FCC SAR Test Report

APPLICANT	:	**Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd.**
EQUIPMENT	:	**cdma2000/LTE dual-mode Mobile Phone**
BRAND NAME	:	**Coolpad**
MODEL NAME	:	**Coolpad 5860E**
FCC ID	:	**R38YL5860E**
STANDARD	:	**FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2003 FCC OET Bulletin 65 Supplement C (Edition 01-01)**

The product was received on Mar. 09, 2012 and completely tested on May 05, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA230902	Rev. 01	Initial issue of report	May 17, 2012
FA230902	Rev. 02	Update report for revising the model name	May 24, 2012

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd., DUT: cdma2000/LTE dual-mode Mobile Phone, Brand Name: Coolpad, Model Name: Coolpad 5860E** are as follows.

<Standalone SAR>

Band	Position	SAR_{1g} (W/kg)
CDMA2000 BC0	Head	0.646
CDMA2000 BC15	Head	1.17
CDMA2000 BC1	Head	1.29
LTE Band IV	Head	1.21
LTE Band II	Head	1.4
WLAN 2.4G	Head	0.035
CDMA2000 BC0	Hotspot (1 cm Gap)	0.896
	Body-worn (1 cm Gap)	0.896
CDMA2000 BC15	Hotspot (1 cm Gap)	1.42
	Body-worn (1 cm Gap)	1.42
CDMA2000 BC1	Hotspot (1 cm Gap)	1.38
	Body-worn (1 cm Gap)	1.41
LTE Band IV	Hotspot (1 cm Gap)	0.791
	Body-worn (1 cm Gap)	0.867
LTE Band II	Hotspot (1 cm Gap)	0.641
	Body-worn (1 cm Gap)	0.667
WLAN 2.4G	Hotspot (1 cm Gap)	0.107
	Body-worn (1 cm Gap)	0.107

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2003 and FCC OET Bulletin 65 Supplement C (Edition 01-01).

2. Administration Data

2.1 Testing Laboratory

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958

2.2 Applicant

Company Name	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd.
Address	Hi-Tech Industry Park(North), Nanshan District, Shenzhen City, Guangdong Province, P.R.C

2.3 Manufacturer

Company Name	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd.
Address	Hi-Tech Industry Park(North), Nanshan District, Shenzhen City, Guangdong Province, P.R.C

2.4 Application Details

Date of Receipt of Application	Mar. 09, 2012
Date of Start during the Test	Apr. 20, 2012
Date of End during the Test	May 05, 2012

3. General Information

3.1 Description of Device Under Test (DUT)

Product Feature & Specification	
DUT Type	cdma2000/LTE dual-mode Mobile Phone
Brand Name	Coolpad
Model Name	Coolpad 5860E
FCC ID	R38YL5860E
Tx Frequency	CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz CDMA2000 BC15 : 1711.25 ~ 1753.75 MHz LTE Band II: 1850.7 MHz ~ 1909.3 MHz LTE Band IV: 1710.7MHz ~ 1754.3 MHz 802.11b/g: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Rx Frequency	CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz CDMA2000 BC15 : 2111.25 ~ 2153.75 MHz LTE Band II : 1930.7 MHz ~ 1989.3 MHz LTE Band IV : 2110.7 MHz ~ 2154.3 MHz 802.11b/g: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Maximum Output Power to Antenna	CDMA2000 BC0: 23.40 dBm CDMA2000 BC1: 23.85 dBm CDMA2000 BC15: 23.99 dBm LTE Band II: 21.36 dBm LTE Band IV: 21.73 dBm 802.11b: 15.41 dBm 802.11g: 7.87 dBm Bluetooth: 2.39 dBm
Antenna Type	WWAN: IFA + Parasitic Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna
HW Version	P4
SW Version	CP5860E-user 2.3.7 GWK74 2.3.027.P3.120220.5860E release-keys
Type of Modulation	CDMA2000: QPSK LTE: QPSK / 16QAM (Uplink) 802.11b: DSSS (BPSK / QPSK / CCK) 802.11g: OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth (1Mbps): GFSK Bluetooth EDR (2Mbps): π/4-DQPSK Bluetooth EDR (3Mbps): 8-DPSK
DUT Stage	Identical Prototype
Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

The table below summarized necessary items addressed in KDB 941225 D05 v01.

FCC ID	R38YL5860E
DUT Type	CDMA2000/LTE dual-mode Mobile Phone
Operating Frequency Range of each LTE transmission band	Band II: TX: 1850.7 MHz ~ 1909.3 MHz, RX: 1930.7 MHz ~ 1989.3 MHz Band IV: TX: 1710.7MHz ~ 1754.3MHz RX: 2110.7MHz ~ 2154.3MHz
Channel Bandwidth	Band II: 1.4MHz, 3MHz, 5MHz, 10MHz Band IV: 1.4MHz, 3MHz, 5MHz, 10MHz

Transmission (H, M, L) channel numbers and frequencies in each LTE band

Band II

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855
M	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905

Band IV

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750

UE category, uplink modulations used	Category 3, QPSK and 16QAM	
LTE transmitter and antenna implementation (standalone or sharing hardware components / antennas)	LTE owns standalone transmitter and antenna, while supporting Band II and Band IV.	
LTE Voice / Data requirements	Data only	
LTE MPR permanently built-in by design	Yes	
LTE A-MPR	Disabled during SAR testing. With CMW500, set NS value to NS_01 to disable A-MPR.	
LTE maximum averaged conducted output power	LTE Band 2: 21.36 dBm LTE Band 4: 21.73 dBm	
Other U.S. wireless operating modes / bands	CDMA2000 1xRTT/1xEVDO	BC0: UL: 869.7~893.31MHz / DL: 824.7~848.31MHz BC1: UL: 1851.25~1908.75MHz / DL: 1931.25~1988.75MHz BC15: UL: 1711.25~1753.75MHz / DL: 2111.25 ~ 2153.75 MHz
	WLAN	2.4G: 2412 MHz ~ 2462 MHz
	Bluetooth	2402 MHz ~ 2480 MHz
Simultaneous transmission configurations	In Section 12.4	
Power reduction applied to satisfy SAR compliance	No.	

3.2 Product Photos

Please refer to Appendix D.

3.3 Applied Standards

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2003
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v04
- FCC KDB 648474 D01 v01r05
- FCC KDB 941225 D01 v02
- FCC KDB 941225 D05 v01
- FCC KDB 941225 D06 v01
- FCC KDB 248227 D01 v01r02

3.4 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 tissue.

3.5 Test Conditions

3.5.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.5.2 Test Configuration

The device was controlled by using a base station emulator. Communication between the device and the emulator was established by air link. The distance between the DUT and the antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of DUT. The DUT was set from the emulator to radiate maximum output power during all tests.

For WLAN SAR testing, WLAN engineering testing software installed on the DUT that can provide continuous transmitting RF signal. This RF signal utilized in SAR measurement has over 99% duty cycle and is treated as 1.

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.

4.2 SAR Definition

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

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

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

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

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

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

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

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

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

5. SAR Measurement System

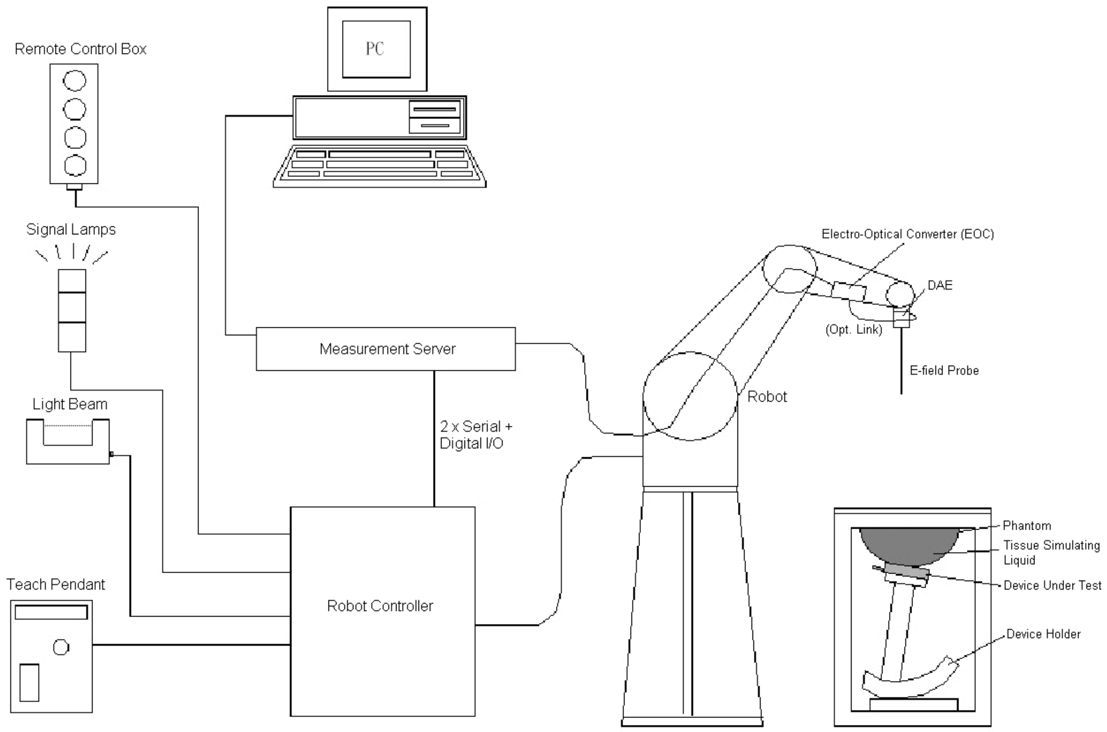


Fig 5.1 SPEAG DASY4 or DASY5 System Configurations

The DASY4 or DASY5 system for performance compliance tests is illustrated above graphically. This system consists of the following items:

- A standard high precision 6-axis robot with controller, a teach pendant and software
- A data acquisition electronic (DAE) attached to the robot arm extension
- A dosimetric probe equipped with an optical surface detector system
- The electro-optical converter (ECO) performs the conversion between optical and electrical signals
- A measurement server performs the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the accuracy of the probe positioning
- A computer operating Windows XP
- DASY4 or DASY5 software
- Remove control with teach pendant and additional circuitry for robot safety such as warming lamps, etc.
- The SAM twin phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

Some of the components are described in details in the following sub-sections.

5.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

5.1.1 E-Field Probe Specification

<EX3DV4 Probe>

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μW/g to 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

Fig 5.2 Photo of EX3DV4

5.1.2 E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than ± 10%. The spherical isotropy shall be evaluated and within ± 0.25 dB. The sensitivity parameters (NormX, NormY, and NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested. The calibration data can be referred to appendix C of this report.

5.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.3 Photo of DAE

5.3 Robot

The SPEAG DASY system uses the high precision robots (DASY5: TX90XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

Fig 5.4 Photo of DASY5

5.4 Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5: 128 MB), RAM (DASY5: 128 MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.

Fig 5.5 Photo of Server for DASY5

5.5 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	 **Fig 5.6 Photo of SAM Phantom**
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI4 Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	 Fig 5.7 Photo of ELI4 Phantom
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

5.6 Device Holder

<Device Holder for SAM Twin Phantom>

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5 mm distance, a positioning uncertainty of ± 0.5 mm would produce a SAR uncertainty of ± 20 %. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

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

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

Fig 5.8 Device Holder

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

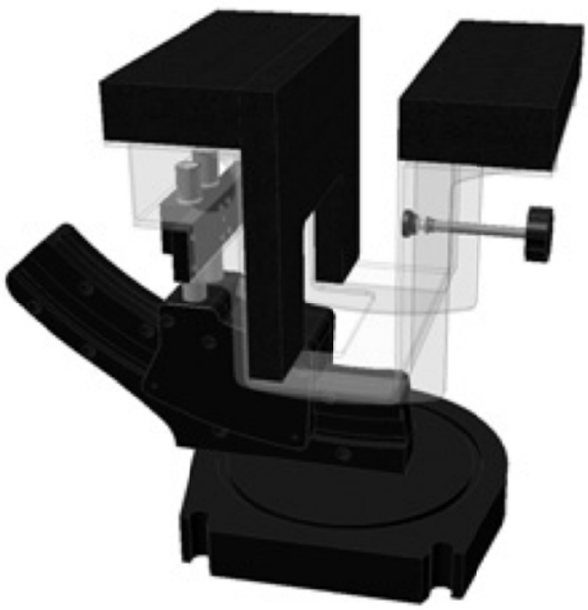


Fig 5.9 Laptop Extension Kit

5.7 Data Storage and Evaluation

5.7.1 Data Storage

The DASY software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files. The post-processing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type (e.g., [V/m], [A/m], [mW/g]). Some of these units are not available in certain situations or give meaningless results, e.g., a SAR-output in a non-lose media, will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

5.7.2 Data Evaluation

The DASY post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software：

Probe parameters：	- Sensitivity	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	dcp_i
Device parameters：	- Frequency	f
	- Crest factor	cf
Media parameters：	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multi-meter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power.

