	23.53
	3	21.67	22.23	22.23	23.22	23.16	23.14	23.17	23.14	23.07
	4	21.63	21.27	22.21	23.19	23.15	23.12	23.16	23.15	23.04
HSUPA	1	22.02	22.76	22.69	23.65	23.59	23.57	23.42	23.55	23.57
	2	20.03	20.75	20.61	21.62	21.57	21.56	21.41	21.54	21.55
	3	21.05	21.69	21.66	22.61	22.55	22.54	22.43	22.54	22.58
	4	20.03	20.73	20.63	21.64	21.56	21.49	21.41	21.53	21.55
	5	22.02	22.75	22.69	23.58	23.54	23.52	23.40	23.49	23.53
HSPA+	1	22.05	22.86	22.75	23.61	23.52	23.59	23.59	23.57	23.46
Note:	The Conducted RF Output Power test of WCDMA /HSDPA /HSUPA/HSPA+ was tested by power meter.									

2. GPRS Mode Conducted peak output power

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	32.87	29.53	28.15	27.41
	190	836.6	33.42	29.49	28.17	27.55
	251	848.8	33.12	29.42	28.04	27.37
PCS 1900	512	1850.2	28.33	26.30	24.43	23.51
	661	1880.0	28.13	26.39	24.51	23.46
	810	1909.8	27.96	26.31	24.32	23.31

GPRS Time-based Average Power

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	23.87	23.51	23.89	24.40
	190	836.6	24.42	23.47	23.91	24.54
	251	848.8	24.12	23.40	23.78	24.36
PCS 1900	512	1850.2	19.33	20.28	20.17	20.50
	661	1880.0	19.13	20.37	20.25	20.45
	810	1909.8	18.96	20.29	20.06	20.30

Timeslot consignations:

No. Of Slots	Slot 1	Slot 2	Slot 3	Slot 4
Slot Consignation	1Up4Down	2Up2Down	3Up2Down	4Up1Down
Duty Cycle	1:8	1:4	1:2.67	1:2
Correct Factor	-9.00dB	-6.02dB	-4.26dB	-3.01dB

3. EDGE Mode Conducted peak output power

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	32.91	29.50	27.85	27.21
	190	836.6	33.50	29.43	27.92	27.32
	251	848.8	33.19	29.47	27.84	27.17
PCS 1900	512	1850.2	28.51	26.27	24.46	23.41
	661	1880.0	28.28	26.36	24.41	23.36
	810	1909.8	28.05	26.30	24.42	23.31

EDGE Time-based Average Power

Band	Channel	Frequency (MHz)	Output Power(dBm)			
			Slot 1	Slot 2	Slot 3	Slot 4
GSM 850	128	824.2	23.91	23.48	23.59	24.20
	190	836.6	24.50	23.41	23.66	24.31
	251	848.8	24.19	23.45	23.58	24.16
PCS 1900	512	1850.2	19.51	20.25	20.20	20.40
	661	1880.0	19.28	20.34	20.15	20.35
	810	1909.8	19.05	20.28	20.16	20.30

4. Wifi average output power

Band	Channel	Frequency (MHz)	Output Power(dBm)		
			802.11B (DSSS)	802.11G (OFDM)	802.11N20 (OFDM)
Wifi	1	2412	13.60	10.93	9.33
	6	2437	13.39	10.79	8.76
	11	2462	13.82	12.22	9.75

13. Standalone SAR Evaluation & Test Results List

Summary of Measurement Results (GSM 850MHz Band)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	GPRS	Horizontal-Up	190	0.661	1.035	0.684
		Horizontal-Down	190	0.373	1.035	0.386
		Vertical-Front	190	0.409	1.035	0.423
		Vertical-Back	190	0.428	1.035	0.443
		Dongle-Tip	190	0.150	1.035	0.155
	EDGE	Horizontal-Up	190	0.511	1.042	0.532

Summary of Measurement Results (GSM 1900MHz Band)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	GPRS	Horizontal-Up	512	0.658	1.045	0.688
		Horizontal-Down	512	0.373	1.045	0.390
		Vertical-Front	512	0.235	1.045	0.246
		Vertical-Back	512	0.393	1.045	0.411
		Dongle-Tip	512	0.210	1.045	0.219
	EDGE	Horizontal-Up	512	0.614	1.021	0.627

GPRS&EDGE Test configuration

Band	Channel	Slots	Power level	Duty Cycle
GPRS850	Middle	4	5	1:2
EDGE850	Middle	4	5	1:2
GPRS1900	Low	4	0	1:2
EDGE1900	Low	4	0	1:2

