FCC SAR Test Report

APPLICANT	:	**HTC Corporation**
EQUIPMENT	:	**Smartphone**
MODEL NAME	:	**PL80110**
FCC ID	:	**NM8PL80110**
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 completely tested on Dec. 27, 2012. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
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Table of Contents

1. Statement of Compliance 5
2. Administration Data 7
2.1 Testing Laboratory 7
2.2 Applicant 7
2.3 Manufacturer 7
2.4 Application Details 7
3. General Information 8
3.1 Description of Equipment Under Test (EUT) 8
3.2 Maximum RF output power among production units 9
3.3 Product Photos 12
3.4 Applied Standard 12
3.5 Device Category and SAR Limits 12
3.6 Test Conditions 12
4. Specific Absorption Rate (SAR) 13
4.1 Introduction 13
4.2 SAR Definition 13
5. SAR Measurement System 14
5.1 E-Field Probe 15
5.2 Data Acquisition Electronics (DAE) 16
5.3 Robot 16
5.4 Measurement Server 16
5.5 Phantom 17
5.6 Device Holder 18
5.7 Data Storage and Evaluation 19
5.8 Test Equipment List 21
6. Tissue Simulating Liquids 22
7. SAR System Evaluation 24
7.1 Purpose of System Performance check 24
7.2 System Setup 24
7.3 SAR System Verification Results 26
8. EUT Testing Position 27
8.1 Define two imaginary lines on the handset 27
8.2 Cheek Position 28
8.3 Tilted Position 28
8.4 Body Worn Position 29
9. Measurement Procedures 30
9.1 Spatial Peak SAR Evaluation 30
9.2 Area & Zoom Scan Procedures 31
9.3 Volume Scan Procedures 32
9.4 SAR Averaged Methods 32
9.5 Power Drift Monitoring 32
10. SAR Test Configurations 33
10.1 Exposure Positions Consideration 33
10.2 Conducted RF Output Power (Unit: dBm) 35
11. SAR Test Results 41
11.1 Test Records for Head SAR Test 41
11.2 Test Records for Hotspot SAR Test 44
11.3 Test Records for Body-worn SAR Test 47
11.4 Repeated SAR Measurement 50
11.5 Highest SAR Plot 51
11.6 Simultaneous Multi-band Transmission Analysis 69
11.7 Simultaneous analysis - SPLSR calculation 74
12. Uncertainty Assessment 90
13. References 93

Appendix A. Plots of System Performance Check
Appendix B. Plots of SAR Measurement
Appendix C. DASY Calibration Certificate
Appendix D. Product Photos
Appendix E. Test Setup Photos
Appendix F. System Validation

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA2O2633	Rev. 01	Initial issue of report	Dec. 18, 2012
FA2O2633	Rev. 02	Update Section 3.2 Tune up procedure	Dec. 28, 2012

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **HTC Corporation Smartphone, PL80110** are as follows.

Exposure Position	Frequency Band	Highest Reported 1g-SAR (W/kg)	Equipment Class	Highest Reported 1g-SAR (W/kg)
Head	CDMA2000 BC0	**0.37**	PCE	**1.07**
	CDMA2000 BC10	**0.33**		
	CDMA2000 BC1	**0.65**		
	LTE Band 25	**1.07**		
	WLAN, 2412 - 2462 MHz	**0.37**	DTS	**0.37**
	WLAN, 5745 - 5825 MHz	**0.08**		
	WLAN, 5180 - 5240 MHz	**0.03**	NII	**0.09**
	WLAN, 5260 - 5320 MHz	**0.05**		
	WLAN, 5500 - 5700 MHz	**0.09**		
Hotspot (1cm Gap)	CDMA2000 BC0	**0.95**	PCE	**0.95**
	CDMA2000 BC10	**0.83**		
	CDMA2000 BC1	**0.87**		
	LTE Band 25	**0.82**		
	WLAN, 2412 - 2462 MHz	**0.17**	DTS	**0.17**
	WLAN, 5745 - 5825 MHz	**0.02**		
Body-worn (1cm Gap)	CDMA2000 BC0	**0.93**	PCE	**0.98**
	CDMA2000 BC10	**0.88**		
	CDMA2000 BC1	**0.98**		
	LTE Band 25	**0.82**		
	WLAN, 2412 - 2462 MHz	**0.17**	DTS	**0.17**
	WLAN, 5745 - 5825 MHz	**0.03**		
	WLAN, 5180 - 5240 MHz	**0.02**	NII	**0.04**
	WLAN, 5260 - 5320 MHz	**0.03**		
	WLAN, 5500 - 5700 MHz	**0.04**		

Exposure Position	Frequency Band	Equipment Class	Highest Reported Simultaneous Transmission 1g-SAR (W/kg)
Body (1 cm Gap)	CDMA BC 1	PCE	**1.59**
	LTE Band 25	PCE	
	Bluetooth	DSS	
Exposure Position	**Frequency Band**	**Equipment Class**	**Highest Reported Simultaneous Transmission 1g-SAR (W/kg)**
Body (1 cm Gap)	CDMA BC 10	PCE	**1.49**
	LTE Band 25	PCE	
	WLAN, 2412 - 2462 MHz	DTS	
Exposure Position	**Frequency Band**	**Equipment Class**	**Highest Reported Simultaneous Transmission 1g-SAR (W/kg)**
Body (1 cm Gap)	CDMA BC 1	PCE	**1.51**
	LTE Band 25	PCE	
	WLAN, 5500 - 5700 MHz	NII	

Remark:
The highest simultaneous transmission reported SAR is scalar SAR summation per FCC KDB 690873 D01 v01r02. Simultaneous transmission SAR measurement is exempted according to the SPLSR analysis per KDB 447498 D01v05.

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 INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

2.2 Applicant

Company Name	HTC Corporation
Address	No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan.

2.3 Manufacturer

Company Name	HTC Corporation
Address	No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan.

2.4 Application Details

Date of Start during the Test	Nov. 30, 2012
Date of End during the Test	Dec. 27, 2012

3. General Information

3.1 Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT	Smartphone
Model Name	PL80110
FCC ID	NM8PL80110
Tx Frequency	CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz CDMA2000 BC10 : 817.9 MHz ~ 823.1 MHz LTE Band 25: 1882.5 MHz ~ 1910 MHz WLAN 2.4GHz: 2412 MHz ~ 2462 MHz WLAN 5.2GHz: 5180 MHz ~ 5240 MHz WLAN 5.3GHz: 5260 MHz ~ 5320 MHz WLAN 5.5GHz: 5500 MHz ~ 5700 MHz WLAN 5.8GHz: 5745 MHz ~ 5825 MHz Bluetooth : 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Antenna Type	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna NFC: Loop Antenna
Uplink Modulations	CDMA2000 : QPSK LTE: QPSK / 16QAM (uplink) 802.11b : DSSS (BPSK / QPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth : GFSK Bluetooth EDR : π/4-DQPSK, 8-DPSK Bluetooth v4.0+LE : GFSK NFC : ASK
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. WLAN operation in 5600 MHz ~ 5650 MHz is notched.
3. This device supports WLAN 2.4GHz and 5.8GHz in hotspot operation; WLAN 5.2GHz/5.3GHz/5.5GHz is disabled when hotspot mode activated.

3.2 Maximum RF output power among production units

Band	CDMA BC0 Average power (dBm)	CDMA BC1 Average power (dBm)	CDMA BC10 Average power (dBm)
1xRTT RC1 SO55	24	24.5	24
1xRTT RC3 SO55	24	24.5	24
1xRTT RC3 SO32	24	24.5	24
1x Advanced, RC8 SO75	24	24.5	24
1xEV-DO Rev 0	24	24.5	24
1xEV-DO Rev A	24	24.5	24

	LTE Band 25 Average power (dBm)			
Modulation	BW (MHz)	RB size	Target MPR	Target Power
QPSK	10	≤ 12	0	23
QPSK	10	> 12	1	22
16QAM	10	≤ 12	1	22
16QAM	10	> 12	2	21

For Band 25:

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

Remark:

1. By design, maximum LTE RF power of smaller supported bandwidth does not exceed the RF power of largest supported bandwidth; the information is included in “tune-up procedure” exhibit

IEEE 802.11 Average power (dBm)				
Mode/Band	a	b	g	n
WLAN 2.4 GHz		18	13.5	12.5
WLAN 5.2 GHz	13			13
WLAN 5.3 GHz	13			13
WLAN 5.5 GHz	13			13
WLAN 5.8 GHz	13			13

Bluetooth Average power (dBm)				
Mode/Band	1Mbps (GFSK)	2Mbps (π/4-DQPSK)	3Mbps (8-DPSK)	BT4.0-LE (GFSK)
2.4 GHz Bluetooth	8	4	4	1

The table below summarized necessary items addressed in KDB 941225 D05 v02.

FCC ID	NM8PL80110
EUT	Smartphone
Operating Frequency Range of each LTE transmission band	Band 25 Transmitting: 1855MHz ~ 1908.5 MHz
Channel Bandwidth	Band 25:, 5MHz, 10MHz

Transmission (H, M, L) channel numbers and frequencies in each LTE band				
Band 25				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Frequency (MHz)	Channel #	Frequency (MHz)
L	26065	1852.5	26090	1855
M	26365	1882.5	26365	1882.5
H	26665	1912.5	26640	1910

UE category, uplink modulations used	Category 3, QPSK, and 16QAM
LTE transmitter and antenna implementation (standalone or sharing hardware components /	A primary antenna is used for LTE transmitting and receiving, standalone
LTE Voice / Data transmission capability	VoLTE not supported Data only
LTE MPR permanently built-in by design	Yes, per 3GPP TS 36.101 v11.0.0
LTE A-MPR	In the base simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing.
Base station simulator used for Testing	Anritsu MT8820C
Simultaneous transmission configurations	In Section 11.6

3.3 Product Photos

Please refer to Appendix D.

3.4 Applied Standard

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 648474 D04 v01
- FCC KDB 248227 D01 v01r02
- FCC KDB 447498 D01 v05
- FCC KDB 941225 D01 v02
- FCC KDB 941225 D05 v02
- FCC KDB 941225 D06 v01
- FCC KDB 865664 D01 v01

3.5 Device Category and SAR Limits

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

3.6 Test Conditions

3.5.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.5.2 Test Configuration

For WWAN SAR testing, 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 EUT 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 EUT.

During WLAN SAR testing EUT is configured with the WLAN continuous TX tool,

The EUT was set from the emulator to radiate maximum WWAN output power during all tests.

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

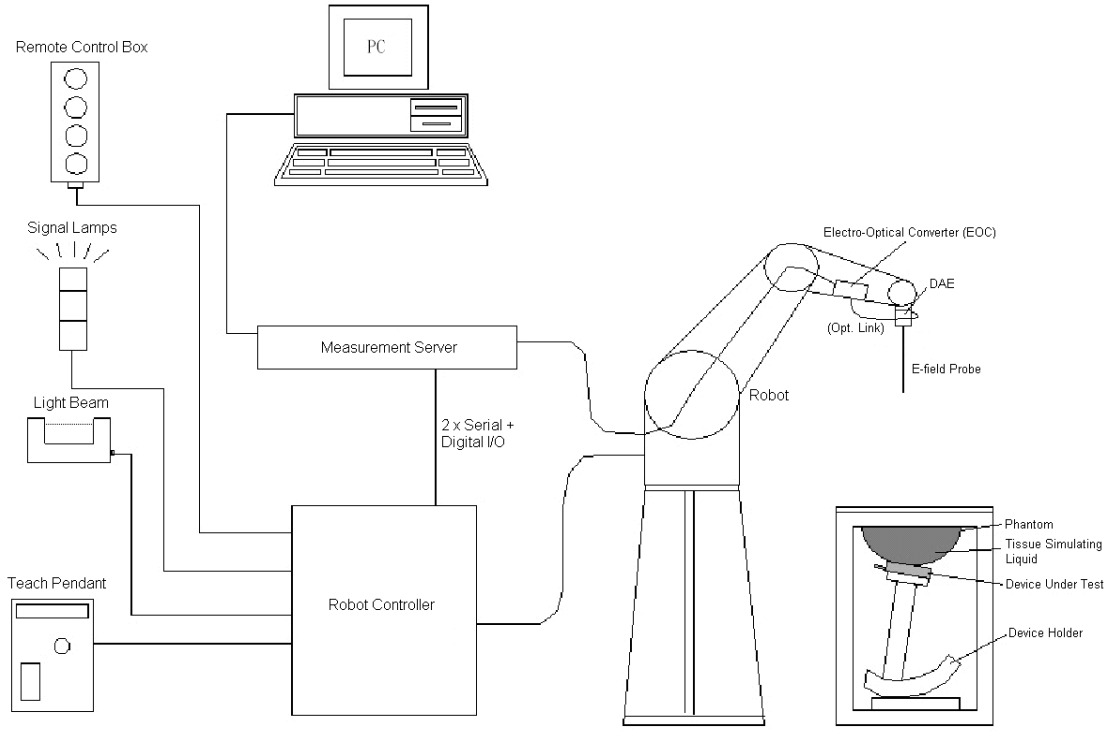


Fig 5.1 SPEAG DASY System Configurations

The DASY 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 (EOC) 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
- DASY 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

Component details are described in 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

<ET3DV6 / ET3DV6R Probe >

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 3 GHz; Linearity: ± 0.2 dB
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 µW/g to 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 16 mm) Tip diameter: 6.8 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.7 mm

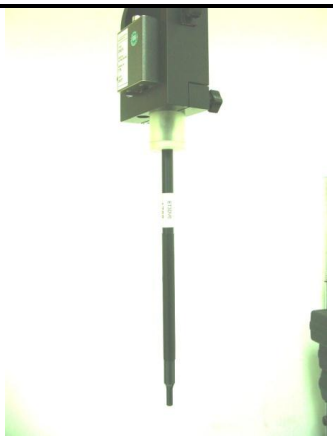


Fig 5.2 Photo of ET3DV6/ET3DV6

<EX3DV4 / ES3DV4 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 5.3 Photo of EX3DV4/ES3DV4

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 5.4 Photo of DAE

5.3 Robot

The SPEAG DASY system uses the high precision robots (DASY4: RX90BL; DASY5: TX90XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB; 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)

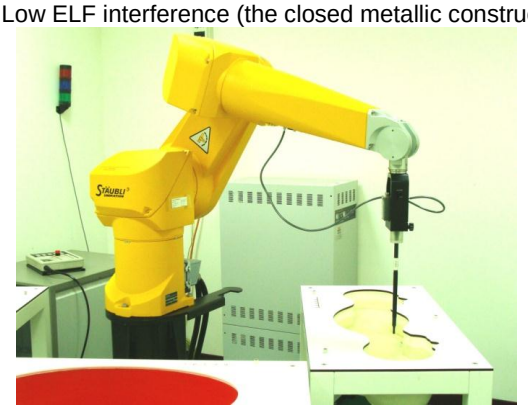


Fig 5.5 Photo of DASY4

Fig 5.6 Photo of DASY5

5.4 Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY4: 166 MHz, Intel Pentium; DASY5: 400 MHz, Intel Celeron), chipdisk (DASY4: 32 MB; DASY5: 128 MB), RAM (DASY4: 64 MB, 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 5.7 Photo of Server for DASY4

Fig 5.8 Photo of Server for DASY5

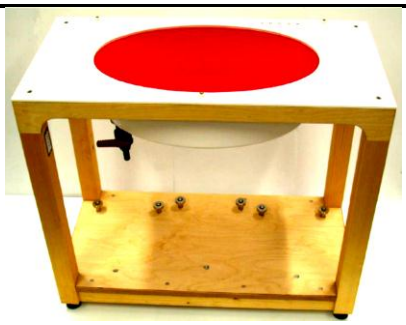
5.5 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	 **Fig 5.9 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 5.10 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 (ERP). 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 5.11 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.