The formula for each channel can be given as：

$$\mathbf{V_i} = \mathbf{U_i} + \mathbf{U_i^2} \cdot \frac{\mathbf{cf}}{\mathbf{dcp_i}}$$

with V_i = compensated signal of channel i, (i = x, y, z)
U_i = input signal of channel i, (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp_i = diode compression point (DASY parameter)

From the compensated input signals, the primary field data for each channel can be evaluated：

E-field Probes：$\mathbf{E_i} = \sqrt{\frac{\mathbf{V_i}}{\mathbf{Norm_i \cdot ConvF}}}$

H-field Probes：$\mathbf{H_i} = \sqrt{\mathbf{V_i}} \cdot \frac{\mathbf{a_{i0} + a_{i1} f + a_{i2} f^2}}{\mathbf{f}}$

with V_i = compensated signal of channel i, (i = x, y, z)
$Norm_i$ = sensor sensitivity of channel i, (i = x, y, z), μV/(V/m)^2 for E-field Probes
ConvF = sensitivity enhancement in solution
a_{ij} = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
E_i = electric field strength of channel i in V/m
H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude)：

$$\mathbf{E_{tot}} = \sqrt{\mathbf{E_x^2} + \mathbf{E_y^2} + \mathbf{E_z^2}}$$

The primary field data are used to calculate the derived field units.

$$\mathbf{SAR} = \mathbf{E_{tot}^2} \cdot \frac{\boldsymbol{\sigma}}{\boldsymbol{\rho} \cdot \mathbf{1000}}$$

with SAR = local specific absorption rate in mW/g
E_{tot} = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm^3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

5.8 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Dosimetric E-Field Probe	EX3DV4	3819	Nov. 16, 2011	Nov. 15, 2012
SPEAG	Data Acquisition Electronics	DAE4	1303	Nov. 10, 2011	Nov. 09, 2012
SPEAG	835MHz System Validation Kit	D835V2	4d091	Nov. 18, 2011	Nov. 17, 2012
SPEAG	1800MHz System Validation Kit	D1800V2	2d177	Nov. 21, 2011	Nov. 20, 2012
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	Nov. 21, 2011	Nov. 20, 2012
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 25, 2011	Jul. 24, 2012
Agilent	ENA Series Network Analyzer	E5071C	MY46106933	Jun. 02, 2011	Jun. 01, 2012
Agilent	Wireless Communication Test Set	E5515C	MY50264165	Mar. 29, 2012	Mar. 28, 2013
Agilent	Wireless Communication Test Set	E5515C	GB47050646	Aug. 18, 2011	Aug. 17, 2012
Anritsu	Radio communication analyzer	MT8820C	6201074235	Nov. 30, 2011	Nov. 29, 2013
Agilent	Dielectric Probe Kit	85070E	MY44300475	NCR	NCR
R&S	Signal Generator	SMR40	100455	Dec. 30, 2011	Dec. 29, 2012
AR	Amplifier	551G4	333096	NCR	NCR
R&S	Spectrum Analyzer	FSP30	101400	Jun. 02, 2011	Jun. 01, 2012
Agilent	Power Meter	E4416A	MY45101555	Aug. 23, 2012	Aug. 22, 2012
Agilent	Power Sensor	E9327A	MY44421198	Aug. 23, 2012	Aug. 22, 2012
ARRA	Power Divider	A3200-2	N/A	NA	NA
MCL	Attenuation	BW-S10W5	N/A	NA	NA
SPEAG	SAM Twin Phantom	QD 000 P40 CD	TP-1670	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CD	TP-1671	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1477	NCR	NCR
SPEAG	Dosimetric E-Field Probe	EX3DV4	3697	Sep. 02, 2011	Sep. 01, 2012
SPEAG	Data Acquisition Electronics	DAE4	1210	Nov. 18, 2011	Nov. 17, 2012

Table 5.1 Test Equipment List

Note: The calibration certificate of DASY can be referred to appendix C of this report.

6. Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 6.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 6.2.

Fig 6.1 Photo of Liquid Height for Head SAR

Fig 6.2 Photo of Liquid Height for Body SAR

The following table gives the recipes for tissue simulating liquid.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ε_r)
For Head								
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
For Body								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7

Table 6.1 Recipes of Tissue Simulating Liquid

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an Agilent 85070D Dielectric Probe Kit and an Agilent Network Analyzer.

The following table shows the measuring results for simulating liquid.

Freq.	Liquid Type	Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Head	21.6	0.897	40.781	0.9	41.5	-0.33	-1.73	±5	Apr. 23, 2012
835	Body	21.5	0.976	54.382	0.97	55.2	0.62	-1.48	±5	Apr. 23, 2012
1800	Head	21.7	1.437	41.098	1.40	40.0	2.64	2.75	±5	Apr. 20, 2012
1800	Body	21.4	1.576	53.977	1.52	53.3	3.68	1.27	±5	Apr. 22, 2012
1800	Head	21.6	1.437	41.296	1.40	40.0	2.64	3.24	±5	Apr. 21, 2012
1800	Body	21.6	1.571	55.608	1.52	53.3	3.36	4.33	±5	Apr. 24, 2012
1800	Head	21.5	1.443	41.041	1.40	40.0	3.07	2.60	±5	Apr. 23, 2012
1900	Head	21.6	1.427	41.191	1.40	40.0	1.93	2.98	±5	Apr. 20, 2012
1900	Body	21.5	1.535	54.565	1.52	53.3	0.99	2.37	±5	Apr. 21, 2012
1900	Head	21.3	1.407	39.644	1.40	40.0	0.50	-0.89	±5	Apr. 23, 2012
1900	Body	21.5	1.532	52.397	1.52	53.3	0.79	-1.69	±5	Apr. 24, 2012
2450	Head	21.1	1.825	39.664	1.8	39.2	1.39	1.18	±5	May 05, 2012
2450	Body	21.2	2.002	53.464	1.95	52.7	2.67	1.45	±5	May 05, 2012

Table 6.2 Measuring Results for Simulating Liquid

CH	Frequency (MHz)	Liquid Type	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Date
1013	824.7	Head	0.888	40.881	0.9	41.5	-1.33	-1.49	Apr. 23, 2012
384	836.52	Head	0.898	40.771	0.9	41.5	-0.22	-1.76	Apr. 23, 2012
777	848.31	Head	0.908	40.645	0.91	41.5	-0.22	-2.06	Apr. 23, 2012
25	1711.25	Head	1.342	41.498	1.38	40.1	-2.75	3.49	Apr. 23, 2012
425	1731.25	Head	1.363	41.397	1.39	40	-1.94	3.49	Apr. 23, 2012
875	1753.75	Head	1.388	41.281	1.39	40	-0.14	3.20	Apr. 23, 2012
25	1851.25	Head	1.361	39.814	1.35	40.2	0.81	-0.96	Apr. 23, 2012
600	1880	Head	1.388	39.717	1.36	40.1	2.06	-0.96	Apr. 23, 2012
1175	1908.75	Head	1.415	39.609	1.37	40.1	3.28	-1.22	Apr. 23, 2012
20000	1715	Head	1.339	41.533	1.35	40.1	-0.81	3.57	Apr. 20, 2012
20000	1715	Head	1.338	41.73	1.35	40.1	-0.89	4.06	Apr. 21, 2012
20175	1732.5	Head	1.358	41.445	1.36	40.1	-0.15	3.35	Apr. 20, 2012
20175	1732.5	Head	1.358	41.634	1.36	40.1	-0.15	3.83	Apr. 21, 2012
20350	1750	Head	1.377	41.359	1.37	40.1	0.51	3.14	Apr. 20, 2012
20350	1750	Head	1.375	41.541	1.37	40.1	0.36	3.59	Apr. 21, 2012
18650	1855	Head	1.37	41.235	1.35	40.2	1.48	2.57	Apr. 20, 2012
18900	1880	Head	1.402	41.184	1.36	40.1	3.09	2.70	Apr. 20, 2012
19150	1905	Head	1.432	41.194	1.37	40.1	4.53	2.73	Apr. 20, 2012
1	2412	Head	1.782	39.791	1.76	39.2	1.25	1.51	May. 05, 2012
6	2437	Head	1.811	39.802	1.79	39.2	1.17	1.54	May. 05, 2012
11	2462	Head	1.827	39.856	1.81	39.2	0.94	1.67	May. 05, 2012
1013	824.7	Body	0.967	54.451	0.97	55.3	-0.31	-1.54	Apr. 23, 2012
384	836.52	Body	0.978	54.365	0.97	55.3	0.82	-1.69	Apr. 23, 2012
777	848.31	Body	0.988	54.267	0.97	55.2	1.86	-1.69	Apr. 23, 2012
25	1711.25	Body	1.468	55.797	1.47	53.5	-0.14	4.29	Apr. 24, 2012
425	1731.25	Body	1.489	55.758	1.48	53.4	0.61	4.42	Apr. 24, 2012
875	1753.75	Body	1.514	55.722	1.49	53.4	1.61	4.35	Apr. 24, 2012
25	1851.25	Body	1.476	52.574	1.5	53.4	-1.60	-1.55	Apr. 24, 2012
600	1880	Body	1.509	52.468	1.51	53.5	-0.07	-1.93	Apr. 24, 2012
1175	1908.75	Body	1.542	52.376	1.51	53.5	2.12	-2.10	Apr. 24, 2012
20000	1715	Body	1.477	54.297	1.47	53.5	0.48	1.49	Apr. 22, 2012
20175	1732.5	Body	1.497	54.273	1.48	53.4	1.15	1.63	Apr. 22, 2012
20350	1750	Body	1.515	54.222	1.49	53.4	1.68	1.54	Apr. 22, 2012
18650	1855	Body	1.479	54.653	1.5	53.4	-1.40	2.35	Apr. 21, 2012
18900	1880	Body	1.513	54.594	1.51	53.5	0.20	2.04	Apr. 21, 2012
19150	1905	Body	1.54	54.558	1.51	53.5	1.99	1.98	Apr. 21, 2012
1	2412	Body	1.933	53.535	1.90	52.7	1.74	1.58	May 05, 2012
6	2437	Head	1.956	53.802	1.93	52.7	1.35	2.09	May 05, 2012
11	2462	Head	1.997	53.956	1.97	52.7	1.37	2.38	May 05, 2012

Table 6.3 Low/mid/High channel for liquid validation

7. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table 7.1

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 7.1 Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is showed in Table 7.2.

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.0	Normal	1	1	1	± 6.0 %	± 6.0 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.4	Rectangular	√3	1	1	± 0.2 %	± 0.2 %
Probe Positioning	2.9	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 11.0 %	± 11.8 %
Coverage Factor for 95 %						K = 2	
Expanded Uncertainty						**± 22.0 %**	**± 21.5 %**

Table 7.2 Uncertainty Budget of DASY for frequency range 300 MHz to 3 GHz

8. SAR Measurement Evaluation

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performance check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom, and a corresponding distance holder.

8.1 Purpose of System Performance check

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

8.2 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 that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:

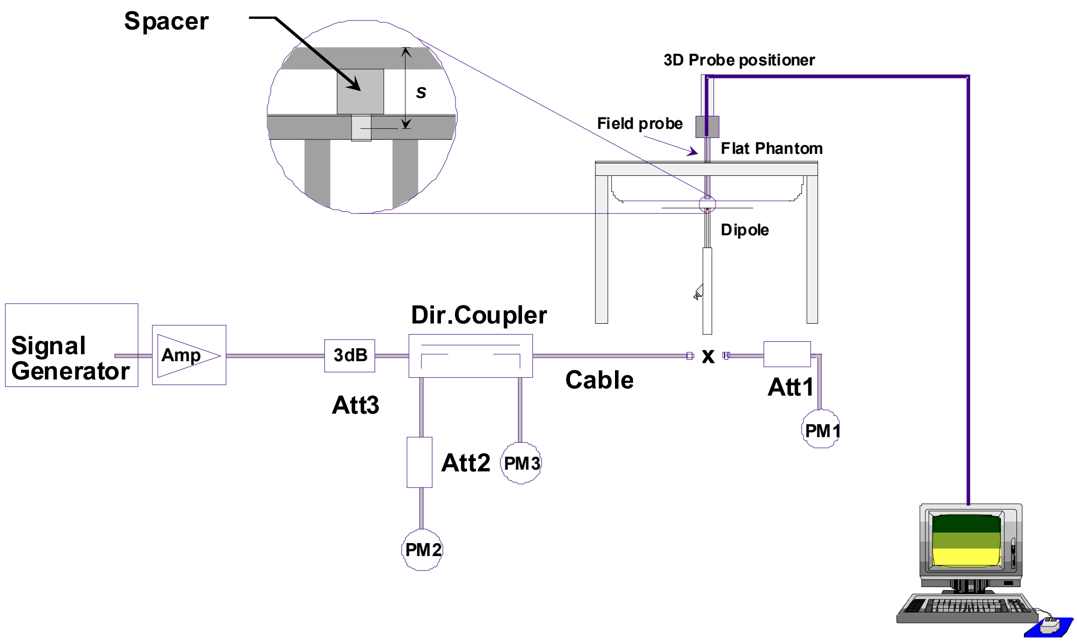


Fig 8.1 System Setup for System Evaluation

1. Signal Generator
2. Amplifier
3. Directional Coupler
4. Power Meter
5. Calibrated Dipole

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

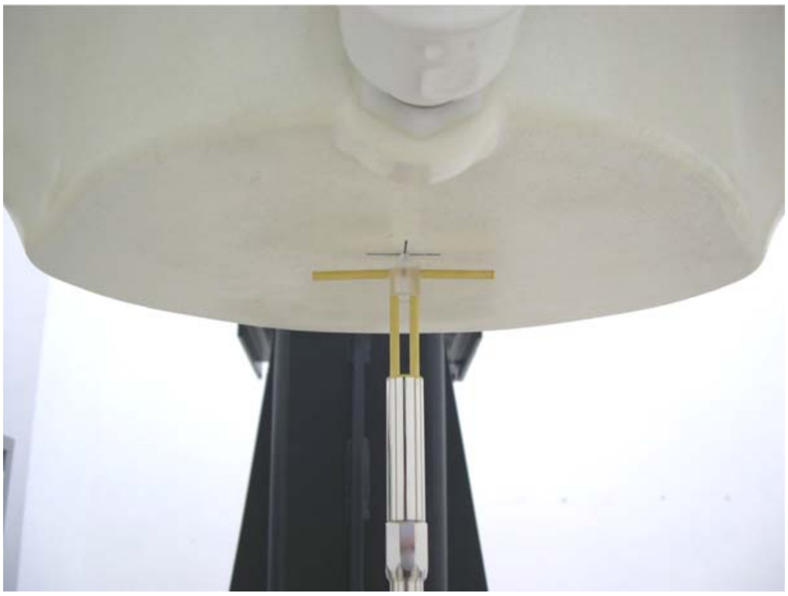


Fig 8.2 Photo of Dipole Setup

8.3 Validation Results

Comparing to the original SAR value provided by SPEAG, the validation data should be within its specification of 10 %. Table 8.1 shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Measurement Date	Frequency (MHz)	Liquid Type	Targeted SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	Normalized SAR_{1g} (W/kg)	Deviation (%)
Apr. 23, 2012	835	Head	9.4	2.33	9.32	-0.85
Apr. 23, 2012	835	Body	9.42	2.51	10.04	6.58
Apr. 20, 2012	1800	Head	38	10	40.00	5.26
Apr. 22, 2012	1800	Body	39.2	10.3	41.20	5.10
Apr. 21, 2012	1800	Head	38	9.77	39.08	2.84
Apr. 24, 2012	1800	Body	39.2	10.2	40.80	4.08
Apr. 23, 2012	1800	Head	38	9.81	39.24	3.26
Apr. 20, 2012	1900	Head	40.3	10.6	42.40	5.21
Apr. 21, 2012	1900	Body	41.8	11	44.00	5.26
Apr. 23, 2012	1900	Head	40.3	9.76	39.04	-3.13
Apr. 24, 2012	1900	Body	41.8	10.5	42.00	0.48
May 05, 2012	2450	Head	54.8	14.1	56.40	2.92
May 05, 2012	2450	Body	52.3	13.6	54.40	4.02