Summary of Measurement Results (WCDMA Band V)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	12.2kbps RMC	Horizontal-Up	4175	0.711	1.040	0.739
		Horizontal-Down	4175	0.356	1.040	0.370
		Vertical-Front	4175	0.419	1.040	0.436
		Vertical-Back	4175	0.470	1.040	0.489
		Dongle-Tip	4175	0.135	1.040	0.140

Summary of Measurement Results (WCDMA Band IV)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	12.2kbps RMC	Horizontal-Up	1312	0.444	1.069	0.475
		Horizontal-Down	1312	0.616	1.069	0.659
		Vertical-Front	1312	0.434	1.069	0.464
		Vertical-Back	1312	0.305	1.069	0.326
		Dongle-Tip	1312	0.093	1.069	0.099

Summary of Measurement Results (WCDMA Band II)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	12.2kbps RMC	Horizontal-Up	9262	0.511	1.076	0.550
		Horizontal-Down	9262	0.865	1.076	0.931
			9400	0.799	1.083	0.865
			9538	0.847	1.099	0.931
		Vertical-Front	9262	0.560	1.076	0.603
		Vertical-Back	9262	0.330	1.076	0.355
		Dongle-Tip	9262	0.204	1.076	0.220

Summary of Measurement Results (WiFi 2450 Band b)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	802.11b	Horizontal-Up	11	0.174	1.042	0.181
		Horizontal-Down	11	0.147	1.042	0.153
		Vertical-Front	11	0.074	1.042	0.077
		Vertical-Back	11	0.114	1.042	0.119
		Dongle-Tip	11	0.071	1.042	0.074

Summary of Measurement Results (LTE Band 2 bandwidth 20MHz with QPSK 1RB)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	No.1	Horizontal-Up	18700	0.523	1.052	0.550
		Horizontal-Down	18700	0.870	1.052	0.915
			18900	0.767	1.083	0.831
			19100	0.736	1.189	0.875
		Vertical-Front	18700	0.396	1.052	0.417
		Vertical-Back	18700	0.256	1.052	0.269
		Dongle-Tip	18700	0.114	1.052	0.120

Summary of Measurement Results (LTE Band 2 bandwidth 20MHz with QPSK 50RB)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	No.2	Horizontal-Up	18700	0.376	1.038	0.390
		Horizontal-Down	18700	0.721	1.038	0.748
		Vertical-Front	18700	0.413	1.038	0.429
		Vertical-Back	18700	0.351	1.038	0.364
		Dongle-Tip	18700	0.112	1.038	0.116

Additional LTE test requirement for 100%RB

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	100RB	Horizontal-Down	18700	0.659	1.035	0.682

Additional LTE test requirement for 16QAM

Not required.

Additional LTE test requirement for other bandwidth

Not required.

Summary of Measurement Results (LTE Band 4 bandwidth 20MHz with QPSK 1RB)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	No.3	Horizontal-Up	20050	0.331	1.030	0.341
		Horizontal-Down	20050	0.629	1.030	0.648
		Vertical-Front	20050	0.407	1.030	0.419
		Vertical-Back	20050	0.397	1.030	0.409
		Dongle-Tip	20050	0.123	1.030	0.127

Summary of Measurement Results (LTE Band 4 bandwidth 20MHz with QPSK 50RB)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	No.4	Horizontal-Up	20175	0.389	1.091	0.424
		Horizontal-Down	20175	0.716	1.091	0.781
		Vertical-Front	20175	0.509	1.091	0.555
		Vertical-Back	20175	0.258	1.091	0.281
		Dongle-Tip	20175	0.136	1.091	0.148

Additional LTE test requirement for 100%RB
Not required.
Additional LTE test requirement for 16QAM
Not required.
Additional LTE test requirement for other bandwidth
Not required.

Summary of Measurement Results (LTE Band 5 bandwidth 10MHz with QPSK 1RB)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	No.5	Horizontal-Up	20450	0.502	1.021	0.513
		Horizontal-Down	20450	0.340	1.021	0.347
		Vertical-Front	20450	0.327	1.021	0.334
		Vertical-Back	20450	0.394	1.021	0.402
		Dongle-Tip	20450	0.189	1.021	0.193

Summary of Measurement Results (LTE Band 5 bandwidth 10MHz with QPSK 50RB)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	No.6	Horizontal-Up	20450	0.640	1.052	0.673
		Horizontal-Down	20450	0.512	1.052	0.539
		Vertical-Front	20450	0.290	1.052	0.305
		Vertical-Back	20450	0.332	1.052	0.349
		Dongle-Tip	20450	0.129	1.052	0.136

Additional LTE test requirement for 100%RB
Not required.
Additional LTE test requirement for 16QAM
Not required.
Additional LTE test requirement for other bandwidth
Not required.