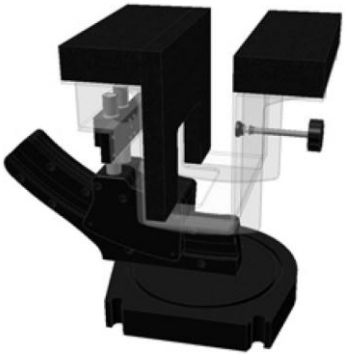


Fig 5.12 Laptop Extension Kit

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：

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

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：$\mathbf{E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}}$

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

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)：

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

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

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

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	835MHz System Validation Kit	D835V2	499	Mar. 22, 2010	Mar. 21, 2013
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 23, 2010	Mar. 22, 2013
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 25, 2011	Jul. 24, 2013
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Jan. 18, 2012	Jan. 17, 2013
SPEAG	Data Acquisition Electronics	DAE4	778	Aug. 27, 2012	Aug. 26, 2013
SPEAG	Data Acquisition Electronics	DAE4	1279	May. 03, 2012	May. 02, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3697	Sep. 28, 2012	Sep. 27, 2013
SPEAG	Dosimetric E-Field Probe	ES3DV3	3270	Sep. 28, 2012	Sep. 27, 2013
Wisewind	Thermometer	ETP-101	TM560	Nov. 13, 2012	Nov. 12, 2013
Wisewind	Thermometer	ETP-101	TM685	Nov. 13, 2012	Nov. 12, 2013
Wisewind	Thermometer	HTC-1	TM642	Nov. 13, 2012	Nov. 12, 2013
Wisewind	Thermometer	HTC-1	TM281	Nov. 13, 2012	Nov. 12, 2013
H.M.IRIS	Thermometer	TH-08	TM658	Nov. 13, 2012	Nov. 12, 2013
SPEAG	Device Holder	N/A	N/A	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 CD	TP-1718	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 CD	TP-1719	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1383	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1477	NCR	NCR
Agilent	Network Analyzer	E5071C	MY46101588	May. 11, 2012	May. 10, 2013
Agilent	ESG Vector Series Signal Generator	E4438C	MY49070755	Oct. 02, 2012	Oct. 01, 2013
Anritsu	Power Meter	ML2495A	1132003	Aug. 14, 2012	Aug. 13, 2013
Anritsu	Radio Communication Analyzer	MT8820C	6201074414	Dec. 21, 2011	Dec. 20, 2012
Agilent	Wireless Communication Test Set	E5515E	MY52112043	Apr. 18, 2012	Apr. 17, 2014
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 05, 2012	Jan. 04, 2014
Agilent	Dual Directional Coupler	778D	50422	NCR	NCR
Woken	Attenuator	WK0602-XX	N/A	NCR	NCR
AR	Power Amplifier	5S1G4M2	0328767	NCR	NCR
R&S	Spectrum Analyzer	FSP	101131	Jul. 23, 2012	Jul. 22, 2013

Table 5.1 Test Equipment List

Note:

1. The calibration certificate of DASY can be referred to appendix C of this report.
2. Referring to KDB 865664 D01v01, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole D835V2, SN: 499, D1900V2, SN: 5d041, D2450V2, SN: 736, can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

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.

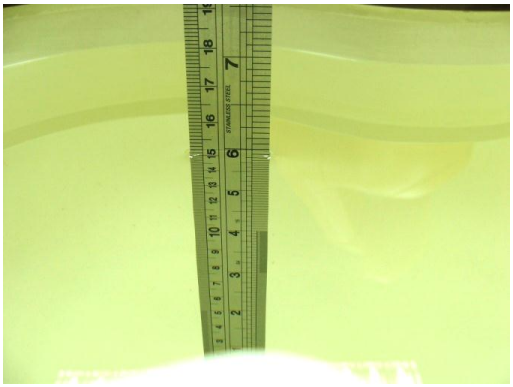


Fig 6.1 Photo of Liquid Height for Head SAR

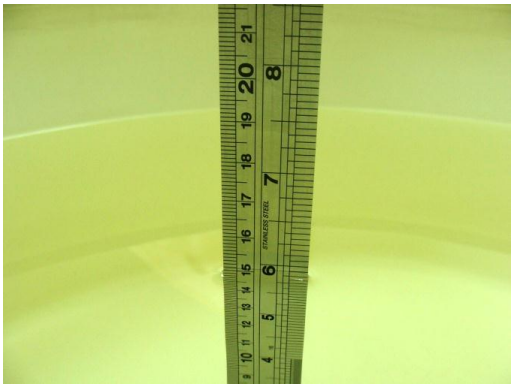


Fig 6.2 Photo of Liquid Height for Body SAR

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

Simulating Liquid for 5G, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

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. (MHz)	Liquid Type	Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Head	21.4	0.9	40.246	0.9	41.5	0.00	-3.02	±5	2012/12/1
835	Head	21.4	0.945	41.195	0.9	41.5	5.00	-0.73	±5	2012/12/2
835	Body	21.5	0.968	54.6	0.97	55.2	-0.21	-1.09	±5	2012/12/1
835	Body	21.5	0.998	53.888	0.97	55.2	2.89	-2.38	±5	2012/12/2
1900	Head	21.6	1.389	40.188	1.4	40	-0.79	0.47	±5	2012/11/30
1900	Head	21.2	1.431	38.973	1.4	40	2.21	-2.57	±5	2012/12/2
1900	Body	21.5	1.539	54.55	1.52	53.3	1.25	2.35	±5	2012/12/1
1900	Body	21.3	1.545	51.942	1.52	53.3	1.64	-2.55	±5	2012/12/3
2450	Head	21.3	1.835	37.539	1.8	39.2	1.94	-4.24	±5	2012/12/5
2450	Body	21.5	2.018	52.307	1.95	52.7	3.49	-0.75	±5	2012/12/5
2450	Body	21.4	1.875	51.836	1.95	52.7	-3.85	-1.64	±5	2012/12/27
5200	Head	21.6	4.687	37.2	4.66	36	0.58	3.33	±5	2012/12/6
5200	Body	21.2	5.244	47.499	5.3	49	-1.06	-3.06	±5	2012/12/5
5300	Head	21.6	4.81	36.999	4.66	36	3.22	2.78	±5	2012/12/6
5300	Body	21.2	5.38	47.244	5.3	49	1.51	-3.58	±5	2012/12/5
5500	Head	21.6	5.058	36.612	4.96	35.6	1.98	2.84	±5	2012/12/6
5500	Body	21.2	5.631	46.992	5.65	48.6	-0.34	-3.31	±5	2012/12/5
5600	Head	21.6	5.189	36.41	4.96	35.6	4.62	2.28	±5	2012/12/6
5600	Body	21.2	5.773	46.756	5.65	48.6	2.18	-3.79	±5	2012/12/5
5800	Head	21.6	5.439	35.975	5.27	35.3	3.21	1.91	±5	2012/12/6
5800	Body	21.2	6.127	46.464	6	48.2	2.12	-3.60	±5	2012/12/5

Table 6.2 Measuring Results for Simulating Liquid

7. SAR System 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.

7.1 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.

7.2 System Setup

In the simplified setup for system evaluation, the EUT 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:

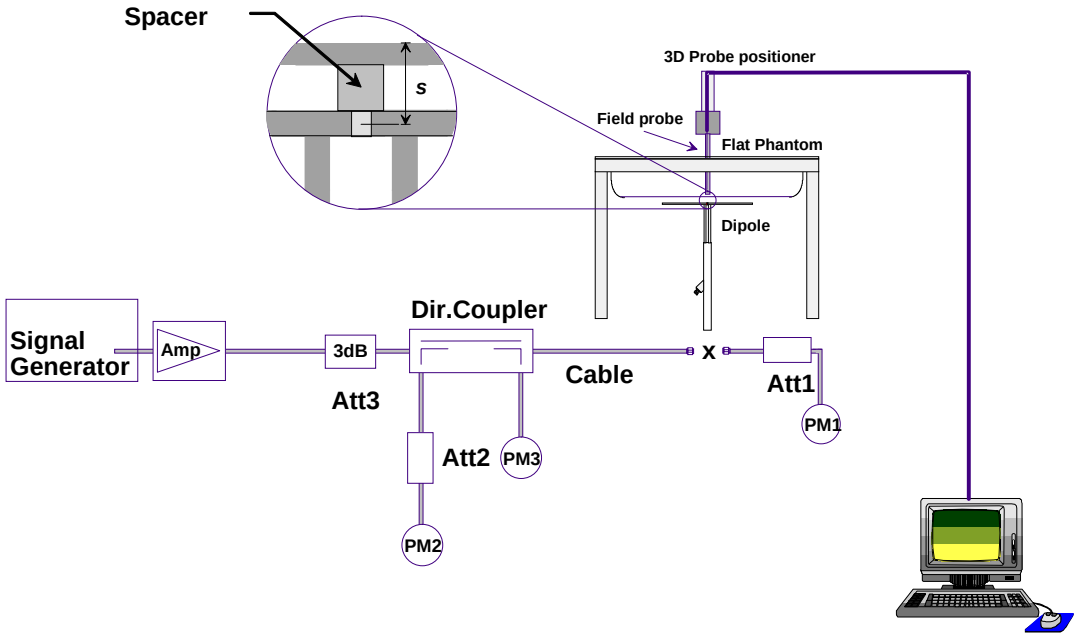


Fig 7.1 System Setup for System Evaluation

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

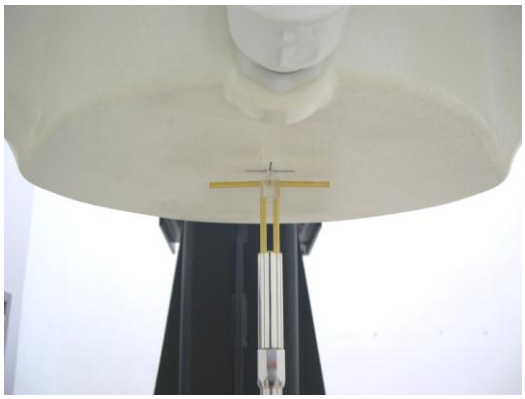


Fig 7.2 Photo of Dipole Setup

7.3 SAR System Verification Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Table 7.1 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.

For 5600MHz measurement, the probe is calibrated at 5600MHz; per KDB 865664D01v01, 5600MHz system verification was performed and the result is compared to 5500MHz target SAR and the deviation is within 15%

Measurement Date	Frequency (MHz)	Liquid Type	Power fed onto reference dipole (mW)	Targeted SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	Normalized SAR_{1g} (W/kg)	Deviation (%)
2012/12/1	835	Head	250	9.71	2.31	9.24	-4.84
2012/12/2	835	Head	250	9.71	2.39	9.56	-1.54
2012/12/1	835	Body	250	9.82	2.56	10.24	4.28
2012/12/2	835	Body	250	9.82	2.63	10.52	7.13
2012/11/30	1900	Head	250	39.80	9.92	39.68	-0.30
2012/12/2	1900	Head	250	39.80	10.6	42.40	6.53
2012/12/1	1900	Body	250	40.00	9.69	38.76	-3.10
2012/12/3	1900	Body	250	40	9.6	38.40	-4.00
2012/12/5	2450	Head	250	54.8	14	56.00	2.19
2012/12/5	2450	Body	250	52.3	14.1	56.40	7.84
2012/12/27	2450	Body	250	52.3	12.3	49.20	-5.93
2012/12/6	5200	Head	100	79.2	8.02	80.20	1.26
2012/12/5	5200	Body	100	72.6	7.29	72.90	0.41
2012/12/6	5300	Head	100	79.2	7.78	77.80	-1.77
2012/12/5	5300	Body	100	72.6	7.5	75.00	3.31
2012/12/6	5500	Head	100	85.2	8.72	87.20	2.35
2012/12/5	5500	Body	100	78.8	7.45	74.50	-5.46
2012/12/6	5600	Head	100	85.2	8.59	85.90	0.82
2012/12/5	5600	Body	100	78.8	7.76	77.60	-1.52
2012/12/6	5800	Head	100	79	7.61	76.10	-3.67
2012/12/5	5800	Body	100	73.1	6.9	69.00	-5.61

Table 7.1 Target and Measurement SAR after Normalized

8. EUT Testing Position

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

8.1 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.

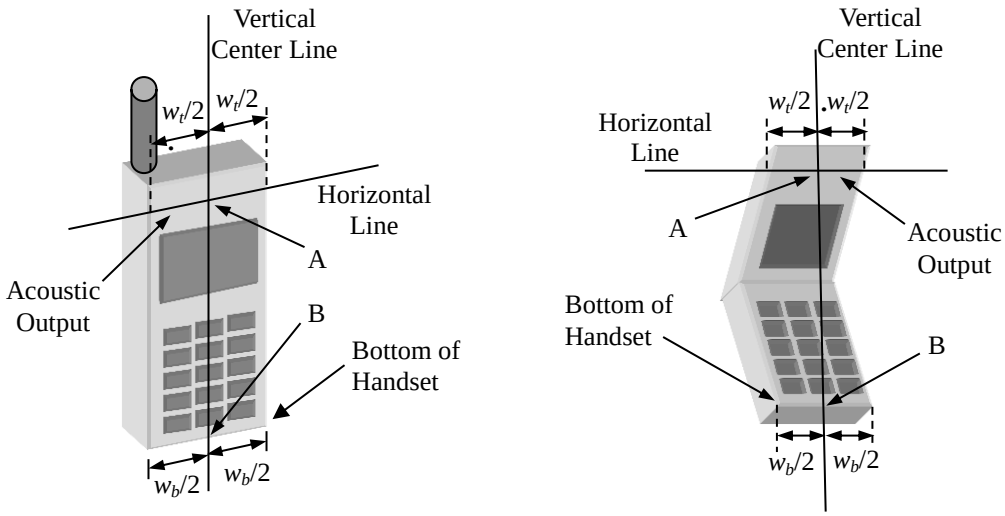


Fig 8.1 Illustration for Handset Vertical and Horizontal Reference Lines

8.2 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. 8.2).

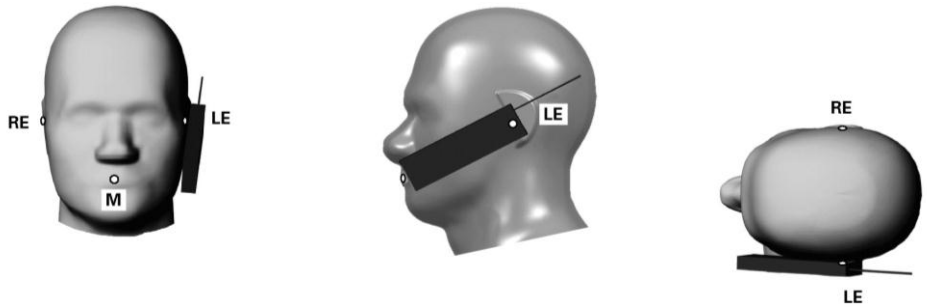


Fig 8.2 Illustration for Cheek Position

8.3 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. 8.3).

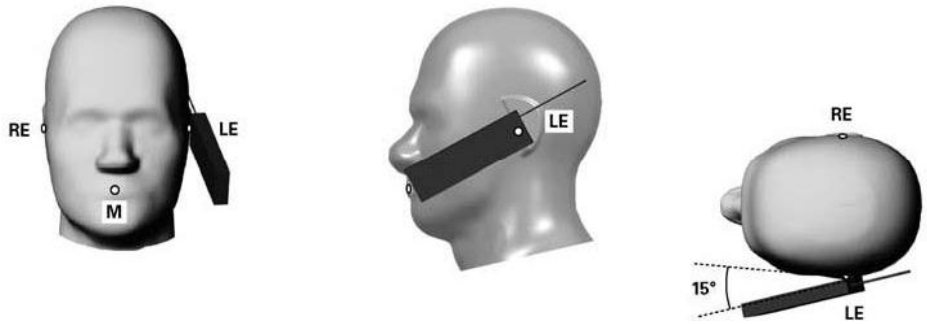


Fig 8.3 Illustration for Tilted Position

8.4 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.

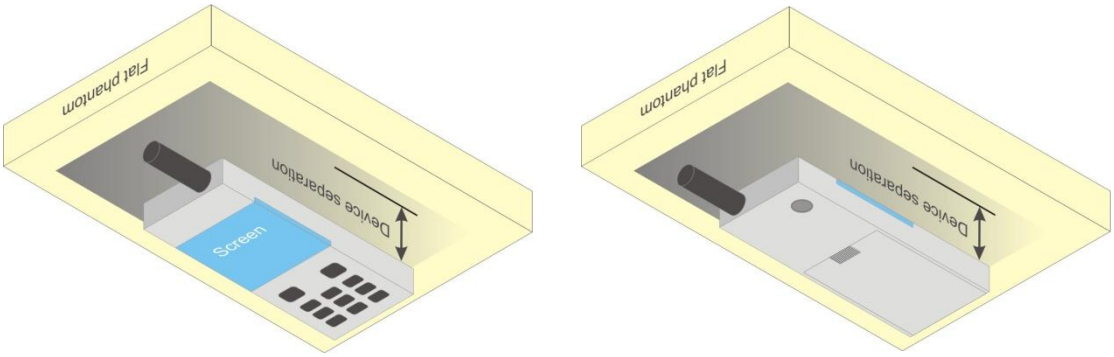


Fig 8.4 Illustration for Body Worn Position

8.5 Hotspot Position

(a) To position the device parallel to the phantom surface with all sides and either keypad up or down.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device and the flat phantom to 1.0cm.

<EUT Setup Photos>

Please refer to Appendix E for the test setup photos.

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix E demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported 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

9.1 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

9.2 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 is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.
Area scan and zoom scan resolution setting follows KDB 865664 D01v01 quoted below.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the area scan based *1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

9.3 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 EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.4 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.

