



FCC SAR TEST REPORT

Report No. : SET2018-05895

Product : Smartphone

Brand Name: Coolpad

Model No. : Coolpad 3310A

FCC ID : R38YL3310A

Applicant : Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd

Address : Coolpad Information Harbor, 2nd Mengxi Road, Northern Part of Science & Technology Park, Nanshan, Shenzhen, China

Issued by : CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.

Lab Location : Building 28/29, East of Shigu Xili Industrial Zone, Nanshan District Shenzhen, Guangdong 518055, China

Tel : 86 755 26627338 **Fax:** 86 755 26627238

Mail : manager@ccic-set.com **Website:** <http://www.ccic-set.com>

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Test Report

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Manufacturer.....: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd

Manufacturer Address: Coolpad Information Harbor, 2nd Mengxi Road,Northern Part of Science&Technology Park, Nanshan, Shenzhen,China

Test Standards.....: **47CFR § 2.1093-** Radiofrequency Radiation Exposure Evaluation: Portable Devices;
ANSI C95.1–1992: Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991)
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

Test Result.....: Pass

Test Date.....: 2018.05.15-2018-07-20

Tested by: Mei Chun 2018-07-20
Chun Mei, Test Engineer

Reviewed by.....: Zhu Qi 2018-07-20
Zhu Qi, Senior EGINEER

Approved by.....: Smartli 2018-07-20
Li Sixiong , Manager



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1. Administrative Data

1.1 Testing Laboratory

Test Site: CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd

Address: Electronic Testing Building, No. 43 Shahe Road, Xili Jiedao, Nanshan District, Shenzhen, Guangdong, China

CNAS Lab Code: CCIC-SET is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

NVLAP Lab Code: CCIC-SET is a third party testing organization accredited by NVLAP according to ISO/IEC 17025. The accreditation certificate number is 201008-0.

FCC Registration: CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN5031, valid time is until December 31, 2018.

ISED Registration: CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Aug. 03, 2019.

Test Environment Temperature (°C): 21°C

Condition: Relative Humidity (%): 60%

Atmospheric Pressure (kPa): 86KPa-106KPa



2. Equipment Under Test (EUT)

Identification of the Equipment under Test

Device Type:	Portable	
Exposure Category:	Population/Uncontrolled	
Sample Name:	Smartphone	
Brand Name:	Coolpad	
Model Name:	Coolpad 3310A	
	Support Band	CDMA BC0,BC1,BC10, LTE Band2/4/5/12/13/25/26/41,WIFI 2.4G, BT,GPS
	Test Band	CDMA BC0,BC1,BC10, LTE Band2/4/5/12/13/25/26/41,WIFI 2.4G
	IMEI No.	990007950008380
	Device Class	Class B
	Development Stage	Identical Prototype
	Accessories	Power Supply
	Hotspot	2.4GHz WLAN support Hotspot mode
General description:	Antenna type	Internal Antenna
	Operation mode	CDMA / LTE /WIFI/BT
	Modulation mode	CDMA(QPSK),LTE(QPSK,16QAM), WIFI(OFDM/DSSS) ,BT(GFSK/ π /4-DQPSK/8-DPSK)
	DTM mode	Not support
	Hardware Version	P0
	Software Version	3310A.SPRINT.180608.00
	Battery	Model No.: CPLD-189 Rated capacity: 2150mAh Nominal Voltage: --- +3.8V Charge Voltage: --- +4.35V
	Max. RF Power	31.92dBm
	Max. SAR Value	Head:0.599 W/kg Body: 1.429W/kg(Limit:1.6W/Kg, 10mm distance)

NOTE:

- The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
- Select Battery 1 as main testing, Battery 2 select the worst case.



EUT testing configuration

Tested frequency range(s)	Transmitter Frequency Range	Receiver Frequency Range
CDMA BC0:	815-849 MHz	860-894 MHz
CDMA BC1:	1850-1910 MHz	1930-1990 MHz
CDMA BC10:	817.25 – 822.75 MHz	862.25 – 867.75MHz
LTE Band2:	1850-1910 MHz	1930-1990 MHz
LTE Band4:	1710-1755 MHz	2110-2155 MHz
LTE Band5:	824-849 MHz	869-894 MHz
LTE Band12:	698-716 MHz	728-746 MHz
LTE Band13:	777-787 MHz	746-756 MHz
LTE Band25:	1850-1915 MHz	1930-1995 MHz
LTE Band26:	814-849 MHz	859-894 MHz
LTE Band41:	2496-2690 MHz	
WIFI(tested):	2412-2462 MHz	
Bluetooth:	2402-2480 MHz	
Test channels(low-mid-high):	1013-384-777(CDMA BC0)	
	25-600-1175(CDMA BC1)	
	450-560-670(CDMA BC10)	
	18700-18900-19100(LTE Band 2 Bandwidth 20M)	
	20050-20175-20300(LTE Band 4 Bandwidth 20M)	
	20450-20525-20600(LTE Band 5 Bandwidth 10M)	
	23060-23095-23130(LTE Band 12 Bandwidth 10M)	
	23230-23230-23230(LTE Band 13 Bandwidth 10M)	
	26140-26365-26590(LTE Band 25 Bandwidth 20M)	
	26765-26865-26965(LTE Band 26 Bandwidth 15M)	
	39750-40620-41490(LTE Band 41 Bandwidth 20M)	
1-6-11(Wife 2.4G 802.11b)		



3. SAR Summary

Highest Standalone SAR Summary

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Head	CDMA BC0	0.599	0.599
	CDMA BC1	0.467	
	CDMA BC10	0.412	
	LTE Band 2	0.453	
	LTE Band 4	0.566	
	LTE Band 5	0.409	
	LTE Band 12	0.340	
	LTE Band 13	0.186	
	LTE Band 25	0.333	
	LTE Band 26	0.036	
	LTE Band 41	0.400	
	WIFI 802.11b	0.175	
Body-worn/ hotspot Accessory (10mm Gap)	CDMA BC0	0.826	1.429
	CDMA BC1	1.401	
	CDMA BC10	0.875	
	LTE Band 2	1.429	
	LTE Band 4	1.327	
	LTE Band 5	0.772	
	LTE Band 12	0.416	
	LTE Band 13	0.346	
	LTE Band 25	1.429	
	LTE Band 26	0.479	
	LTE Band 41	1.179	
	WIFI	0.039	

Highest Simultaneous SAR Summary

Extreme Position	Frequency Band	Highest Scaled 1g-SAR(W/kg)
Head	WWAN(LTE Band4)&WIFI	0.741
Body-worn/hotspot (10mmGap)	WWAN(LTE Band2/25)&WIFI	1.429

4. Specific Absorption Rate (SAR)

4.1 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.

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

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

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

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

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

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

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

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

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



4.2 Applicable Standards and Limits

4.2.1 Applicable Standards

47CFR § 2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI C95.1-1992	Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991)
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
KDB 248227 D01	v02r02 802.11 Wi-Fi SAR
KDB 447498 D01	v06 General RF Exposure Guidance
KDB 648474 D04	v01r03 Handset SAR
KDB 865664 D01	v01r04 SAR Measurement 100MHz to 6GHz
KDB 865664 D02	v01r02 SAR Exposure Reporting
KDB 941225 D01	v03r01 3G SAR Procedures
KDB 941225 D05	v02r05 SAR for LTE Devices
KDB 941225 D06	v02r01 Hotspot Mode

4.2.2 RF exposure Limits

Human Exposure	Uncontrolled Environment General Population
Spatial Peak SAR* (Brain/Body)	1.60 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g
Spatial Peak SAR*** (Limbs)	4.00 mW/g

The limit applied in this test report is shown in bold letters.

Notes:

* The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time

** The Spatial Average value of the SAR averaged over the whole body.

*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

4.3 Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SATIMO. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

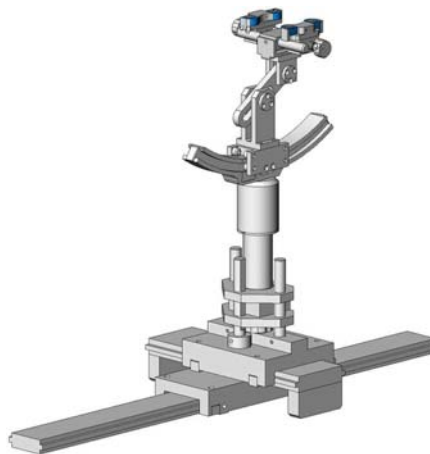


SAM Twin Phantom

4.4 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SATIMO as an integral part of the COMOSAR test system.

The device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.



Device holder

4.5 Probe Specification

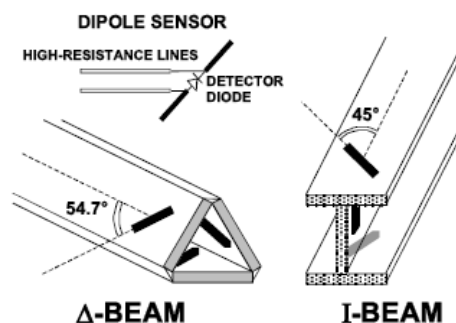


Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	700 MHz to 3 GHz; Linearity: ± 0.5 dB (700 MHz to 3 GHz)
Directivity	± 0.25 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	1.5 μ W/g to 100 mW/g; Linearity: ± 0.5 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 5 mm Distance from probe tip to dipole centers: <2.7 mm
Application	General dosimetry up to 3 GHz Dosimetry in strong gradient fields Compliance tests of Coolpad 3310A LTE USB Modems
Compatibility	COMOSAR

Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



5. Tissue check and recommend Dielectric Parameters

5.1 Tissue Dielectric Parameters for Head and Body Phantoms

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

Table 1: Recommended Dielectric Performance of Tissue

Ingredients (% by weight)	Frequency (MHz)											
	450		835		915		1900		2450		2600	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.46	52.4	41.05	56.0	54.9	40.4	62.7	73.2	55.24	64.49
Salt (Nacl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04	0.5	0.024
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0	0.0	0.0
Triton x-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0	44.45	32.25
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.2	52.5	39.0	52.5
Conductivity (s/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.80	1.78	1.96	2.16

MSL/HSL750 (Body and Head liquid for 650 – 850 MHz)

Item	Head Tissue Simulation Liquid HSL750 Muscle(body)Tissue Simulation Liquid MSL750			
H2O	Water, 35 – 58%			
Sucrose	Sugar, white, refined, 40-60%			
NaCl	Sodium Chloride, 0-6%			
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%			
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyl-3(2H)-isothiazolone, 0.1-0.7%			
Frequency (MHz)	Head ϵ_r	Head σ (S/m)	Body ϵ_r	Body σ (S/m)
750	41.9	0.89	55.2	0.97

Note: The liquid of 700MHz&2600MHz typical liquid composition is provided by SATIMO.

Table 2 Recommended Tissue Dielectric Parameters

Frequency (MHz)	Head Tissue		Body Tissue	
	ϵ_r	σ (S/m)	ϵ_r	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
5800	35.3	5.27	48.2	6.00

5.2 Simulate liquid

Liquid check results:

Table 3: Dielectric Performance of Head Tissue Simulating Liquid

Temperature: 23.2°C; Humidity: 64%;			
/	Frequency	Permittivity ϵ	Conductivity σ (S/m)
Target value	750MHz	41.9±5%	0.89±5%
Validation value (2018-05-19)	750MHz	42.05	0.90
Target value	850MHz	41.5±5%	0.90±5%
Validation value (2018-05-16)	850MHz	41.65	0.88
Target value	1800MHz	40.0±5%	1.40±5%
Validation value (2018-05-16)	1800MHz	38.88	1.37
Target value	1900MHz	40.0±5%	1.40±5%
Validation value (2018-05-17)	1900MHz	41.20	1.35
Target value	1900MHz	40.0±5%	1.40±5%
Validation value (2018-05-24)	1900MHz	41.18	1.34
Target value	2450MHz	39.2±5%	1.80±5%
Validation value (2018-05-15)	2450MHz	38.75	1.76
Target value	2600MHz	39.0±5%	1.96±5%
Validation value (2018-05-21)	2600MHz	38.12	1.94
Target value	750MHz	41.9±5%	0.89±5%
Validation value (2018-07-17)	750MHz	42.01	0.91
Target value	850MHz	41.5±5%	0.90±5%
Validation value (2018-07-17)	850MHz	41.32	0.91
Target value	1800MHz	40.0±5%	1.40±5%
Validation value (2018-07-18)	1800MHz	41.72	1.41
Target value	1900MHz	40.0±5%	1.40±5%
Validation value (2018-07-18)	1900MHz	41.72	1.41
Target value	2450MHz	39.2±5%	1.80±5%
Validation value (2018-07-19)	2450MHz	39.55	2.07
Target value	2600MHz	39.0±5%	1.96±5%
Validation value (2018-07-19)	2600MHz	38.12	1.94