\

Summary of Measurement Results (LTE Band 17 bandwidth 10MHz with QPSK 1RB)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	No.7	Horizontal-Up	23800	0.582	1.052	0.612
		Horizontal-Down	23800	0.542	1.052	0.570
		Vertical-Front	23800	0.374	1.052	0.393
		Vertical-Back	23800	0.326	1.052	0.343
		Dongle-Tip	23800	0.173	1.052	0.182

Summary of Measurement Results (LTE Band 17 bandwidth 10MHz with QPSK 50RB)

Temperature: 21.0~23.8°C, humidity: 50~60%. Power Drift limit:-5%~+5% SAR Limit: 1.6W/Kg averaged over 1gram, Spatial Peak						
Phantom Configurations	Test Mode	Device Test Positions	Device Test channel	SAR (W/Kg)	Scaling Factor	Scaled SAR
Body (5mm Separation)	No.8	Horizontal-Up	23780	0.616	1.094	0.674
		Horizontal-Down	23780	0.523	1.094	0.572
		Vertical-Front	23780	0.337	1.094	0.369
		Vertical-Back	23780	0.202	1.094	0.221
		Dongle-Tip	23780	0.116	1.094	0.127

Note:

1. Refer to KDB 447498 Appendix A for SAR Test Exclusion Power Threshold at test distance of 5mm , standalone SAR test is required for LTE/WCDMA/GSM/WiFi 2450.

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 941225D01v02, 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. During 802.11b testing, engineering testing software installed on the EUT can provide continuous transmitting RF signal.The RF signal utilized in SAR measurement has almost 100% duty cycle, and its crest factor is 1.

5. Refer to power measurement results and 941225D05v02 SAR Evaluation procedure, the test scenarios for each LTE band are as below:

LTE test configuration for QPSK at largest bandwidth(1RB&50% RB)

LTE BAND	Scenario NO.	RB Size	RB offset	Channel	Freq.
2	1	1	0	18700	1860
	2	50	0	18700	1860
4	3	1	0	20050	1720
	4	50	0	20175	1732.5
5	5	1	24	20450	829
	6	25	24	20450	829
17	7	1	0	23800	711
	8	25	0	23780	709

Additional LTE test requirement for 100%RB, 16QAM or other smaller bandwidth are based on test results of Scenario NO. 1 to 8, taking power measurement results into account.

6. Scaling Factor calculation

Band	Tune-up power tolerance (dBm)	SAR test channel Power (dBm)	Scaling Factor
GPRS 850	PCL = 5, PWR =27.2+-0.5(4 slots)	27.55	1.035
EDGE 850	PCL = 5, PWR =27+-0.5(4 slots)	27.32	1.042
GPRS 1900	PCL=0,PWR= 23.2+-0.5(4 slots)	23.51	1.045
EDGE 1900	PCL=0,PWR= 23+-0.5(4 slots)	23.41	1.021
WCDMA 850	Max output power =22(+1/-2)	22.83	1.040
WCDMA 1700	Max output power =23(+1/-2)	23.71	1.069
WCDMA 1900	Max output power =23(+1/-2)	23.68	1.076
		23.65	1.083
		23.59	1.099
WiFi 802.11	Max output power =13.5+-0.5	13.82	1.042
LTE BAND2 (QPSK)	Max output power =21.5+-0.5(1RB)	21.78	1.052
		21.65	1.083
		21.25	1.189
	Max output power =20.2+-0.5(50&100RB)	20.54(50RB)	1.038
		20.55(100RB)	1.035
LTE BAND2 (16-QAM)	Max output power =20.2+-0.5(1RB)	-	-
	Max output power =19.2+-0.5(50&100RB)	-	-
LTE BAND4 (QPSK)	Max output power =22.2+-0.5(1RB)	22.57	1.030
	Max output power =21+-0.5(50&100RB)	21.12(50RB)	1.091
LTE BAND4 (16-QAM)	Max output power =21+-0.5(1RB)	-	-
	Max output power =20+-0.5(50&100RB)	-	-
LTE BAND5 (QPSK)	Max output power =22+-0.5(1RB)	22.41	1.021
	Max output power =21+-0.5(25&50RB)	21.28(25RB)	1.052
LTE BAND5 (16-QAM)	Max output power =21+-0.5(1RB)	-	-
	Max output power =20+-0.5(25&50RB)	-	-
LTE BAND17 (QPSK)	Max output power =22+-0.5(1RB)	22.28	1.052
	Max output power =21+-0.5(25&50RB)	21.11(25RB)	1.094
LTE BAND17 (16-QAM)	Max output power =21+-0.5(1RB)	-	-
	Max output power =20+-0.5(25&50RB)	-	-