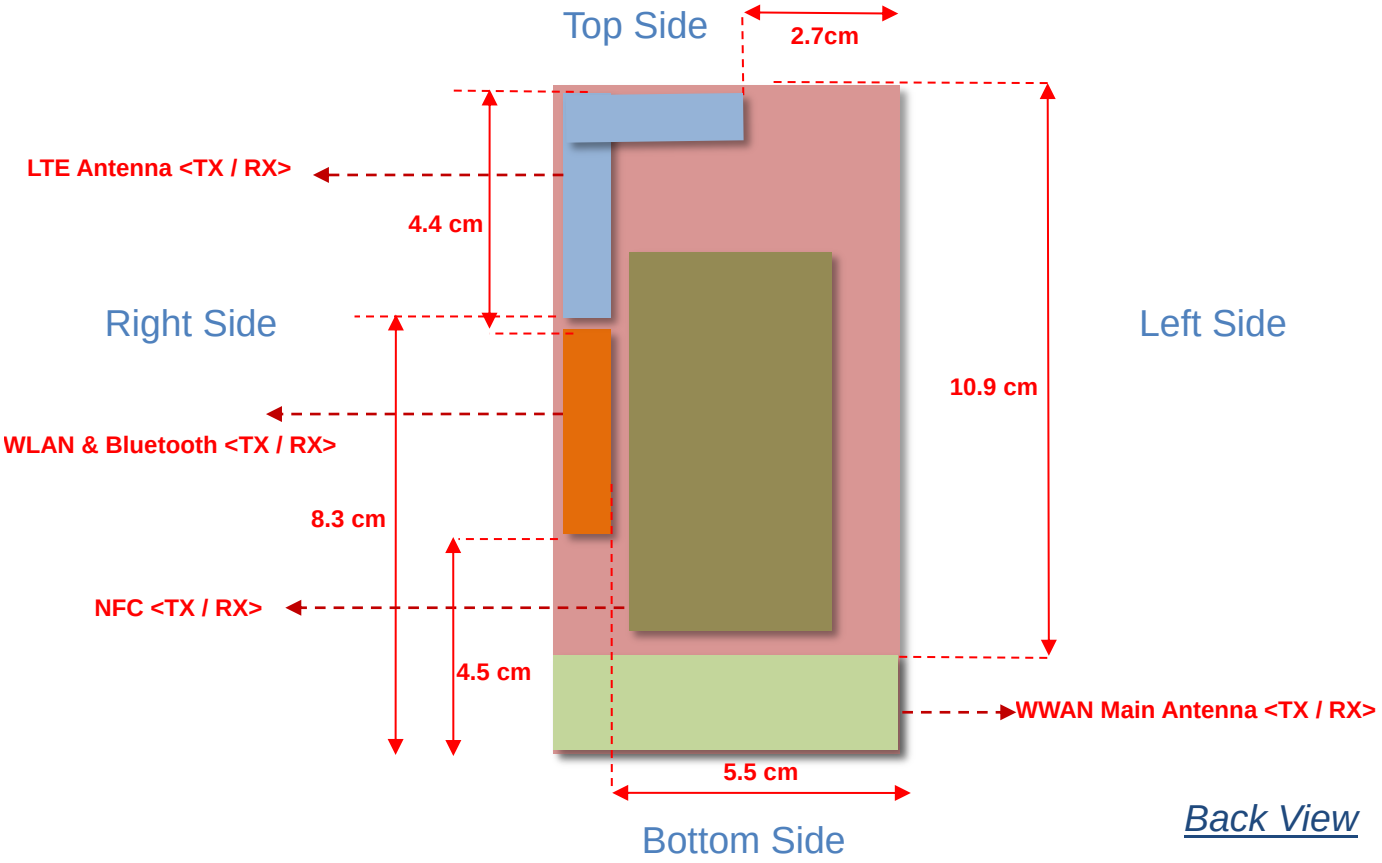
Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty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

9.5 Power Drift Monitoring

All SAR testing is under the EUT 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 EUT 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 drifts more than 5%, the SAR will be retested.

10. SAR Test Configurations

10.1 Exposure Positions Consideration



Antennas	Wireless Interface
WWAN Main Antenna (Tx / Rx)	CDMA2000 BC 0 CDMA2000 BC 1 CDMA2000 BC 10
LTE Antenna (Tx / Rx)	LTE: band 25
BT&WLAN Antenna (Tx / Rx)	WLAN 2.4GHz WLAN 5GHz Bluetooth
NFC Antenna(Tx/Rx)	NFC

Sides for SAR tests; Hotspot mode Test distance: 10 mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
WWAN Main	YES	YES	NO	YES	YES	YES
LTE	YES	YES	YES	NO	YES	NO
WLAN	YES	YES	NO	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 WWAN Main antenna, SAR measurements at Top side are not required since the distance between EUT and flat phantom > 25mm.
4. For LTE Main antenna, SAR measurements at Bottom/ Left side are not required since the distance between EUT and flat phantom > 25mm.
5. For WLAN antenna, SAR measurements Top/Bottom/Left side are not required since the distance between EUT and flat phantom > 25mm.
6. Per KDB 447498 D01v05, for handsets the *test separation distance* is determined by the smallest distance between the outer surface of the device and the user; which is 0mm for head SAR, 10mm for hotspot SAR, 10mm for body-worn SAR.
7. If the test separation distance is < 5mm, 5mm is used for excluded SAR calculation
8. Per KDB 447498 D01v05, for minimum test separation distance ≤50mm, Bluetooth standalone SAR is excluded according to

   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

	Wireless Interface	Bluetooth
Tune-up Maximum power (dBm)		8
Tune-up Maximum rated power (mW)		6.31
Head	Test Separation Distance (mm)	5
	SAR exclusion threshold (mW)	10
	SAR testing required?	**NO**
Body	Test Separation Distance (mm)	10
	SAR exclusion threshold (mW)	19
	SAR testing required?	**NO**

10.2 Conducted RF Output Power (Unit: dBm)

<CDMA2000>

<Measurement procedure for 1x Advanced>

Agilent 8960 base station simulator was used for 1xAdvanced connection, and the measurement setting was followed 2012-Oct TCB workshop RF exposure update.

a) Protocol Rev: 6 (IS-2000-0)
b) Using SO75 with RC8 on uplink, and RC11 on downlink
c) Smart blanking disabled
d) Reverse power control mode: 200-400bps
e) Forward power control mode: 000
f) Rvs power control: All up bits

Band	CDMA2000 BC0			CDMA2000 BC1			CDMA2000 BC10		
Channel	1013	384	777	25	600	1175	476	580	684
Frequency (MHz)	824.70	836.52	848.31	1851.25	1880.00	1908.75	817.9	820.5	823.1
1xRTT RC1+SO55	23.76	23.87	23.80	24.02	24.03	24.05	23.78	23.77	23.87
1xRTT RC3+SO55	23.75	23.84	23.77	24.00	24.03	24.04	23.75	23.71	23.83
1xRTT RC3+SO32 (+ F-SCH)	23.60	23.71	23.63	23.98	23.99	24.03	23.65	23.70	23.80
1xRTT RC3 SO32(+SCH)	23.59	23.65	23.62	23.97	23.98	24.01	23.60	23.66	23.79
1x Advanced Fwd11, Rsv8, SO75	23.78	23.84	23.80	23.92	24.00	23.96	23.60	23.73	23.86
1xEVDO RTAP 153.6	23.70	23.86	23.76	23.99	24.02	24.03	23.71	23.80	23.85
1xEVDO RETAP 4096	23.64	23.75	23.70	23.97	23.98	24.00	23.69	23.75	23.81

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, Ev-Do Rev 0 (RTAP 153.6kbps) Ev-Do Rev A(RETAP 4096 bits) power are all less than 1/4 dB higher than RC3, thus SAR testing in these modes are not required.
3. Referring to KDB 941225 D01, in Hotspot mode EUT is treated as data device and SAR is tested with Ev-Do Rev 0 (RTAP 153.6kbps). If 1xRTT and Ev-Do Rev A(RETAP 4096 bits) power is less than 1/4dB higher than Re v0, SAR tests with those settings are not necessary.
4. Per 2012-Oct TCB workshop RF exposure update, 1x Advanced power is measured using SO75 with RC8 on uplink, and RC11 on downlink. If the 1x Advanced RF power is less than 1/4dB higher than 1xRTT and 1xRTT measured SAR is ≤1.2 W/kg, 1x Advanced SAR testing is not required.
5. Considering VOIP capability, 1xEv-Do Rev. A SAR was repeated on the worst position of 1xRTT head SAR and body-worn SAR testing.

<LTE Conducted Power>

Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each *required test channel*.
4. Per KDB 941225 D05v02, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
5. 16QAM output power for each RB allocation configuration is not > ½ dB higher than the same configuration in QPSK
6. Smaller bandwidth output power for each RB allocation configuration is not > ½ dB higher than the same configuration in the largest supported bandwidth

<LTE band 25>

BW [MHz]	Mod / RB (Size - Offset)	Average Power. (dBm)			3GPP MPR	MPR Result (dB)		
		Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch
Channel		26090	26365	26640		26090	26365	26640
Frequency (MHz)		1855	1882.5	1910		1855	1882.5	1910
10	QPSK 1-0	22.84	**22.86**	22.76	0	0.00	0.00	0.00
10	QPSK 1-24	22.70	22.63	22.32		0.14	0.23	0.44
10	QPSK 1-49	22.61	22.61	22.60		0.23	0.25	0.16
10	QPSK 25-0	21.99	21.51	21.55	≤ 1	0.85	1.35	1.21
10	QPSK 25-12	21.76	21.53	21.64		1.08	1.33	1.12
10	QPSK 25-24	21.88	21.44	21.65		0.96	1.42	1.11
10	QPSK 50-0	21.91	21.50	21.43		0.93	1.36	1.33
10	16QAM 1-0	21.92	21.94	21.75	≤ 1	0.92	0.92	1.01
10	16QAM 1-24	21.91	21.84	21.85		0.93	1.02	0.91
10	16QAM 1-49	21.77	21.64	21.60		1.07	1.22	1.16
10	16QAM 25-0	20.86	20.45	20.45	≤ 2	1.98	2.41	2.31
10	16QAM 25-12	21.00	20.66	20.66		1.84	2.20	2.10
10	16QAM 25-24	20.85	20.62	20.65		1.99	2.24	2.11
10	16QAM 50-0	20.87	20.39	20.41		1.97	2.47	2.35
Channel		26065	26365	26665		26065	26365	26665
Frequency (MHz)		1852.5	1882.5	1912.5		1852.5	1882.5	1912.5
5	QPSK 1-0	22.59	22.61	22.80	0	0.13	0.00	0.00
5	QPSK 1-12	22.72	22.53	22.79		0.00	0.08	0.01
5	QPSK 1-24	22.49	22.45	22.57		0.23	0.16	0.23
5	QPSK 12-0	21.82	21.58	21.87	≤ 1	0.90	1.03	0.93
5	QPSK 12-6	21.84	21.76	21.78		0.88	0.85	1.02
5	QPSK 12-11	21.70	21.54	21.71		1.02	1.07	1.09
5	QPSK 25-0	21.70	21.56	21.53		1.02	1.05	1.27
5	16QAM 1-0	21.89	21.91	21.87	≤ 1	0.83	0.70	0.93
5	16QAM 1-12	21.74	21.84	21.78		0.98	0.77	1.02
5	16QAM 1-24	21.65	21.76	21.72		1.07	0.85	1.08
5	16QAM 12-0	20.80	20.64	20.92	≤ 2	1.92	1.97	1.88
5	16QAM 12-6	20.91	20.91	20.75		1.81	1.70	2.05
5	16QAM 12-11	20.85	20.79	20.82		1.87	1.82	1.98
5	16QAM 25-0	20.78	20.62	20.61		1.94	1.99	2.19

<WLAN 2.4GHz>

WLAN 2.4G 802.11b Average Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
CH 01	2412	**17.78**	CH 1	17.77	17.77	17.76
CH 06	2437	17.52				
CH 11	2462	17.67				

WLAN 2.4G 802.11g Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)						
		6M		9M	12M	18M	24M	36M	48M	54M
CH 01	2412	**13.05**	CH 1	12.89	12.88	12.91	12.87	12.93	12.87	12.90
CH 06	2437	12.55								
CH 11	2462	12.82								

WLAN 2.4G 802.11n (BW 20MHz) Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	**11.99**	CH 1	11.91	11.95	11.98	11.98	11.97	11.97	11.96
CH 06	2437	11.62								
CH 11	2462	11.88								

WLAN 2.4G 802.11n (BW 40MHz) Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	**12.17**	CH 3	12.15	12.09	12.05	12.14	12.16	12.13	12.11
CH 06	2437	11.50								
CH 09	2452	11.68								

Note:

1. Per KDB 248227 D01 v01r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227 D01 v01r02, 11g and 11n output power is less than 1/4 dB higher than 11b mode, thus the SAR can be excluded.
3. 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. 2.4GHz WLAN SAR was tested on 802.11b 1Mbps

<Bluetooth>

Channel	Frequency (MHz)	Average power (dBm)		
		Mode		
		GFSK	π/4-DQPSK	8-DPSK
CH 0	2402	**7.07**	3.63	3.65
CH 39	2441	7.03	3.37	3.41
CH 78	2480	6.78	3.04	3.06

Channel	Frequency (MHz)	Average power (dBm)
		Mode
		BT v4.0 LE, GFSK
CH 0	2402	0.38
CH 19	2440	0.66
CH 39	2480	**0.75**

<WLAN 5GHz>

WLAN 5G 802.11a Average Power (dBm)											
Power vs. Channel			Power vs. Data Rate								
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)							
		6M		9M	12M	18M	24M	36M	48M	54M
CH 36	5180	11.71	CH 40	12.35	12.32	12.31	12.27	12.29	12.29	12.25
CH 40	5200	**12.39**								
CH 44	5220	12.25								
CH 48	5240	11.72								
CH 52	5260	11.98	CH 56	12.61	12.58	12.58	12.54	12.53	12.50	12.47
CH 56	5280	**12.64**								
CH 60	5300	12.05								
CH 64	5320	12.23								
CH 100	5500	11.77	CH 108	12.65	12.62	12.64	12.61	12.57	12.54	12.55
CH 104	5520	12.45								
CH 108	5540	**12.68**								
CH 112	5560	12.38								
CH 116	5580	11.70								
CH 136	5680	12.26								
CH 140	5700	12.23								
CH 149	5745	12.07	CH 165	12.21	12.20	12.20	12.19	12.18	12.21	12.22
CH 153	5765	12.13								
CH 157	5785	11.92								
CH 161	5805	12.11								
CH 165	5825	**12.23**								

WLAN 5G 802.11n (BW 20M) Average Power (dBm)											
Power vs. Channel			Power vs. Data Rate								
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index							
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 36	5180	11.58	CH 40	12.32	12.29	12.25	12.25	12.27	12.21	12.20
CH 40	5200	**12.37**								
CH 44	5220	11.33								
CH 48	5240	11.80								
CH 52	5260	11.87	CH 56	12.56	12.53	12.55	12.51	12.50	12.48	12.48
CH 56	5280	**12.60**								
CH 60	5300	12.02								
CH 64	5320	12.32								
CH 100	5500	12.01	CH 108	12.70	12.66	12.68	12.63	12.63	12.65	12.64
CH 104	5520	12.52								
CH 108	5540	**12.73**								
CH 112	5560	12.52								
CH 116	5580	12.08								
CH 136	5680	12.28								
CH 140	5700	12.42								
CH 149	5745	12.26	CH 165	12.31	12.32	12.31	12.30	12.29	12.29	12.30
CH 153	5765	12.18								
CH 157	5785	12.03								
CH 161	5805	12.17								
CH 165	5825	**12.33**								

WLAN 5G 802.11n (BW 40M) Average Power (dBm)											
Power vs. Channel			Power vs. Data Rate								
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index							
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 38	5190	12.13	CH 46	12.15	12.08	12.03	11.98	11.92	11.89	11.84
CH 46	5230	**12.26**								
CH 54	5270	**12.47**	CH 54	12.33	12.28	12.22	12.19	12.14	12.08	12.02
CH 62	5310	11.91								
CH 102	5510	12.00	CH 134	12.10	12.00	11.95	11.93	11.90	11.88	11.86
CH 110	5550	12.17								
CH 134	5670	**12.23**								
CH 151	5755	**11.86**	CH 151	11.63	11.70	11.80	11.83	11.82	11.83	11.85
CH 159	5795	11.66								

Note:

1. Per KDB 248227 D01 v01r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227 D01 v01r02, 11n average output power is higher than 1/4 dB higher than 11a mode, SAR will be verified.
3. 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. 5GHz WLAN SAR was tested on 802.11a 6Mbps .

11. SAR Test Results

11.1 Test Records for Head SAR Test

Note:

1. Per KDB 447498 D01v05, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   Scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   Reported SAR(W/kg)= Measured SAR(W/kg) Scaling Factor*
2. Per KDB 447498 D01v05, for each exposure position, if the highest output channel reported SAR ≤0.8W/kg, other channels SAR testing are not necessary
3. Considering the possibility of VOIP operation, LTE SAR for the head exposure positions and body-worn positions are performed.
4. Considering the possibility of VOIP operation, per KDB 941225 D01 EVDO Rev. A (4096bits) SAR for the head exposure positions and body-worn positions are performed.
5. Per 2012-Oct TCB workshop RF exposure update, 1x Advanced power is measured using SO75 with RC8 on uplink, and RC11 on downlink. If the 1x Advanced RF power is less than 1/4dB higher than 1xRTT and 1xRTT measured SAR is ≤1.2 W/kg, 1x Advanced SAR testing is not required.