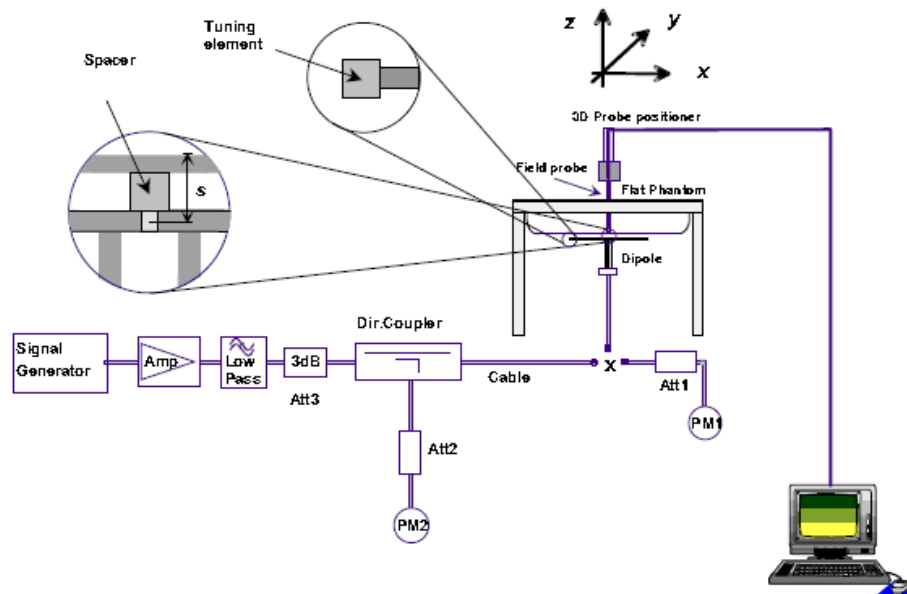
Table 4: Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 23.2°C; Humidity: 64%;			
/	Frequency	Permittivity ϵ	Conductivity σ (S/m)
Target value	750MHz	55.2 ± 5%	0.97 ± 5%
Validation value (2018-05-19)	750MHz	55.69	0.95
Target value	850MHz	55.2 ± 5%	0.97 ± 5%
Validation value (2018-05-16)	850MHz	55.36	0.93
Target value	1800MHz	53.3 ± 5%	1.52 ± 5%
Validation value (2018-05-16)	1800MHz	53.15	1.48
Target value	1900MHz	53.3 ± 5%	1.52 ± 5%
Validation value (2018-05-17)	1900MHz	53.96	1.50
Target value	1900MHz	53.3 ± 5%	1.52 ± 5%
Validation value (2018-05-24)	1900MHz	53.94	1.49
Target value	2450MHz	52.7 ± 5%	1.95 ± 5%
Validation value (2018-05-15)	2450MHz	52.36	1.92
Target value	2600MHz	52.5 ± 5%	2.16 ± 5%
Validation value (2018-05-21)	2600MHz	52.41	2.06
Target value	750MHz	55.2 ± 5%	0.97 ± 5%
Validation value (2018-07-17)	750MHz	55.65	0.94
Target value	850MHz	55.2 ± 5%	0.97 ± 5%
Validation value (2018-07-17)	850MHz	55.35	0.91
Target value	1800MHz	53.3 ± 5%	1.52 ± 5%
Validation value (2018-07-18)	1800MHz	53.14	1.45
Target value	1900MHz	53.3 ± 5%	1.52 ± 5%
Validation value (2018-07-18)	1900MHz	53.95	1.49
Target value	2450MHz	52.7 ± 5%	1.95 ± 5%
Validation value (2018-07-19)	2450MHz	52.35	1.91
Target value	2600MHz	52.5 ± 5%	2.16 ± 5%
Validation value (2018-07-19)	2600MHz	52.40	2.01

6. SAR System validation

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of $\pm 10\%$. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

The following procedure, recommended for performing validation tests using box phantoms is based on the procedures described in the IEEE standard P1528. Setup according to the setup diagram below:



With the SG and Amp and with directional coupler in place, set up the source signal at the relevant frequency and use a power meter to measure the power at the end of the SMA cable that you intend to connect to the balanced dipole. Adjust the SG to make this, say, 0.01W (10 dBm). If this level is too high to read directly with the power meter sensor, insert a calibrated attenuator (e.g. 10 or 20 dB) and make a suitable correction to the power meter reading.

Note 1: In this method, the directional coupler is used for monitoring rather than setting the exact feed power level. If, however, the directional coupler is used for power measurement, you should check the frequency range and power rating of the coupler and measure the coupling factor (referred to output) at the test frequency using a VNA.

Note 2: Remember that the use of a 3dB attenuator (as shown in Figure 8.1 of P1528) means that you need an RF amplifier of 2 times greater power for the same feed power. The other issue is the cable length. You might get up to 1dB of loss per meter of cable, so the cable length after the coupler needs to be quite short.

Note 3: For the validation testing done using CW signals, most power meters are suitable. However, if you are measuring the output of a modulated signal from either a signal generator or a handset, you must ensure that the power meter correctly reads the modulated signals.

The measured 1-gram averaged SAR values of the device against the phantom are provided in Tables 5 and Table 6. The humidity and ambient temperature of test facility were 64% and 23.2°C respectively. The body phantom were full of the body tissue simulating liquid. The EUT was supplied with full-charged battery for each measurement.

The distance between the back of the EUT and the bottom of the flat phantom is 10 mm (taking into account of the IEEE 1528 and the place of the antenna).

Table 5: Head SAR system validation (1g)

Frequency	Duty cycle	Target value (W/kg)	Test value (W/kg)	
			10 mW	1W
750MHz(2018-05-19)	1:1	8.67 ± 10%	0.0885	8.85
835MHz(2018-05-16)	1:1	9.77 ± 10%	0.0988	9.88
1800MHz(2018-05-16)	1:1	40.37 ± 10%	0.4245	42.45
1900MHz(2018-05-17)	1:1	40.37 ± 10%	0.3825	38.25
1900MHz(2018-05-24)	1:1	40.37 ± 10%	0.3861	38.61
2450MHz(2018-05-15)	1:1	53.60 ± 10%	0.5260	52.60
2600MHz(2018-05-21)	1:1	56.19 ± 10%	0.5324	53.24
750MHz(2018-07-17)	1:1	8.67 ± 10%	0.0874	8.74
835MHz(2018-07-17)	1:1	9.77 ± 10%	0.0967	9.67
1800MHz(2018-07-18)	1:1	40.37 ± 10%	0.3706	37.06
1900MHz(2018-07-18)	1:1	40.37 ± 10%	0.3717	37.17
2450MHz(2018-07-19)	1:1	53.60 ± 10%	0.5081	50.81
2600MHz(2018-07-19)	1:1	56.19 ± 10%	0.5111	51.11

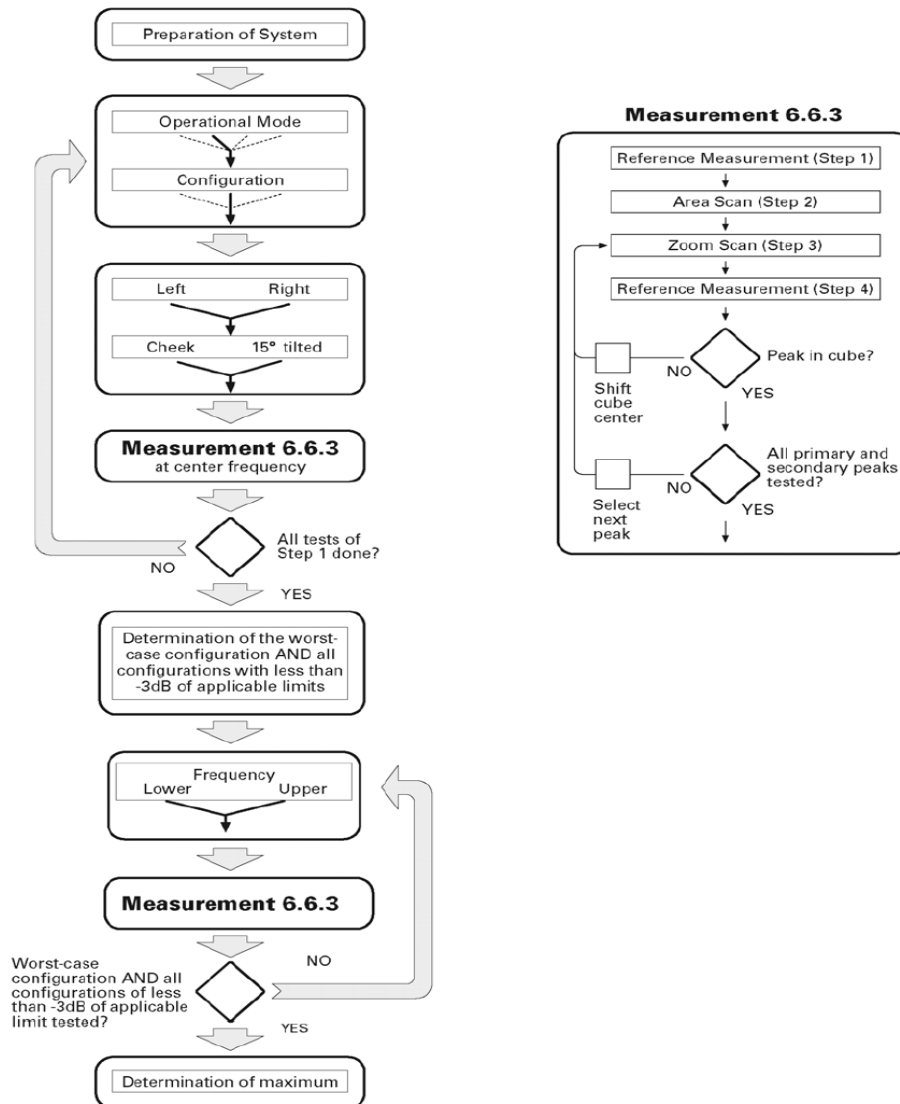
Table 6: Body SAR system validation (1g)

Frequency	Duty cycle	Target value (W/kg)	Test value (W/kg)	
			10 mW	1W
750MHz(2018-05-19)	1:1	8.43 ± 10%	0.0909	9.09
835MHz(2018-05-16)	1:1	10.31 ± 10%	0.0976	9.76
1800MHz(2018-05-16)	1:1	40.81 ± 10%	0.4045	40.45
1900MHz(2018-05-17)	1:1	40.81 ± 10%	0.3972	39.72
1900MHz(2018-05-24)	1:1	40.81 ± 10%	0.3957	39.57
2450MHz(2018-05-15)	1:1	52.66 ± 10%	0.5127	51.27
2600MHz(2018-05-21)	1:1	57.55 ± 10%	0.5520	55.20
750MHz(2018-07-17)	1:1	8.43 ± 10%	0.0883	8.83
835MHz(2018-07-17)	1:1	10.31 ± 10%	0.0962	9.62
1800MHz(2018-07-18)	1:1	40.81 ± 10%	0.3746	37.46
1900MHz(2018-07-18)	1:1	40.81 ± 10%	0.3761	37.61
2450MHz(2018-07-19)	1:1	52.66 ± 10%	0.5175	51.75
2600MHz(2018-07-19)	1:1	57.55 ± 10%	0.5321	53.21

* Note: Target value was referring to the measured value in the calibration certificate of reference dipole.
 Note: All SAR values are normalized to 1W forward power.

7. SAR measurement procedure

The SAR test against the head phantom was carried out as follow:



Establish a call with the maximum output power with a base station simulator, the connection between the EUT and the base station simulator is established via air interface.

After an area scan has been done at a fixed distance of 2mm from the surface of the phantom on the source side, a 3D scan is set up around the location of the maximum spot SAR. First, a point within the scan area is visited by the probe and a SAR reading taken at the start of testing. At the end of testing, the probe is returned to the same point and a second reading is taken. Comparison between these start and end readings enables the power drift during measurement to be assessed.

Above is the scanning procedure flow chart and table from the IEEE p1528 standard. This is the procedure for which all compliant testing should be carried out to ensure that all variations of the device position and transmission behavior are tested.

8. Conducted RF Output Power

8.1 CDMA Conducted output Power

Conducted Power (Unit:dBm)			
Band	CDMA BC0		
Channel	1013	384	777
Frequency(MHz)	824.7	836.52	848.31
RC1 + SO55	23.92	23.89	23.81
RC3 + SO55	23.91	23.87	23.80
RC3 + SO32(+ F-SCH)	23.86	23.83	23.85
RC3 + SO32(+SCH)	23.84	23.82	23.81
1xEVDO Rev A RETAP	22.56	22.42	22.52
Band	CDMA BC1		
Channel	25	600	1175
Frequency(MHz)	1851.25	1880.00	1908.75
RC1 + SO55	22.89	22.85	22.84
RC3 + SO55	22.84	22.75	22.69
RC3 + SO32(+ F-SCH)	22.75	22.67	22.58
RC3 + SO32(+SCH)	22.47	22.38	22.46
1xEVDO Rev A RETAP	21.64	21.52	21.63
Band	CDMA0 BC10		
Channel	450	560	670
Frequency(MHz)	817.25	820.00	822.75
RC1 + SO55	24.35	24.33	24.32
RC3 + SO55	24.29	24.28	24.21
RC3 + SO32(+ F-SCH)	24.30	24.25	24.27
RC3 + SO32(+SCH)	24.22	24.24	24.20
1xEVDO Rev A RETAP	22.83	22.79	22.82

Note:

1. WCDMA SAR was tested under PMC 12.2kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. HSPA SAR was not requires since the average output power of the HSPA subtests was not more than 0.25dB higher than the RMC level and SAR was less than 1.2W/kg.
2. It is expected by the manufacturer that MPR for some HSPA subtests may be up to 2dB more than specified by 3GPP, but also as low as 0dB according to the chipset implementation in this model.