Table 8.1 Target and Measurement SAR after Normalized

9. DUT Testing Position

This DUT was tested in ten different positions. They are right cheek, right tilted, left cheek, left tilted, Front of the DUT with phantom 1 cm gap, Back of the DUT with phantom 1 cm gap, Top Side of the DUT with phantom 1 cm gap, Bottom Side of the DUT with phantom 1 cm gap, Right Side of the DUT with phantom 1 cm gap, and Left Side of the DUT with phantom 1 cm gap, as illustrated below:

1. Define two imaginary lines on the handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

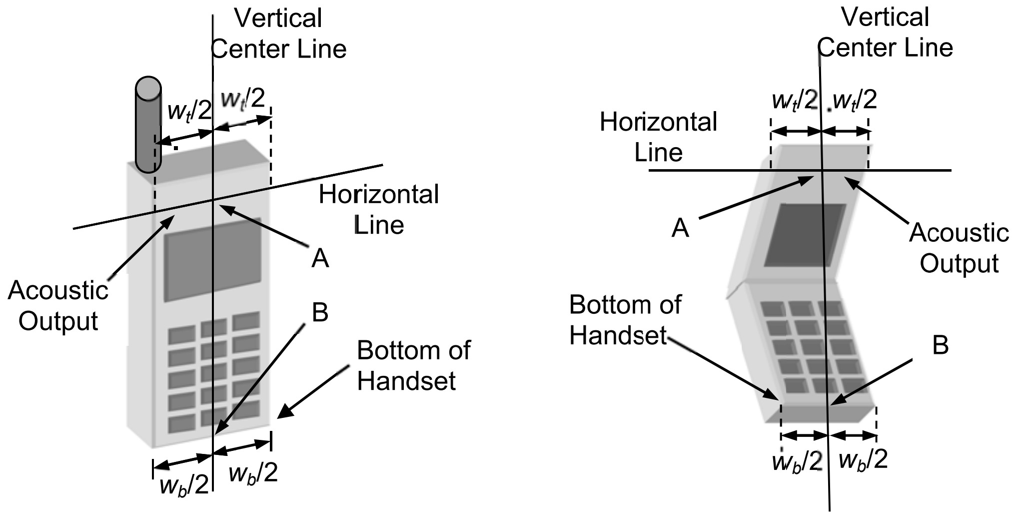


Fig 9.1 Illustration for Handset Vertical and Horizontal Reference Lines

2. **Cheek Position**
   (a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
   (b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig. 9.2).

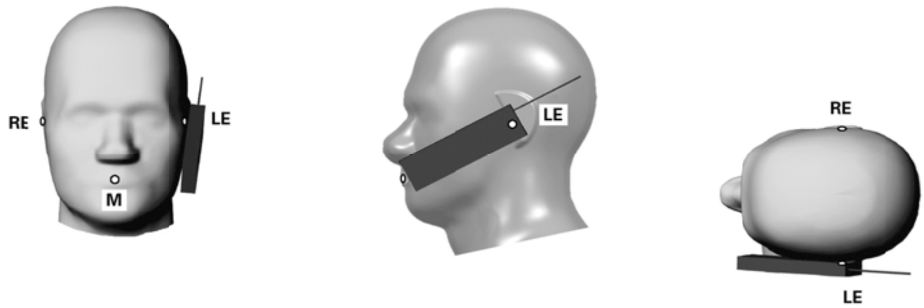


Fig 9.2 Illustration for Cheek Position

3. **Tilted Position**
   (a) To position the device in the "cheek" position described above.
   (b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig. 9.3).

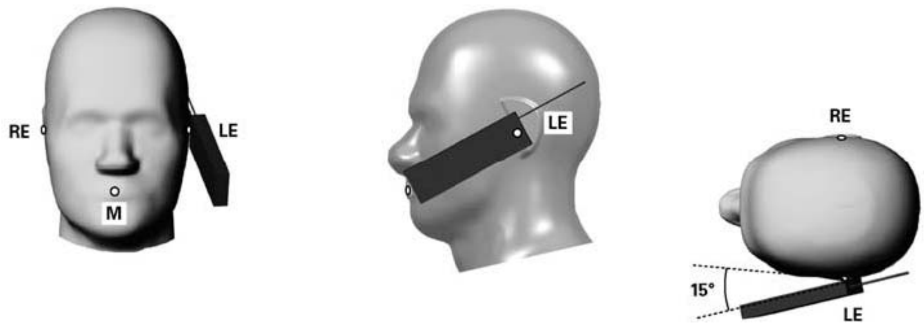


Fig 9.3 Illustration for Tilted Position

4. **Body Worn Position**

(a) To position the device parallel to the phantom surface with either keypad up or down.

(b) To adjust the device parallel to the flat phantom.

(c) To adjust the distance between the device surface and the flat phantom to 1 cm.

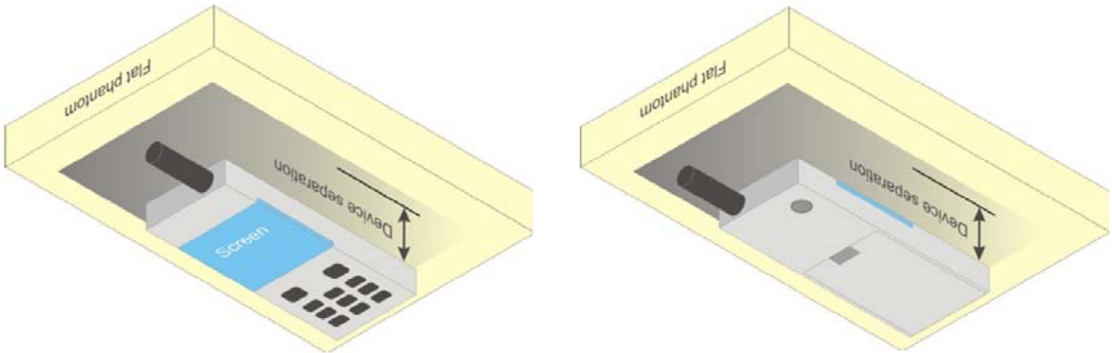


Fig 9.4 Illustration for Body Worn Position

<DUT Setup Photos>

Please refer to Appendix E for the test setup photos.

10. Measurement Procedures

The measurement procedures are as follows:

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

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

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

10.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

10.2 Area & Zoom Scan Procedures

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

10.3 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the DUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing (step-size is 4, 4 and 2.5 mm). When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

10.4 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

10.5 Power Drift Monitoring

All SAR testing is under the DUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of DUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

11. SAR Test Configurations

11.1 Conducted Power (Unit: dBm)

<CDMA2000>

Conducted Power (*Unit: dBm)									
Band	CDMA2000 BC0			CDMA2000 BC1			CDMA2000 BC15		
Channel	1013	384	777	25	600	1175	25	425	875
Frequency	824.7	836.52	848.31	1851.25	1880	1908.75	1711.25	1731.25	1753.75
1xRTT RC1+SO55	23.39	23.30	23.33	23.77	23.64	23.44	23.93	23.91	23.88
1xRTT RC3+SO55	23.40	23.34	23.35	23.85	23.70	23.55	23.97	23.93	23.89
1xRTT RC3+SO32(+ F-SCH)	23.37	23.29	23.28	23.80	23.66	23.46	23.99	23.91	23.87
1xRTT RC3+SO32(+SCH)	22.92	22.78	22.73	23.31	23.12	22.95	23.43	23.41	23.40
1xEVDO RTAP 153.6	23.37	23.26	23.28	23.81	23.68	23.49	23.92	23.88	23.86
1xEVDO RETAP 4096	23.34	23.25	23.33	23.83	23.70	23.51	23.92	23.90	23.82

Note:

1. According to KDB 941225 D01, Head SAR for RC1-SO55 is not required because the maximum average output power of RC1 is less than 1/4 dB higher than RC3-SO55.
2. Referring to KDB 941225 D01, the CDMA Handset Body-worn SAR tests based on RC3+SO32. RC1, RTAP (REV 0), and RETAP (Rev A) power are all less than 1/4 dB higher than RC3, thus SAR tests in these mode are not necessary.
3. Referring to KDB 941225 D01, in Hotspot mode DUT is treated as data device and SAR is tested with RTAP 153.6kbps (Ev-Do). If RC3+SO32 power is less than 1/4 dB higher than Ev-Do, SAR tests with RC3+SO32 setting are not necessary.

<LTE Band II, Low Channel>

Frequency [MHz]	Uplink Channel Number	BW [MHz]	RB Size	RB Offset	Mod	Maximum Average Power (dBm)	Target MPR (dB)	MPR Result (dB)
1855	18650	10	1	0	QPSK	20.64	0	0.00
1855	18650	10	1	49	QPSK	20.58	0	0.06
1855	18650	10	25	13	QPSK	20.36	0.5	0.28
1855	18650	10	50	0	QPSK	20.28	0.5	0.36
1855	18650	10	1	0	16-QAM	20.76	0	-0.12
1855	18650	10	1	49	16-QAM	21.12	0	-0.48
1855	18650	10	25	13	16-QAM	19.38	1.5	1.26
1855	18650	10	50	0	16-QAM	19.46	1.5	1.18
1852.5	18625	5	1	0	QPSK	20.62	0	0.23
1852.5	18625	5	1	24	QPSK	20.85	0	0.00
1852.5	18625	5	12	6	QPSK	20.46	0.5	0.39
1852.5	18625	5	25	0	QPSK	20.44	0.5	0.41
1852.5	18625	5	1	0	16-QAM	20.90	0	-0.05
1852.5	18625	5	1	24	16-QAM	21.27	0	-0.42
1852.5	18625	5	12	6	16-QAM	19.65	1.5	1.20
1852.5	18625	5	25	0	16-QAM	19.61	1.5	1.24
1851.5	18615	3	1	0	QPSK	20.43	0	0.50
1851.5	18615	3	1	14	QPSK	20.93	0	0.00
1851.5	18615	3	8	4	QPSK	20.42	0.5	0.51
1851.5	18615	3	15	0	QPSK	20.29	0.5	0.64
1851.5	18615	3	1	0	16-QAM	20.71	0	0.22
1851.5	18615	3	1	14	16-QAM	21.21	0	-0.28
1851.5	18615	3	8	4	16-QAM	19.47	1.5	1.46
1851.5	18615	3	15	0	16-QAM	19.26	1.5	1.67
1850.7	18607	1.4	1	0	QPSK	20.31	0	0.19
1850.7	18607	1.4	1	5	QPSK	20.50	0	0.00
1850.7	18607	1.4	3	2	QPSK	20.44	0	0.06
1850.7	18607	1.4	6	0	QPSK	20.11	0.5	0.39
1850.7	18607	1.4	1	0	16-QAM	20.88	0	-0.38
1850.7	18607	1.4	1	5	16-QAM	20.78	0	-0.28
1850.7	18607	1.4	3	2	16-QAM	20.55	0	-0.05
1850.7	18607	1.4	6	0	16-QAM	19.37	1.5	1.13

<LTE Band II, Middle Channel>

Frequency [MHz]	Uplink Channel Number	BW [MHz]	RB Size	RB Offset	Mod	Maximum Average Power (dBm)	Target MPR (dB)	MPR Result (dB)
1880	18900	10	1	0	QPSK	21.22	0	0.00
1880	18900	10	1	49	QPSK	20.79	0	0.43
1880	18900	10	25	13	QPSK	20.36	0.5	0.86
1880	18900	10	50	0	QPSK	20.45	0.5	0.77
1880	**18900**	**10**	**1**	**0**	**16-QAM**	**21.36**	**0**	**-0.14**
1880	18900	10	1	49	16-QAM	20.98	0	0.24
1880	18900	10	25	13	16-QAM	19.74	1.5	1.48
1880	18900	10	50	0	16-QAM	19.51	1.5	1.71
1880	18900	5	1	0	QPSK	20.91	0	0.00
1880	18900	5	1	24	QPSK	20.42	0	0.49
1880	18900	5	12	6	QPSK	20.30	0.5	0.61
1880	18900	5	25	0	QPSK	20.21	0.5	0.70
1880	18900	5	1	0	16-QAM	21.30	0	-0.39
1880	18900	5	1	24	16-QAM	20.80	0	0.11
1880	18900	5	12	6	16-QAM	19.35	1.5	1.56
1880	18900	5	25	0	16-QAM	19.22	1.5	1.69
1880	18900	3	1	0	QPSK	20.73	0	0.00
1880	18900	3	1	14	QPSK	20.57	0	0.16
1880	18900	3	8	4	QPSK	20.19	0.5	0.54
1880	18900	3	15	0	QPSK	20.18	0.5	0.55
1880	18900	3	1	0	16-QAM	21.22	0	-0.49
1880	18900	3	1	14	16-QAM	20.90	0	-0.17
1880	18900	3	8	4	16-QAM	19.31	1.5	1.42
1880	18900	3	15	0	16-QAM	19.24	1.5	1.49
1880	18900	1.4	1	0	QPSK	20.85	0	0.00
1880	18900	1.4	1	5	QPSK	20.64	0	0.21
1880	18900	1.4	3	2	QPSK	20.59	0	0.26
1880	18900	1.4	6	0	QPSK	20.45	0.5	0.40
1880	18900	1.4	1	0	16-QAM	20.86	0	-0.01
1880	18900	1.4	1	5	16-QAM	20.76	0	0.09
1880	18900	1.4	3	2	16-QAM	20.65	0	0.20
1880	18900	1.4	6	0	16-QAM	20.18	1.5	0.67