<CDMA2000>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)
27	CDMA BC0	RC3 SO55	Right Cheek	384	836.52	23.84	24.00	1.038	-0.02	0.335	0.348
28	CDMA BC0	RC3 SO55	Right Tilted	384	836.52	23.84	24.00	1.038	-0.12	0.214	0.222
29	CDMA BC0	RC3 SO55	Left Cheek	384	836.52	23.84	24.00	1.038	-0.05	0.334	0.347
30	CDMA BC0	RC3 SO55	Left Tilted	384	836.52	23.84	24.00	1.038	0.01	0.238	0.247
31	**CDMA BC0**	**RETAP4096**	**Right Cheek**	**384**	**836.52**	**23.75**	**24**	**1.059**	**-0.01**	**0.35**	**0.371**
32	**CDMA BC10**	**RC3 SO55**	**Right Cheek**	**684**	**823.1**	**23.83**	**24**	**1.040**	**0.03**	**0.314**	**0.327**
33	CDMA BC10	RC3 SO55	Right Tilted	684	823.1	23.83	24	1.040	0.01	0.201	0.209
34	CDMA BC10	RC3 SO55	Left Cheek	684	823.1	23.83	24	1.040	0.04	0.31	0.322
35	CDMA BC10	RC3 SO55	Left Tilted	684	823.1	23.83	24	1.040	-0.01	0.223	0.232
36	CDMA BC10	RETAP4096	Right Cheek	684	823.1	23.81	24	1.045	-0.04	0.304	0.318
1	CDMA BC1	RC3 SO55	Right Cheek	1175	1908.75	24.04	24.50	1.112	0.06	0.495	0.550
2	CDMA BC1	RC3 SO55	Right Tilted	1175	1908.75	24.04	24.50	1.112	-0.01	0.176	0.196
3	CDMA BC1	RC3 SO55	Left Cheek	1175	1908.75	24.04	24.50	1.112	0.03	0.577	0.641
4	CDMA BC1	RC3 SO55	Left Tilted	1175	1908.75	24.04	24.50	1.112	0.08	0.249	0.255
5	**CDMA BC1**	**RETAP4096**	**Left Cheek**	**1175**	**1908.75**	**24.00**	**24.50**	**1.122**	**-0.02**	**0.575**	**0.645**

<LTE>

Plot No.	Band	BW [MHz]	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)
64	LTE Band 25	10M	QPSK 1RB 0offset	Right Cheek	26365	1882.5	22.86	23	1.033	-0.13	0.537	0.555
65	LTE Band 25	10M	QPSK 25RB 0offset	Right Cheek	26090	1855	21.99	22	1.002	-0.03	0.473	0.474
66	LTE Band 25	10M	QPSK 1RB 0offset	Right Tilted	26365	1882.5	22.86	23	1.033	0.07	0.783	0.809
69	LTE Band 25	10M	QPSK 1RB 0offset	Right Tilted	26090	1855	22.84	23	1.038	0.114	0.935	0.970
70	LTE Band 25	10M	QPSK 1RB 0offset	Right Tilted	26640	1910	22.76	23	1.057	0.121	0.707	0.747
67	LTE Band 25	10M	QPSK 25RB 0offset	Right Tilted	26090	1855	21.99	22	1.002	-0.06	0.72	0.722
68	LTE Band 25	10M	QPSK 50RB 0offset	Right Tilted	26090	1855	21.91	22	1.021	0.13	0.704	0.719
71	LTE Band 25	10M	QPSK 1RB 0offset	Left Cheek	26365	1882.5	22.86	23	1.033	0.05	0.654	0.675
72	LTE Band 25	10M	QPSK 25RB 0offset	Left Cheek	26090	1855	21.99	22	1.002	-0.01	0.625	0.626
73	LTE Band 25	10M	QPSK 1RB 0offset	Left Tilted	26365	1882.5	22.86	23	1.033	0.06	0.952	0.983
76	**LTE Band 25**	**10M**	**QPSK 1RB 0offset**	**Left Tilted**	**26090**	**1855**	**22.84**	**23**	**1.038**	**0.04**	**1.03**	**1.069**
77	LTE Band 25	10M	QPSK 1RB 0offset	Left Tilted	26640	1910	22.76	23	1.057	0.02	0.857	0.906
74	LTE Band 25	10M	QPSK 25RB 0offset	Left Tilted	26090	1855	21.99	22	1.002	0.03	0.836	0.838
78	LTE Band 25	10M	QPSK 25RB 0offset	Left Tilted	26365	1882.5	21.51	22	1.119	-0.03	0.722	0.808
79	LTE Band 25	10M	QPSK 25RB 0offset	Left Tilted	26640	1910	21.55	22	1.109	0.07	0.629	0.698
80	LTE Band 25	10M	QPSK 50RB 0offset	Left Tilted	26090	1855	21.91	22	1.021	0.06	0.796	0.813

Note:

1. Per KDB 941225 D05v02, when reported SAR of 1RB and 50%RB allocation for QPSK ≤0.8W/kg, and 100%RB with QPSK output power is less than 1RB and 50%RB, 100%RB allocation for QPSK is not required.
2. Per KDB 941225 D05v02, when reported SAR of 1RB and 50%RB allocation for QPSK >0.8W/kg for any exposure position, SAR testing of 100%RB allocation for QPSK is performed at the highest power channel.
3. 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the *reported* SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02, 16QAM SAR testing is not required.
4. Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the *reported* SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02, smaller bandwidth SAR testing is not required.

<WLAN>

Plot No.	Band	Mode	Data Rate	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)
139	**WLAN 2.4GHz**	**802.11b**	**1Mbps**	**Right Cheek**	**1**	**2412**	**17.78**	**18**	**1.052**	**0.11**	**0.354**	**0.372**
140	WLAN 2.4GHz	802.11b	**1Mbps**	Right Tilted	1	2412	17.78	18	1.052	-0.02	0.142	0.149
141	WLAN 2.4GHz	802.11b	**1Mbps**	Left Cheek	1	2412	17.78	18	1.052	0.01	0.31	0.326
142	WLAN 2.4GHz	802.11b	**1Mbps**	Left Tilted	1	2412	17.78	18	1.052	-0.13	0.123	0.129
123	WLAN 5.2GHz	802.11a	**6Mbps**	Right Cheek	40	5200	12.39	12.5	1.048	0.01	0.00924	0.010
124	**WLAN 5.2GHz**	**802.11a**	**6Mbps**	**Right Tilted**	**40**	**5200**	**12.39**	**12.5**	**1.048**	**-0.158**	**0.023**	**0.025**
125	WLAN 5.2GHz	802.11a	**6Mbps**	Left Cheek	40	5200	12.39	12.5	1.048	-0.191	0.00972	0.010
126	WLAN 5.2GHz	802.11a	**6Mbps**	Left Tilted	40	5200	12.39	12.5	1.048	0.17	0.0013	0.001
127	**WLAN 5.3GHz**	**802.11a**	**6Mbps**	**Right Cheek**	**56**	**5280**	**12.64**	**13**	**1.048**	**-0.16**	**0.04**	**0.046**
128	WLAN 5.3GHz	802.11a	**6Mbps**	Right Tilted	56	5280	12.64	13	1.048	-0.03	0.00546	0.007
129	WLAN 5.3GHz	802.11a	**6Mbps**	Left Cheek	56	5280	12.64	13	1.048	-0.136	0.011	0.013
130	WLAN 5.3GHz	802.11a	**6Mbps**	Left Tilted	56	5280	12.64	13	1.048	-0.165	0.00442	0.005
131	WLAN 5.5GHz	802.11a	**6Mbps**	Right Cheek	108	5540	12.68	13	1.048	-0.193	0.00728	0.009
132	**WLAN 5.5GHz**	**802.11a**	**6Mbps**	**Right Tilted**	**108**	**5540**	**12.68**	**13**	**1.048**	**0.02**	**0.077**	**0.087**
133	WLAN 5.5GHz	802.11a	**6Mbps**	Left Cheek	108	5540	12.68	13	1.048	-0.123	0.015	0.017
134	WLAN 5.5GHz	802.11a	**6Mbps**	Left Tilted	108	5540	12.68	13	1.048	-0.138	0.00111	0.001
135	**WLAN 5.8GHz**	**802.11a**	**6Mbps**	**Right Cheek**	**165**	**5825**	**12.23**	**12.5**	**1.048**	**-0.149**	**0.075**	**0.084**
136	WLAN 5.8GHz	802.11a	**6Mbps**	Right Tilted	165	5825	12.23	12.5	1.048	0.13	0.052	0.059
137	WLAN 5.8GHz	802.11a	**6Mbps**	Left Cheek	165	5825	12.23	12.5	1.048	-0.061	0.016	0.018
138	WLAN 5.8GHz	802.11a	**6Mbps**	Left Tilted	165	5825	12.23	12.5	1.048	0.041	0.01	0.011

11.2 Test Records for Hotspot SAR Test

General Note:

1. Per KDB 941225 D06, for EUT 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.

<CDMA2000>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)
37	CDMA BC0	RTAP 153.6	Front	1cm	384	836.52	23.86	24.00	1.033	-0.07	0.603	0.623
38	CDMA BC0	RTAP 153.6	Back	1cm	384	836.52	23.86	24.00	1.033	0.08	0.875	0.904
39	CDMA BC0	RTAP 153.6	Left Side	1cm	384	836.52	23.86	24.00	1.033	0.02	0.593	0.612
40	CDMA BC0	RTAP 153.6	Right Side	1cm	384	836.52	23.86	24.00	1.033	0.06	0.625	0.645
41	CDMA BC0	RTAP 153.6	Bottom Side	1cm	384	836.52	23.86	24.00	1.033	-0.04	0.078	0.081
42	CDMA BC0	RTAP 153.6	Back	1cm	1013	824.7	23.70	24.00	1.072	0.01	0.785	0.841
43	**CDMA BC0**	**RTAP 153.6**	**Back**	**1cm**	**777**	**848.31**	**23.76**	**24.00**	**1.057**	**0.02**	**0.901**	**0.952**
50	CDMA BC10	RTAP 153.6	Front	1cm	684	823.1	23.85	24.00	1.035	0.05	0.453	0.469
51	**CDMA BC10**	**RTAP 153.6**	**Back**	**1cm**	**684**	**823.1**	**23.85**	**24.00**	**1.035**	**-0.1**	**0.806**	**0.834**
52	CDMA BC10	RTAP 153.6	Left Side	1cm	684	823.1	23.85	24.00	1.035	-0.03	0.585	0.606
53	CDMA BC10	RTAP 153.6	Right Side	1cm	684	823.1	23.85	24.00	1.035	-0.03	0.603	0.624
54	CDMA BC10	RTAP 153.6	Bottom Side	1cm	684	823.1	23.85	24.00	1.035	0	0.063	0.065
55	CDMA BC10	RTAP 153.6	Back	1cm	476	817.9	23.71	24.00	1.069	0.04	0.719	0.769
56	CDMA BC10	RTAP 153.6	Back	1cm	580	820.5	23.80	24.00	1.047	0.04	0.743	0.778
6	CDMA BC1	RTAP 153.6	Front	1cm	1175	1908.75	24.03	24.50	1.114	0.01	0.647	0.721
7	**CDMA BC1**	**RTAP 153.6**	**Back**	**1cm**	**1175**	**1908.75**	**24.03**	**24.50**	**1.114**	**0.07**	**0.784**	**0.874**
24	CDMA BC1	RTAP 153.6	Left Side	1cm	1175	1908.75	24.03	24.50	1.114	0.04	0.274	0.305
25	CDMA BC1	RTAP 153.6	Right Side	1cm	1175	1908.75	24.03	24.50	1.114	0.01	0.123	0.137
26	CDMA BC1	RTAP 153.6	Bottom Side	1cm	1175	1908.75	24.03	24.50	1.114	-0.02	0.424	0.472
11	CDMA BC1	RTAP 153.6	Back	1cm	25	1851.25	23.99	24.50	1.125	-0.05	0.76	0.855
12	CDMA BC1	RTAP 153.6	Back	1cm	600	1880	24.02	24.50	1.117	0.02	0.774	0.864

<LTE>

Plot No.	Band	BW [MHz]	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)
81	LTE Band 25	10M	QPSK 1RB 0offset	Front	1cm	26365	1882.5	22.86	23	1.033	0.11	0.201	0.208
82	LTE Band 25	10M	QPSK 25RB 0offset	Front	1cm	26090	1855	21.99	22	1.002	0.07	0.193	0.193
83	**LTE Band 25**	**10M**	**QPSK 1RB 0offset**	**Back**	**1cm**	**26365**	**1882.5**	**22.86**	**23**	**1.033**	**-0.14**	**0.791**	**0.817**
94	LTE Band 25	10M	QPSK 1RB 0offset	Back	1cm	26090	1855	22.84	23	1.038	-0.09	0.776	0.805
95	LTE Band 25	10M	QPSK 1RB 0offset	Back	1cm	26640	1910	22.76	23	1.057	0.11	0.585	0.618
84	LTE Band 25	10M	QPSK 25RB 0offset	Back	1cm	26090	1855	21.99	22	1.002	-0.02	0.711	0.713
99	LTE Band 25	10M	QPSK 50RB 0offset	Back	1cm	26090	1855	21.91	22	1.021	-0.03	0.653	0.667
87	LTE Band 25	10M	QPSK 1RB 0offset	Right Side	1cm	26365	1882.5	22.86	23	1.033	-0.02	0.053	0.055
88	LTE Band 25	10M	QPSK 25RB 0offset	Right Side	1cm	26090	1855	21.99	22	1.002	-0.03	0.047	0.047
89	LTE Band 25	10M	QPSK 1RB 0offset	Top Side	1cm	26365	1882.5	22.86	23	1.033	0.01	0.572	0.591
90	LTE Band 25	10M	QPSK 25RB 0offset	Top Side	1cm	26090	1855	21.99	22	1.002	0.01	0.496	0.497

Note:

1. Per KDB 941225 D05v02, when reported SAR of 1RB and 50%RB allocation for QPSK ≤0.8W/kg, and 100%RB with QPSK output power is less than 1RB and 50%RB, 100%RB allocation for QPSK is not required.
2. Per KDB 941225 D05v02, when reported SAR of 1RB and 50%RB allocation for QPSK >0.8W/kg for any exposure position, SAR testing of 100%RB allocation for QPSK is performed at the highest power channel.
3. 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the *reported* SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02, 16QAM SAR testing is not required.
4. Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the *reported* SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02, smaller bandwidth SAR testing is not required.

<WLAN>

Plot No.	Band	Mode	Data Rate	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)
116	WLAN 2.4GHz	802.11b	**1Mbps**	Front	1cm	1	2412	17.78	18	1.052	-0.02	0.086	0.090
117	**WLAN 2.4GHz**	**802.11b**	**1Mbps**	**Back**	**1cm**	**1**	**2412**	**17.78**	**18**	**1.052**	**-0.18**	**0.164**	**0.172**
119	WLAN 2.4GHz	802.11b	**1Mbps**	Right Side	1cm	1	2412	17.78	18	1.052	-0.15	0.1	0.105
109	WLAN 5.8GHz	802.11a	**6Mbps**	Front	1cm	165	5825	12.23	12.5	1.065	-0.124	0.00744	0.009
110	**WLAN 5.8GHz**	**802.11a**	**6Mbps**	**Back**	**1cm**	**165**	**5825**	**12.23**	**12.5**	**1.065**	**-0.121**	**0.021**	**0.022**
112	WLAN 5.8GHz	802.11a	**6Mbps**	Right Side	1cm	165	5825	12.23	12.5	1.065	0.166	0.012	0.014

11.3 Test Records for Body-worn SAR Test

<CDMA2000>

Plot No.	Band	Mode	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)
44	CDMA BC0	RC3 SO32	Front	1cm		384	836.52	23.71	24	1.069	-0.11	0.444	0.475
45	CDMA BC0	RC3 SO32	Back	1cm		384	836.52	23.71	24	1.069	0.01	0.77	0.823
46	CDMA BC0	RC3 SO32	Back	1cm		1013	824.7	23.6	24	1.096	0.13	0.678	0.743
47	**CDMA BC0**	**RC3 SO32**	**Back**	**1cm**		**777**	**848.31**	**23.63**	**24**	**1.089**	**0.07**	**0.852**	**0.928**
48	CDMA BC0	RC3 SO32	Back	1cm	V	777	848.31	23.63	24	1.089	-0.03	0.718	0.782
49	CDMA BC0	RETAP 4096	Back	1cm	V	777	848.31	23.7	24	1.072	-0.07	0.734	0.786
57	CDMA BC10	RC3 SO32	Front	1cm		684	823.1	23.80	24.00	1.047	0.03	0.452	0.473
58	**CDMA BC10**	**RC3 SO32**	**Back**	**1cm**		**684**	**823.1**	**23.80**	**24.00**	**1.047**	**0.02**	**0.833**	**0.872**
59	CDMA BC10	RC3 SO32	Back	1cm		476	817.9	23.65	24.00	1.084	-0.01	0.742	0.804
60	CDMA BC10	RC3 SO32	Back	1cm		580	820.5	23.70	24.00	1.072	0.01	0.767	0.822
61	CDMA BC10	RC3 SO32	Back	1cm	V	684	823.1	23.80	24.00	1.047	0.03	0.626	0.656
62	CDMA BC10	RETAP 4096	Back	1cm	V	684	823.1	23.81	24.00	1.045	0.001	0.532	0.556
13	CDMA BC1	RC3 SO32	Front	1cm		1175	1908.75	24.03	24.50	1.114	0.07	0.649	0.723
14	CDMA BC1	RC3 SO32	Back	1cm		1175	1908.75	24.03	24.50	1.114	-0.04	0.792	0.883
15	CDMA BC1	RC3 SO32	Back	1cm		25	1851.25	23.98	24.50	1.127	0.07	0.76	0.857
16	CDMA BC1	RC3 SO32	Back	1cm		600	1880	23.99	24.50	1.125	-0.01	0.784	0.882
17	CDMA BC1	RC3 SO32	Back	1cm	V	1175	1908.75	24.03	24.50	1.114	-0.03	0.807	0.899
18	CDMA BC1	RC3 SO32	Back	1cm	V	25	1851.25	23.98	24.50	1.127	0.14	0.759	0.856
19	CDMA BC1	RC3 SO32	Back	1cm	V	600	1880	23.99	24.50	1.125	0.09	0.802	0.902
21	CDMA BC1	RETAP 4096	Back	1cm	V	1175	1908.75	24.00	24.50	1.122	-0.09	0.825	0.926
20	CDMA BC1	RETAP 4096	Back	1cm	V	25	1851.25	23.97	24.50	1.130	0.001	0.782	0.884
22	**CDMA BC1**	**RETAP 4096**	**Back**	**1cm**	**V**	**600**	**1880**	**23.98**	**24.50**	**1.127**	**0.02**	**0.826**	**0.931**

Note:

1. Between the front and back without headset mode and pick up worst position to test with headset mode.
2. "V" in the Headset column means the Headset is plugged during SAR testing.