8.2 LTE Conducted peak output Power

LTE Test Configurations

The CMW500 Wide Band Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR test were performed with the same number of RB and RB offsets transmitting on all frames.

1) Spectrum Plots for RB configurations

A properly configured base station simulator was used for LTE output power measurements and SAR testing. Therefore, spectrum plots for RB configurations were not required to be included in this report.

2) MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.

The allowed Maximum Power Reduction(MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101:

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

3)A-MPR LTE procedures for SAR testing

A-MPR(Additional MPR) has been disabled for all SAR tests by using Network Signaling Value of "NS_01" on the base station simulator.

4)LTE procedures for SAR testing

A) Largest channel bandwidth standalone SAR test

requirements i) 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 $\leq 0.8W/kg$, testing of the remaining RB offset configurations and required test channels is not required for 1RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. 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.



1. LTE Band 2 Conducted Power Test Verdict:

LTE FDD Band 2				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				18607	18900	19193
1.4MHz	QPSK	1	0	25.03	24.7	24.85
		1	3	24.9	24.6	24.73
		1	5	24.92	24.59	24.72
		3	0	24.2	23.88	24
		3	2	24.21	23.87	23.97
		3	3	24.22	23.89	23.98
		6	0	24.08	23.76	23.87
	16QAM	1	0	23.9	23.55	23.74
		1	3	23.75	23.44	23.61
		1	5	23.88	23.52	23.73
		3	0	22.97	22.63	22.92
		3	2	23.05	22.73	22.95
		3	3	23.07	22.74	22.89
		6	0	22.95	22.64	22.74
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				18615	18900	19185
3MHz	QPSK	1	0	25.1	24.89	25.01
		1	7	24.97	24.79	24.89
		1	14	24.99	24.78	24.88
		8	0	24.27	24.07	24.16
		8	4	24.28	24.06	24.13
		8	7	24.29	24.08	24.14
		15	0	24.15	23.95	24.03
	16QAM	1	0	23.97	23.74	23.9
		1	7	23.82	23.63	23.77
		1	14	23.95	23.71	23.89
		8	0	23.04	22.82	23.08
		8	4	23.12	22.92	23.11
		8	7	23.14	22.93	23.05
		15	0	23.02	22.83	22.9
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				18625	18900	19175
5MHz	QPSK	1	0	25.1	25.03	25.11
		1	13	24.97	24.93	24.99
		1	24	24.99	24.92	24.98
		12	0	24.27	24.21	24.26
		12	6	24.28	24.2	24.23
		12	13	24.29	24.22	24.24



	16QAM	25	0	24.15	24.09	24.13
		1	0	23.97	23.88	24
		1	13	23.82	23.77	23.87
		1	24	23.95	23.85	23.99
		12	0	23.04	22.96	23.18
		12	6	23.12	23.06	23.21
		12	13	23.14	23.07	23.15
		25	0	23.02	22.97	23
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				18650	18900	19150
10MHz	QPSK	1	0	25.33	25.11	25.16
		1	25	25.2	25.01	25.04
		1	49	25.22	25	25.03
		25	0	24.5	24.29	24.31
		25	13	24.51	24.28	24.28
		25	25	24.52	24.3	24.29
		50	0	24.38	24.17	24.18
	16QAM	1	0	24.2	23.96	24.05
		1	25	24.05	23.85	23.92
		1	49	24.18	23.93	24.04
		25	0	23.27	23.04	23.23
		25	13	23.35	23.14	23.26
		25	25	23.37	23.15	23.2
		50	0	23.25	23.05	23.05
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				18675	18900	19125
15MHz	QPSK	1	0	25.41	25.33	25.31
		1	38	25.28	25.23	25.19
		1	74	25.3	25.22	25.18
		36	0	24.58	24.51	24.46
		36	18	24.59	24.5	24.43
		36	39	24.6	24.52	24.44
		75	0	24.46	24.39	24.33
	16QAM	1	0	24.28	24.18	24.2
		1	38	24.13	24.07	24.07
		1	74	24.26	24.15	24.19
		36	0	23.35	23.26	23.38
		36	18	23.43	23.36	23.41
		36	39	23.45	23.37	23.35
		75	0	23.33	23.27	23.2
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				18700	18900	19100
20MHz	QPSK	1	0	25.54	25.51	25.62



		1	50	25.41	25.41	25.5
		1	99	25.43	25.4	25.49
		50	0	24.38	24.03	24.16
		50	25	24.23	23.92	24.03
		50	50	24.36	24	24.15
		100	0	23.43	23.12	23.16
	16QAM	1	0	24.22	24.12	24.12
		1	50	24.13	23.85	24.01
		1	99	24.14	23.65	24.12
		50	0	23.45	23.11	23.34
		50	25	23.53	23.21	23.37
		50	50	23.55	23.22	23.31
		100	0	23.33	23.11	23.13

LTE FDD Band 4				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				19957	20175	20393
1.4MHz	QPSK	1	0	25.12	25.03	24.56
		1	3	24.99	24.93	24.44
		1	5	25.01	24.92	24.43
		3	0	24.29	24.21	23.71
		3	2	24.3	24.2	23.68
		3	3	24.31	24.22	23.69
		6	0	24.17	24.09	23.58
	16QAM	1	0	23.31	23.25	22.62
		1	3	23.16	23.14	22.49
		1	5	23.29	23.22	22.61
		3	0	22.38	22.33	21.8
		3	2	22.46	22.43	21.83
		3	3	22.48	22.44	21.77
		6	0	22.36	22.34	21.62
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				19965	20175	20385
3MHz	QPSK	1	0	25.18	25.06	24.71
		1	7	25.05	24.96	24.59
		1	14	25.07	24.95	24.58
		8	0	24.35	24.24	23.86
		8	4	24.36	24.23	23.83
		8	7	24.37	24.25	23.84
		15	0	24.23	24.12	23.73
	16QAM	1	0	23.46	23.41	22.88



		1	7	23.31	23.3	22.75
		1	14	23.44	23.38	22.87
		8	0	22.53	22.49	22.06
		8	4	22.61	22.59	22.09
		8	7	22.63	22.6	22.03
		15	0	22.51	22.5	21.88
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				19975	20175	20375
5MHz	QPSK	1	0	25.21	25.16	24.88
		1	13	25.08	25.06	24.76
		1	24	25.1	25.05	24.75
		12	0	24.38	24.34	24.03
		12	6	24.39	24.33	24
		12	13	24.4	24.35	24.01
		25	0	24.26	24.22	23.9
	16QAM	1	0	23.65	23.45	22.92
		1	13	23.5	23.34	22.79
		1	24	23.63	23.42	22.91
		12	0	22.72	22.53	22.1
		12	6	22.8	22.63	22.13
		12	13	22.82	22.64	22.07
		25	0	22.7	22.54	21.92
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				20000	20175	20350
10MHz	QPSK	1	0	25.25	25.18	25.01
		1	25	25.12	25.08	24.89
		1	49	25.14	25.07	24.88
		25	0	24.42	24.36	24.16
		25	13	24.43	24.35	24.13
		25	25	24.44	24.37	24.14
		50	0	24.3	24.24	24.03
	16QAM	1	0	23.71	23.56	23.01
		1	25	23.56	23.45	22.88
		1	49	23.69	23.53	23
		25	0	22.78	22.64	22.19
		25	13	22.86	22.74	22.22
		25	25	22.88	22.75	22.16
		50	0	22.76	22.65	22.01
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				20025	20175	20325
15MHz	QPSK	1	0	25.42	25.33	25.26
		1	38	25.29	25.23	25.14
		1	74	25.31	25.22	25.13



		36	0	24.59	24.51	24.41
		36	18	24.6	24.5	24.38
		36	39	24.61	24.52	24.39
		75	0	24.47	24.39	24.28
	16QAM	1	0	23.88	23.71	23.13
		1	38	23.73	23.6	23
		1	74	23.86	23.68	23.12
		36	0	22.95	22.79	22.31
		36	18	23.03	22.89	22.34
		36	39	23.05	22.9	22.28
		75	0	22.93	22.8	22.13
Bandwidth	Modulation	RB size	RB offset	Channel 20050	Channel 20175	Channel 20300
20MHz	QPSK	1	0	25.45	25.42	25.4
		1	50	25.42	25.32	25.28
		1	99	25.44	25.31	25.27
		50	0	24.16	23.9	23.77
		50	25	24.01	23.79	23.04
		50	50	24.14	23.87	23.16
		100	0	23.21	22.99	22.17
	16QAM	1	0	24.12	23.78	23.15
		1	50	24.02	23.61	23.01
		1	99	24.13	23.33	23.12
		50	0	23.23	22.46	22.35
		50	25	23.31	23.23	22.38
		50	50	23.33	23.15	22.32
		100	0	23.21	22.81	22.02



LTE FDD Band 5				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				20407	20525	20643
1.4MHz	QPSK	1	0	25.22	25.01	24.62
		1	3	25.09	24.9	24.51
		1	5	25.07	24.86	24.48
		3	0	24.41	24.15	23.76
		3	2	24.37	24.18	23.8
		3	3	24.38	24.17	23.75
		6	0	24.23	23.98	23.65
	16QAM	1	0	25.03	25.01	24.07
		1	3	24.92	24.86	23.96
		1	5	25.01	24.97	24.05
		3	0	24.12	24.09	23.24
		3	2	24.15	24.18	23.3
		3	3	24.21	24.2	23.21
		6	0	24.07	24.02	23
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				20415	20525	20635
3MHz	QPSK	1	0	25.36	25.1	24.74
		1	7	25.21	24.96	24.6
		1	14	25.25	24.97	24.59
		8	0	24.54	24.25	23.91
		8	4	24.55	24.28	23.93
		8	7	24.56	24.26	23.86
		15	0	24.38	24.13	23.75
	16QAM	1	0	25.11	25.13	24.05
		1	7	24.96	24.98	23.9
		1	14	25.08	25.07	24.02
		8	0	24.19	24.19	23.24
		8	4	24.25	24.31	23.33
		8	7	24.3	24.29	23.22
		15	0	24.15	24.13	22.98
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				20425	20525	20625
5MHz	QPSK	1	0	25.45	25.15	24.88
		1	13	25.3	25	24.77
		1	24	25.32	25.03	24.73
		12	0	24.63	24.32	24.07
		12	6	24.64	24.31	24.04



		12	13	24.62	24.28	24.03
		25	0	24.48	24.16	23.83
	16QAM	1	0	25.13	25.23	24.1
		1	13	25	25.09	23.96
		1	24	25.08	25.21	24.03
		12	0	24.19	24.31	23.25
		12	6	24.32	24.37	23.38
		12	13	24.31	24.4	23.24
		25	0	24.16	24.29	23
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				20450	20525	20600
10MHz	QPSK	1	0	25.58	25.25	25.02
		1	25	25.4	25.13	24.87
		1	49	25.42	25.13	24.91
		25	0	25.19	25.34	24.14
		25	13	25.08	25.23	24.03
		25	25	25.14	25.26	24.11
		50	0	24.21	24.31	23.04
	16QAM	1	0	25.11	25.26	24.11
		1	25	25.05	25.21	24.01
		1	49	25.06	25.18	24.06
		25	0	24.28	24.4	23.3
		25	13	24.33	24.45	23.38
		25	25	24.34	24.48	23.26
		50	0	24.15	24.23	23.01



LTE FDD Band 12				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				23017	23095	23173
1.4MHz	QPSK	1	0	25.36	25.21	24.41
		1	3	25.24	25.09	24.29
		1	5	25.25	25.1	24.28
		3	0	24.51	24.39	23.59
		3	2	24.54	24.36	23.57
		3	3	24.48	24.4	23.58
		6	0	24.38	24.26	23.44
	16QAM	1	0	25.13	25.18	25.31
		1	3	25.02	25.07	25.18
		1	5	25.11	25.15	25.26
		3	0	24.18	24.23	24.47
		3	2	24.3	24.36	24.58
		3	3	24.29	24.33	24.5
		6	0	24.11	24.2	24.28
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				23025	23095	23165
3MHz	QPSK	1	0	25.51	25.26	24.43
		1	7	25.39	25.14	24.31
		1	14	25.4	25.15	24.3
		8	0	24.66	24.44	23.61
		8	4	24.69	24.41	23.59
		8	7	24.63	24.45	23.6
		15	0	24.53	24.31	23.46
	16QAM	1	0	25.23	25.21	25.44
		1	7	25.12	25.1	25.31
		1	14	25.21	25.18	25.39
		8	0	24.28	24.26	24.6
		8	4	24.4	24.39	24.71
		8	7	24.39	24.36	24.63
		15	0	24.21	24.23	24.41
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				23035	23095	23155
5MHz	QPSK	1	0	25.55	25.31	24.61
		1	13	25.43	25.19	24.49
		1	24	25.44	25.2	24.48
		12	0	24.7	24.49	23.79
		12	6	24.73	24.46	23.77