<LTE Band II, High Channel>

Frequency [MHz]	Uplink Channel Number	BW [MHz]	RB Size	RB Offset	Mod	Maximum Average Power (dBm)	Target MPR (dB)	MPR Result (dB)
1905	19150	10	1	0	QPSK	20.65	0	0.00
1905	19150	10	1	49	QPSK	20.47	0	0.18
1905	19150	10	25	13	QPSK	20.29	0.5	0.36
1905	19150	10	50	0	QPSK	20.07	0.5	0.58
1905	19150	10	1	0	16-QAM	21.11	0	-0.46
1905	19150	10	1	49	16-QAM	20.23	0	0.42
1905	19150	10	25	13	16-QAM	19.58	1.5	1.07
1905	19150	10	50	0	16-QAM	19.39	1.5	1.26
1907.5	19175	5	1	0	QPSK	20.77	0	0.00
1907.5	19175	5	1	24	QPSK	20.55	0	0.22
1907.5	19175	5	12	6	QPSK	19.90	0.5	0.87
1907.5	19175	5	25	0	QPSK	19.80	0.5	0.97
1907.5	19175	5	1	0	16-QAM	21.25	0	-0.48
1907.5	19175	5	1	24	16-QAM	20.35	0	0.42
1907.5	19175	5	12	6	16-QAM	19.32	1.5	1.45
1907.5	19175	5	25	0	16-QAM	19.37	1.5	1.40
1908.5	19185	3	1	0	QPSK	20.21	0	0.00
1908.5	19185	3	1	14	QPSK	19.86	0	0.35
1908.5	19185	3	8	4	QPSK	19.55	0.5	0.66
1908.5	19185	3	15	0	QPSK	19.58	0.5	0.63
1908.5	19185	3	1	0	16-QAM	20.68	0	-0.47
1908.5	19185	3	1	14	16-QAM	19.97	0	0.24
1908.5	19185	3	8	4	16-QAM	18.74	1.5	1.47
1908.5	19185	3	15	0	16-QAM	18.60	1.5	1.61
1909.3	19193	1.4	1	0	QPSK	20.12	0	0.00
1909.3	19193	1.4	1	5	QPSK	19.84	0	0.28
1909.3	19193	1.4	3	2	QPSK	19.57	0	0.55
1909.3	19193	1.4	6	0	QPSK	19.38	0.5	0.74
1909.3	19193	1.4	1	0	16-QAM	20.25	0	-0.13
1909.3	19193	1.4	1	5	16-QAM	20.00	0	0.12
1909.3	19193	1.4	3	2	16-QAM	19.57	0	0.55
1909.3	19193	1.4	6	0	16-QAM	19.05	1.5	1.07

<LTE band IV, Low Channel>

Frequency [MHz]	Uplink Channel Number	BW [MHz]	RB Size	RB Offset	Mod	Maximum Average Power (dBm)	Target MPR (dB)	MPR Result (dB)
1715	20000	10	1	0	QPSK	20.92	0	0.31
1715	20000	10	1	49	QPSK	21.23	0	0.00
1715	20000	10	25	13	QPSK	20.64	0.5	0.59
1715	20000	10	50	0	QPSK	20.70	0.5	0.53
1715	20000	10	1	0	16-QAM	21.23	0	0.00
1715	**20000**	**10**	**1**	**49**	**16-QAM**	**21.73**	**0**	**-0.50**
1715	20000	10	25	13	16-QAM	19.65	1.5	1.58
1715	20000	10	50	0	16-QAM	19.55	1.5	1.68
1712.5	19975	5	1	0	QPSK	20.90	0	0.25
1712.5	19975	5	1	24	QPSK	21.15	0	0.00
1712.5	19975	5	12	6	QPSK	20.55	0.5	0.60
1712.5	19975	5	25	0	QPSK	20.36	0.5	0.79
1712.5	19975	5	1	0	16-QAM	21.24	0	-0.09
1712.5	19975	5	1	24	16-QAM	21.64	0	-0.49
1712.5	19975	5	12	6	16-QAM	19.37	1.5	1.78
1712.5	19975	5	25	0	16-QAM	19.58	1.5	1.57
1711.5	19965	3	1	0	QPSK	20.85	0	0.18
1711.5	19965	3	1	14	QPSK	21.03	0	0.00
1711.5	19965	3	8	4	QPSK	20.46	0.5	0.57
1711.5	19965	3	15	0	QPSK	20.30	0.5	0.73
1711.5	19965	3	1	0	16-QAM	21.15	0	-0.12
1711.5	19965	3	1	14	16-QAM	21.35	0	-0.32
1711.5	19965	3	8	4	16-QAM	19.22	1.5	1.81
1711.5	19965	3	15	0	16-QAM	19.15	1.5	1.88
1710.7	19957	1.4	1	0	QPSK	20.83	0	0.02
1710.7	19957	1.4	1	5	QPSK	20.85	0	0.00
1710.7	19957	1.4	3	2	QPSK	20.97	0	-0.12
1710.7	19957	1.4	6	0	QPSK	20.23	0.5	0.62
1710.7	19957	1.4	1	0	16-QAM	21.31	0	-0.46
1710.7	19957	1.4	1	5	16-QAM	21.28	0	-0.43
1710.7	19957	1.4	3	2	16-QAM	20.78	0	0.07
1710.7	19957	1.4	6	0	16-QAM	19.33	1.5	1.52

<LTE Band IV, Middle Channel>

Frequency [MHz]	Uplink Channel Number	BW [MHz]	RB Size	RB Offset	Mod	Maximum Average Power (dBm)	Target MPR (dB)	MPR Result (dB)
1732.5	20175	10	1	0	QPSK	20.99	0	0.00
1732.5	20175	10	1	49	QPSK	20.52	0	0.47
1732.5	20175	10	25	13	QPSK	20.25	0.5	0.74
1732.5	20175	10	50	0	QPSK	20.36	0.5	0.63
1732.5	20175	10	1	0	16-QAM	21.46	0	-0.47
1732.5	20175	10	1	49	16-QAM	21.03	0	-0.04
1732.5	20175	10	25	13	16-QAM	19.14	1.5	1.85
1732.5	20175	10	50	0	16-QAM	19.27	1.5	1.72
1732.5	20175	5	1	0	QPSK	20.96	0	0.00
1732.5	20175	5	1	24	QPSK	20.48	0	0.48
1732.5	20175	5	12	6	QPSK	20.42	0.5	0.54
1732.5	20175	5	25	0	QPSK	20.33	0.5	0.63
1732.5	20175	5	1	0	16-QAM	21.41	0	-0.45
1732.5	20175	5	1	24	16-QAM	21.14	0	-0.18
1732.5	20175	5	12	6	16-QAM	19.14	1.5	1.82
1732.5	20175	5	25	0	16-QAM	19.25	1.5	1.71
1732.5	20175	3	1	0	QPSK	20.97	0	0.00
1732.5	20175	3	1	14	QPSK	20.54	0	0.43
1732.5	20175	3	8	4	QPSK	20.26	0.5	0.71
1732.5	20175	3	15	0	QPSK	20.27	0.5	0.70
1732.5	20175	3	1	0	16-QAM	21.34	0	-0.37
1732.5	20175	3	1	14	16-QAM	21.21	0	-0.24
1732.5	20175	3	8	4	16-QAM	19.31	1.5	1.66
1732.5	20175	3	15	0	16-QAM	19.33	1.5	1.64
1732.5	20175	1.4	1	0	QPSK	20.95	0	0.00
1732.5	20175	1.4	1	5	QPSK	20.86	0	0.09
1732.5	20175	1.4	3	2	QPSK	20.61	0	0.34
1732.5	20175	1.4	6	0	QPSK	20.63	0.5	0.32
1732.5	20175	1.4	1	0	16-QAM	21.33	0	-0.38
1732.5	20175	1.4	1	5	16-QAM	21.04	0	-0.09
1732.5	20175	1.4	3	2	16-QAM	20.99	0	-0.04
1732.5	20175	1.4	6	0	16-QAM	19.30	1.5	1.65

<LTE Band IV, High Channel>

Frequency [MHz]	Uplink Channel Number	BW [MHz]	RB Size	RB Offset	Mod	Maximum Average Power (dBm)	Target MPR (dB)	MPR Result (dB)
1750	20350	10	1	0	QPSK	20.73	0	0.00
1750	20350	10	1	49	QPSK	20.59	0	0.14
1750	20350	10	25	13	QPSK	20.11	0.5	0.62
1750	20350	10	50	0	QPSK	20.36	0.5	0.37
1750	20350	10	1	0	16-QAM	21.19	0	-0.46
1750	20350	10	1	49	16-QAM	21.15	0	-0.42
1750	20350	10	25	13	16-QAM	19.33	1.5	1.40
1750	20350	10	50	0	16-QAM	19.46	1.5	1.27
1752.5	20375	5	1	0	QPSK	20.71	0	0.00
1752.5	20375	5	1	24	QPSK	20.57	0	0.14
1752.5	20375	5	12	6	QPSK	20.31	0.5	0.40
1752.5	20375	5	25	0	QPSK	20.20	0.5	0.51
1752.5	20375	5	1	0	16-QAM	21.13	0	-0.42
1752.5	20375	5	1	24	16-QAM	21.02	0	-0.31
1752.5	20375	5	12	6	16-QAM	19.42	1.5	1.29
1752.5	20375	5	25	0	16-QAM	19.30	1.5	1.41
1753.5	20385	3	1	0	QPSK	20.71	0	0.00
1753.5	20385	3	1	14	QPSK	20.64	0	0.07
1753.5	20385	3	8	4	QPSK	20.23	0.5	0.48
1753.5	20385	3	15	0	QPSK	20.31	0.5	0.40
1753.5	20385	3	1	0	16-QAM	21.18	0	-0.47
1753.5	20385	3	1	14	16-QAM	21.11	0	-0.40
1753.5	20385	3	8	4	16-QAM	19.21	1.5	1.50
1753.5	20385	3	15	0	16-QAM	19.31	1.5	1.40
1754.3	20393	1.4	1	0	QPSK	20.75	0	0.00
1754.3	20393	1.4	1	5	QPSK	20.52	0	0.23
1754.3	20393	1.4	3	2	QPSK	20.30	0	0.45
1754.3	20393	1.4	6	0	QPSK	20.22	0.5	0.53
1754.3	20393	1.4	1	0	16-QAM	21.01	0	-0.26
1754.3	20393	1.4	1	5	16-QAM	20.60	0	0.15
1754.3	20393	1.4	3	2	16-QAM	20.53	0	0.22
1754.3	20393	1.4	6	0	16-QAM	19.28	1.5	1.47

Note:

1. Per KDB 941225, if the output power variation across the band < 0.5 dB, test middle channel SAR first and determine further test reduction based on the SAR results.

LTE Target MPR level

The device implements maximum power reduction per 3GPP 36.101 requirements where the MPR target is as below table. The MPR settings are permanently implemented configured into firmware and cannot be disabled by the end user or LTE carrier network.

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]				MPR Target (dB)				3GPP MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	1.4 MHz	3.0 MHz	5 MHz	10 MHz	
QPSK	> 5	> 4	> 8	> 12	0.5	0.5	0.5	0.5	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	0	0	0	0	≤ 1
16 QAM	> 5	> 4	> 8	> 12	1.5	1.5	1.5	1.5	≤ 2

Note: The measurement result showed some difference from the target MPR level, due to expected measurement tolerance

<WLAN>

Mode	Channel	Frequency (MHz)	Average power (dBm) Data Rate (bps)			
			1M	2M	5.5M	11M
802.11b	CH 01	2412 MHz	15.41	14.85	14.84	14.90
	CH 06	2437 MHz	15.28	14.70	14.86	14.85
	CH 11	2462 MHz	14.77	14.36	14.30	14.44

Mode	Channel	Frequency (MHz)	Average power (dBm) Data Rate (bps)							
			6M	9M	12M	18M	24M	36M	48M	54M
802.11g	CH 01	2412 MHz	7.87	7.81	6.21	7.54	7.68	7.70	7.61	7.73
	CH 06	2437 MHz	7.52	7.81	7.12	7.66	7.13	7.79	7.63	7.84
	CH 11	2462 MHz	6.72	6.99	7.12	7.07	7.64	7.18	7.06	7.06

Note:

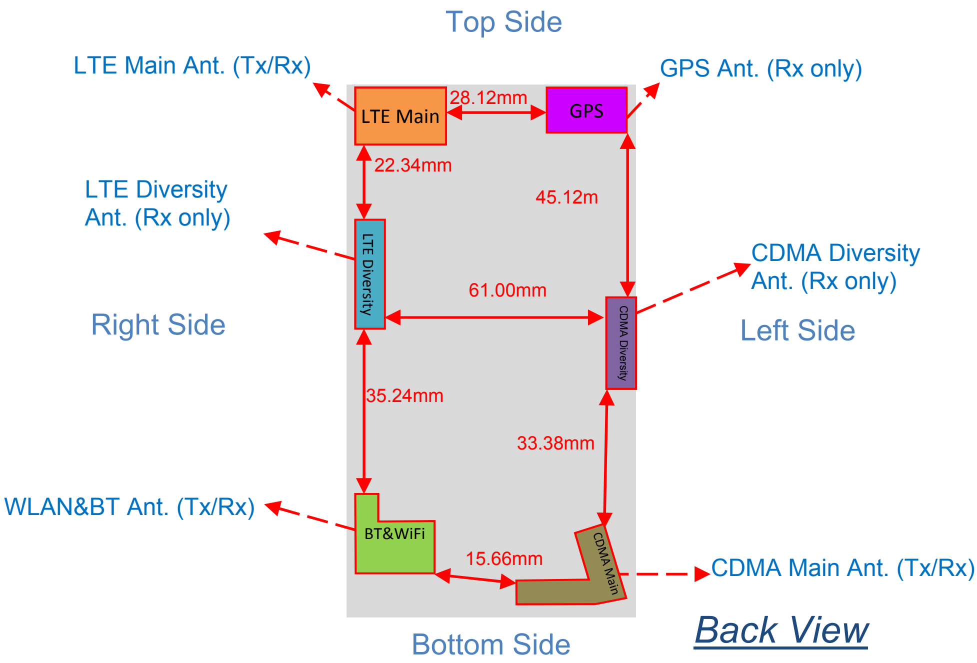
Per KDB 248227, 11g output power is less than 1/4 dB higher than 11b mode, thus the SAR can be excluded. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.