13. Simultaneous Transmission SAR Evaluation

No.	Simultaneous transmission conditions				
	WWAN			WLAN	Sum of WWAN&WLAN
#	LTE Data	GSM Data	WCDMA Data	Wi-Fi 802.11a/b/g/n	
1	×			×	×
2		×		×	×
3			×	×	×

Note:

1. When the user uses the USB Dongle Transmitters, actual operations include simultaneous transmission of both the WiFi 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 "Hotspot" feature of the USB Dongle was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

2. For Simultaneous Transmission Scenario **No.1,2,3** LTE/WCDMA/GSM and WiFi 2450 is tested separately. Standalone SAR test configuration for LTE/WCDMA/GSM and WiFi 2450, please refer to Section 13.

3. Per KDB 447498D01v05, 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)

4. Applicable Simultaneous Transmission Scenario Evaluation

Test Position	LTE&WCDMA&GSM SAR_{Max} (W/Kg)	WiFi SAR_{Max}(W/Kg)	∑1-gSAR_{Max}(W/Kg) WiFi&Primary Ant
Body SAR	0.915	0.181	1.096

Simultaneous Transmission SAR evaluation is not required for Wifi and LTE/WCDMA/GSM, because the sum of 1g SAR_{Max} is **1.096**W/Kg < 1.6W/Kg for Wifi and LTE/WCDMA/GSM.
(According to KDB 447498D01v05, the sum of the highest *reported* SAR of each antenna does not exceed the limit, simultaneous transmission SAR evaluation is not required.)

Annex A Photographs of the EUT

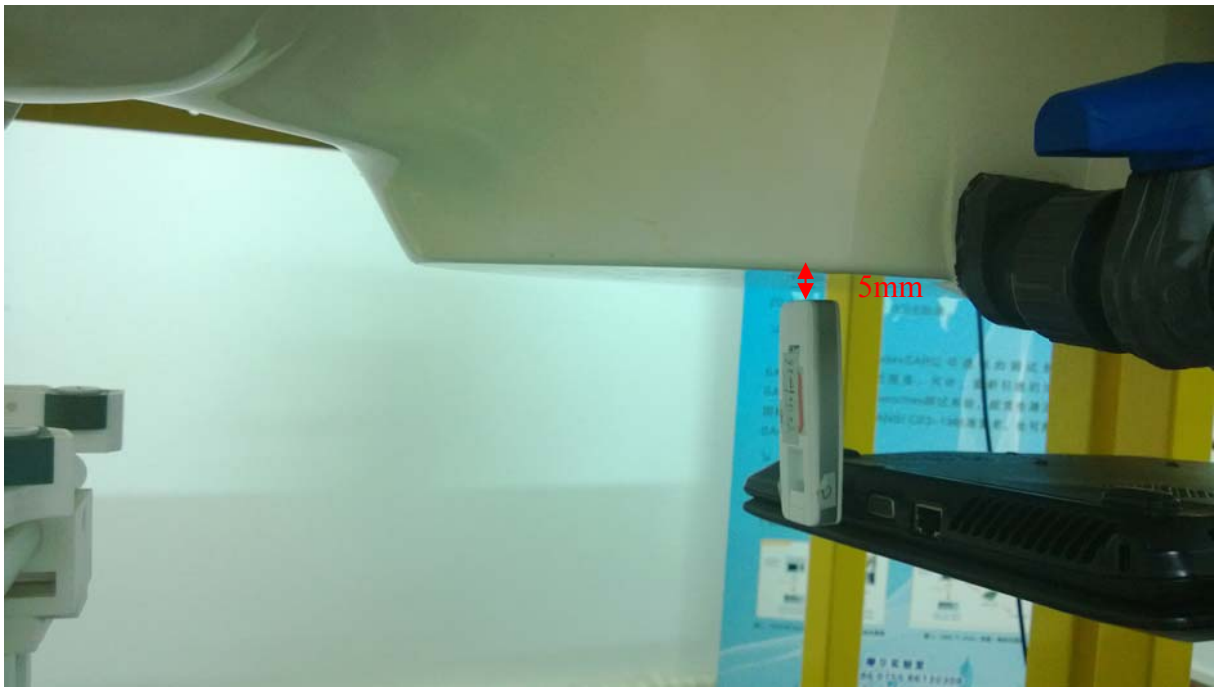
1 EUT Horizontal-Up

2 EUT Horizontal-Down

3 EUT Vertical-Front

4 EUT Vertical-Back

5 EUT Dongle-Tip



6 Data line

Liquid Level Photo

Annex B Graph Test Results (WCDMA/GSM/WiFi)

Annex C Graph Test Results (for LTE)

Annex D System Performance Check Data