		12	13	24.67	24.5	23.78
		25	0	24.57	24.36	23.64
	16QAM	1	0	25.33	25.26	24.58
		1	13	25.22	25.15	24.45
		1	24	25.31	25.23	24.53
		12	0	24.38	24.31	23.74
		12	6	24.5	24.44	23.85
		12	13	24.49	24.41	23.77
		25	0	24.31	24.28	23.55
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				23060	23095	23130
10MHz	QPSK	1	0	25.62	25.34	24.76
		1	25	25.5	25.22	24.64
		1	49	25.51	25.23	24.63
		25	0	25.52	25.31	24.61
		25	13	25.41	25.2	24.48
		25	25	25.5	25.28	24.56
		50	0	24.5	24.33	23.58
	16QAM	1	0	25.56	25.23	24.51
		1	25	25.33	25.16	24.43
		1	49	25.45	25.15	24.42
		25	0	24.57	24.36	23.77
		25	13	24.69	24.49	23.88
		25	25	24.68	24.46	23.8
		50	0	24.36	24.25	23.51



LTE FDD Band 13				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				23205	23230	23255
5MHz	QPSK	1	0	25.52	25.33	25.02
		1	13	25.4	25.21	24.9
		1	24	25.41	25.22	24.89
		12	0	24.67	24.51	24.2
		12	6	24.7	24.48	24.18
		12	13	24.64	24.52	24.19
		25	0	24.54	24.38	24.05
	16QAM	1	0	25.12	25.33	23.88
		1	13	25.01	25.22	23.75
		1	24	25.1	25.3	23.83
		12	0	24.17	24.38	23.04
		12	6	24.29	24.51	23.15
		12	13	24.28	24.48	23.07
		25	0	24.1	24.35	22.85
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				23230	23230	23230
10MHz	QPSK	1	0	25.62	25.39	25.1
		1	25	25.5	25.27	24.98
		1	49	25.51	25.28	24.97
		25	0	25.35	25.35	24.06
		25	13	25.24	25.24	23.93
		25	25	25.33	25.32	24.01
		50	0	24.33	24.37	23.03
	16QAM	1	0	25.31	25.31	24.02
		1	25	25.22	25.18	23.85
		1	49	25.32	25.26	23.96
		25	0	24.4	24.4	23.22
		25	13	24.52	24.53	23.33
		25	25	24.51	24.5	23.25
		50	0	24.26	24.25	23.01



LTE FDD Band 25				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26047	26365	26683
1.4MHz	QPSK	1	0	25.06	25.03	24.61
		1	3	24.93	24.93	24.49
		1	5	24.95	24.92	24.48
		3	0	24.23	24.21	23.76
		3	2	24.24	24.2	23.73
		3	3	24.25	24.22	23.74
		6	0	24.11	24.09	23.63
	16QAM	1	0	24.02	24.01	24.88
		1	3	23.87	23.9	24.75
		1	5	24	23.98	24.87
		3	0	23.09	23.09	24.06
		3	2	23.17	23.19	24.09
		3	3	23.19	23.2	24.03
		6	0	23.07	23.1	23.88
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26055	26365	26675
3MHz	QPSK	1	0	25.13	25.08	24.81
		1	7	25	24.98	24.69
		1	14	25.02	24.97	24.68
		8	0	24.3	24.26	23.96
		8	4	24.31	24.25	23.93
		8	7	24.32	24.27	23.94
		15	0	24.18	24.14	23.83
	16QAM	1	0	24.08	24.06	25.03
		1	7	23.93	23.95	24.9
		1	14	24.06	24.03	25.02
		8	0	23.15	23.14	24.21
		8	4	23.23	23.24	24.24
		8	7	23.25	23.25	24.18
		15	0	23.13	23.15	24.03
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26065	26365	26665
5MHz	QPSK	1	0	25.23	25.18	24.82
		1	13	25.1	25.08	24.7
		1	24	25.12	25.07	24.69
		12	0	24.4	24.36	23.97
		12	6	24.41	24.35	23.94
		12	13	24.42	24.37	23.95
		25	0	24.28	24.24	23.84



	16QAM	1	0	24.11	24.08	23.05
		1	13	23.96	23.97	22.92
		1	24	24.09	24.05	23.04
		12	0	23.18	23.16	22.23
		12	6	23.26	23.26	22.26
		12	13	23.28	23.27	22.2
		25	0	23.16	23.17	22.05
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26090	26365	26640
10MHz	QPSK	1	0	25.33	25.23	24.89
		1	25	25.2	25.13	24.77
		1	49	25.22	25.12	24.76
		25	0	24.5	24.41	24.04
		25	13	24.51	24.4	24.01
		25	25	24.52	24.42	24.02
		50	0	24.38	24.29	23.91
	16QAM	1	0	24.13	24.11	23.08
		1	25	23.98	24	22.95
		1	49	24.11	24.08	23.07
		25	0	23.2	23.19	22.26
		25	13	23.28	23.29	22.29
		25	25	23.3	23.3	22.23
		50	0	23.18	23.2	22.08
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26115	26365	26615
15MHz	QPSK	1	0	25.51	25.43	25.02
		1	38	25.38	25.33	24.9
		1	74	25.4	25.32	24.89
		36	0	24.68	24.61	24.17
		36	18	24.69	24.6	24.14
		36	39	24.7	24.62	24.15
		75	0	24.56	24.49	24.04
	16QAM	1	0	24.15	24.22	23.15
		1	38	24	24.11	23.02
		1	74	24.13	24.19	23.14
		36	0	23.22	23.3	22.33
		36	18	23.3	23.4	22.36
		36	39	23.32	23.41	22.3
		75	0	23.2	23.31	22.15
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26140	26365	26590
20MHz	QPSK	1	0	25.6	25.49	25.11
		1	50	25.47	25.39	24.99



		1	99	25.49	25.38	24.98
		50	0	24.18	24.31	23.22
		50	25	24.03	24.2	23.09
		50	50	24.16	24.28	23.21
		100	0	23.23	23.4	22.22
	16QAM	1	0	24.15	24.22	23.13
		1	50	24.01	24.15	23.05
		1	99	24.06	24.16	23.15
		50	0	23.25	23.39	22.4
		50	25	23.33	23.49	22.43
		50	50	23.35	23.5	22.37
		100	0	23.15	23.26	22.14

LTE FDD Band 26				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26697	26865	27033
1.4MHz	QPSK	1	0	25.11	24.62	24.76
		1	3	24.98	24.52	24.64
		1	5	25	24.51	24.63
		3	0	24.28	23.8	23.91
		3	2	24.29	23.79	23.88
		3	3	24.3	23.81	23.89
	16QAM	6	0	24.16	23.68	23.78
		1	0	24.51	24.89	23.96
		1	3	24.36	24.78	23.83
		1	5	24.49	24.86	23.95
		3	0	23.58	23.97	23.14
		3	2	23.66	24.07	23.17
		3	3	23.68	24.08	23.11
		6	0	23.56	23.98	22.96
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26705	26865	27025
3MHz	QPSK	1	0	25.15	24.78	24.82
		1	7	25.02	24.68	24.7
		1	14	25.04	24.67	24.69
		8	0	24.32	23.96	23.97
		8	4	24.33	23.95	23.94
		8	7	24.34	23.97	23.95
		15	0	24.2	23.84	23.84
	16QAM	1	0	24.56	25.01	23.99
		1	7	24.41	24.9	23.86
		1	14	24.54	24.98	23.98



		8	0	23.63	24.09	23.17
		8	4	23.71	24.19	23.2
		8	7	23.73	24.2	23.14
		15	0	23.61	24.1	22.99
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26715	26865	27015
5MHz	QPSK	1	0	25.23	24.81	24.89
		1	13	25.1	24.71	24.77
		1	24	25.12	24.7	24.76
		12	0	24.4	23.99	24.04
		12	6	24.41	23.98	24.01
		12	13	24.42	24	24.02
	16QAM	25	0	24.28	23.87	23.91
		1	0	24.88	25.12	24.01
		1	13	24.73	25.01	23.88
		1	24	24.86	25.09	24
		12	0	23.95	24.2	23.19
		12	6	24.03	24.3	23.22
		12	13	24.05	24.31	23.16
		25	0	23.93	24.21	23.01
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26750	26865	26990
10MHz	QPSK	1	0	25.33	24.89	24.91
		1	25	25.2	24.79	24.79
		1	49	25.22	24.78	24.78
		25	0	24.5	24.07	24.06
		25	13	24.51	24.06	24.03
		25	25	24.52	24.08	24.04
	16QAM	50	0	24.38	23.95	23.93
		1	0	25.02	25.26	24.05
		1	25	24.87	25.15	23.92
		1	49	25	25.23	24.04
		25	0	24.09	24.34	23.23
		25	13	24.17	24.44	23.26
		25	25	24.19	24.45	23.2
		50	0	24.07	24.35	23.05
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				26775	26865	26965
15MHz	QPSK	1	0	25.65	25.02	24.93
		1	38	25.52	24.92	24.81
		1	74	25.54	24.91	24.8
		36	0	25.09	25.35	24.09
		36	18	24.94	25.24	23.96



		36	39	25.07	25.32	24.08
		75	0	24.14	24.44	23.09
	16QAM	1	0	25.02	25.26	24.04
		1	38	24.55	25.15	23.64
		1	74	25.02	25.26	24.14
		36	0	24.16	24.43	23.27
		36	18	24.24	24.53	23.3
		36	39	24.26	24.54	23.24
		75	0	24.12	24.35	23.05

LTE FDD Band 41				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				39675	40620	41565
5MHz	QPSK	1	0	25.33	25.18	24.83
		1	13	25.2	25.08	24.71
		1	24	25.22	25.07	24.7
		12	0	24.5	24.36	23.98
		12	6	24.51	24.35	23.95
		12	13	24.52	24.37	23.96
		25	0	24.38	24.24	23.85
	16QAM	1	0	25.18	25.13	24.06
		1	13	25.03	25.02	23.93
		1	24	25.16	25.1	24.05
		12	0	24.25	24.21	23.24
		12	6	24.33	24.31	23.27
		12	13	24.35	24.32	23.21
		25	0	24.23	24.22	23.06
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				39700	40620	41540
10MHz	QPSK	1	0	25.51	25.23	24.89
		1	25	25.38	25.13	24.77
		1	49	25.4	25.12	24.76
		25	0	24.68	24.41	24.04
		25	13	24.69	24.4	24.01
		25	25	24.7	24.42	24.02
		50	0	24.56	24.29	23.91
	16QAM	1	0	25.21	25.18	24.11
		1	25	25.06	25.07	23.98
		1	49	25.19	25.15	24.1
		25	0	24.28	24.26	23.29



		25	13	24.36	24.36	23.32
		25	25	24.38	24.37	23.26
		50	0	24.26	24.27	23.11
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				39725	40620	41515
15MHz	QPSK	1	0	25.55	25.31	25.01
		1	38	25.42	25.21	24.89
		1	74	25.44	25.2	24.88
		36	0	24.72	24.49	24.16
		36	18	24.73	24.48	24.13
		36	39	24.74	24.5	24.14
		75	0	24.6	24.37	24.03
	16QAM	1	0	25.26	25.22	24.13
		1	38	25.11	25.11	24
		1	74	25.24	25.19	24.12
		36	0	24.33	24.3	23.31
		36	18	24.41	24.4	23.34
		36	39	24.43	24.41	23.28
		75	0	24.31	24.31	23.13
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				39750	40620	41490
20MHz	QPSK	1	0	25.63	25.33	25.03
		1	50	25.5	25.23	24.91
		1	99	25.52	25.22	24.9
		50	0	25.29	25.3	24.16
		50	25	25.14	25.19	24.03
		50	50	25.27	25.27	24.15
		100	0	24.34	24.39	23.16
	16QAM	1	0	25.25	25.21	24.12
		1	50	25.11	25.12	24.01
		1	99	25.22	25.16	24.11
		50	0	24.36	24.38	23.34
		50	25	24.44	24.48	23.37
		50	50	24.46	24.49	23.31
		100	0	24.12	24.24	23.13

8.4 WLAN 2.4GHz Band Conducted Power

Channel/Freq.(MHz)	Maximum Conducted Out Power (dBm) Average		
	802.11b	802.11g	802.11n(HT20)
1(2412)	17.08	17.78	17.75
6(2437)	17.45	17.57	17.48
11(2462)	17.54	17.66	17.95
Channel/Freq.(MHz)	Maximum Conducted Out Power (dBm) Average		
	802.11n40		
3(2422)	15.82		
6(2437)	15.53		
9(2452)	15.54		

Note:

1. Per KDB248227 D01 v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4dB higher than those measured at lowest data rate
3. Per KDB248227 D01 v02r02, 802.11g /11n-HT20/11n-HT40 is not required. . When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is $\leq 1.2\text{W/Kg}$. Thus the SAR can be excluded.