<Bluetooth>

Mode	Channel	Frequency (MHz)	Average power (dBm) Data Rate								
			DH1	DH3	DH5	2DH1	2DH3	2DH5	3DH1	3DH3	3DH5
Bluetooth	CH 00	2402 MHz	1.95	2.06	2.03	1.63	1.83	1.76	1.63	2.07	1.85
	CH 39	2441 MHz	2.39	2.38	2.37	2.05	2.10	2.26	2.04	2.23	2.30
	CH 78	2480 MHz	1.74	1.82	1.78	1.61	1.87	1.81	1.72	1.86	1.93

Note: Bluetooth output power (2.39dBm) ≤ P_{Ref}(10.8dBm).

11.2 Exposure Positions Consideration



Antennas	Wireless Interface
CDMA Main Antenna (Tx / Rx)	CDMA2000 BC 0/1/15 (Tx/Rx)
CDMA Diversity Antenna (Rx)	CDMA2000 BC 0/1/15 (Rx)
Bluetooth /WLAN Antenna (Tx / Rx)	WLAN 2.4GHz (Tx/Rx) Bluetooth (Tx/Rx)
LTE Main Antenna (Tx / Rx)	LTE: Band II/IV (Tx/Rx)
LTE Diversity Antenna (Rx)	LTE: Band II/IV (Rx)
GPS Diversity Antenna (Rx)	GPS receiving only

Hotspot side for SAR assessment Test distance: 10 mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
CDMA Main	YES	YES	NO	YES	YES	YES
Bluetooth/WLAN	YES	YES	NO	YES	YES	NO
LTE Main	YES	YES	YES	NO	YES	NO

Note:
1. Head/Body-worn/Hotspot mode SAR assessments are required.
2. Referring to KDB 941225 D06, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.
3. For CDMA Main antenna, SAR measurements at Top Side are not required since the nearest distance between CDMA Main antenna and top side surface> 25mm.
4. For WLAN& Bluetooth antenna, SAR measurements Top Side and Left Side are not required since the nearest distance between WLAN& Bluetooth antenna and top side surface or left side surface > 25mm. WLAN and Bluetooth cannot transmit simultaneously.
5. For LTE Main antenna, SAR measurements at Bottom Side and Left Side are not required since the nearest distance between LTE Main antenna and bottom side surface or left side surface > 25mm.
6. Bluetooth output power (2.39dBm) ≤ P_{Ref}(10.8dBm). Based on the output power, plus WLAN2.4G/Bluetooth operates at the same frequency where Bluetooth output power is far less than 802.11b output power (max: 15.41dBm; min: 14.30dBm), therefore SAR measurements for WLAN2.4G/Bluetooth antenna are based on WLAN2.4G in SAR assessment.

12. SAR Test Results

12.1 Test Records for Head SAR Test

<CDMA2000>

Plot No.	Antenna	Band	Mode	Test Position	Ch.	Freq. (MHz)	Output Power (dBm)	SAR_{1g} (W/kg)	Power Drift (dB)
173	CDMA Main	CDMA2000 BC0	RC3 SO55	Right Cheek	1013	824.7	23.40	0.622	-0.03
174	CDMA Main	CDMA2000 BC0	RC3 SO55	Right Tilted	1013	824.7	23.40	0.382	0.05
175	**CDMA Main**	**CDMA2000 BC0**	**RC3 SO55**	**Left Cheek**	**1013**	**824.7**	**23.40**	**0.646**	**0.02**
176	CDMA Main	CDMA2000 BC0	RC3 SO55	Left Tilted	1013	824.7	23.40	0.411	0.07
167	CDMA Main	CDMA2000 BC15	RC3 SO55	Right Cheek	25	1711.25	23.97	0.701	-0.08
168	CDMA Main	CDMA2000 BC15	RC3 SO55	Right Tilted	25	1711.25	23.97	0.379	-0.03
169	CDMA Main	CDMA2000 BC15	RC3 SO55	Left Cheek	25	1711.25	23.97	1.000	0.07
170	CDMA Main	CDMA2000 BC15	RC3 SO55	Left Tilted	25	1711.25	23.97	0.359	0.03
171	CDMA Main	CDMA2000 BC15	RC3 SO55	Left Cheek	425	1731.25	23.93	1.120	0.03
172	**CDMA Main**	**CDMA2000 BC15**	**RC3 SO55**	**Left Cheek**	**875**	**1753.75**	**23.89**	**1.170**	**0.09**
161	CDMA Main	CDMA2000 BC1	RC3 SO55	Right Cheek	25	1851.25	23.85	0.608	-0.14
162	CDMA Main	CDMA2000 BC1	RC3 SO55	Right Tilted	25	1851.25	23.85	0.349	-0.12
163	**CDMA Main**	**CDMA2000 BC1**	**RC3 SO55**	**Left Cheek**	**25**	**1851.25**	**23.85**	**1.290**	**-0.03**
164	CDMA Main	CDMA2000 BC1	RC3 SO55	Left Tilted	25	1851.25	23.85	0.419	-0.07
165	CDMA Main	CDMA2000 BC1	RC3 SO55	Left Cheek	600	1880	23.70	0.921	0.01
166	CDMA Main	CDMA2000 BC1	RC3 SO55	Left Cheek	1175	1908.75	23.55	0.874	0.07

Note:

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

<LTE>

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Ch.	Freq. (MHz)	Output Power (dBm)	SAR_{1g} (W/kg)	Power Drift (dB)
31	LTE Main	LTE Band IV	QPSK	10	25	13	Right Cheek	20175	1732.5	20.25	0.920	0.05
32	LTE Main	LTE Band IV	QPSK	10	25	13	Right Tilted	20175	1732.5	20.25	0.899	-0.02
33	LTE Main	LTE Band IV	QPSK	10	25	13	Left Cheek	20175	1732.5	20.25	1.090	-0.03
34	LTE Main	LTE Band IV	QPSK	10	25	13	Left Tilted	20175	1732.5	20.25	0.920	0.16
35	LTE Main	LTE Band IV	QPSK	10	25	13	Right Cheek	20000	1715	20.64	0.853	0.04
36	LTE Main	LTE Band IV	QPSK	10	25	13	Right Cheek	20350	1750	20.11	0.853	-0.10
239	LTE Main	LTE Band IV	QPSK	10	25	13	Right Tilted	20000	1715	20.64	0.754	0.03
240	LTE Main	LTE Band IV	QPSK	10	25	13	Right Tilted	20350	1750	20.11	0.785	0.06
37	LTE Main	LTE Band IV	QPSK	10	25	13	Left Cheek	20000	1715	20.64	0.975	0.04
38	LTE Main	LTE Band IV	QPSK	10	25	13	Left Cheek	20350	1750	20.11	1.000	-0.07
39	LTE Main	LTE Band IV	QPSK	10	25	13	Left Tilted	20000	1715	20.64	0.795	-0.10
40	LTE Main	LTE Band IV	QPSK	10	25	13	Left Tilted	20350	1750	20.11	0.824	0.09
41	LTE Main	LTE Band IV	QPSK	10	1	0	Right Cheek	20175	1732.5	20.99	1.010	0.04
42	LTE Main	LTE Band IV	QPSK	10	1	0	Right Tilted	20175	1732.5	20.99	0.949	-0.17
43	**LTE Main**	**LTE Band IV**	**QPSK**	**10**	**1**	**0**	**Left Cheek**	**20175**	**1732.5**	**20.99**	**1.210**	**-0.05**
44	LTE Main	LTE Band IV	QPSK	10	1	0	Left Tilted	20175	1732.5	20.99	0.950	0.04
45	LTE Main	LTE Band IV	QPSK	10	1	49	Right Cheek	20175	1732.5	20.52	1.010	0.15
46	LTE Main	LTE Band IV	QPSK	10	1	49	Right Tilted	20175	1732.5	20.52	0.943	0.03
47	LTE Main	LTE Band IV	QPSK	10	1	49	Left Cheek	20175	1732.5	20.52	1.060	0.05
48	LTE Main	LTE Band IV	QPSK	10	1	49	Left Tilted	20175	1732.5	20.52	0.849	0.08
49	LTE Main	LTE Band IV	16-QAM	10	25	13	Right Cheek	20175	1732.5	19.14	0.635	0.09
50	LTE Main	LTE Band IV	16-QAM	10	25	13	Right Tilted	20175	1732.5	19.14	0.611	-0.10
51	LTE Main	LTE Band IV	16-QAM	10	25	13	Left Cheek	20175	1732.5	19.14	0.749	-0.05
52	LTE Main	LTE Band IV	16-QAM	10	25	13	Left Tilted	20175	1732.5	19.14	0.621	0.06
53	LTE Main	LTE Band IV	16-QAM	10	1	0	Right Cheek	20175	1732.5	21.46	0.971	0.11
54	LTE Main	LTE Band IV	16-QAM	10	1	0	Right Tilted	20175	1732.5	21.46	0.893	-0.16
55	LTE Main	LTE Band IV	16-QAM	10	1	0	Left Cheek	20175	1732.5	21.46	1.180	0.04
56	LTE Main	LTE Band IV	16-QAM	10	1	0	Left Tilted	20175	1732.5	21.46	0.937	0.05
57	LTE Main	LTE Band IV	16-QAM	10	1	49	Right Cheek	20175	1732.5	21.03	0.995	-0.10
58	LTE Main	LTE Band IV	16-QAM	10	1	49	Right Tilted	20175	1732.5	21.03	0.927	-0.01
59	LTE Main	LTE Band IV	16-QAM	10	1	49	Left Cheek	20175	1732.5	21.03	1.160	-0.05
60	LTE Main	LTE Band IV	16-QAM	10	1	49	Left Tilted	20175	1732.5	21.03	0.915	0.03

Note:

1. Considering the users may install 3rd party software to enable VOIP, LTE Head SAR is also evaluated. Because FCC has not published uniform procedures for VOIP in LTE, therefore all channels and modes and modulations required under the other KDB pub 941225 D05 FCC LTE procedures were used for the held-near-head testing.
2. Per KDB 941225 D05, for LTE, if the smaller bandwidth output power is within +/- ½dB of the largest bandwidth, and the maximum SAR of the largest bandwidth is ≤ 1.45 W/kg, SAR for smaller bandwidth can be excluded.
3. Per KDB 941225 D05, if the measured 50%-RB QPSK 1g-SAR for the middle or highest output power channel is ≤ 0.8W/kg, remaining 2 channels SAR tests can be excluded. Otherwise, 50% RB allocation of the remaining 2 channels SAR tests are necessary.
4. Per KDB 941225 D05, for LTE, if 50%-RB QPSK SAR ≤ 1.45 W/kg, 100%-RB QPSK SAR can be excluded; if 50%-RB 16QAM SAR ≤ 1.45 W/kg, 100%-RB 16QAM SAR can be excluded.
5. If SAR of 1 RB allocation is ≤ 1.45W/kg, SAR of 1 RB allocation of remaining channels can be excluded.
6. Per KDB 447498, if the highest output channels SAR for each exposure position is ≤ 0.8 W/kg, other channels SAR tests are not necessary.
7. If the maximum average conducted output power for a 1 RB allocation is > ½ dB higher than the 50% RB allocation, instead of using the highest SAR channel measured for QPSK and 50% RB allocation, measure SAR on the highest output power channel for the 1 RB allocation.
8. If the maximum average conducted output power for a 1 RB allocation is > ½ dB higher than the 50% RB allocation, instead of using the highest SAR channel measured for 16QAM and 50% RB measure SAR on the highest output power channel for the 1 RB allocation.

<LTE>

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Ch.	Freq. (MHz)	Output Power (dBm)	SAR_{1g} (W/kg)	Power Drift (dB)
1	LTE Main	LTE Band II	QPSK	10	25	13	Right Cheek	18900	1880	20.36	0.937	0.17
2	LTE Main	LTE Band II	QPSK	10	25	13	Right Tilted	18900	1880	20.36	0.937	-0.07
3	LTE Main	LTE Band II	QPSK	10	25	13	Left Cheek	18900	1880	20.36	1.230	0.09
4	LTE Main	LTE Band II	QPSK	10	25	13	Left Tilted	18900	1880	20.36	0.823	0.05
5	LTE Main	LTE Band II	QPSK	10	25	13	Right Cheek	18650	1855	20.36	0.832	-0.01
6	LTE Main	LTE Band II	QPSK	10	25	13	Right Cheek	19150	1905	20.29	0.840	0.03
7	LTE Main	LTE Band II	QPSK	10	25	13	Right Tilted	18650	1855	20.36	0.932	0.01
8	LTE Main	LTE Band II	QPSK	10	25	13	Right Tilted	19150	1905	20.29	0.869	-0.09
9	LTE Main	LTE Band II	QPSK	10	25	13	Left Cheek	18650	1855	20.36	1.140	0.03
10	LTE Main	LTE Band II	QPSK	10	25	13	Left Cheek	19150	1905	20.29	1.150	0.08
241	LTE Main	LTE Band II	QPSK	10	25	13	Left Tilted	18650	1855	20.36	0.737	0.03
242	LTE Main	LTE Band II	QPSK	10	25	13	Left Tilted	19150	1905	20.29	0.667	0.04
11	LTE Main	LTE Band II	QPSK	10	1	0	Right Cheek	18900	1880	21.22	1.000	0.01
12	LTE Main	LTE Band II	QPSK	10	1	0	Right Tilted	18900	1880	21.22	1.030	-0.16
13	LTE Main	LTE Band II	QPSK	10	1	0	Left Cheek	18900	1880	21.22	1.210	0.04
14	LTE Main	LTE Band II	QPSK	10	1	0	Left Tilted	18900	1880	21.22	0.851	-0.15
15	LTE Main	LTE Band II	QPSK	10	1	49	Right Cheek	18900	1880	20.79	1.010	0.07
16	LTE Main	LTE Band II	QPSK	10	1	49	Right Tilted	18900	1880	20.79	1.020	-0.02
17	LTE Main	LTE Band II	QPSK	10	1	49	Left Cheek	18900	1880	20.79	1.240	-0.01
18	LTE Main	LTE Band II	QPSK	10	1	49	Left Tilted	18900	1880	20.79	0.861	0.02
19	LTE Main	LTE Band II	16-QAM	10	25	13	Right Cheek	18900	1880	19.74	0.811	0.03
20	LTE Main	LTE Band II	16-QAM	10	25	13	Right Tilted	18900	1880	19.74	0.770	-0.10
21	LTE Main	LTE Band II	16-QAM	10	25	13	Left Cheek	18900	1880	19.74	1.040	0.02
22	LTE Main	LTE Band II	16-QAM	10	25	13	Left Tilted	18900	1880	19.74	0.694	0.10
23	LTE Main	LTE Band II	16-QAM	10	1	0	Right Cheek	18900	1880	21.36	1.090	0.02
24	LTE Main	LTE Band II	16-QAM	10	1	0	Right Tilted	18900	1880	21.36	1.020	-0.14
25	LTE Main	LTE Band II	16-QAM	10	1	0	Left Cheek	18900	1880	21.36	1.350	0.04
26	LTE Main	LTE Band II	16-QAM	10	1	0	Left Tilted	18900	1880	21.36	0.950	0.01
27	LTE Main	LTE Band II	16-QAM	10	1	49	Right Cheek	18900	1880	20.98	1.090	-0.08
28	LTE Main	LTE Band II	16-QAM	10	1	49	Right Tilted	18900	1880	20.98	1.070	0.03
29	LTE Main	**LTE Band II**	**16-QAM**	**10**	**1**	**49**	**Left Cheek**	**18900**	**1880**	**20.98**	**1.400**	**0.07**
30	LTE Main	LTE Band II	16-QAM	10	1	49	Left Tilted	18900	1880	20.98	0.905	0.04