<LTE>

Plot No.	Band	BW [MHz]	Mode	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)
81	LTE Band 25	10M	QPSK 1RB 0offset	Front	1cm		26365	1882.5	22.86	23	1.033	0.11	0.201	0.208
82	LTE Band 25	10M	QPSK 25RB 0offset	Front	1cm		26090	1855	21.99	22	1.002	0.07	0.193	0.193
83	**LTE Band 25**	**10M**	**QPSK 1RB 0offset**	**Back**	**1cm**		**26365**	**1882.5**	**22.86**	**23**	**1.033**	**-0.14**	**0.791**	**0.817**
94	LTE Band 25	10M	QPSK 1RB 0offset	Back	1cm		26090	1855	22.84	23	1.038	-0.09	0.776	0.805
95	LTE Band 25	10M	QPSK 1RB 0offset	Back	1cm		26640	1910	22.76	23	1.057	0.11	0.585	0.618
84	LTE Band 25	10M	QPSK 25RB 0offset	Back	1cm		26090	1855	21.99	22	1.002	-0.02	0.711	0.713
99	LTE Band 25	10M	QPSK 50RB 0offset	Back	1cm		26090	1855	21.91	22	1.021	-0.03	0.653	0.667
93	LTE Band 25	10M	QPSK 1RB 0offset	Back	1cm	V	26365	1882.5	22.86	23	1.033	0.04	0.758	0.783
96	LTE Band 25	10M	QPSK 1RB 0offset	Back	1cm	V	26090	1855	22.84	23	1.038	-0.03	0.786	0.815
97	LTE Band 25	10M	QPSK 1RB 0offset	Back	1cm	V	26640	1910	22.76	23	1.057	-0.17	0.686	0.725
98	LTE Band 25	10M	QPSK 50RB 0offset	Back	1cm	V	26090	1855	21.91	22	1.021	-0.07	0.717	0.732

Note:

1. Per KDB 941225 D05v02, when reported SAR of 1RB and 50%RB allocation for QPSK ≤0.8W/kg, and 100%RB with QPSK output power is less than 1RB and 50%RB, 100%RB allocation for QPSK is not required.
2. Per KDB 941225 D05v02, when reported SAR of 1RB and 50%RB allocation for QPSK >0.8W/kg for any exposure position, SAR testing of 100%RB allocation for QPSK is performed at the highest power channel.
3. 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the *reported* SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02, 16QAM SAR testing is not required.
4. Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the *reported* SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02, smaller bandwidth SAR testing is not required
5. "V" in the Headset column means the Headset is plugged during SAR testing.
6. Between the front and back without headset mode and pick up worst position to test with headset mode.

<WLAN>

Plot No.	Band	Mode	Data Rate	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)
116	WLAN 2.4GHz	802.11b	1Mbps	Front	1cm		1	2412	17.78	18	1.052	-0.02	0.086	0.090
117	**WLAN 2.4GHz**	**802.11b**	**1Mbps**	**Back**	**1cm**		**1**	**2412**	**17.78**	**18**	**1.052**	**-0.18**	**0.164**	**0.172**
122	WLAN 2.4GHz	802.11b	1Mbps	Back	1cm	V	1	2412	17.78	18	1.052	0.09	0.139	0.146
100	WLAN 5.2GHz	802.11a	6Mbps	Front	1cm		40	5200	12.39	12.5	1.026	-0.11	0.00577	0.006
101	WLAN 5.2GHz	802.11a	6Mbps	Back	1cm		40	5200	12.39	12.5	1.026	-0.14	0.01	0.010
102	**WLAN 5.2GHz**	**802.11a**	**6Mbps**	**Back**	**1cm**	**V**	**40**	**5200**	**12.39**	**12.5**	**1.026**	**-0.11**	**0.015**	**0.016**
103	WLAN 5.3GHz	802.11a	6Mbps	Front	1cm		56	5280	12.64	13	1.086	0.01	0.022	0.025
104	**WLAN 5.3GHz**	**802.11a**	**6Mbps**	**Back**	**1cm**		**56**	**5280**	**12.64**	**13**	**1.086**	**-0.19**	**0.024**	**0.027**
105	WLAN 5.3GHz	802.11a	6Mbps	Back	1cm	V	56	5280	12.64	13	1.086	-0.06	0.019	0.022
106	WLAN 5.5GHz	802.11a	6Mbps	Front	1cm		108	5540	12.68	13	1.078	-0.01	0.017	0.019
107	WLAN 5.5GHz	802.11a	6Mbps	Back	1cm		108	5540	12.68	13	1.078	0.05	0.035	0.040
108	**WLAN 5.5GHz**	**802.11a**	**6Mbps**	**Back**	**1cm**	**V**	**108**	**5540**	**12.68**	**13**	**1.078**	**0.01**	**0.036**	**0.041**
109	WLAN 5.8GHz	802.11a	6Mbps	Front	1cm		165	5825	12.23	12.5	1.065	-0.124	0.00744	0.009
110	WLAN 5.8GHz	802.11a	6Mbps	Back	1cm		165	5825	12.23	12.5	1.065	-0.121	0.021	0.023
115	**WLAN 5.8GHz**	**802.11a**	**6Mbps**	**Back**	**1cm**	**V**	**165**	**5825**	**12.23**	**12.5**	**1.065**	**-0.16**	**0.025**	**0.028**

Note:

1. "V" in the Headset column means the Headset is plugged during SAR testing.
2. Between the front and back without headset mode and pick up worst position to test with headset mode.

11.4 Repeated SAR Measurement

Plot No.	Band	BW (MHz)	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Tune-up Scaled 1g SAR
76	LTE Band 25	10M	QPSK 1RB 0offset	Left Tilted	1cm	26090	1855	22.84	23	1.038	0.04	1.03	1.069
75	LTE Band 25	10M	QPSK 1RB 0offset	Left Tilted	1cm	26090	1855	22.84	23	1.038	0.12	1.01	1.048
43	CDMA BC0	-	RTAP 153.6	Back	1cm	777	848.31	23.76	24	1.057	0.02	0.901	0.952
143	CDMA BC0	-	RTAP 153.6	Back	1cm	777	848.31	23.76	24	1.057	-0.1	0.857	0.906
58	CDMA BC10	-	RC3 SO32	Back	1cm	684	823.1	23.80	24.00	1.047	0.02	0.833	0.872
63	CDMA BC10	-	RC3 SO32	Back	1cm	684	823.1	23.80	24.00	1.047	-0.02	0.842	0.882
22	CDMA BC1	-	RETAP 4096	Back	1cm	600	1880	23.98	24.50	1.127	0.02	0.826	0.931
23	CDMA BC1	-	RETAP 4096	Back	1cm	600	1880	23.98	24.50	1.127	0.129	0.868	0.978

Note:

1. Per KDB 865664 D01v01, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg
2. Per KDB 865664 D01v01, if the deviation among the repeated measurement is ≤20% and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The deviation is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

11.5 Highest SAR Plot

Plot No.	Band	BW (MHz)	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
76	LTE Band 25	10MHz	QPSK 1RB 0offset	Left Tilted		26090	1855	22.84	23	1.038	0.04	1.03	1.069
83	LTE Band 25	10MHz	QPSK 1RB 0offset	Back	1cm	26365	1882.5	22.86	23	1.033	-0.14	0.791	0.817
31	CDMA BC0		RETAP4096	Right Cheek		384	836.52	23.75	24	1.059	-0.01	0.35	0.371
43	CDMA BC0		RTAP 153.6	Back	1cm	777	848.31	23.76	24	1.057	0.02	0.901	0.952
32	CDMA BC10		RC3 SO55	Right Cheek		684	823.1	23.83	24	1.040	0.03	0.314	0.327
63	CDMA BC10		RC3 SO32	Back	1cm	684	823.1	23.80	24	1.047	-0.02	0.842	0.882
5	CDMA BC1		RETAP4096	Left Cheek		1175	1908.75	24.00	24.50	1.122	-0.02	0.575	0.645
23	CDMA BC1		RETAP 4096	Back	1cm	600	1880	23.98	24.5	1.127	0.129	0.868	0.978
139	WLAN 2.4GHz		802.11b	Right Cheek		1	2412	17.78	18	1.052	0.11	0.354	0.372
117	WLAN 2.4GHz		802.11b	Back		1	2412	17.78	18	1.052	0.05	0.164	0.172
124	WLAN 5.2GHz		802.11a	Right Tilted		40	5200	12.39	12.5	1.048	-0.158	0.023	0.025
102	WLAN 5.2GHz		802.11a	Back	1cm	40	5200	12.39	12.5	1.026	-0.11	0.015	0.016
127	WLAN 5.3GHz		802.11a	Right Cheek		56	5280	12.64	13	1.048	-0.16	0.04	0.046
104	WLAN 5.3GHz		802.11a	Back	1cm	56	5280	12.64	13	1.086	-0.19	0.024	0.027
132	WLAN 5.5GHz		802.11a	Right Tilted		108	5540	12.68	13	1.048	0.02	0.077	0.087
108	WLAN 5.5GHz		802.11a	Back	1cm	108	5540	12.68	13	1.078	0.01	0.036	0.041
135	WLAN 5.8GHz		802.11a	Right Cheek		165	5825	12.23	12.5	1.048	-0.149	0.075	0.084
115	WLAN 5.8GHz		802.11a	Back	1cm	165	5825	12.23	12.5	1.065	-0.16	0.025	0.028

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/2

#76_LTE Band 25_10M_QPSK 1RB 0offset_Left Tilted_Ch26090

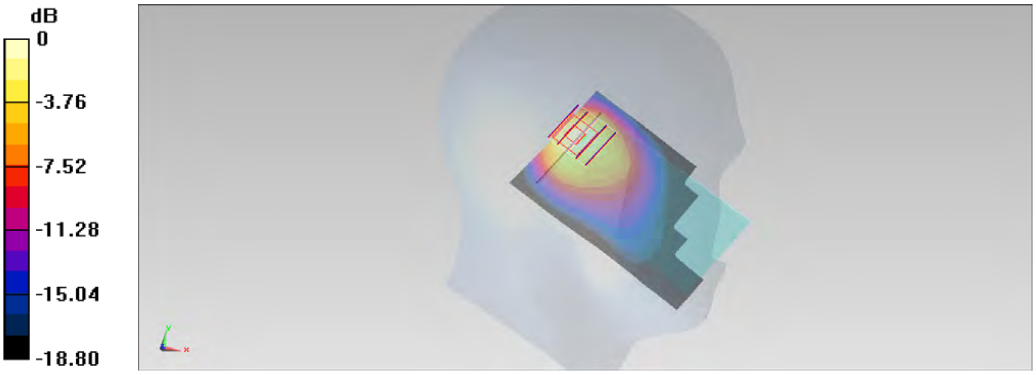
DUT: 2O2633

Communication System: LTE; Frequency: 1855 MHz;Duty Cycle: 1:1
Medium: HSL_1900_121202 Medium parameters used: f = 1855 MHz; σ = 1.387 mho/m; ε_r = 39.036; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch26090/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.33 mW/g

Configuration/Ch26090/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.485 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 2.041 mW/g
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.540 mW/g
Maximum value of SAR (measured) = 1.31 mW/g



0 dB = 1.31 mW/g = 2.35 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/3

#83_LTE Band 25_10M_QPSK 1RB 0offset_Back_1cm_Ch26365

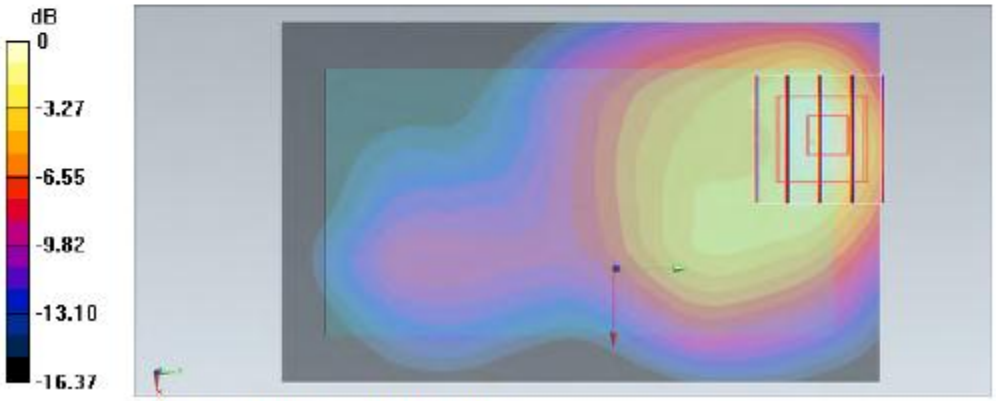
DUT: 2O2633

Communication System: LTE; Frequency: 1882.5 MHz;Duty Cycle: 1:1
Medium: MSL_1900_121203 Medium parameters used : f = 1882.5 MHz; σ = 1.53 mho/m; ε_r = 52.036;
ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch26365/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.991 mW/g

Configuration/Ch26365/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.745 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 1.406 mW/g
SAR(1 g) = 0.791 mW/g; SAR(10 g) = 0.414 mW/g
Maximum value of SAR (measured) = 0.944 mW/g



0 dB = 0.944 mW/g = -0.50 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/1

#31_CDMA BC0_RETAP4096_Right Cheek_Ch384

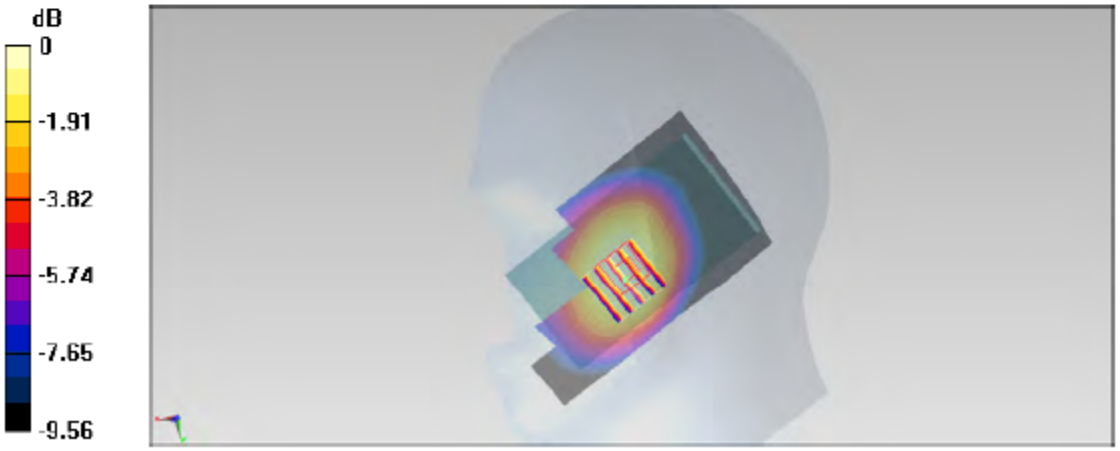
DUT: 2O2633

Communication System: CDMA ; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: HSL_850_121201 Medium parameters used: f = 837 MHz; σ = 0.902 mho/m; ε_r = 40.227; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch384/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.384 mW/g

Configuration/Ch384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.204 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.439 mW/g
SAR(1 g) = 0.350 mW/g; SAR(10 g) = 0.264 mW/g
Maximum value of SAR (measured) = 0.381 mW/g



0 dB = 0.381 mW/g = -8.38 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/1