8.5 Bluetooth Output Power

Channel	Frequency (MHz)	BT3.0 Output Power(dBm)Peak		
		GFSK	π /4-DQPSK	8-DPSK
CH 0	2402	0.76	1.77	2.04
CH 39	2441	0.74	1.85	2.05
CH 78	2480	0.88	1.85	2.00
Channel	Frequency (MHz)	BT4.0 Output Power(dBm)Peak		
		GFSK		
CH 0	2402	0.661		
CH 20	2442	0.912		
CH 39	2480	0.802		

Channel	Frequency (MHz)	BT3.0 Output Power(dBm)Average		
		GFSK	π /4-DQPSK	8-DPSK
CH 0	2402	-2.21	-1.33	-0.96
CH 39	2441	-2.24	-1.35	-0.95
CH 78	2480	-2.18	-1.29	-1.00
Channel	Frequency (MHz)	BT4.0 Output Power(dBm)Average		
		GFSK		
CH 0	2402	-2.93		
CH 20	2442	-2.68		
CH 39	2480	-2.75		

9. SAR test Exclusion and estimate SAR calculation:

Note:

1. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100MHz to 6GHz at test separation distances $\leq 50\text{mm}$ are determined by: $[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f} \text{ (GHz)}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
 - (1) f(GHz) is the RF channel transmit frequency in GHz
 - (2) Power and distance are round to the nearest mW and mm before calculation
 - (3) The result is rounded to one decimal place for comparison
 - (4) If the test separation distance(antenna-user) is $< 5\text{mm}$, 5mm is used for excluded SAR calculation
 - (5)

BT3.0 Max Power (dBm)	mW	Test Distance (mm)	Frequency(GHz)	Exclusion Thresholds
0	1	5	2.45	0.313

Per KDB 447498 D01v06 exclusion thresholds is $0.313 < 3$, RF exposure evaluation is not required.

BT estimated SAR value=Exclusion Thresholds/7.5= $0.313/7.5=0.042\text{W/Kg}$

BT3.0 Max Power (dBm)	Mw	Test Distance (mm)	Frequency(GHz)	Exclusion Thresholds
0	1	10	2.45	0.157

Per KDB 447498 D01v06 exclusion thresholds is $0.157 < 3$, RF exposure evaluation is not required.

(6) BT estimated SAR value=Exclusion Thresholds/7.5= $0.157/7.5=0.021\text{W/Kg}$

BT4.0 Max Power (dBm)	mW	Test Distance (mm)	Frequency(GHz)	Exclusion Thresholds
-2	0.631	5	2.45	0.198

Per KDB 447498 D01v06 exclusion thresholds is $0.198 < 3$, RF exposure evaluation is not required.

BT estimated SAR value=Exclusion Thresholds/7.5= $0.198/7.5=0.026\text{W/Kg}$

BT4.0 Max Power (dBm)	Mw	Test Distance (mm)	Frequency(GHz)	Exclusion Thresholds
-2	1.603	10	2.45	0.099

Per KDB 447498 D01v06 exclusion thresholds is $0.251 < 3$, RF exposure evaluation is not required.

BT estimated SAR value=Exclusion Thresholds/7.5= $0.099/7.5=0.013\text{W/Kg}$

Antenna Location:

BT/WIFI- Antenna



Edge C

Antenna-to-User (Edge Side) distance (mm):

Antenna	Front	Back	Edge A	Edge B	Edge C	Edge D
WWAN Main Antenna	5	1	133	10	1	4
WIFI Antenna	4	1	1	2.5	127	50

Note: The diagonal distance of the overall section is 12.7cm.

The Body SAR measurement positions of each band are as below:

Antenna	Front	Back	Edge A	Edge B	Edge C	Edge D
WWAN Antenna Body-worn	Yes	Yes	No	No	No	No
WWAN Antenna hotspot	Yes	Yes	No	Yes	Yes	Yes
WIFI Antenna Body-worn	Yes	Yes	No	No	No	No
WIFI Antenna hotspot	Yes	Yes	Yes	Yes	No	No

Note: According to KDB 941225 D06 v02r01, when antenna-to-edge>2.5cm, SAR is not required.



10. Scaling Factor calculation

Operation Mode	Channel	Output Power(dBm)	Tune up Power in tolerance(dBm)	Scaling Factor
CDMA BC0 1XRTT(RC1 SO55)	1013	23.92	23.0 ± 1.0	1.019
	384	23.89	23.0 ± 1.0	1.026
	777	23.85	23.0 ± 1.0	1.035
CDMA BC0 1XRTT(RC3 SO32)	1013	23.86	23.0 ± 1.0	1.033
	384	23.83	23.0 ± 1.0	1.040
	777	23.85	23.0 ± 1.0	1.035
CDMA BC0 (1xEVDO (Rel.A))	1013	22.56	22.0 ± 1.0	1.107
	384	22.42	22.0 ± 1.0	1.143
	777	22.52	22.0 ± 1.0	1.117
CDMA BC1 1XRTT(RC1 SO55)	25	22.89	22.0 ± 1.0	1.026
	600	22.85	22.0 ± 1.0	1.035
	1175	22.84	22.0 ± 1.0	1.038
CDMA BC1 1XRTT(RC3 SO32)	25	22.75	22.0 ± 1.0	1.059
	600	22.67	22.0 ± 1.0	1.079
	1175	22.58	22.0 ± 1.0	1.102
CDMA BC1 (1xEVDO (Rel.A))	25	21.64	21.0 ± 1.0	1.086
	600	21.52	21.0 ± 1.0	1.117
	1175	21.63	21.0 ± 1.0	1.089
CDMA BC10 1XRTT(RC1 SO55)	476	24.35	23.5 ± 1.0	1.035
	580	24.33	23.5 ± 1.0	1.040
	684	24.32	23.5 ± 1.0	1.042
CDMA BC10 1XRTT(RC3 SO32)	476	24.30	23.5 ± 1.0	1.047
	580	24.25	23.5 ± 1.0	1.059
	684	24.27	23.5 ± 1.0	1.054
CDMA BC10 (1xEVDO (Rel.A))	25	22.83	22.0 ± 1.0	1.040
	600	22.79	22.0 ± 1.0	1.050
	1175	22.82	22.0 ± 1.0	1.042
LTE B2 20MHz 1RB#0	18700	25.54	25.0 ± 1.0	1.112
	18900	25.51	25.0 ± 1.0	1.119
	19100	25.62	25.0 ± 1.0	1.091
LTE B2 20MHz 50RB#0	18700	24.38	23.5 ± 1.0	1.028
	18900	24.03	23.5 ± 1.0	1.114
	19100	24.16	23.5 ± 1.0	1.081
LTE B4 20MHz 1RB#0	20050	25.45	24.5 ± 1.0	1.012
	20175	25.42	24.5 ± 1.0	1.019
	20300	25.40	24.5 ± 1.0	1.023
LTE B4 20MHz 50RB#0	20050	24.16	23.5 ± 1.0	1.081
	20175	23.90	23.5 ± 1.0	1.148
	20300	23.77	23.5 ± 1.0	1.358
LTE B5 10MHz	20450	25.58	25.0 ± 1.0	1.102



1RB#0	20525	25.25	25.0 ± 1.0	1.189
	20600	25.02	25.0 ± 1.0	1.253
LTE B5 10MHz 25RB#0	20450	25.19	24.5 ± 1.0	1.074
	20525	25.34	24.5 ± 1.0	1.038
	20600	24.14	24.5 ± 1.0	1.368
LTE B12 10MHz 1RB#0	23060	25.62	25.0 ± 1.0	1.091
	23095	25.34	25.0 ± 1.0	1.164
	23130	24.76	25.0 ± 1.0	1.330
LTE B12 10MHz 25RB#0	23060	25.15	24.6 ± 1.0	1.109
	23095	25.58	24.6 ± 1.0	1.005
	23130	23.97	24.6 ± 1.0	1.130
LTE B13 10MHz 1RB#0	23230	25.62	25.0 ± 1.0	1.091
	23230	25.39	25.0 ± 1.0	1.151
	23230	25.10	25.0 ± 1.0	1.230
LTE B13 10MHz 25RB#0	23230	25.35	24.5 ± 1.0	1.035
	23230	25.35	24.5 ± 1.0	1.035
	23230	24.06	24.5 ± 1.0	1.393
LTE B25 20MHz 1RB#0	26140	25.60	25.0 ± 1.0	1.096
	26365	25.49	25.0 ± 1.0	1.125
	26590	25.11	25.0 ± 1.0	1.227
LTE B25 20MHz 50RB#0	26140	24.18	23.5 ± 1.0	1.076
	26365	24.31	23.5 ± 1.0	1.045
	26590	23.22	23.5 ± 1.0	1.343
LTE B26 15MHz 1RB#0	26765	25.65	25.0 ± 1.0	1.084
	26865	25.02	25.0 ± 1.0	1.253
	26965	24.93	25.0 ± 1.0	1.279
LTE B26 15MHz 36RB#0	26765	25.09	24.5 ± 1.0	1.099
	26865	25.35	24.5 ± 1.0	1.035
	26965	24.09	24.5 ± 1.0	1.384
LTE B41 20MHz 1RB#0	39750	25.63	25.0 ± 1.0	1.089
	40620	25.33	25.0 ± 1.0	1.167
	41490	25.03	25.0 ± 1.0	1.250
LTE B41 20MHz 25RB#0	39750	25.29	24.5 ± 1.0	1.050
	40620	25.30	24.5 ± 1.0	1.047
	41490	24.16	24.5 ± 1.0	1.361
WIFI 802.11b	1	17.08	17.0 ± 1.0	1.236
	6	17.45	17.0 ± 1.0	1.135
	11	17.54	17.0 ± 1.0	1.112
BT	39	-0.95	-1.0 ± 1.0	1.245

Note: for LTE power tolerance, only QPSK modulation mode was provide here.



11. Test Results

Table 1: SAR Values of CDMA BC0

Test Positions		Mode	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)			Power drift (%)	Plot No.
				SAR(W/Kg)1g	Scaled Factor	Scaled SAR(W/Kg),1g		
Battery 1								
Right Side of Head	Cheek	1XRTT(R C1 SO55)	384/836.5	0.584	1.026	0.599	2.53	1
	Tilt 15 degrees		384/836.5	0.383	1.026	0.393	2.00	--
Left Side of Head	Cheek		384/836.5	0.469	1.026	0.481	-2.33	--
	Tilt 15 degrees		384/836.5	0.349	1.026	0.358	3.79	--
Hotspot (10mm Separation)	Face Upward	1XRTT(R C3 SO32)	384/836.5	0.496	1.033	0.512	-1.36	--
	Back Upward		1013/824.7	0.785	1.035	0.812	-0.03	--
			384/836.5	0.800	1.033	0.826	0.43	2
			777/848.3	0.715	1.040	0.744	-1.92	--
			1013/824.7 Repeat 1st	0.765	1.035	0.792	-3.25	--
			384/836.5 Repeat 1st	0.788	1.033	0.814	-0.13	--
			777/848.3 Repeat 1st	0.711	1.040	0.739	0.15	--
	Edge B	384/836.5	0.404	1.040	0.420	1.48	--	
	Edge C	384/836.5	0.172	1.040	0.179	-1.64	--	
	Edge D	384/836.5	0.331	1.040	0.344	-0.41	--	
	Face Upward	1Xevdo(R el.0)	384/836.5	0.441	1.143	0.504	-4.74	--
	Back Upward		384/836.5	0.698	1.143	0.798	1.38	--
	Edge B		384/836.5	0.361	1.143	0.413	0.36	--
	Edge C		384/836.5	0.132	1.143	0.151	1.69	--
Edge D	384/836.5		0.278	1.143	0.318	-1.43	--	
Worst Value Test with Battery 2								
Right Head Check		1XRTT(R C1 SO55)	384/836.5	0.512	1.026	0.525	-1.21	--
Back Upward		1XRTT(R C3 SO32)	384/836.5	0.703	1.033	0.726	-1.11	--



Table 2: SAR Values of CDMA BC1

Test Positions		Mode	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Plot No.
				SAR(W/Kg) 1g	Scaled Factor	Scaled SAR(W/Kg), 1g	Power drift (%)	
Battery 1								
Right Side of Head	Cheek	1XRTT(R C3 SO55)	600/1880	0.451	1.035	0.467	-1.04	3
	Tilt 15 degrees		600/1880	0.416	1.035	0.431	-0.12	--
Left Side of Head	Cheek		600/1880	0.374	1.035	0.387	-4.45	--
	Tilt 15 degrees		600/1880	0.256	1.035	0.265	1.67	--
Hotspot (10mm Separation)	Face Upward	1XRTT(R C3 SO32)	600/1880	0.698	1.079	0.753	1.63	--
	Back Upward		25/1851.3	1.044	1.059	1.106	2.96	--
			600/1880	1.065	1.079	1.147	-0.16	--
			1175/1908.8	1.032	1.102	1.137	1.07	--
			25/1851.3 Repeat 1st	1.015	1.059	1.075	-3.26	--
			600/1880 Repeat 1st	1.042	1.079	1.124	2.86	--
			1175/1908.8 Repeat 1st	1.033	1.102	1.138	3.18	--
	Edge B		600/1880	0.251	1.079	0.271	4.51	--
	Edge C		25/1851.3	1.222	1.059	1.294	1.39	--
			600/1880	1.298	1.079	1.401	-1.12	4
			1175/1908.8	1.265	1.102	1.394	-1.71	--
			25/1851.3 Repeat 1st	1.218	1.059	1.290	4.41	--
		600/1880 Repeat 1st	1.246	1.079	1.344	-1.77	--	
		1175/1908.8 Repeat 1st	1.201	1.102	1.324	-0.44	--	
		25/1851.3 Repeat 2nd	1.201	1.059	1.272	-3.56	--	
		600/1880 Repeat 2nd	1.223	1.079	1.320	-2.33	--	
	Edge D	1175/1908.8 Repeat 2nd	1.214	1.102	1.338	-3.66	--	
	600/1880	0.333	1.079	0.359	-0.36	--		
	Face Upward	1X Evdo(Rel. 0)	600/1880	0.415	1.117	0.464	0.97	--
	Back Upward		600/1880	0.715	1.117	0.799	-2.15	--
	Edge B		600/1880	0.213	1.117	0.238	-0.92	--
	Edge C		25/1851.3	1.033	1.086	1.122	-5.25	--
			600/1880	1.102	1.117	1.231	0.87	--
			1175/1908.8 Repeated	1.058	1.089	1.152	-3.99	--
25/1851.3 Repeated			1.015	1.086	1.102	-2.66	--	
600/1880 Repeated			1.086	1.117	1.213	-2.78	--	
Edge D	1175/1908.8 Repeated		1.042	1.089	1.135	-4.55	--	
600/1880	0.182		1.117	0.203	-1.88	--		