Note:

1. Considering the users may install 3rd party software to enable VOIP, LTE Head SAR is also evaluated. Because FCC has not published uniform procedures for VOIP in LTE, therefore all channels and modes and modulations required under the other KDB pub 941225 D05 FCC LTE procedures were used for the held-near-head testing.
2. Per KDB 941225 D05, for LTE, if the smaller bandwidth output power is within +/- ½dB of the largest bandwidth, and the maximum SAR of the largest bandwidth is ≤ 1.45 W/kg, SAR for smaller bandwidth can be excluded.
3. Per KDB 941225 D05, if the measured 50%-RB QPSK 1g-SAR for the middle or highest output power channel is ≤ 0.8W/kg, remaining 2 channels SAR tests can be excluded. Otherwise, 50% RB allocation of the remaining 2 channels SAR tests are necessary.
4. Per KDB 941225 D05, for LTE, if 50%-RB QPSK SAR ≤ 1.45 W/kg, 100%-RB QPSK SAR can be excluded; if 50%-RB 16QAM SAR ≤ 1.45 W/kg, 100%-RB 16QAM SAR can be excluded.
5. If SAR of 1 RB allocation is ≤ 1.45W/kg, SAR of 1 RB allocation of remaining channels can be excluded.
6. Per KDB 447498, if the highest output channels SAR for each exposure position is ≤ 0.8 W/kg, other channels SAR tests are not necessary.
7. If the maximum average conducted output power for a 1 RB allocation is > ½ dB higher than the 50% RB allocation, instead of using the highest SAR channel measured for QPSK and 50% RB allocation, measure SAR on the highest output power channel for the 1 RB allocation.
8. If the maximum average conducted output power for a 1 RB allocation is > ½ dB higher than the 50% RB allocation, instead of using the highest SAR channel measured for 16QAM and 50% RB measure SAR on the highest output power channel for the 1 RB allocation.

<WLAN>

Plot No.	Antenna	Band	Mode	Test Position	Ch.	Freq. (MHz)	Output Power (dBm)	SAR_{1g} (W/kg)	Power Drift (dB)
229	WLAN/Bluetooth	WiFi 2.4G	802.11b	Right Cheek	1	2412	15.41	0.034	0.03
230	WLAN/Bluetooth	WiFi 2.4G	802.11b	Right Tilted	1	2412	15.41	0.018	0.07
231	**WLAN/Bluetooth**	**WiFi 2.4G**	**802.11b**	**Left Cheek**	**1**	**2412**	**15.41**	**0.035**	**0.04**
232	WLAN/Bluetooth	WiFi 2.4G	802.11b	Left Tilted	1	2412	15.41	0.013	0.04

Note:

Per KDB 648474, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

12.2 Test Records for Hotspot SAR Test

<CDMA2000>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Output Power (dBm)	SAR_{1g} (W/kg)	Power Drift (dB)
177	CDMA Main	CDMA2000 BC0	RTAP 153.6	Front	1	1013	824.7	23.37	0.862	-0.13
178	CDMA Main	CDMA2000 BC0	RTAP 153.6	Back	1	1013	824.7	23.37	0.841	0.17
179	CDMA Main	CDMA2000 BC0	RTAP 153.6	Left Side	1	1013	824.7	23.37	0.418	-0.03
180	CDMA Main	CDMA2000 BC0	RTAP 153.6	Right Side	1	1013	824.7	23.37	0.551	-0.0087
182	CDMA Main	CDMA2000 BC0	RTAP 153.6	Bottom Side	1	1013	824.7	23.37	0.116	0.07
183	CDMA Main	CDMA2000 BC0	RTAP 153.6	Front	1	384	836.52	23.26	0.819	0.02
184	**CDMA Main**	**CDMA2000 BC0**	**RTAP 153.6**	**Front**	**1**	**777**	**848.31**	**23.28**	**0.896**	**0.01**
185	CDMA Main	CDMA2000 BC0	RTAP 153.6	Back	1	384	836.52	23.26	0.779	-0.02
186	CDMA Main	CDMA2000 BC0	RTAP 153.6	Back	1	777	848.31	23.28	0.885	-0.14
193	CDMA Main	CDMA2000 BC15	RTAP 153.6	Front	1	25	1711.25	23.92	1.150	0.02
194	CDMA Main	CDMA2000 BC15	RTAP 153.6	Back	1	25	1711.25	23.92	1.270	0.11
195	CDMA Main	CDMA2000 BC15	RTAP 153.6	Left Side	1	25	1711.25	23.92	0.558	0.14
196	CDMA Main	CDMA2000 BC15	RTAP 153.6	Right Side	1	25	1711.25	23.92	0.193	-0.05
198	CDMA Main	CDMA2000 BC15	RTAP 153.6	Bottom Side	1	25	1711.25	23.92	1.180	0.07
199	CDMA Main	CDMA2000 BC15	RTAP 153.6	Front	1	425	1731.25	23.88	1.380	-0.05
200	CDMA Main	CDMA2000 BC15	RTAP 153.6	Front	1	875	1753.75	23.86	1.190	0.01
201	**CDMA Main**	**CDMA2000 BC15**	**RTAP 153.6**	**Back**	**1**	**425**	1731.25	**23.88**	**1.420**	**0.13**
202	CDMA Main	CDMA2000 BC15	RTAP 153.6	Back	1	875	1753.75	23.86	1.270	-0.17
203	CDMA Main	CDMA2000 BC15	RTAP 153.6	Bottom Side	1	425	1731.25	23.88	1.320	0.09
204	CDMA Main	CDMA2000 BC15	RTAP 153.6	Bottom Side	1	875	1753.75	23.86	1.390	0.08
211	CDMA Main	CDMA2000 BC1	RTAP 153.6	Front	1	25	1851.25	23.81	1.120	0.06
212	**CDMA Main**	**CDMA2000 BC1**	**RTAP 153.6**	**Back**	**1**	**25**	**1851.25**	**23.81**	**1.360**	**-0.09**
213	CDMA Main	CDMA2000 BC1	RTAP 153.6	Left Side	1	25	1851.25	23.81	0.716	-0.10
214	CDMA Main	CDMA2000 BC1	RTAP 153.6	Right Side	1	25	1851.25	23.81	0.242	0.07
216	CDMA Main	CDMA2000 BC1	RTAP 153.6	Bottom Side	1	25	1851.25	23.81	1.380	-0.01
217	CDMA Main	CDMA2000 BC1	RTAP 153.6	Front	1	600	1880	23.68	0.760	0.17
218	CDMA Main	CDMA2000 BC1	RTAP 153.6	Front	1	1175	1908.75	23.49	0.628	-0.09
219	CDMA Main	CDMA2000 BC1	RTAP 153.6	Back	1	600	1880	23.68	0.792	-0.03
220	CDMA Main	CDMA2000 BC1	RTAP 153.6	Back	1	1175	1908.75	23.49	0.709	-0.03
221	CDMA Main	CDMA2000 BC1	RTAP 153.6	Bottom Side	1	600	1880	23.68	1.080	-0.0056
222	CDMA Main	CDMA2000 BC1	RTAP 153.6	Bottom Side	1	1175	1908.75	23.49	0.978	-0.01

Note:

1. Per KDB 941225 D06, for DUT dimension ≥ 9cm*5cm, the test distance is 1cm. SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.
2. As in (1), SAR for Front / Back / Right Side / Left Side / Bottom Side is necessary.
3. Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

<LTE>

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Output Power (dBm)	SAR_{1g} (W/kg)	Power Drift (dB)
109	LTE Main	LTE Band IV	QPSK	10	25	13	Front	1	20175	1732.5	20.25	0.449	0.15
110	LTE Main	LTE Band IV	QPSK	10	25	13	Back	1	20175	1732.5	20.25	0.655	-0.06
112	LTE Main	LTE Band IV	QPSK	10	25	13	Right Side	1	20175	1732.5	20.25	0.392	-0.06
113	LTE Main	LTE Band IV	QPSK	10	25	13	Top Side	1	20175	1732.5	20.25	0.228	0.02
117	LTE Main	LTE Band IV	QPSK	10	1	0	Front	1	20175	1732.5	20.99	0.482	0.03
118	LTE Main	LTE Band IV	QPSK	10	1	0	Back	1	20175	1732.5	20.99	0.733	0.15
120	LTE Main	LTE Band IV	QPSK	10	1	0	Right Side	1	20175	1732.5	20.99	0.458	-0.02
121	LTE Main	LTE Band IV	QPSK	10	1	0	Top Side	1	20175	1732.5	20.99	0.264	-0.15
125	LTE Main	LTE Band IV	QPSK	10	1	49	Front	1	20175	1732.5	20.52	0.476	-0.01
126	LTE Main	LTE Band IV	QPSK	10	1	49	Back	1	20175	1732.5	20.52	0.723	0.0039
128	LTE Main	LTE Band IV	QPSK	10	1	49	Right Side	1	20175	1732.5	20.52	0.475	0.06
129	LTE Main	LTE Band IV	QPSK	10	1	49	Top Side	1	20175	1732.5	20.52	0.276	-0.07
133	LTE Main	LTE Band IV	16-QAM	10	25	13	Front	1	20175	1732.5	19.14	0.347	-0.04
134	LTE Main	LTE Band IV	16-QAM	10	25	13	Back	1	20175	1732.5	19.14	0.548	0.07
136	LTE Main	LTE Band IV	16-QAM	10	25	13	Right Side	1	20175	1732.5	19.14	0.353	0.14
137	LTE Main	LTE Band IV	16-QAM	10	25	13	Top Side	1	20175	1732.5	19.14	0.191	-0.04
141	LTE Main	LTE Band IV	16-QAM	10	1	0	Front	1	20175	1732.5	21.46	0.555	0.02
142	LTE Main	LTE Band IV	16-QAM	10	1	0	Back	1	20175	1732.5	21.46	0.788	-0.09
144	LTE Main	LTE Band IV	16-QAM	10	1	0	Right Side	1	20175	1732.5	21.46	0.521	0.09
145	LTE Main	LTE Band IV	16-QAM	10	1	0	Top Side	1	20175	1732.5	21.46	0.270	-0.11
151	LTE Main	LTE Band IV	16-QAM	10	1	49	Front	1	20175	1732.5	21.03	0.545	-0.04
152	**LTE Main**	**LTE Band IV**	**16-QAM**	**10**	**1**	**49**	**Back**	**1**	**20175**	**1732.5**	**21.03**	**0.791**	**0.11**
154	LTE Main	LTE Band IV	16-QAM	10	1	49	Right Side	1	20175	1732.5	21.03	0.523	0.01
155	LTE Main	LTE Band IV	16-QAM	10	1	49	Top Side	1	20175	1732.5	21.03	0.287	-0.0051
61	LTE Main	LTE Band II	QPSK	10	25	13	Front	1	18900	1880	20.36	0.411	-0.03
62	LTE Main	LTE Band II	QPSK	10	25	13	Back	1	18900	1880	20.36	0.579	0.10
64	LTE Main	LTE Band II	QPSK	10	25	13	Right Side	1	18900	1880	20.36	0.550	0.04
65	LTE Main	LTE Band II	QPSK	10	25	13	Top Side	1	18900	1880	20.36	0.329	0.07
69	LTE Main	LTE Band II	QPSK	10	1	0	Front	1	18900	1880	21.22	0.464	0.11
70	LTE Main	LTE Band II	QPSK	10	1	0	Back	1	18900	1880	21.22	0.600	0.0031
72	LTE Main	LTE Band II	QPSK	10	1	0	Right Side	1	18900	1880	21.22	0.474	0.02
73	LTE Main	LTE Band II	QPSK	10	1	0	Top Side	1	18900	1880	21.22	0.296	0.12
77	LTE Main	LTE Band II	QPSK	10	1	49	Front	1	18900	1880	20.79	0.468	0.06
78	LTE Main	LTE Band II	QPSK	10	1	49	Back	1	18900	1880	20.79	0.588	-0.15
80	LTE Main	LTE Band II	QPSK	10	1	49	Right Side	1	18900	1880	20.79	0.511	-0.03
81	LTE Main	LTE Band II	QPSK	10	1	49	Top Side	1	18900	1880	20.79	0.305	0.09
85	LTE Main	LTE Band II	16-QAM	10	25	13	Front	1	18900	1880	19.74	0.366	0.04
86	LTE Main	LTE Band II	16-QAM	10	25	13	Back	1	18900	1880	19.74	0.431	0.04
88	LTE Main	LTE Band II	16-QAM	10	25	13	Right Side	1	18900	1880	19.74	0.397	-0.09
89	LTE Main	LTE Band II	16-QAM	10	25	13	Top Side	1	18900	1880	19.74	0.240	0.09
93	LTE Main	LTE Band II	16-QAM	10	1	0	Front	1	18900	1880	21.70	0.492	0.10
94	LTE Main	LTE Band II	16-QAM	10	1	0	Back	1	18900	1880	21.70	0.627	0.02
96	LTE Main	LTE Band II	16-QAM	10	1	0	Right Side	1	18900	1880	21.70	0.511	-0.13
97	LTE Main	LTE Band II	16-QAM	10	1	0	Top Side	1	18900	1880	21.70	0.321	0.01
101	LTE Main	LTE Band II	16-QAM	10	1	49	Front	1	18900	1880	20.88	0.491	0.12
102	**LTE Main**	**LTE Band II**	**16-QAM**	**10**	**1**	**49**	**Back**	**1**	**18900**	**1880**	**20.88**	**0.641**	**-0.01**
104	LTE Main	LTE Band II	16-QAM	10	1	49	Right Side	1	18900	1880	20.88	0.551	-0.12
105	LTE Main	LTE Band II	16-QAM	10	1	49	Top Side	1	18900	1880	20.88	0.328	-0.02