#43_CDMA BC0_RTAP 153.6_Back_1cm_Ch777

DUT: 2O2633

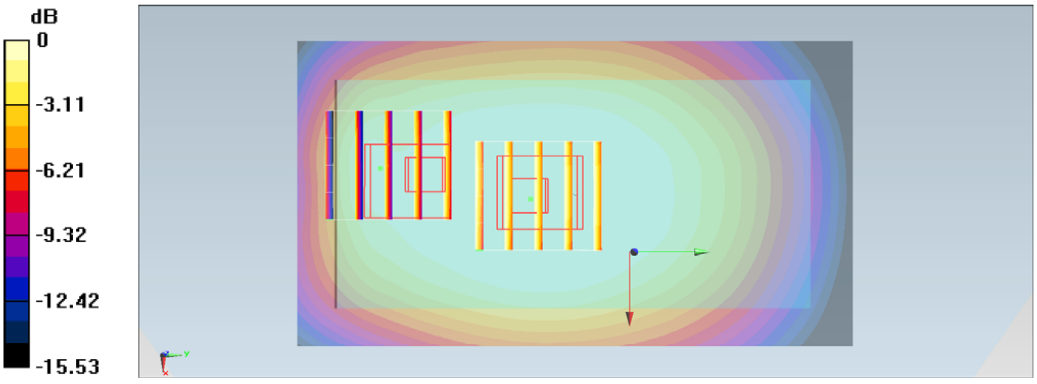
Communication System: CDMA ; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: MSL_850_121201 Medium parameters used: f = 848.31 MHz; σ = 0.981 mho/m; ε_r = 54.488; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch777/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.994 mW/g

Configuration/Ch777/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.725 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.131 mW/g
SAR(1 g) = 0.901 mW/g; SAR(10 g) = 0.683 mW/g
Maximum value of SAR (measured) = 0.983 mW/g

Configuration/Ch777/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.725 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.910 mW/g
SAR(1 g) = 0.615 mW/g; SAR(10 g) = 0.404 mW/g
Maximum value of SAR (measured) = 0.772 mW/g



0 dB = 0.772 mW/g = -2.25 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/2

#32_CDMA BC10_RC3 SO55_Right Cheek_Ch684

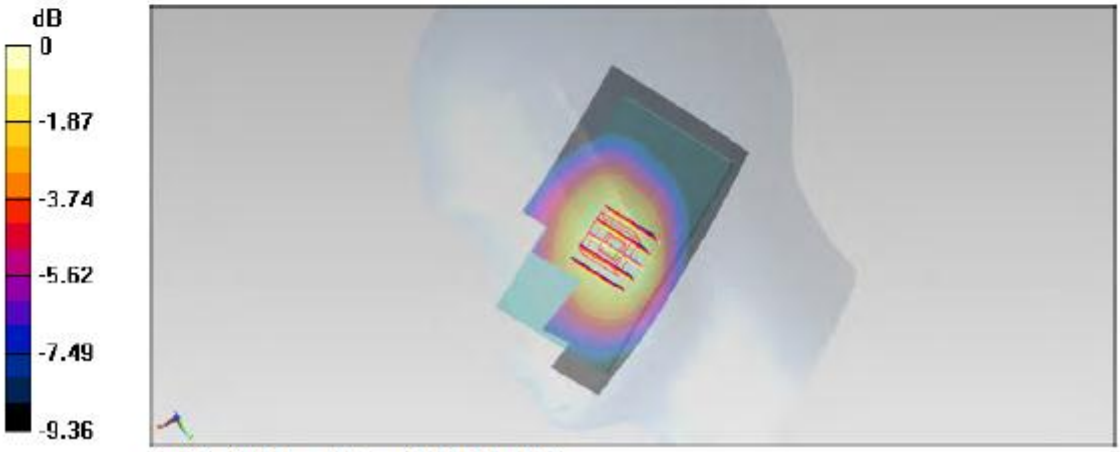
DUT: 2O2633

Communication System: CDMA ; Frequency: 823.1 MHz;Duty Cycle: 1:1
Medium: HSL_850_121202 Medium parameters used : f = 823.1 MHz; σ = 0.934 mho/m; ε_r = 41.342; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch684/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.338 mW/g

Configuration/Ch684/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.691 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.390 mW/g
SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.238 mW/g
Maximum value of SAR (measured) = 0.341 mW/g



0 dB = 0.341 mW/g = -9.34 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/2

#63_CDMA BC10_RC3 SO32_Back_1cm_Ch684

DUT: 2O2633

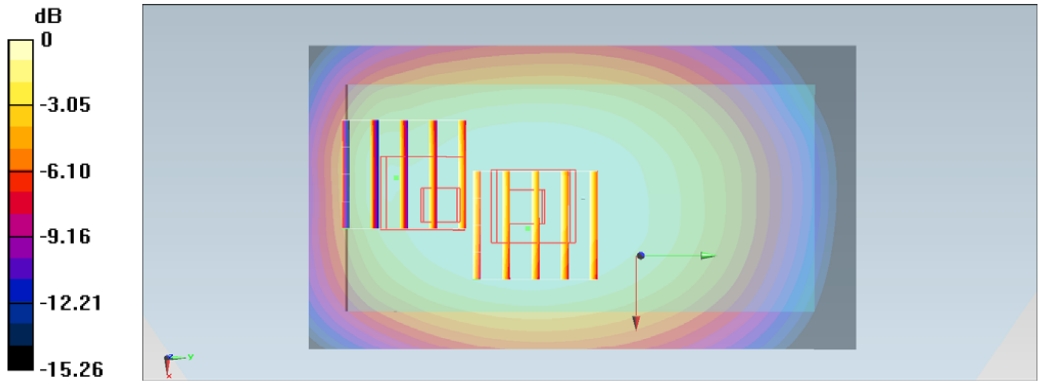
Communication System: CDMA ; Frequency: 823.1 MHz;Duty Cycle: 1:1
Medium: MSL_850_121202 Medium parameters used : f = 823.1 MHz; σ = 0.987 mho/m; ε_r = 54; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch684/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.929 mW/g

Configuration/Ch684/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.492 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.059 mW/g
SAR(1 g) = 0.842 mW/g; SAR(10 g) = 0.638 mW/g
Maximum value of SAR (measured) = 0.916 mW/g

Configuration/Ch684/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.492 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.932 mW/g
SAR(1 g) = 0.651 mW/g; SAR(10 g) = 0.426 mW/g
Maximum value of SAR (measured) = 0.795 mW/g



0 dB = 0.795 mW/g = -1.99 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/11/30

#05_CDMA BC1_RETAP4096_Left Cheek_Ch1175

DUT: 2O2633

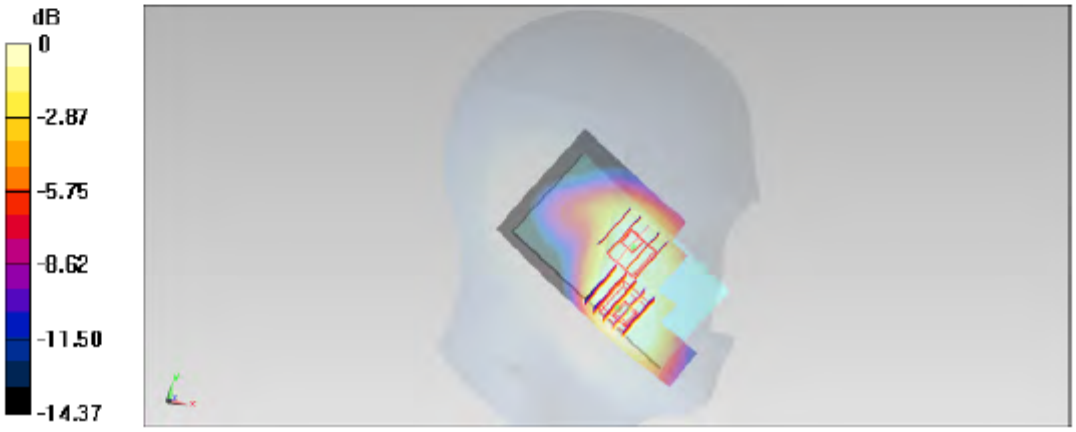
Communication System: CDMA ; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium: HSL_1900_121130 Medium parameters used: f = 1909 MHz; σ = 1.398 mho/m; ε_r = 40.12; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch1175/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.714 mW/g

Configuration/Ch1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.532 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.908 mW/g
SAR(1 g) = 0.575 mW/g; SAR(10 g) = 0.356 mW/g
Maximum value of SAR (measured) = 0.684 mW/g

Configuration/Ch1175/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.532 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.578 mW/g
SAR(1 g) = 0.398 mW/g; SAR(10 g) = 0.268 mW/g
Maximum value of SAR (measured) = 0.452 mW/g



0 dB = 0.452 mW/g = -6.90 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/1

#23_CDMA BC1_RETAP 4096_Back_1cm_Ch600;Headset

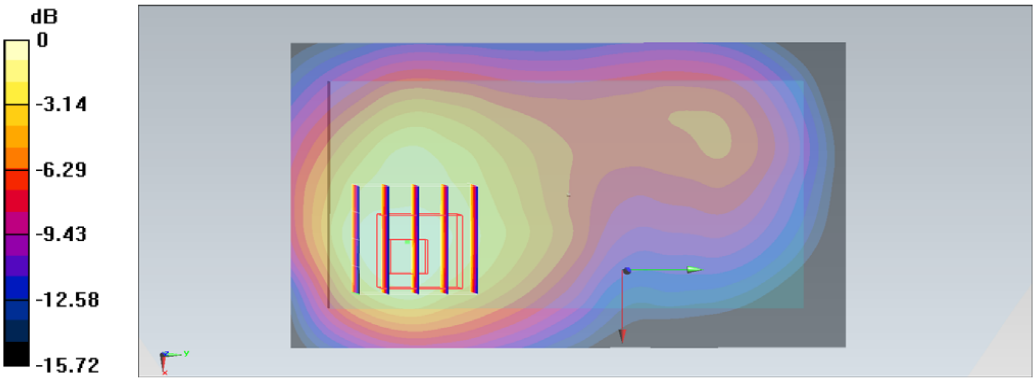
DUT: 2O2633

Communication System: CDMA ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900_121201 Medium parameters used: f = 1880 MHz; σ = 1.515 mho/m; ε_r = 54.657; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch600/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.05 mW/g

Configuration/Ch600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.752 V/m; Power Drift = 0.129 dB
Peak SAR (extrapolated) = 1.546 mW/g
SAR(1 g) = 0.868 mW/g; SAR(10 g) = 0.501 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



0 dB = 1.04 mW/g = 0.34 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/5

#139_WLAN2.4G_802.11b_Right Cheek_Ch1

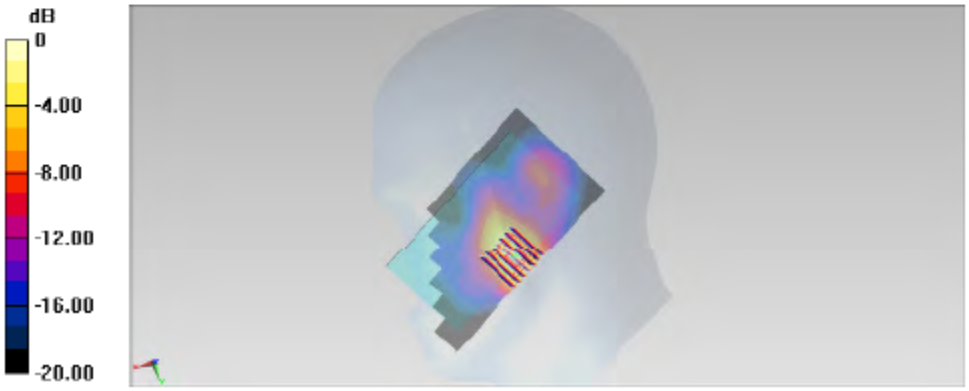
DUT: 2O2633

Communication System: 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: HSL_2450_121205 Medium parameters used: f = 2412 MHz; σ = 1.792 mho/m; ε_r = 37.743; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.45, 4.45, 4.45); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch1/Area Scan (71x131x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.459 mW/g

Configuration/Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.909 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.779 mW/g
SAR(1 g) = 0.354 mW/g; SAR(10 g) = 0.167 mW/g
Maximum value of SAR (measured) = 0.473 mW/g



0 dB = 0.473 mW/g = -6.50 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/6

#124_WLAN5G_802.11a_Right Tilted_Ch40

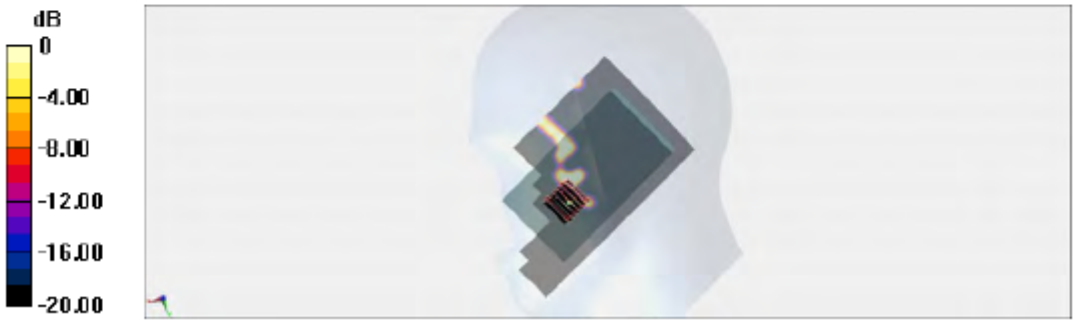
DUT: 2O2633

Communication System: 802.11a; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: HSL_5G_121206 Medium parameters used: f = 5200 MHz; σ = 4.687 mho/m; ε_r = 37.2; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(4.86, 4.86, 4.86); Calibrated: 2012/9/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: SAM RIGHT; Type: SAM; Serial: 1719
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch40/Area Scan (101x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.62 mW/g

Configuration/Ch40/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 8.563 V/m; Power Drift = -0.158 dB
Peak SAR (extrapolated) = 1.786 mW/g
SAR(1 g) = 0.023 mW/g; SAR(10 g) = 0.002 mW/g
Maximum value of SAR (measured) = 0.481 mW/g



0 dB = 0.481 mW/g = -6.36 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/5

#102_WLAN5G_802.11a_Back_1cm_Ch40;Headset

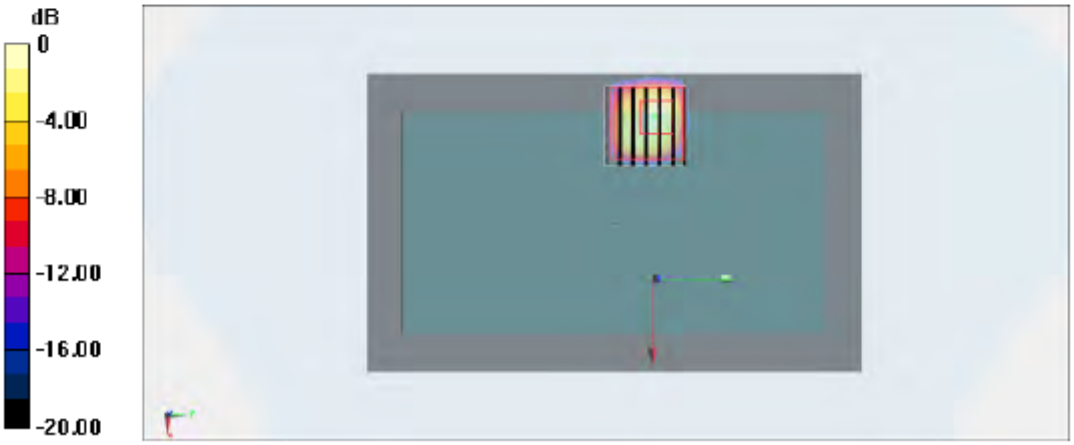
DUT: 2O2633

Communication System: 802.11a; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: MSL_5G_121205 Medium parameters used: f = 5200 MHz; σ = 5.244 mho/m; ε_r = 47.499; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(4.29, 4.29, 4.29); Calibrated: 2012/9/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: SAM RIGHT; Type: SAM; Serial: 1719
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch40/Area Scan (91x151x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.0435 mW/g

Configuration/Ch40/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 3.407 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.101 mW/g
SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00329 mW/g
Maximum value of SAR (measured) = 0.0502 mW/g



0 dB = 0.0502 mW/g = -25.99 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/6

#127_WLAN5G_802.11a_Right Cheek_Ch56

DUT: 2O2633

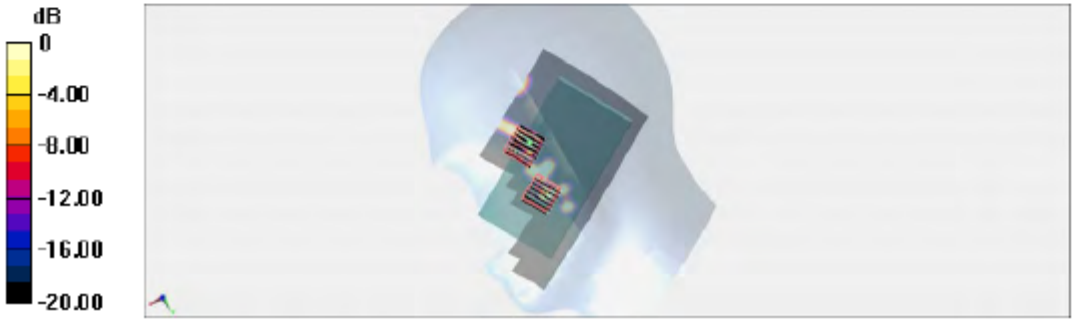
Communication System: 802.11a; Frequency: 5280 MHz;Duty Cycle: 1:1
Medium: HSL_5G_121206 Medium parameters used : f = 5280 MHz; σ = 4.787 mho/m; ε_r = 37.034; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃； Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(4.86, 4.86, 4.86); Calibrated: 2012/9/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: SAM RIGHT; Type: SAM; Serial: 1719
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch56/Area Scan (101x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 2.43 mW/g