Worst Value Test with Battery 2							
Right Head Check	1XRTT(R C1 SO55)	600/1880	0.411	1.035	0.425	-1.21	--
Back Upward	1XRTT(R C3 SO32)	25/1851.3	1.103	1.059	1.168	-1.01	--
		600/1880	1.152	1.079	1.243	-1.11	--
		1175/1908.8	1.133	1.102	1.248	1.25	--
		25/1851.3 Repeat 1st	1.125	1.059	1.191	-0.52	--
		600/1880 Repeat 1st	1.145	1.079	1.235	2.22	--
		1175/1908.8 Repeat 1st	1.126	1.102	1.240	3.12	--
		25/1851.3 Repeat 2nd	1.118	1.059	1.183	1.15	--
		600/1880 Repeat 2nd	1.141	1.079	1.231	4.25	--
		1175/1908.8 Repeat 2nd	1.123	1.102	1.237	-3.22	--



Table 3: SAR Values of CDMA BC10 band

Test Positions		Mode	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Plot No.
				SAR(W/Kg) 1g	Scaled Factor	Scaled SAR(W/Kg), 1g	Power drift (%)	
Battery 1								
Right Side of Head	Cheek	1XRTT(R C3 SO55)	580/820.5	0.396	1.040	0.412	1.93	5
	Tilt 15 degrees		580/820.5	0.306	1.040	0.318	-2.2	--
Left Side of Head	Cheek		580/820.5	0.368	1.040	0.383	-3.53	--
	Tilt 15 degrees		580/820.5	0.276	1.040	0.287	-0.41	--
Hotspot (10mm Separation)	Face Upward	1XRTT(R C3 SO32)	580/820.5	0.470	1.059	0.498	1.36	--
	Back Upward		476/817.9	0.764	1.047	0.800	1.72	--
			580/820.5	0.805	1.059	0.852	-1.4	--
			670/822..8	0.830	1.054	0.875	-0.83	6
			476/817.9 Repeat 1st	0.745	1.047	0.780	-4.5	--
			580/820.5 Repeat 1st	0.768	1.059	0.813	1.62	--
	670/822..8 Repeat 1st		0.781	1.054	0.823	1.11	--	
	Edge B		580/820.5	0.450	1.059	0.477	2.44	--
	Edge C		580/820.5	0.105	1.059	0.111	-0.68	--
	Edge D	580/820.5	0.404	1.059	0.428	0.55	--	
	Face Upward	1x Evdo(Rel. 0)	580/820.5	0.425	1.050	0.446	-3.78	--
	Back Upward		580/820.5	0.657	1.050	0.690	2.34	--
	Edge B		580/820.5	0.412	1.050	0.433	1.43	--
	Edge C		580/820.5	0.085	1.050	0.089	2.76	--
	Edge D		580/820.5	0.368	1.050	0.386	-0.36	--
Worst Value Test with Battery 2								
Right Head Check	1XRTT(R C1 SO55)	580/820.5	0.355	1.040	0.369	-1.11	--	
Back Upward	1XRTT(R C3 SO32)	670/822..8	0.751	1.054	0.792	0.35	--	



Table 4: SAR Values of LTE Band 2,20MHz, QPSK

Temperature: 23.0~23.5°C, humidity: 62~64%.

Test Positions	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Plot No.	
		SAR (W/Kg),1g	Scaled Factor	Scaled SAR (W/Kg),1g	Power drift (%)		
Battery 1							
1RB #0							
Right Side of Head	Cheek	18900/1880	0.245	1.119	0.245	-0.51	--
	Tilt 15 degrees	18900/1880	0.152	1.119	0.170	1.22	--
Left Side of Head	Cheek	18900/1880	0.405	1.119	0.453	0.22	7
	Tilt 15 degrees	18900/1880	0.217	1.119	0.243	-2.14	--
Body (10mm Separation) Hotspot	Face Upward	18900/1880	0.605	1.119	0.677	1.54	--
	Back Upward	18700/1860	0.787	1.112	0.875	4.32	--
		18900/1880	0.932	1.119	1.043	-3.41	--
		19100/1900	0.798	1.091	0.871	1.23	--
		18700/1860 Repeat 1st	0.745	1.112	0.828	0.25	--
		18900/1880 Repeat 1st	0.853	1.119	0.955	1.01	--
		19100/1900 Repeat 1st	0.712	1.091	0.777	-0.89	--
	Edge B	18900/1880	0.159	1.119	0.178	-1.12	--
	Edge C	18700/1860	1.283	1.112	1.427	2.13	--
		18900/1880	1.131	1.119	1.266	2.88	--
		19100/1900	1.310	1.091	1.429	-0.99	8
		18700/1860 Repeat 1st	1.251	1.112	1.391	1.27	--
		18900/1880 Repeat 1st	1.118	1.119	1.251	1.84	--
		19100/1900 Repeat 1st	1.278	1.091	1.394	-1.11	--
		18700/1860 Repeat 2st	1.250	1.112	1.390	1.27	--
		18900/1880 Repeat 2st	1.118	1.119	1.251	0.38	--
		19100/1900 Repeat 2st	1.276	1.091	1.392	-0.52	--
	Edge D	18900/1880	0.338	1.119	0.378	-0.84	--
	50%RB #0						
	Right Side of Head	Cheek	18900/1880	0.185	1.114	0.206	1.25
Tilt 15 degrees		18900/1880	0.096	1.114	0.107	2.13	--
Left Side of Head	Cheek	18900/1880	0.284	1.114	0.316	2.18	--
	Tilt 15 degrees	18900/1880	0.167	1.114	0.186	1.78	--
Body (10mm Separation) Hotspot	Face Upward	18900/1880	0.415	1.114	0.462	-1.25	--
	Back Upward	18900/1880	0.641	1.114	0.714	1.11	--
	Edge B	18900/1880	0.113	1.114	0.126	0.21	--
	Edge C	18700/1860	1.103	1.028	1.134	2.34	--
		18900/1880	1.061	1.114	1.182	2.11	--
		18500/1970	1.107	1.081	1.197	3.24	--
		18700/1860 Repeat 1st	1.100	1.028	1.131	-2.45	--
		18900/1880 Repeat 1st	1.042	1.114	1.161	-4.11	--
		19100/1900 Repeat 1st	1.103	1.081	1.192	-1.25	--
	Edge D	18900/1880	0.189	1.114	0.211	0.24	--



Worst Value Test with Battery 2							
Left Side of Head	Cheek	18900/1880	0.378	1.119	0.423	0.52	--
Body (10mm Separation) Hotspot	Edge C	18700/1860	1.231	1.112	1.369	1.11	--
		18900/1880	1.111	1.119	1.243	1.12	--
		19100/1900	1.261	1.091	1.376	-1.25	--
		18700/1860 Repeat 1st	1.229	1.112	1.367	-2.23	--
		18900/1880 Repeat 1st	1.110	1.119	1.242	0.81	--
		19100/1900 Repeat 1st	1.258	1.091	1.372	0.17	--
		18700/1860 Repeat 2st	1.228	1.112	1.366	0.52	--
		18900/1880 Repeat 2st	1.107	1.119	1.239	-1.12	--
		19100/1900 Repeat 2st	1.255	1.091	1.369	-2.36	--



Table 5: SAR Values of LTE Band 4, 20MHz, QPSK

Temperature: 23.0~23.5°C, humidity: 62~64%.								
Test Positions	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Plot No.		
		SAR (W/Kg),1g	Scaled Factor	Scaled SAR (W/Kg),1g	Power drift (%)			
Battery 1								
1RB #0								
Right Side of Head	Cheek	20175/1732.5	0.534	1.019	0.544	1.25	--	
	Tilt 15 degrees	20175/1732.5	0.202	1.019	0.206	3.12	--	
Left Side of Head	Cheek	20175/1732.5	0.555	1.019	0.566	-0.55	9	
	Tilt 15 degrees	20175/1732.5	0.343	1.019	0.350	2.31	--	
Body (10mm Separation) Hotspot	Face Upward	20175/1732.5	0.658	1.019	0.671	2.11	--	
	Back Upward	20050/1720	0.994	1.012	1.006	3.15	--	
		20175/1732.5	1.024	1.019	1.043	1.24	--	
		20300/1745	1.013	1.023	1.036	0.24	--	
		20050/1720 Repeat 1st	0.915	1.012	0.926	1.24	--	
		20175/1732.5 Repeat 1st	0.956	1.019	0.974	0.18	--	
		20300/1745 Repeat 1st	0.936	1.023	0.958	3.66	--	
	Edge B	20175/1732.5	0.251	1.019	0.256	4.15	--	
	Edge C	20050/1720	1.288	1.012	1.303	-1.23	--	
		20175/1732.5	1.285	1.019	1.309	2.12	--	
		20300/1745	1.297	1.023	1.327	-0.53	10	
		20050/1720 Repeat 1st	1.218	1.012	1.233	-0.21	--	
		20175/1732.5 Repeat 1st	1.246	1.019	1.270	1.25	--	
		20300/1745 Repeat 1st	1.261	1.023	1.290	0.36	--	
		20050/1720 Repeat 2nd	1.212	1.012	1.227	0.32	--	
		20175/1732.5 Repeat 2nd	1.234	1.019	1.257	0.41	--	
		20300/1745 Repeat 2nd	1.245	1.023	1.274	-0.22	--	
	Edge D	20175/1732.5	0.446	1.019	0.454	0.66	--	
	50%RB #0							
	Right Side of Head	Cheek	20175/1732.5	0.471	1.148	0.541	-1.22	--
Tilt 15 degrees		20175/1732.5	0.155	1.148	0.178	-2.36	--	
Left Side of Head	Cheek	20175/1732.5	0.491	1.148	0.564	-3.12	--	
	Tilt 15 degrees	20175/1732.5	0.305	1.148	0.350	2.25	--	
Body (10mm Separation) Hotspot	Face Upward	20175/1732.5	0.485	1.148	0.557	2.81	--	
	Back Upward	20050/1720	0.845	1.081	0.913	3.11	--	
		20175/1732.5	0.897	1.148	1.030	1.36	--	
		20300/1745	0.813	1.183	0.962	2.11	--	
		20050/1720 Repeat 1st	0.822	1.081	0.889	1.96	--	



		20175/1732.5 Repeat 1st	0.866	1.148	0.994	-1.23	--
		20300/1745 Repeat 1st	0.804	1.183	0.951	-2.36	--
	Edge B	20175/1732.5	0.199	1.148	0.228	-3.12	--
	Edge C	20050/1720	1.001	1.081	1.082	1.21	--
		20175/1732.5	1.008	1.148	1.157	2.36	--
		20300/1745	1.011	1.183	1.196	3.11	--
		20050/1720 Repeat 1st	1.001	1.081	1.082	2.13	--
		20175/1732.5 Repeat 1st	1.005	1.148	1.154	-1.11	--
		20300/1745 Repeat 1st	1.008	1.183	1.192	-1.48	--
	Edge D	20175/1732.5	0.391	1.148	0.449	-2.36	--
Worst Value Test with Battery 2							
Left Side of Head	Cheek	20175/1732.5	0.532	1.109	0.590	1.12	--
Body (10mm Separation) Hotspot	Edge C	20050/1720	1.263	1.012	1.278	2.35	--
		20175/1732.5	1.255	1.019	1.279	-3.25	--
		20300/1745	1.278	1.023	1.037	-4.25	--
		20050/1720 Repeat 1st	1.248	1.012	1.263	-0.25	--
		20175/1732.5 Repeat 1st	1.266	1.019	1.290	1.25	--
		20300/1745 Repeat 1st	1.285	1.023	1.314	1.00	--
		20050/1720 Repeat 2nd	1.241	1.012	1.256	0.25	--
		20175/1732.5 Repeat 2nd	1.222	1.019	1.245	2.95	--
		20300/1745 Repeat 2nd	1.267	1.023	1.296	2.25	--