Note:
1. Per KDB 941225 D06, for DUT dimension ≥ 9cm*5cm, the test distance is 1cm. SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.
2. As in (1), SAR for Front/Back/Top Side/ Right Side is necessary for LTE Band 2; SAR for Front/Back/Top Side/ Right Side is necessary for LTE Band 4.
3. Per KDB 941225 D05, for LTE, if the smaller bandwidth output power is within +/- ½ dB of the largest bandwidth, and the maximum SAR of the largest bandwidth is < 1.45 W/kg, SAR for smaller bandwidth can be excluded. Therefore LTE 5MHz bandwidth SAR tests are excluded.
4. Per KDB 941225 D05, if the measured 50%-RB 1g-SAR for the middle or highest output power channel is ≤ 0.8W/kg, remaining 2 channels SAR tests can be excluded. Otherwise, 50% RB allocation of the remaining 2 channels SAR tests are necessary.
5. Per KDB 941225 D05, for LTE, if 50%-RB QPSK/16QAM SAR < 1.45 W/kg, 100%-RB SAR can be excluded.
6. If SAR of 1 RB allocation is ≤ 1.45W/kg, SAR of 1 RB allocation of remaining channels can be excluded.
7. Per KDB 447498, if the highest output channel SAR for each exposure position is ≤ 0.8 W/kg, other channels SAR tests are not necessary

<WLAN>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Output Power (dBm)	SAR_{1g} (W/kg)	Power Drift (dB)
233	WLAN/Bluetooth	WiFi 2.4G	802.11b	Front	1	1	2412	15.41	0.035	0.05
234	**WLAN/Bluetooth**	**WiFi 2.4G**	**802.11b**	**Back**	**1**	**1**	**2412**	**15.41**	**0.107**	**-0.03**
235	WLAN/Bluetooth	WiFi 2.4G	802.11b	Right Side	1	1	2412	15.41	0.011	0.04
236	WLAN/Bluetooth	WiFi 2.4G	802.11b	Bottom Side	1	1	2412	15.41	0.064	0.19

Note:

1. Per KDB 941225 D06, for DUT dimension ≥ 9cm*5cm, the test distance is 1cm. SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.
2. As in (1), SAR for Front/Back/ Right Side /Bottom Side is necessary.
3. Per KDB 648474, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

12.3 Test Records for Body-worn SAR Test

<CDMA2000>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Ear-phone	Output Power (dBm)	SAR_{1g} (W/kg)	Power Drift (dB)
177	CDMA Main	CDMA2000 BC0	RTAP 153.6	Front	1	1013	824.7	-	23.37	0.862	-0.13
178	CDMA Main	CDMA2000 BC0	RTAP 153.6	Back	1	1013	824.7	-	23.37	0.841	0.17
183	CDMA Main	CDMA2000 BC0	RTAP 153.6	Front	1	384	836.52	-	23.26	0.819	0.02
184	**CDMA Main**	**CDMA2000 BC0**	**RTAP 153.6**	**Front**	**1**	**777**	**848.31**	**-**	**23.28**	**0.896**	**0.01**
185	CDMA Main	CDMA2000 BC0	RTAP 153.6	Back	1	384	836.52	-	23.26	0.779	-0.02
186	CDMA Main	CDMA2000 BC0	RTAP 153.6	Back	1	777	848.31	-	23.28	0.885	-0.14
187	CDMA Main	CDMA2000 BC0	RC3 SO32	Front	1	777	848.31	V	23.28	0.803	0.08
188	CDMA Main	CDMA2000 BC0	RC3 SO32	Back	1	777	848.31	V	23.28	0.805	0.10
189	CDMA Main	CDMA2000 BC0	RC3 SO32	Front	1	1013	824.7	V	23.37	0.748	0.03
190	CDMA Main	CDMA2000 BC0	RC3 SO32	Front	1	384	836.52	V	23.29	0.752	-0.02
191	CDMA Main	CDMA2000 BC0	RC3 SO32	Back	1	1013	824.7	V	23.37	0.759	0.06
192	CDMA Main	CDMA2000 BC0	RC3 SO32	Back	1	384	836.52	V	23.29	0.710	-0.01
193	CDMA Main	CDMA2000 BC15	RTAP 153.6	Front	1	25	1711.25	-	23.92	1.150	0.02
194	CDMA Main	CDMA2000 BC15	RTAP 153.6	Back	1	25	1711.25	-	23.92	1.270	0.11
199	CDMA Main	CDMA2000 BC15	RTAP 153.6	Front	1	425	1731.25	-	23.88	1.38	-0.05
200	CDMA Main	CDMA2000 BC15	RTAP 153.6	Front	1	875	1753.75	-	23.86	1.19	0.01
201	**CDMA Main**	**CDMA2000 BC15**	**RTAP 153.6**	**Back**	**1**	**425**	**1731.25**	**-**	**23.88**	**1.42**	**0.13**
202	CDMA Main	CDMA2000 BC15	RTAP 153.6	Back	1	875	1753.75	-	23.86	1.27	-0.17
205	CDMA Main	CDMA2000 BC15	RC3 SO32	Front	1	425	1731.25	V	23.91	1.180	0.12
206	CDMA Main	CDMA2000 BC15	RC3 SO32	Back	1	425	1731.25	V	23.91	1.380	-0.15
207	CDMA Main	CDMA2000 BC15	RC3 SO32	Front	1	25	1711.25	V	23.99	1.170	0.10
208	CDMA Main	CDMA2000 BC15	RC3 SO32	Front	1	875	1753.75	V	23.87	1.190	-0.0025
209	CDMA Main	CDMA2000 BC15	RC3 SO32	Back	1	25	1711.25	V	23.99	1.340	-0.05
210	CDMA Main	CDMA2000 BC15	RC3 SO32	Back	1	875	1753.75	V	23.87	1.350	0.12
211	CDMA Main	CDMA2000 BC1	RTAP 153.6	Front	1	25	1851.25	-	23.81	1.120	0.06
212	CDMA Main	CDMA2000 BC1	RTAP 153.6	Back	1	25	1851.25	-	23.81	1.360	-0.09
217	CDMA Main	CDMA2000 BC1	RTAP 153.6	Front	1	600	1880	-	23.68	0.760	0.17
218	CDMA Main	CDMA2000 BC1	RTAP 153.6	Front	1	1175	1908.75	-	23.49	0.628	-0.09
219	CDMA Main	CDMA2000 BC1	RTAP 153.6	Back	1	600	1880	-	23.68	0.792	-0.03
220	CDMA Main	CDMA2000 BC1	RTAP 153.6	Back	1	1175	1908.75	-	23.49	0.709	-0.03
223	CDMA Main	CDMA2000 BC1	RC3 SO32	Front	1	25	1851.25	V	23.80	1.200	-0.0063
224	**CDMA Main**	**CDMA2000 BC1**	**RC3 SO32**	**Back**	**1**	**25**	**1851.25**	**V**	**23.80**	**1.410**	**-0.03**
225	CDMA Main	CDMA2000 BC1	RC3 SO32	Front	1	600	1880	V	23.66	0.948	0.0054
226	CDMA Main	CDMA2000 BC1	RC3 SO32	Front	1	1175	1908.75	V	23.46	0.824	0.14
227	CDMA Main	CDMA2000 BC1	RC3 SO32	Back	1	600	1880	V	23.66	0.965	0.14
228	CDMA Main	CDMA2000 BC1	RC3 SO32	Back	1	1175	1908.75	V	23.46	0.780	0.02

Note:

1. "V" in the earphone column means the earphone is plugged during SAR testing.
2. Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg, other channels SAR tests are not necessary.

<LTE >

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Ear-phone	Output Power (dBm)	SAR$_{1g}$ (W/kg)	Power Drift (dB)
109	LTE Main	LTE Band IV	QPSK	10	25	13	Front	1	20175	1732.5	-	20.25	0.449	0.15
110	LTE Main	LTE Band IV	QPSK	10	25	13	Back	1	20175	1732.5	-	20.25	0.655	-0.06
115	LTE Main	LTE Band IV	QPSK	10	25	13	Front	1	20175	1732.5	V	20.25	0.473	0.02
116	LTE Main	LTE Band IV	QPSK	10	25	13	Back	1	20175	1732.5	V	20.25	0.671	-0.05
117	LTE Main	LTE Band IV	QPSK	10	1	0	Front	1	20175	1732.5	-	20.99	0.482	0.03
118	LTE Main	LTE Band IV	QPSK	10	1	0	Back	1	20175	1732.5	-	20.99	0.733	0.15
123	LTE Main	LTE Band IV	QPSK	10	1	0	Front	1	20175	1732.5	V	20.99	0.516	-0.02
124	LTE Main	LTE Band IV	QPSK	10	1	0	Back	1	20175	1732.5	V	20.99	0.776	-0.008
125	LTE Main	LTE Band IV	QPSK	10	1	49	Front	1	20175	1732.5	-	20.52	0.476	-0.01
126	LTE Main	LTE Band IV	QPSK	10	1	49	Back	1	20175	1732.5	-	20.52	0.723	0.0039
131	LTE Main	LTE Band IV	QPSK	10	1	49	Front	1	20175	1732.5	V	20.52	0.502	-0.10
132	LTE Main	LTE Band IV	QPSK	10	1	49	Back	1	20175	1732.5	V	20.52	0.770	-0.04
133	LTE Main	LTE Band IV	16-QAM	10	25	13	Front	1	20175	1732.5	-	19.14	0.347	-0.04
134	LTE Main	LTE Band IV	16-QAM	10	25	13	Back	1	20175	1732.5	-	19.14	0.548	0.07
139	LTE Main	LTE Band IV	16-QAM	10	25	13	Front	1	20175	1732.5	V	19.14	0.375	-0.09
140	LTE Main	LTE Band IV	16-QAM	10	25	13	Back	1	20175	1732.5	V	19.14	0.564	-0.05
141	LTE Main	LTE Band IV	16-QAM	10	1	0	Front	1	20175	1732.5	-	21.46	0.555	0.02
142	LTE Main	LTE Band IV	16-QAM	10	1	0	Back	1	20175	1732.5	-	21.46	0.788	-0.09
147	LTE Main	LTE Band IV	16-QAM	10	1	0	Front	1	20175	1732.5	V	21.46	0.602	0.17
148	LTE Main	LTE Band IV	16-QAM	10	1	0	Back	1	20175	1732.5	V	21.46	0.859	0.06
151	LTE Main	LTE Band IV	16-QAM	10	1	49	Front	1	20175	1732.5	-	21.03	0.545	-0.04
152	LTE Main	LTE Band IV	16-QAM	10	1	49	Back	1	20175	1732.5	-	21.03	0.791	0.11
157	LTE Main	LTE Band IV	16-QAM	10	1	49	Front	1	20175	1732.5	V	21.03	0.590	0.07
158	**LTE Main**	**LTE Band IV**	**16-QAM**	**10**	**1**	**49**	**Back**	**1**	**20175**	**1732.5**	**V**	**21.03**	**0.867**	**-0.13**
61	LTE Main	LTE Band II	QPSK	10	25	13	Front	1	18900	1880	-	20.36	0.411	-0.03
62	LTE Main	LTE Band II	QPSK	10	25	13	Back	1	18900	1880	-	20.36	0.579	0.10
67	LTE Main	LTE Band II	QPSK	10	25	13	Front	1	18900	1880	V	20.36	0.422	0.05
68	LTE Main	LTE Band II	QPSK	10	25	13	Back	1	18900	1880	V	20.36	0.578	0.07
69	LTE Main	LTE Band II	QPSK	10	1	0	Front	1	18900	1880	-	21.22	0.464	0.11
70	LTE Main	LTE Band II	QPSK	10	1	0	Back	1	18900	1880	-	21.22	0.600	0.0031
75	LTE Main	LTE Band II	QPSK	10	1	0	Front	1	18900	1880	V	21.22	0.479	-0.09
76	LTE Main	LTE Band II	QPSK	10	1	0	Back	1	18900	1880	V	21.22	0.638	0.07
77	LTE Main	LTE Band II	QPSK	10	1	49	Front	1	18900	1880	-	20.79	0.468	0.06
78	LTE Main	LTE Band II	QPSK	10	1	49	Back	1	18900	1880	-	20.79	0.588	-0.15
83	LTE Main	LTE Band II	QPSK	10	1	49	Front	1	18900	1880	V	20.79	0.468	-0.05
84	LTE Main	LTE Band II	QPSK	10	1	49	Back	1	18900	1880	V	20.79	0.589	-0.05
85	LTE Main	LTE Band II	16-QAM	10	25	13	Front	1	18900	1880	-	19.74	0.366	0.04
86	LTE Main	LTE Band II	16-QAM	10	25	13	Back	1	18900	1880	-	19.74	0.431	0.04
91	LTE Main	LTE Band II	16-QAM	10	25	13	Front	1	18900	1880	V	19.74	0.389	0.02
92	LTE Main	LTE Band II	16-QAM	10	25	13	Back	1	18900	1880	V	19.74	0.459	-0.09
93	LTE Main	LTE Band II	16-QAM	10	1	0	Front	1	18900	1880	-	21.36	0.492	0.10
94	LTE Main	LTE Band II	16-QAM	10	1	0	Back	1	18900	1880	-	21.36	0.627	0.02
99	LTE Main	LTE Band II	16-QAM	10	1	0	Front	1	18900	1880	V	21.36	0.515	-0.07
100	LTE Main	LTE Band II	16-QAM	10	1	0	Back	1	18900	1880	V	21.36	0.625	-0.10
101	LTE Main	LTE Band II	16-QAM	10	1	49	Front	1	18900	1880	-	20.98	0.491	0.12
102	LTE Main	LTE Band II	16-QAM	10	1	49	Back	1	18900	1880	-	20.98	0.641	-0.01
107	LTE Main	LTE Band II	16-QAM	10	1	49	Front	1	18900	1880	V	20.98	0.517	-0.005
108	**LTE Main**	**LTE Band II**	**16-QAM**	**10**	**1**	**49**	**Back**	**1**	**18900**	**1880**	**V**	**20.98**	**0.667**	**-0.10**

Note:

1. “V” in the earphone column means the earphone is plugged during SAR testing.
2. Per KDB 941225 D05, for LTE, if the smaller bandwidth output power is within +/- ½ dB of the largest bandwidth, and the maximum SAR of the largest bandwidth is ≤ 1.45 W/kg, SAR for smaller bandwidth can be excluded.
3. Per KDB 941225 D05, if the measured 50%-RB 1g-SAR for the middle or highest output power channel is ≤ 0.8W/kg, remaining 2 channels SAR tests can be excluded. Otherwise, 50% RB allocation of the remaining 2 channels SAR tests are necessary.
4. Per KDB 941225 D05, for LTE, if 50%-RB QPSK SAR ≤ 1.45 W/kg, 100%-RB QPSK SAR can be excluded; if 50%-RB 16QAM SAR ≤ 1.45 W/kg, 100%-RB 16QAM SAR can be excluded.