Configuration/Ch56/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 8.641 V/m; Power Drift = -0.160 dB
Peak SAR (extrapolated) = 1.386 mW/g
SAR(1 g) = 0.040 mW/g; SAR(10 g) = 0.00762 mW/g
Maximum value of SAR (measured) = 0.849 mW/g

Configuration/Ch56/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 8.641 V/m; Power Drift = -0.160 dB
Peak SAR (extrapolated) = 1.285 mW/g
SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.00395 mW/g
Maximum value of SAR (measured) = 0.537 mW/g



0 dB = 0.537 mW/g = -5.40 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/5

#104_WLAN5G_802.11a_Back_1cm_Ch56

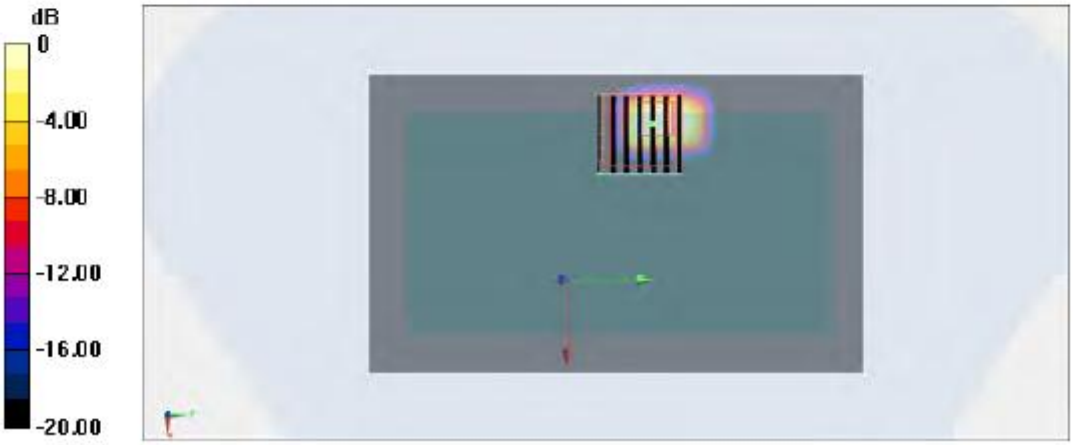
DUT: 2O2633

Communication System: 802.11a; Frequency: 5280 MHz;Duty Cycle: 1:1
Medium: MSL_5G_121205 Medium parameters used: f = 5280 MHz; σ = 5.339 mho/m; ε_r = 47.286; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(4.29, 4.29, 4.29); Calibrated: 2012/9/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: SAM RIGHT; Type: SAM; Serial: 1719
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch56/Area Scan (91x151x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.175 mW/g

Configuration/Ch56/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 4.273 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.183 mW/g
SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.00516 mW/g
Maximum value of SAR (measured) = 0.0816 mW/g



0 dB = 0.0816 mW/g = -21.77 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/6

#132_WLAN5G_802.11a_Right Tilted_Ch108

DUT: 2O2633

Communication System: 802.11a; Frequency: 5540 MHz;Duty Cycle: 1:1
Medium: HSL_5G_121206 Medium parameters used: f = 5540 MHz; σ = 5.105 mho/m; ε_r = 36.513; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(4.6, 4.6, 4.6); Calibrated: 2012/9/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: SAM RIGHT; Type: SAM; Serial: 1719
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch108/Area Scan (101x151x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 3.36 mW/g

Configuration/Ch108/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.535 mW/g
SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.018 mW/g
Maximum value of SAR (measured) = 1.43 mW/g

Configuration/Ch108/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.324 mW/g
SAR(1 g) = 0.045 mW/g; SAR(10 g) = 0.00784 mW/g
Maximum value of SAR (measured) = 0.906 mW/g

0 dB = 0.906 mW/g = -0.86 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/5

#108_WLAN5G_802.11a_Back_1cm_Ch108;Headset

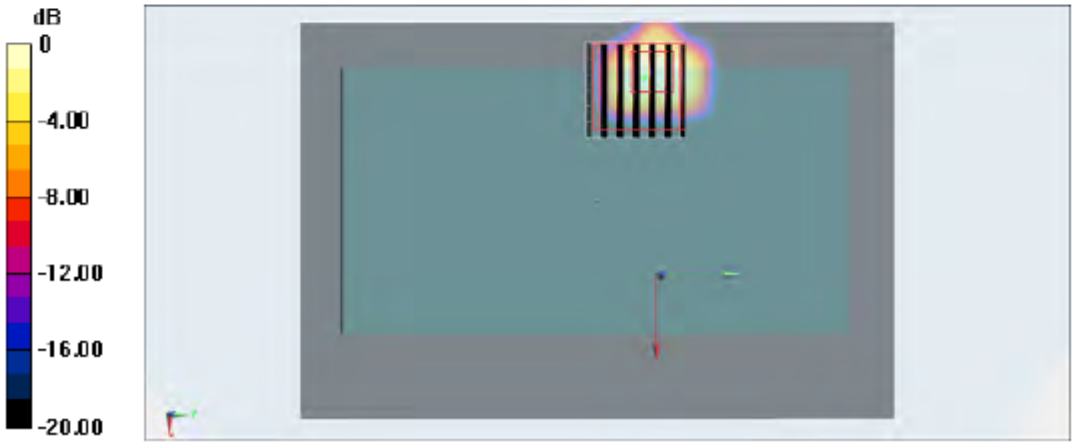
DUT: 2O2633

Communication System: 802.11a; Frequency: 5540 MHz;Duty Cycle: 1:1
Medium: MSL_5G_121205 Medium parameters used: f = 5540 MHz; σ = 5.696 mho/m; ε_r = 46.942; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃； Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(3.91, 3.91, 3.91); Calibrated: 2012/9/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: SAM RIGHT; Type: SAM; Serial: 1719
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch108/Area Scan (101x151x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.179 mW/g

Configuration/Ch108/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 4.916 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.238 mW/g
SAR(1 g) = 0.036 mW/g; SAR(10 g) = 0.00695 mW/g
Maximum value of SAR (measured) = 0.120 mW/g



0 dB = 0.120 mW/g = -18.42 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/6

#135_WLAN5G_802.11a_Right Cheek_Ch165

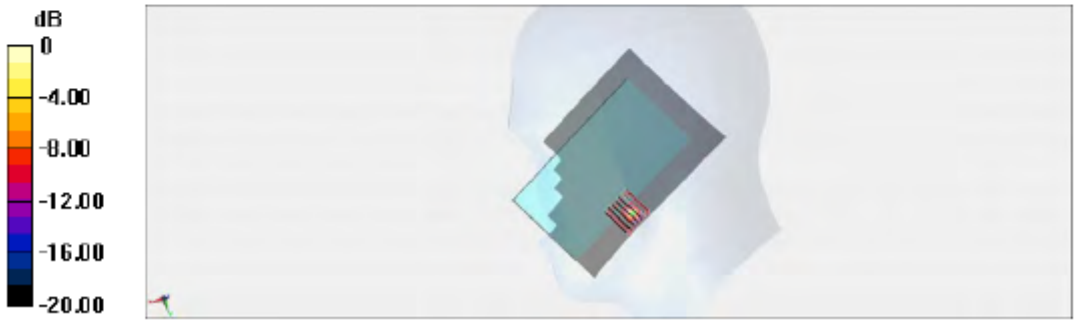
DUT: 2O2633

Communication System: 802.11a; Frequency: 5825 MHz;Duty Cycle: 1:1
Medium: HSL_5G_121206 Medium parameters used : f = 5825 MHz; σ = 5.467 mho/m; ε_r = 35.932; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(4.28, 4.28, 4.28); Calibrated: 2012/9/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: SAM RIGHT; Type: SAM; Serial: 1719
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch165/Area Scan (101x151x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.266 mW/g

Configuration/Ch165/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 5.882 V/m; Power Drift = -0.149 dB
Peak SAR (extrapolated) = 0.394 mW/g
SAR(1 g) = 0.075 mW/g; SAR(10 g) = 0.016 mW/g
Maximum value of SAR (measured) = 0.200 mW/g



0 dB = 0.200 mW/g = -13.98 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/5

#115_WLAN5G_802.11a_Back_1cm_Ch165_Headset

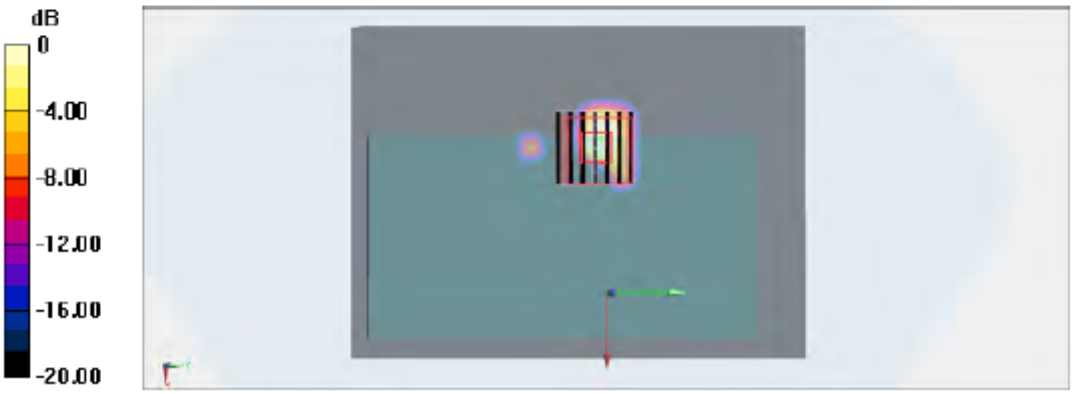
DUT: 2O2633

Communication System: 802.11a; Frequency: 5825 MHz;Duty Cycle: 1:1
Medium: MSL_5G_121205 Medium parameters used : f = 5825 MHz; σ = 6.193 mho/m; ε_r = 46.405; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃； Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(4.06, 4.06, 4.06); Calibrated: 2012/9/28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: SAM RIGHT; Type: SAM; Serial: 1719
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch165/Area Scan (111x151x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.198 mW/g

Configuration/Ch165/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 5.553 V/m; Power Drift = -0.160 dB
Peak SAR (extrapolated) = 0.337 mW/g
SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.00616 mW/g
Maximum value of SAR (measured) = 0.0782 mW/g



0 dB = 0.0782 mW/g = -22.14 dB mW/g

11.6 Simultaneous Multi-band Transmission Analysis

No.	Applicable Simultaneous Transmission Combination
1.	CDMA2000(voice) +LTE (data) + BT
2.	CDMA2000(voice) +LTE (data) +WLAN (router)
3.	LTE (data) +WLAN (router)
4.	EVDO (data) +WLAN (router)
5.	CDMA2000(voice) + BT
6.	CDMA2000(voice) +WLAN (data)

Note:

1. 2.4GHz WLAN and BT share the same antenna, and cannot transmit simultaneously.
2. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, they will not transmit simultaneously.
3. By design, WLAN 5.2GHz/5.3GHz/5.5GHz does not support mobile hotspot operation
4. The Scaled SAR summation is calculated based on the same configuration and test position.
5. For simultaneous transmission at head and body-worn exposure positions, 3 transmitters simultaneous transmission was analyzed to cover 2 transmitters simultaneous transmission compliance.
6. No power reduction is implemented for SAR compliance, SAR was tested at maximum RF power.
7. 1xRTT and EVDO share the same antenna, and no SVDO feature in this device
8. Simultaneous transmission analysis for hotspot mode 1cm separation to the body represents the compliance for hand-held and near-body use conditions. Simultaneous transmission of Hotspot mode for head and body-worn conditions was covered under simultaneous transmission analysis of head and body-worn positions, due to the possible WWAN voice call and data transmission SAR was considered in standalone SAR measurement for those exposure positions.
9. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v05 based on the formula below.
   i) (*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)]·[$\sqrt{f(GHz)/x}$] W/kg for *test separation distances* ≤ 50 mm; where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
   ii) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the *test separation distances* is > 50 mm.

Wireless Interface	Max. Power	Estimated SAR (W/kg)	
		Head 0cm gap	Body 1cm gap
Bluetooth	8 dBm	0.265 W/kg	0.132 W/kg

10. Per KDB 447498 D01v05, simultaneous transmission SAR is compliant if,
    i) Scalar SAR summation < 1.6W/kg
    ii) SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*), and the peak separation distance is determined from the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the zoom scan
    If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary
    iii) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg

<Head >

Position	WWAN			LTE WWAN			WLAN 2.4GHz		3 TX SAR summation (W/kg)	Note	Case No.
	WWAN Band	Plot No	Max. Reported SAR (W/kg)	WWAN Band	Plot No	Max. Reported SAR (W/kg)	Plot No	Max. Reported SAR (W/kg)			
Right Cheek	CDMA BC0	31	0.371	LTE Band 25	64	0.555	139	0.372	**1.30**		
	CDMA BC10	32	0.327	LTE Band 25	64	0.555	139	0.372	**1.25**		
	CDMA BC1	1	0.55	LTE Band 25	64	0.555	139	0.372	**1.48**		
Right Tilted	CDMA BC0	28	0.222	LTE Band 25	69	0.97	140	0.149	**1.34**		
	CDMA BC10	33	0.209	LTE Band 25	69	0.97	140	0.149	**1.33**		
	CDMA BC1	2	0.196	LTE Band 25	69	0.97	140	0.149	**1.32**		
Left Cheek	CDMA BC0	29	0.347	LTE Band 25	71	0.675	141	0.326	**1.35**		
	CDMA BC10	34	0.322	LTE Band 25	71	0.675	141	0.326	**1.32**		
	CDMA BC1	5	0.645	LTE Band 25	71	0.675	141	0.326	**1.65**	**Cube 0**	**#1**
	CDMA BC1	5	0.447	LTE Band 25	71	0.675	141	0.326	**1.45**	**Cube 1**	
Left Tilted	CDMA BC0	30	0.247	LTE Band 25	76	1.069	142	0.129	**1.45**		
	CDMA BC10	35	0.232	LTE Band 25	76	1.069	142	0.129	**1.43**		
	CDMA BC1	4	0.255	LTE Band 25	76	1.069	142	0.129	**1.45**		

Position	WWAN			LTE WWAN			WLAN 5GHz		3 TX SAR summation (W/kg)	Note
	WWAN Band	Plot No	Max. Reported SAR (W/kg)	WWAN Band	Plot No	Max. Reported SAR (W/kg)	Plot No	Max. Reported SAR (W/kg)		
Right Cheek	CDMA BC0	31	0.371	LTE Band 25	64	0.555	135	0.084	**1.01**	
	CDMA BC10	32	0.327	LTE Band 25	64	0.555	135	0.084	**0.97**	
	CDMA BC1	1	0.55	LTE Band 25	64	0.555	135	0.084	**1.19**	
Right Tilted	CDMA BC0	28	0.222	LTE Band 25	69	0.97	132	0.087	**1.28**	
	CDMA BC10	33	0.209	LTE Band 25	69	0.97	132	0.087	**1.27**	
	CDMA BC1	2	0.196	LTE Band 25	69	0.97	132	0.087	**1.25**	
Left Cheek	CDMA BC0	29	0.347	LTE Band 25	71	0.675	137	0.018	**1.04**	
	CDMA BC10	34	0.322	LTE Band 25	71	0.675	137	0.018	**1.02**	
	CDMA BC1	5	0.645	LTE Band 25	71	0.675	137	0.018	**1.34**	**Cube 0**
	CDMA BC1	5	0.447	LTE Band 25	71	0.675	137	0.018	**1.14**	**Cube 1**
Left Tilted	CDMA BC0	30	0.247	LTE Band 25	76	1.069	138	0.011	**1.33**	
	CDMA BC10	35	0.232	LTE Band 25	76	1.069	138	0.011	**1.31**	
	CDMA BC1	4	0.255	LTE Band 25	76	1.069	138	0.011	**1.34**	