Table 6: SAR Values of LTE Band 5,10MHz, QPSK

Temperature: 23.0~23.5°C, humidity: 62~64%.							
Test Positions	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Power drift (%)	Plot No.
		SAR (W/Kg),1g	Scaled Factor	Scaled SAR(W/Kg),1g			
Battery 1							
1RB #0							
Right Side of Head	Cheek	20525/836.5	0.338	1.189	0.402	1.23	--
	Tilt 15 degrees	20525/836.5	0.302	1.189	0.359	2.13	--
Left Side of Head	Cheek	20525/836.5	0.344	1.189	0.409	-0.61	11
	Tilt 15 degrees	20525/836.5	0.307	1.189	0.365	1.45	--
Body (10mm Separation) Hotspot	Face Upward	20525/836.5	0.336	1.189	0.400	1.12	--
	Back Upward	20525/836.5	0.649	1.189	0.772	-0.78	12
	Edge B	20525/836.5	0.437	1.189	0.520	2.85	--
	Edge C	20525/836.5	0.338	1.189	0.402	-1.02	--
	Edge D	20525/836.5	0.371	1.189	0.441	1.32	--
50%RB #0							
Right Side of Head	Cheek	20525/836.5	0.302	1.038	0.313	-0.12	--
	Tilt 15 degrees	20525/836.5	0.278	1.038	0.289	-1.11	--
Left Side of Head	Cheek	20525/836.5	0.312	1.038	0.324	-2.35	--
	Tilt 15 degrees	20525/836.5	0.288	1.038	0.299	-1.15	--
Body (10mm Separation) Hotspot	Face Upward	20525/836.5	0.312	1.038	0.324	0.21	--
	Back Upward	20525/836.5	0.517	1.038	0.537	0.11	--
	Edge B	20525/836.5	0.369	1.038	0.383	1.36	--
	Edge C	20525/836.5	0.213	1.038	0.221	4.21	--
	Edge D	20525/836.5	0.255	1.038	0.265	-2.36	--
Worst Value Test with Battery 2							
Left Side of Head	Cheek	20525/836.5	0.315	1.189	0.375	-1.25	--
Body (10mm Separation) Hotspot	Back Upward	20525/836.5	0.622	1.189	0.740	3.25	--



Table 7: SAR Values of LTE Band 12,10MHz, QPSK

Temperature: 23.0~23.5°C, humidity: 62~64%.							
Test Positions	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Power drift (%)	Plot No.
		SAR (W/Kg),1g	Scaled Factor	Scaled SAR(W/Kg),1g			
Battery 1							
1RB #0							
Right Side of Head	Cheek	23095/707.5	0.248	1.164	0.289	-1.23	--
	Tilt 15 degrees	23095/707.5	0.160	1.164	0.186	2.31	--
Left Side of Head	Cheek	23095/707.5	0.292	1.164	0.340	-0.46	13
	Tilt 15 degrees	23095/707.5	0.246	1.164	0.286	1.23	--
Body (10mm Separation) Hotspot	Face Upward	23095/707.5	0.206	1.164	0.240	2.31	--
	Back Upward	23095/707.5	0.357	1.164	0.416	0.17	14
	Edge B	23095/707.5	0.140	1.164	0.163	0.26	--
	Edge C	23095/707.5	0.050	1.164	0.058	3.12	--
	Edge D	23095/707.5	0.072	1.164	0.084	1.11	--
50%RB #0							
Right Side of Head	Cheek	23095/707.5	0.215	1.005	0.216	3.15	--
	Tilt 15 degrees	23095/707.5	0.134	1.005	0.135	2.36	--
Left Side of Head	Cheek	23095/707.5	0.269	1.005	0.270	-1.22	--
	Tilt 15 degrees	23095/707.5	0.213	1.005	0.214	-2.13	--
Body (10mm Separation) Hotspot	Face Upward	23095/707.5	0.165	1.005	0.166	1.58	--
	Back Upward	23095/707.5	0.289	1.005	0.290	1.88	--
	Edge B	23095/707.5	0.102	1.005	0.103	2.36	--
	Edge C	23095/707.5	0.033	1.005	0.033	3.12	--
	Edge D	23095/707.5	0.043	1.005	0.043	1.11	--
Worst Value Test with Battery 2							
Left Side of Head	Cheek	23095/707.5	0.274	1.164	0.319	1.25	--
Body (10mm Separation) Hotspot	Back Upward	23095/707.5	0.319	1.164	0.371	-1.25	--



Table 8: SAR Values of LTE Band 13,10MHz, QPSK

Temperature: 23.0~23.5°C, humidity: 62~64%.							
Test Positions	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Power drift (%)	Plot No.
		SAR (W/Kg),1g	Scaled Factor	Scaled SAR (W/Kg),1g			
Battery 1							
1RB #0							
Right Side of Head	Cheek	23230/782	0.162	1.151	0.186	-2.77	15
	Tilt 15 degrees	23230/782	0.118	1.151	0.136	-1.02	--
Left Side of Head	Cheek	23230/782	0.139	1.151	0.160	0.11	--
	Tilt 15 degrees	23230/782	0.074	1.151	0.085	-3.12	--
Body (10mm Separation) Hotspot	Face Upward	23230/782	0.204	1.151	0.235	-4.21	--
	Back Upward	23230/782	0.301	1.151	0.346	0.89	16
	Edge B	23230/782	0.117	1.151	0.135	2.35	--
	Edge C	23230/782	0.040	1.151	0.046	1.11	--
	Edge D	23230/782	0.161	1.151	0.185	3.12	--
50%RB #0							
Right Side of Head	Cheek	23230/782	0.132	1.035	0.137	1.11	--
	Tilt 15 degrees	23230/782	0.078	1.035	0.081	1.85	--
Left Side of Head	Cheek	23230/782	0.103	1.035	0.107	2.36	--
	Tilt 15 degrees	23230/782	0.033	1.035	0.034	2.87	--
Body (10mm Separation) Hotspot	Face Upward	23230/782	0.165	1.035	0.171	3.16	--
	Back Upward	23230/782	0.244	1.035	0.253	2.15	--
	Edge B	23230/782	0.074	1.035	0.077	1.14	--
	Edge C	23230/782	0.013	1.035	0.013	-1.23	--
	Edge D	23230/782	0.125	1.035	0.129	-2.35	--
Worst Value Test with Battery 2							
Right Side of Head	Cheek	23230/782	0.148	1.151	0.170	2.52	--
Body (10mm Separation) Hotspot	Back Upward	23230/782	0.288	1.151	0.331	1.15	--



Table 9: SAR Values of LTE Band 25,20MHz, QPSK

Temperature: 23.0~23.5°C, humidity: 62~64%.							
Test Positions	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Plot No.	
		SAR (W/Kg),1g	Scaled Factor	Scaled SAR (W/Kg),1g	Power drift (%)		
Battery 1							
1RB #0							
Right Side of Head	Cheek	26365/1882.5	0.296	1.125	0.333	-2.80	17
	Tilt 15 degrees	26365/1882.5	0.144	1.125	0.162	0.69	--
Left Side of Head	Cheek	26365/1882.5	0.270	1.125	0.304	-3.64	--
	Tilt 15 degrees	26365/1882.5	0.136	1.125	0.153	2.48	--
Body (10mm Separation) Hotspot	Face Upward	26365/1882.5	0.667	1.125	0.750	2.36	--
	Back Upward	26365/1882.5	0.710	1.125	0.799	3.69	--
	Edge B	26365/1882.5	0.104	1.125	0.117	0.57	--
	Edge C	26140/1860	1.136	1.096	1.245	1.8	--
		26365/1882.5	1.184	1.125	1.332	0.27	18
		26590/1905	1.165	1.227	1.429	3.59	--
		26140/1860 Repeat 1st	1.122	1.096	1.230	0.23	--
		26365/1882.5 Repeat 1st	1.167	1.125	1.313	1.56	--
		26590/1905 Repeat 1st	1.153	1.227	1.415	-1.56	--
		26140/1860 Repeat 2nd	1.128	1.096	1.236	-0.33	--
		26365/1882.5 Repeat 2nd	1.151	1.125	1.295	-4.66	--
	26590/1905 Repeat 2nd	1.131	1.227	1.388	1.46	--	
	Edge D	26365/1882.5	0.308	1.125	0.347	0.23	--
50%RB #0							
Right Side of Head	Cheek	26365/1882.5	0.251	1.045	0.262	3.36	--
	Tilt 15 degrees	26365/1882.5	0.102	1.045	0.107	4.69	--
Left Side of Head	Cheek	26365/1882.5	0.223	1.045	0.233	1.57	--
	Tilt 15 degrees	26365/1882.5	0.089	1.045	0.093	2.8	--
Body (10mm Separation) Hotspot	Face Upward	26365/1882.5	0.512	1.045	0.535	-1.53	--
	Back Upward	26365/1882.5	0.623	1.045	0.651	4.59	--
	Edge B	26365/1882.5	0.101	1.045	0.106	-1.36	--
	Edge C	26140/1860	0.981	1.076	1.056	-0.03	--
		26365/1882.5	1.012	1.045	1.058	-3.15	--
		26590/1905	0.826	1.343	1.109	-1.92	--
		26140/1860 Repeat 1st	0.956	1.076	1.029	-3.25	--
		26365/1882.5 Repeat 1st	0.974	1.045	1.018	-0.13	--
26590/1905 Repeat 1st	0.824	1.343	1.107	0.15	--		
Edge D	26365/1882.5	0.213	1.045	0.223	2.33	--	
Worst Value Test with Battery 2							
Right Side of Head	Cheek	26365/1882.5	0.274	1.125	0.308	1.25	--



Body (10mm Separation) Hotspot	Edge C	26140/1860	1.132	1.096	1.241	2.33	--
		26365/1882.5	1.155	1.125	1.299	3.15	--
		26590/1905	1.148	1.227	1.409	1.28	--
		26140/1860 Repeat 1st	1.138	1.096	1.247	1.85	--
		26365/1882.5 Repeat 1st	1.145	1.125	1.288	-1.25	--
		26590/1905 Repeat 1st	1.141	1.227	1.400	-0.25	--
		26140/1860 Repeat 2nd	1.128	1.096	1.236	1.28	--
		26365/1882.5 Repeat 2nd	1.144	1.125	1.287	-2.22	--
		26590/1905 Repeat 2nd	1.126	1.227	1.382	1.69	--



Table 10: SAR Values of LTE Band 26,10MHz, QPSK

Temperature: 23.0~23.5°C, humidity: 62~64%.							
Test Positions	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Plot No.	
		SAR (W/Kg),1g	Scaled Factor	Scaled SAR (W/Kg),1g	Power drift (%)		
Battery 1							
1RB #0							
Right Side of Head	Cheek	26865/831.5	0.027	1.253	0.034	1.18	--
	Tilt 15 degrees	26865/831.5	0.013	1.253	0.016	2.51	--
Left Side of Head	Cheek	26865/831.5	0.029	1.253	0.036	-2.26	19
	Tilt 15 degrees	26865/831.5	0.018	1.253	0.023	2.41	--
Body (10mm Separation) Hotspot	Face Upward	26865/831.5	0.245	1.253	0.307	0.11	--
	Back Upward	26865/831.5	0.382	1.253	0.479	1.20	20
	Edge B	26865/831.5	0.058	1.253	0.073	-4.78	--
	Edge C	26865/831.5	0.012	1.253	0.015	1.34	--
	Edge D	26865/831.5	0.082	1.253	0.103	1.26	--
50%RB #0							
Right Side of Head	Cheek	26865/831.5	0.021	1.035	0.022	1.96	--
	Tilt 15 degrees	26865/831.5	0.007	1.035	0.007	3.29	--
Left Side of Head	Cheek	26865/831.5	0.022	1.035	0.023	0.17	--
	Tilt 15 degrees	26865/831.5	0.013	1.035	0.013	1.4	--
Body (10mm Separation) Hotspot	Face Upward	26865/831.5	0.213	1.035	0.220	-2.93	--
	Back Upward	26865/831.5	0.332	1.035	0.344	3.19	--
	Edge B	26865/831.5	0.017	1.035	0.018	3.12	--
	Edge C	26865/831.5	0.005	1.035	0.005	4.45	--
	Edge D	26865/831.5	0.067	1.035	0.069	1.33	--
Worst Value Test with Battery 2							
Left Side of Head	Cheek	26865/831.5	0.025	1.253	0.031	1.85	--
Body (10mm Separation) Hotspot	Back Upward	26865/831.5	0.374	1.253	0.469	2.22	--