5. If SAR of 1 RB allocation is ≤ 1.45W/kg, SAR of 1 RB allocation of remaining channels can be excluded.
6. Per KDB 447498, if the highest output channels SAR for each exposure position is ≤ 0.8 W/kg, other channels SAR tests are not necessary.

<WLAN>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Ear-phone	Output Power (dBm)	SAR_{1g} (W/kg)	Power Drift (dB)
233	WLAN/Bluetooth	WiFi 2.4G	802.11b	Front	1	1	2412	-	15.41	0.035	0.05
234	**WLAN/Bluetooth**	**WiFi 2.4G**	**802.11b**	**Back**	**1**	**1**	**2412**	**-**	**15.41**	**0.107**	**-0.03**
237	WLAN/Bluetooth	WiFi 2.4G	802.11b	Front	1	1	2412	V	15.41	0.036	-0.04
238	WLAN/Bluetooth	WiFi 2.4G	802.11b	Back	1	1	2412	V	15.41	0.106	0.08

Note:
1. “V” in the earphone column means the earphone is plugged during SAR testing.
2. Per KDB 648474, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

12.4 Simultaneous Multi-band Transmission

<Applicable simultaneously transmission configuration>

Position	Combination	Availability
Head/Body-worn/Hotspot	LTE (data) + WLAN	Yes
	CDMA (voice) + WLAN	Yes
	CDMA (data) + WLAN	Yes
	LTE (data) + BT	Yes
	CDMA (voice) + BT	Yes
	CDMA (data) + BT	Yes
	CDMA (voice) + LTE (data)	No
	CDMA (data) + LTE (data)	No
	CDMA (voice) + CDMA (data)	No
	WLAN + BT	No

Note:

1. The device switches between WiFi and BT therefore WiFi and BT cannot transmit at the same time.
2. CDMA and LTE cannot transmit simultaneously.
3. CDMA 1xRTT and CDMA 1xEVDO cannot transmit simultaneously.

<WWAN + WLAN simultaneously transmission - Head SAR >

Position	WWAN Band	Max. WWAN SAR (W/kg)	Output Power (dBm)	Max. Tolerance Power (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Max. WLAN SAR (W/kg)	Max. SAR Summation	Scaled WWAN + WLAN	Result
Right Cheek	CDMA BC0	0.622	23.40	23.5	1.02	0.636	0.034	**0.66**	0.67	PASS
	CDMA BC15	0.701	23.97	24	1.01	0.706		**0.74**	0.74	PASS
	CDMA BC1	0.608	23.85	24	1.04	0.629		**0.64**	0.66	PASS
	LTE Band IV	1.01	20.99	21.8	1.21	1.217		**1.04**	1.25	PASS
	LTE Band II	1.09	21.36	21.4	1.01	1.100		**1.12**	1.13	PASS
Right Tilted	CDMA BC0	0.382	23.4	23.5	1.02	0.391	0.018	**0.40**	0.41	PASS
	CDMA BC15	0.379	23.97	24	1.01	0.382		**0.40**	0.40	PASS
	CDMA BC1	0.349	23.85	24	1.04	0.361		**0.37**	0.38	PASS
	LTE Band IV	0.949	20.99	21.8	1.21	1.144		**0.97**	1.16	PASS
	LTE Band II	1.07	20.98	21.4	1.10	1.179		**1.09**	1.20	PASS
Left Cheek	CDMA BC0	0.646	23.40	23.5	1.02	0.661	0.035	**0.68**	0.70	PASS
	CDMA BC15	1.17	23.89	24	1.03	1.200		**1.21**	1.24	PASS
	CDMA BC1	1.29	23.85	24	1.04	1.335		**1.33**	1.37	PASS
	LTE Band IV	1.21	20.99	21.8	1.21	1.458		**1.25**	1.49	PASS
	LTE Band II	1.4	20.98	21.4	1.10	1.542		**1.44**	1.58	PASS
Left Tilted	CDMA BC0	0.411	23.40	23.5	1.02	0.421	0.013	**0.42**	0.43	PASS
	CDMA BC15	0.359	23.97	24	1.01	0.361		**0.37**	0.37	PASS
	CDMA BC1	0.419	23.85	24	1.04	0.434		**0.43**	0.45	PASS
	LTE Band IV	0.95	20.99	21.8	1.21	1.145		**0.96**	1.16	PASS
	LTE Band II	0.95	21.36	21.4	1.01	0.959		**0.96**	0.97	PASS

Note:

1. The maximum SAR summation is calculated based on the same configuration and test position.
2. The WWAN scaling factor is calculated according to the difference between measured output power and maximum tolerance output power on this device.
3. For 1g-SAR summation < 1.6W/kg, simultaneous SAR measurement is not necessary.

< WWAN + WLAN simultaneously transmission - Hotspot SAR >

Position	WWAN Band	Max. WWAN SAR (W/kg)	Output Power (dBm)	Max. Tolerance Power (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Max. WLAN SAR (W/kg)	Max. SAR Summation	Scaled WWAN + WLAN	Result
Front	CDMA BC0	0.896	23.28	23.5	1.05	0.943	0.035	**0.93**	0.98	PASS
	CDMA BC15	1.38	23.88	24	1.03	1.419		**1.42**	1.45	PASS
	CDMA BC1	1.12	23.81	24	1.04	1.170		**1.16**	1.21	PASS
	LTE Band IV	0.555	21.46	21.8	1.08	0.600		**0.59**	0.64	PASS
	LTE Band II	0.492	21.70	21.4	0.93	0.459		**0.53**	0.49	PASS
Back	CDMA BC0	0.885	23.28	23.5	1.05	0.931	0.107	**0.99**	1.04	PASS
	CDMA BC15	1.42	23.88	24	1.03	1.460		**1.53**	1.57	PASS
	CDMA BC1	1.36	23.81	24	1.04	1.421		**1.47**	1.53	PASS
	LTE Band IV	0.791	21.03	21.8	1.19	0.944		**0.90**	1.05	PASS
	LTE Band II	0.641	20.88	21.4	1.13	0.723		**0.75**	0.83	PASS
Left Side	CDMA BC0	0.418	23.37	23.5	1.03	0.431	-	**0.42**	0.43	PASS
	CDMA BC15	0.558	23.92	24	1.02	0.568		**0.56**	0.57	PASS
	CDMA BC1	0.716	23.81	24	1.04	0.748		**0.72**	0.75	PASS
	LTE Band IV	-	-	-	-	-		**0.00**	0.00	PASS
	LTE Band II	-	-	-	-	-		**0.00**	0.00	PASS
Right Side	CDMA BC0	0.551	23.37	23.5	1.03	0.568	0.011	**0.56**	0.58	PASS
	CDMA BC15	0.193	23.92	24	1.02	0.197		**0.20**	0.21	PASS
	CDMA BC1	0.242	23.81	24	1.04	0.253		**0.25**	0.26	PASS
	LTE Band IV	0.523	21.03	21.8	1.19	0.624		**0.53**	0.64	PASS
	LTE Band II	0.551	20.88	21.4	1.13	0.621		**0.56**	0.63	PASS
Top Side	CDMA BC0	-	-	-	-	-	-	**0.00**	0.00	PASS
	CDMA BC15	-	-	-	-	-		**0.00**	0.00	PASS
	CDMA BC1	-	-	-	-	-		**0.00**	0.00	PASS
	LTE Band IV	0.287	21.03	21.8	1.19	0.343		**0.29**	0.34	PASS
	LTE Band II	0.329	20.36	21.4	1.27	0.418		**0.33**	0.42	PASS
Bottom Side	CDMA BC0	0.116	23.37	23.5	1.03	0.120	0.064	**0.18**	0.18	PASS
	CDMA BC15	1.39	23.86	24	1.03	1.436		**1.45**	1.50	PASS
	CDMA BC1	1.38	23.81	24	1.04	1.442		**1.44**	1.51	PASS
	LTE Band IV	-	-	-	-	-		**0.00**	0.00	PASS
	LTE Band II	-	-	-	-	-		**0.00**	0.00	PASS

Note:

1. The maximum SAR summation is calculated based on the same configuration and test position.
2. The WWAN scaling factor is calculated according to the difference between measured output power and maximum tolerance output power on this device.
3. For 1g-SAR summation < 1.6W/kg, simultaneous SAR measurement is not necessary.

< WWAN + WLAN simultaneously transmission - Body-Worm SAR >

Position	WWAN Band	Max. WWAN SAR (W/kg)	Output Power (dBm)	Max. Tolerance Power (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Max. WLAN SAR (W/kg)	Max. SAR Summation	Scaled WWAN + WLAN	Result
Front	CDMA BC0	0.896	23.28	23.5	1.05	0.943	0.035	**0.93**	0.98	PASS
	CDMA BC15	1.38	23.88	24	1.03	1.419		**1.42**	1.45	PASS
	CDMA BC1	1.12	23.81	24	1.04	1.170		**1.16**	1.21	PASS
	LTE Band IV	0.555	21.46	21.8	1.08	0.600		**0.59**	0.64	PASS
	LTE Band II	0.492	21.36	21.4	1.01	0.497		**0.53**	0.53	PASS
Back	CDMA BC0	0.885	23.28	23.5	1.05	0.931	0.107	**0.99**	1.04	PASS
	CDMA BC15	1.42	23.88	24	1.03	1.460		**1.53**	1.57	PASS
	CDMA BC1	1.36	23.81	24	1.04	1.421		**1.47**	1.53	PASS
	LTE Band IV	0.791	21.03	21.8	1.19	0.944		**0.90**	1.05	PASS
	LTE Band II	0.641	20.98	21.4	1.10	0.706		**0.75**	0.81	PASS
Front (w/ earphone)	CDMA BC0	0.803	23.28	23.5	1.05	0.845	0.036	**0.84**	0.88	PASS
	CDMA BC15	1.190	23.87	24	1.03	1.226		**1.23**	1.26	PASS
	CDMA BC1	1.200	23.80	24	1.05	1.257		**1.24**	1.29	PASS
	LTE Band IV	0.602	21.46	21.8	1.08	0.651		**0.64**	0.69	PASS
	LTE Band II	0.517	20.98	21.4	1.10	0.569		**0.55**	0.61	PASS
Back (w/ earphone)	CDMA BC0	0.805	23.28	23.5	1.05	0.847	0.106	**0.91**	0.95	PASS
	CDMA BC15	1.380	23.91	24	1.02	1.409		**1.49**	1.52	PASS
	CDMA BC1	1.410	23.80	24	1.05	1.476		**1.52**	1.58	PASS
	LTE Band IV	0.867	21.03	21.8	1.19	1.035		**0.97**	1.14	PASS
	LTE Band II	0.667	20.98	21.4	1.10	0.735		**0.77**	0.84	PASS

Note:

1. The maximum SAR summation is calculated based on the same configuration and test position.
2. The WWAN scaling factor is calculated according to the difference between measured output power and maximum tolerance output power on this device.
3. For 1g-SAR summation < 1.6W/kg, simultaneous SAR measurement is not necessary.

Test Engineer： Jeme Li and Jimmy Cheng

13. References

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[2] ANSI/IEEE Std. C95.1-1992, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", September 1992

[3] IEEE Std. 1528-2003, "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003

[4] FCC OET Bulletin 65 (Edition 97-01) Supplement C (Edition 01-01), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", June 2001

[5] SPEAG DASY System Handbook

[6] FCC KDB 248227 D01 v01r02, "SAR Measurement Procedures for 802.11 a/b/g Transmitters", May 2007

[7] FCC KDB 447498 D01 v04, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", November 2009

[8] FCC KDB 648474 D01 v01r05, "SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas", September 2008

[9] FCC KDB 941225 D01 v02, "SAR Measurement Procedures for 3G Devices – CDMA 2000 / Ev-Do / WCDMA / HSDPA / HSPA", October 2007

[10] FCC KDB 941225 D02 v02 "3GPP R6 HSPA and R7 HSPA+ SAR Guidance", December 2009.

[11] FCC KDB 941225 D03 v01, "Recommended SAR Test Reduction Procedures for GSM / GPRS / EDGE", December 2008

[12] FCC KDB 941225 D04 v01, "Evaluating SAR for GSM/(E)GPRS Dual Transfer Mode", January 27 2010

[13] FCC KDB 941225 D05 v01, "SAR Test Considerations for LTE Handsets and Data Modems", December 2010

[14] FCC KDB 941225 D06 v01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", April 2011

[15] FCC KDB 388624 D02, "Permit But Ask List", December 2011.