Table 11: SAR Values of LTE Band 41,20MHz, QPSK

Temperature: 23.0~23.5°C, humidity: 62~64%.								
Test Positions	Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Plot No.		
		SAR (W/Kg),1g	Scaled Factor	Scaled SAR (W/Kg),1g	Power drift (%)			
Battery 1								
1RB #0								
Right Side of Head	Cheek	40620/2595	0.333	1.167	0.389	2.33	--	
	Tilt 15 degrees	40620/2595	0.219	1.167	0.256	3.66	--	
Left Side of Head	Cheek	40620/2593	0.343	1.167	0.400	-0.30	21	
	Tilt 15 degrees	40620/2595	0.249	1.167	0.291	3.56	--	
Body (10mm Separation) Hotspot	Face Upward	40620/2595	0.429	1.167	0.501	-2.41	--	
	Back Upward	40620/2595	0.667	1.167	0.778	-1.08	--	
	Edge C	Edge B	40620/2595	0.043	1.167	0.050	-4.2	--
		Edge C	39750/2506	0.912	1.089	0.993	-2.97	--
			40620/2593	0.959	1.167	1.119	-1.18	22
			41490/2680	0.943	1.250	1.179	-1.18	--
			39750/2506 Repeat 1st	0.811	1.089	0.883	-1.22	--
	40620/2593 Repeat 1st		0.854	1.167	0.997	0.11	--	
	41490/2680 Repeat 1st	0.833	1.250	1.041	-3.01	--		
	Edge D	40620/2595	0.395	1.167	0.461	-1.78	--	
50%RB #0								
Right Side of Head	Cheek	40620/2595	0.302	1.047	0.316	3.66	--	
	Tilt 15 degrees	40620/2595	0.178	1.047	0.186	4.34	--	
Left Side of Head	Cheek	40620/2595	0.312	1.047	0.327	1.87	--	
	Tilt 15 degrees	40620/2595	0.191	1.047	0.200	3.1	--	
Body (10mm Separation) Hotspot	Face Upward	40620/2595	0.333	1.047	0.349	-1.23	--	
	Back Upward	40620/2595	0.489	1.047	0.512	4.89	--	
	Edge B	40620/2595	0.023	1.047	0.024	2.36	--	
	Edge C	40620/2595	0.715	1.047	0.749	3.69	--	
	Edge D	40620/2595	0.311	1.047	0.326	0.57	--	
Worst Value Test with Battery 2								
Left Side of Head	Cheek	40620/2593	0.338	1.167	0.394	1.52	--	
Body (10mm Separation) Hotspot	39750/2506	39750/2506	0.901	1.089	0.942	0.45	--	
	40620/2593	40620/2593	0.932	1.167	0.974	2.15	--	
	41490/2680	41490/2680	0.913	1.250	0.954	3.21	--	
	39750/2506 Repeat 1st	39750/2506 Repeat 1st	0.775	1.089	0.810	-2.04	--	
	40620/2593 Repeat 1st	40620/2593 Repeat 1st	0.820	1.167	0.857	1.95	--	
	41490/2680 Repeat 1st	41490/2680 Repeat 1st	0.806	1.250	1.067	-0.57	--	



Table 12: SAR Values of Wi-Fi 802.11b

Test Positions		Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)				Plot No.
			SAR(W/Kg)1g	Scaled Factor	Scaled SAR(W/Kg),1g	Power drift (%)	
Battery 1							
Right Side of Head	Cheek	11/2462	0.096	1.112	0.107	1.26	--
	Tilt 15 degrees	11/2462	0.074	1.112	0.082	3.67	--
Left Side of Head	Cheek	11/2462	0.157	1.112	0.175	0.27	23
	Tilt 15 degrees	11/2462	0.110	1.112	0.122	3.57	--
Hotspot (10mm Separation)	Face Upward	11/2462	0.035	1.112	0.039	0.80	24
	Back Upward	11/2462	0.030	1.112	0.033	3.8	--
	Edge A	11/2462	0.014	1.112	0.016	-0.53	--
	Edge B	11/2462	0.025	1.112	0.028	4.59	--
Worst Value Test with Battery 2							
Left Side of Head	Cheek	11/2462	0.145	1.112	0.161	2.22	--
Hotspot (10mm Separation)	Face Upward	11/2462	0.031	1.112	0.034	1.87	--

Note:

Per KDB941225 D06 v02r01, When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. As the manufacture requirement the separation distance use 5mm for Hotspot mode.

Per KDB Publication 941225 D01v03r01. RMC 12.2kbps was as primary mode SAR, when the primary mode SAR less than 1.2W/kg, secondary SAR (HSPA) was not requires.

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, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg, when the transmission band is ≥ 200 MHz



12. Simultaneous Transmissions Analysis

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 6 of this report. Maximum localized SAR is **below** exposure limits specified in the relevant standards.

Simultaneous SAR

No.	Transmitter Combinations	Scenario Supported or not	Supported for Mobile Hotspot or not
1	CDMA+LTE	No	No
2	CDMA+WIFI	Yes	No
3	CDMA+BT	Yes	No
4	LTE+BT	Yes	No
5	LTE+WIFI	Yes	Yes
6	WIFI+BT	No	No

Test Position		Right Cheek	Right Title	Left Cheek	Left Tilt
MAX 1-g SAR(W/Kg)	CDMA BC0	0.599	0.393	0.481	0.358
	CDMA BC1	0.467	0.431	0.387	0.265
	CDMA BC10	0.412	0.318	0.383	0.287
	LTE Band2	0.245	0.170	0.453	0.243
	LTE Band4	0.544	0.206	0.566	0.350
	LTE Band5	0.402	0.359	0.409	0.365
	LTE Band12	0.289	0.186	0.340	0.286
	LTE Band13	0.186	0.136	0.160	0.085
	LTE Band25	0.333	0.162	0.304	0.153
	LTE Band26	0.034	0.016	0.036	0.023
	LTE Band41	0.389	0.256	0.400	0.291
	WIFI 802.11b	0.107	0.082	0.175	0.122
	BT	0.042*	0.042*	0.042*	0.042*
WIFI Simultaneous Σ 1-g SAR(W/Kg)		0.706	0.513	0.741	0.487
BT Simultaneous Σ 1-g SAR(W/Kg)		0.641	0.473	0.608	0.407

Simultaneous Tx Combination of CDMA/LTE and BT/WIFI (Head).



Test Position		Face	Back	Edge A	Edge B	Edge C	Edge D
Body-worn 10mm separation MAX 1-g SAR(W/Kg)	CDMA BC0	0.512	0.826	--	0.420	0.179	0.344
	CDMA BC1	0.753	1.147	--	0.271	1.401	0.359
	CDMA BC10	0.489	0.875	--	0.477	0.111	0.428
	LTE Band2	0.677	1.043	--	0.178	1.429	0.378
	LTE Band4	0.671	1.043	--	0.256	1.327	0.454
	LTE Band5	0.400	0.772	--	0.520	0.402	0.441
	LTE Band12	0.240	0.416	--	0.163	0.058	0.084
	LTE Band13	0.235	0.346	--	0.135	0.046	0.185
	LTE Band25	0.750	0.799	--	0.117	1.429	0.347
	LTE Band26	0.307	0.479	--	0.073	0.015	0.103
	LTE Band41	0.501	0.778	--	0.050	1.179	0.461
	WIFI 802.11b	0.039	0.033	0.016	0.028	--	--
	BT	0.021*	0.021*	0.021*	0.021*	--	--
WIFI Simultaneous Σ 1-g SAR(W/Kg)		0.792	1.180	--	0.548	1.429	0.461
BT Simultaneous Σ 1-g SAR(W/Kg)		0.774	1.164	--	0.541	1.429	0.461

Simultaneous Tx Combination of CDMA/LTE and BT/WIFI (Body).

The estimated SAR value with * Signal

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required

13.Measurement Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) $u_i(\%)$	Degree of freedom V_{eff} or v_i
Measurement System								
1	–Probe Calibration	B	5.8	N	1	1	5.8	∞
2	–Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	∞
3	–Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	∞
4	–Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	∞
5	–Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	∞
6	–System Detection Limits	B	1.0	R	$\sqrt{3}$	1	0.58	∞
7	Modulation response	B	3	N	1	1	3.00	
8	–Readout Electronics	B	0.5	N	1	1	0.50	∞
9	–Response Time	B	1.4	R	$\sqrt{3}$	1	0.81	∞
10	–Integration Time	B	3.0	R	$\sqrt{3}$	1	1.73	∞
11	–RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	–Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	∞
13	–Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	∞
14	–Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	∞



Uncertainties of the DUT								
15	– Position of the DUT	A	2.6	N	$\sqrt{3}$	1	2.6	5
16	– Holder of the DUT	A	3	N	$\sqrt{3}$	1	3.0	5
17	– Output Power Variation – SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.89	∞
Phantom and Tissue Parameters								
18	– Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	∞
19	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	B	2	N	1	1	2.00	
20	– Liquid Conductivity Target –tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
21	– Liquid Conductivity –measurement Uncertainty)	B	4	N	$\sqrt{3}$	1	0.92	9
22	– Liquid Permittivity Target tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
23	– Liquid Permittivity –measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	∞
Combined Standard Uncertainty				RSS			10.63	
Expanded uncertainty (Confidence interval of 95 %)				K=2			21.26	

System Check Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) $u_i(\%)$	Degree of freedom V_{eff} or v_i
Measurement System								
1	– Probe Calibration	B	5.8	N	1	1	5.8	∞



2	– Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	∞
3	– Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	∞
4	– Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	∞
5	– Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	∞
6	– System Detection Limits	B	1	R	$\sqrt{3}$	1	0.58	∞
7	Modulation response	B	0	N	1	1	0.00	
8	– Readout Electronics	B	0.5	N	1	1	0.50	∞
9	– Response Time	B	0.00	R	$\sqrt{3}$	1	0.00	∞
10	– Integration Time	B	1.4	R	$\sqrt{3}$	1	0.81	∞
11	– RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	– Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	∞
13	– Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	∞
14	– Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	∞
Uncertainties of the DUT								
15	Deviation of experimental source from numerical source	A	4	N	1	1	4.00	5
16	Input Power and SAR drift measurement	A	5	R	$\sqrt{3}$	1	2.89	5
17	Dipole Axis to Liquid Distance	B	2	R	$\sqrt{3}$	1	1.2	∞

Phantom and Tissue Parameters								
18	–Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	∞
19	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	B	2	N	1	1	2.00	
20	–Liquid Conductivity Target –tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
21	–Liquid Conductivity –measurement Uncertainty)	B	4	N	$\sqrt{3}$	1	0.92	9
22	–Liquid Permittivity Target tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
23	–Liquid Permittivity –measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	∞
Combined Standard Uncertainty				RSS			10.15	
Expanded uncertainty (Confidence interval of 95 %)				K=2			20.29	



14. Equipment List

This table is a complete overview of the SAR measurement equipment. Devices used during the test described are marked .

	EQUIPMENT	Model	Serial number	Calibration Date	Due Date
<input checked="" type="checkbox"/>	SAR Probe	SSE5	SN 43/15 EP276	2017/11/27	2018/11/26
<input checked="" type="checkbox"/>	Dipole	SID750	SN 23/15 DIP0G750-378	2017/11/27	2018/11/26
<input checked="" type="checkbox"/>	Dipole	SID835	SN 09/13 DIP0G835-217	2017/11/27	2018/11/26
<input type="checkbox"/>	Dipole	SID900	SN 09/13 DIP0G900-215	2017/11/27	2018/11/26
<input checked="" type="checkbox"/>	Dipole	SID1800	SN 09/13 DIP1G800-216	2017/11/27	2018/11/26
<input checked="" type="checkbox"/>	Dipole	SID1900	SN 09/13 DIP1G900-219	2017/11/27	2018/11/26
<input type="checkbox"/>	Dipole	SID2000	SN 09/13 DIP2G000-219	2017/11/27	2018/11/26
<input checked="" type="checkbox"/>	Dipole	SID2450	SN_09/13_DIP2G450-220	2017/11/27	2018/11/26
<input checked="" type="checkbox"/>	Dipole	SID2600	SN 32/14_DIP2G600-338	2017/11/27	2018/11/26
<input type="checkbox"/>	SAR Probe	SSE2	SN27/15 EPGO261	2017/11/27	2018/11/26
<input type="checkbox"/>	Dipole	SWG5500	SN15/15 WGA39	2017/11/27	2018/11/26
<input checked="" type="checkbox"/>	Multimeter	Keithley-2000	4085310	2017/09/08	2018/09/07
<input checked="" type="checkbox"/>	System Simulator(R&S)	CMU200	A0304212	2017/11/08	2018/11/07
<input checked="" type="checkbox"/>	System Simulator(Agilent 8960)	E5515C	GB 47200710	2017/11/08	2018/11/07
<input checked="" type="checkbox"/>	System Simulator(R&S)	CMW500	130805	2017/08/29	2018/08/28
<input checked="" type="checkbox"/>	Vector Network Analyzer(R&S)	ZVB8	A0802530	2017/05/04	2019/05/09
<input checked="" type="checkbox"/>	PC 3.5 Fixed Match Calibration Kit	ZV-Z32	100571	2017/11/29	2018/11/28
<input checked="" type="checkbox"/>	Dielectric Probe Kit	SCLMP	SN 09/13 OCPG51	2017/11/27	2018/11/26
<input checked="" type="checkbox"/>	Signal Generator	SMU200A	A140801889	2017/05/04	2019/05/09
<input checked="" type="checkbox"/>	Amplifier	Nucletudes	143060	2018/03/27	2019/03/28
<input checked="" type="checkbox"/>	Directional Coupler	DC6180A	305827	2018/03/27	2019/03/28
<input checked="" type="checkbox"/>	Power Meter	NRP2	A140401673	2018/03/27	2019/03/28
<input checked="" type="checkbox"/>	Power Sensor	NPR-Z11	1138.3004.02-114072-nq	2018/03/27	2019/03/28
<input checked="" type="checkbox"/>	Power Meter	NRVS	A0802531	2018/03/27	2019/03/28
<input checked="" type="checkbox"/>	Power Sensor	NRV-Z4	100069	2018/03/27	2019/03/28



ANNEX A: Appendix A: SAR System performance Check Plots

(Please See Appendix A)

ANNEX B: Appendix B: SAR Measurement results Plots

(Please See Appendix B)

ANNEX C: Appendix C: Calibration reports

(Please See Appendix C)

ANNEX D: Appendix D: SAR Test Setup

(Please See Appendix D)

—End of the Report—