Position	WWAN			LTE WWAN			BT	3 TX SAR summation (W/kg)
	WWAN Band	Plot No	Max. Reported SAR (W/kg)	WWAN Band	Plot No	Max. Reported SAR (W/kg)	Estimated SAR (W/kg)	
Right Cheek	CDMA BC0	31	0.371	LTE Band 25	64	0.555	0.265	**1.19**
	CDMA BC10	32	0.327	LTE Band 25	64	0.555	0.265	**1.15**
	CDMA BC1	1	0.55	LTE Band 25	64	0.555	0.265	**1.37**
Right Tilted	CDMA BC0	28	0.222	LTE Band 25	69	0.97	0.265	**1.46**
	CDMA BC10	33	0.209	LTE Band 25	69	0.97	0.265	**1.44**
	CDMA BC1	2	0.196	LTE Band 25	69	0.97	0.265	**1.43**
Left Cheek	CDMA BC0	29	0.347	LTE Band 25	71	0.675	0.265	**1.29**
	CDMA BC10	34	0.322	LTE Band 25	71	0.675	0.265	**1.26**
	CDMA BC1	5	0.645	LTE Band 25	71	0.675	0.265	**1.59**
	CDMA BC1	5	0.447	LTE Band 25	71	0.675	0.265	**1.39**
Left Tilted	CDMA BC0	30	0.247	LTE Band 25	76	1.069	0.265	**1.58**
	CDMA BC10	35	0.232	LTE Band 25	76	1.069	0.265	**1.57**
	CDMA BC1	4	0.255	LTE Band 25	76	1.069	0.265	**1.59**

<Hotspot>

Position	WWAN			WLAN 2.4GHz		2 TX SAR summation (W/kg)
	WWAN Band	Plot No	Max. Reported SAR (W/kg)	Plot No	Max. Reported SAR (W/kg)	
Front	CDMA BC0	37	0.623	116	0.09	**0.71**
	CDMA BC10	50	0.469	116	0.09	**0.56**
	CDMA BC1	6	0.721	116	0.09	**0.81**
	LTE Band 25	81	0.208	116	0.09	**0.30**
Back	CDMA BC0	43	**0.952**	117	**0.172**	**1.12**
	CDMA BC10	51	0.834	117	0.172	**1.01**
	CDMA BC1	7	0.874	117	0.172	**1.05**
	LTE Band 25	83	0.817	117	0.172	**0.99**
Left Side	CDMA BC0	39	0.612	-	-	**0.61**
	CDMA BC10	52	0.606	-	-	**0.61**
	CDMA BC1	24	0.305	-	-	**0.31**
	LTE Band 25	-	-	-	-	**0.00**
Right Side	CDMA BC0	40	0.645	119	0.105	**0.75**
	CDMA BC10	53	0.624	119	0.105	**0.73**
	CDMA BC1	25	0.137	119	0.105	**0.24**
	LTE Band 25	87	0.055	119	0.105	**0.16**
Top Side	CDMA BC0	-	-	-	-	**0.00**
	CDMA BC10	-	-	-	-	**0.00**
	CDMA BC1	-	-	-	-	**0.00**
	LTE Band 25	89	0.591	-	-	**0.59**
Bottom Side	CDMA BC0	41	0.081	-	-	**0.08**
	CDMA BC10	54	0.065	-	-	**0.07**
	CDMA BC1	26	0.472	-	-	**0.47**
	LTE Band 25	-	-	-	-	**0.00**

Remark:
Per KDB 447498 D01v05 4.3.2)1), the different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR. The highest SAR of each transmitter in the required exposure positions in KDB 941225 D06 was summed, 0.952+0.172 = 1.12W/kg and it's smaller than 1.6W/kg; therefore simultaneous transmission of WWAN and WLAN 2.4GHz in hotspot mode exposure positions is compliant.

Position	WWAN Band	WWAN Plot No	WWAN Max. Reported SAR (W/kg)	WLAN 5.8GHz Plot No	WLAN 5.8GHz Max. Reported SAR (W/kg)	2 TX SAR summation (W/kg)
Front	CDMA BC0	37	0.623	109	0.009	**0.63**
	CDMA BC10	50	0.469	109	0.009	**0.48**
	CDMA BC1	6	0.721	109	0.009	**0.73**
	LTE Band 25	81	0.208	109	0.009	**0.22**
Back	CDMA BC0	43	**0.952**	110	**0.023**	**0.98**
	CDMA BC10	51	0.834	110	0.023	**0.86**
	CDMA BC1	7	0.874	110	0.023	**0.90**
	LTE Band 25	83	0.817	110	0.023	**0.84**
Left Side	CDMA BC0	39	0.612			**0.61**
	CDMA BC10	52	0.606			**0.61**
	CDMA BC1	24	0.305			**0.31**
	LTE Band 25					**0.00**
Right Side	CDMA BC0	40	0.645	112	0.014	**0.66**
	CDMA BC10	53	0.624	112	0.014	**0.64**
	CDMA BC1	25	0.137	112	0.014	**0.15**
	LTE Band 25	87	0.055	112	0.014	**0.07**
Top Side	CDMA BC0					**0.00**
	CDMA BC10					**0.00**
	CDMA BC1					**0.00**
	LTE Band 25	89	0.591			**0.59**
Bottom Side	CDMA BC0	41	0.081			**0.08**
	CDMA BC10	54	0.065			**0.07**
	CDMA BC1	26	0.472			**0.47**
	LTE Band 25					**0.00**

Remark:

1. Per KDB 447498 D01v05 4.3.2)1), the different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR. The highest SAR of each transmitter in the required exposure positions in KDB 941225 D06 was summed, 0.952+0.023 = 0.975W/kg and it's smaller than 1.6W/kg; therefore simultaneous transmission of WWAN and WLAN 5.8GHz in hotspot mode exposure positions is compliant.

<Body-worn>

Position	WWAN			LTE			WLAN 2.4GHz		3 TX SAR summation (W/kg)	Note	Case No.
	WWAN Band	Plot No	Max. Reported SAR (W/kg)	WWAN Band	Plot No	Max. Reported SAR (W/kg)	Plot No	Max. Reported SAR (W/kg)			
Front	CDMA BC0	44	0.475	LTE Band 25	81	0.208	116	0.09	**0.77**		
	CDMA BC10	57	0.473	LTE Band 25	81	0.208	116	0.09	**0.77**		
	CDMA BC1	13	0.723	LTE Band 25	81	0.208	116	0.09	**1.02**		
Back	CDMA BC0	47	0.928	LTE Band 25	83	0.817	117	0.172	**1.92**	**Cube 0**	#2
	CDMA BC0	47	0.623	LTE Band 25	83	0.817	117	0.172	**1.61**	**Cube 1**	
	CDMA BC10	63	0.882	LTE Band 25	83	0.817	117	0.172	**1.87**	**Cube 0**	#3
	CDMA BC10	63	0.682	LTE Band 25	83	0.817	117	0.172	**1.67**	**Cube 1**	
	CDMA BC1	14	0.883	LTE Band 25	83	0.817	117	0.172	**1.87**	**Cube 0**	#4
	CDMA BC1	14	0.721	LTE Band 25	83	0.817	117	0.172	**1.71**	**Cube 1**	
Back (w/ Headset)	CDMA BC0	49	0.786	LTE Band 25	96	0.815	122	0.146	**1.75**		#5
	CDMA BC10	61	0.656	LTE Band 25	96	0.815	122	0.146	**1.62**	**Cube 0**	#6
	CDMA BC10	61	0.569	LTE Band 25	96	0.815	122	0.146	**1.53**	**Cube 1**	
	CDMA BC1	23	0.978	LTE Band 25	96	0.815	122	0.146	**1.94**		#7

Position	WWAN			LTE			WLAN 5GHz		3 TX SAR summation (W/kg)	Note	Case No.
	WWAN Band	Plot No	Max. Reported SAR (W/kg)	WWAN Band	Plot No	Max. Reported SAR (W/kg)	Plot No	Max. Reported SAR (W/kg)			
Front	CDMA BC0	44	0.475	LTE Band 25	81	0.208	103	0.025	**0.71**		
	CDMA BC10	57	0.473	LTE Band 25	81	0.208	103	0.025	**0.71**		
	CDMA BC1	13	0.723	LTE Band 25	81	0.208	103	0.025	**0.96**		
Back	CDMA BC0	47	0.928	LTE Band 25	83	0.817	107	0.04	**1.79**	**Cube 0**	#8
	CDMA BC0	47	0.623	LTE Band 25	83	0.817	107	0.04	**1.48**	**Cube 1**	
	CDMA BC10	63	0.882	LTE Band 25	83	0.817	107	0.04	**1.74**	**Cube 0**	#9
	CDMA BC10	63	0.682	LTE Band 25	83	0.817	107	0.04	**1.54**	**Cube 1**	
	CDMA BC1	14	0.883	LTE Band 25	83	0.817	107	0.04	**1.74**	**Cube 0**	#10
	CDMA BC1	14	0.721	LTE Band 25	83	0.817	107	0.04	**1.58**	**Cube 1**	
Back (w/ Headset)	CDMA BC0	49	0.786	LTE Band 25	96	0.815	**108**	**0.041**	**1.64**		#11
	CDMA BC10	61	0.656	LTE Band 25	96	0.815	**108**	**0.041**	**1.51**	**Cube 0**	
	CDMA BC10	61	0.569	LTE Band 25	96	0.815	**108**	**0.041**	**1.43**	**Cube 1**	
	CDMA BC1	23	0.978	LTE Band 25	96	0.815	**108**	**0.041**	**1.83**		#12

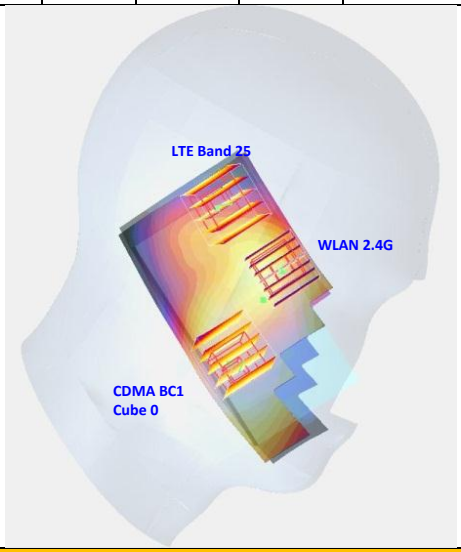
Position	WWAN			LTE			BT	3 TX SAR summation (W/kg)	Note	Case No.
	WWAN Band	Plot No	Max. Reported SAR (W/kg)	WWAN Band	Plot No	Max. Reported SAR (W/kg)	Estimated SAR (W/kg)			
Front	CDMA BC0	44	0.475	LTE Band 25	81	0.208	0.132	**0.82**		
	CDMA BC10	57	0.473	LTE Band 25	81	0.208	0.132	**0.81**		
	CDMA BC1	13	0.723	LTE Band 25	81	0.208	0.132	**1.06**		
Back	CDMA BC0	47	0.928	LTE Band 25	83	0.817	0.132	**1.88**		#13
	CDMA BC0	47	0.623	LTE Band 25	83	0.817	0.132	**1.57**		
	CDMA BC10	63	0.882	LTE Band 25	83	0.817	0.132	**1.83**		#14
	CDMA BC10	63	0.682	LTE Band 25	83	0.817	0.132	**1.63**		
	CDMA BC1	14	0.883	LTE Band 25	83	0.817	0.132	**1.83**		#15
	CDMA BC1	14	0.721	LTE Band 25	83	0.817	0.132	**1.67**		
Back (w/ Headset)	CDMA BC0	49	0.786	LTE Band 25	96	0.815	0.132	**1.73**		#16
	CDMA BC10	61	0.656	LTE Band 25	96	0.815	0.132	**1.60**	**Cube 0**	#17
	CDMA BC10	61	0.569	LTE Band 25	96	0.815	0.132	**1.52**	**Cube 1**	
	CDMA BC1	23	0.978	LTE Band 25	96	0.815	0.132	**1.93**		#18

Remark

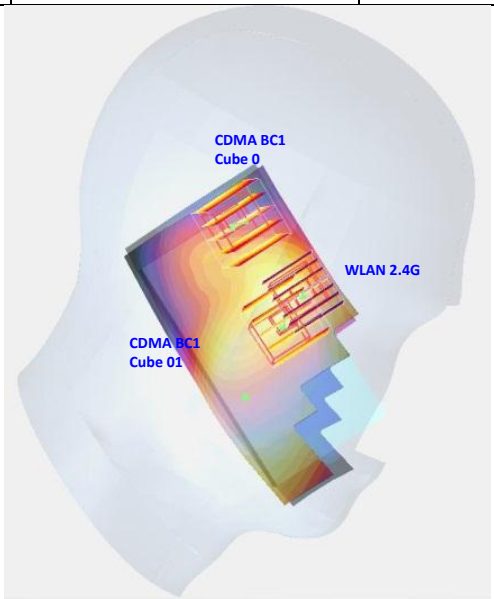
1. For SPLSR calculation Bluetooth SAR peak position is estimated using WLAN 2.4GHz peak location, due to the WLAN and Bluetooth shares the same RF trace to the same antenna, and the operational frequency range is the same.

11.7 Simultaneous analysis - SPLSR calculation

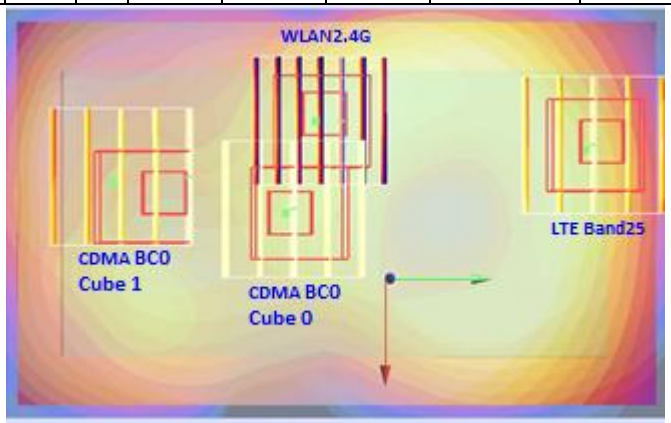
Case No	Cube 0											
#1	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#05	CDMA BC1	Left Cheek	0.645	0	0.0724	0.248	-0.168	92.0	1.32	0.02	Not required
	#71	LTE Band 25		0.675	0	0.0206	0.324	-0.171				
	#05	CDMA BC1	Left Cheek	0.645	0	0.0724	0.248	-0.168	61.2	0.97	0.02	Not required
	#141	WLAN 2.4GHz		0.326	0	0.0685	0.309	-0.17				
	#71	LTE Band 25	Left Cheek	0.675	0	0.0206	0.324	-0.171	50.2	1.00	0.02	Not required
	#141	WLAN 2.4GHz		0.326	0	0.0685	0.309	-0.17				



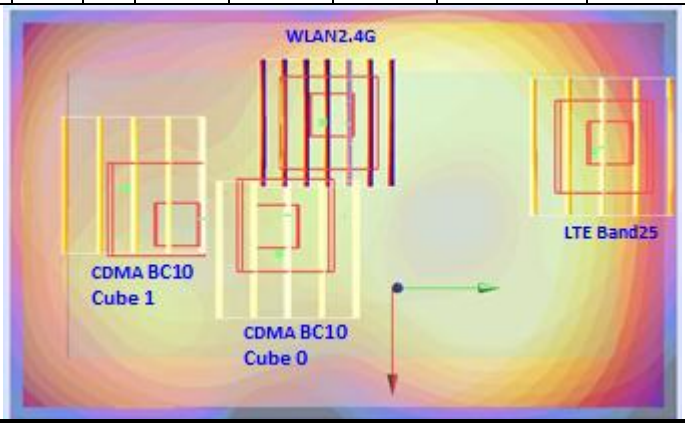
Cube 1					
Plot No	Band	Position	SAR (W/kg)	Pair SAR sum (W/kg)	Simultaneous SAR
#05	CDMA BC1	Left Cheek	0.447	1.448	Not required
#71	LTE Band 25		0.675		
#141	WLAN 2.4GHz		0.326		



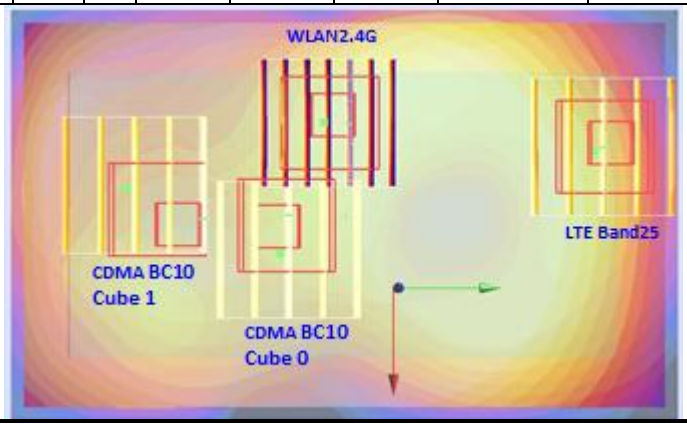
Case No.	Cube 0											
#2	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#47	CDMA BC0	Back	0.928	1	-0.018	-0.011	-0.203	72.1	1.75	0.03	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#47	CDMA BC0	Back	0.928	1	-0.018	-0.011	-0.203	30.3	1.10	0.04	Not required
	#117	WLAN 2.4G		0.172	1	-0.0374	0.0122	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	59.6	0.99	0.02	Not required
	#117	WLAN 2.4G		0.172	1	-0.0386	0.000191	-0.203				
	Cube 1											
	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#47	CDMA BC0	Back	0.623	1	-0.0255	-0.0355	-0.203	95.3	1.44	0.02	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#47	CDMA BC0	Back	0.623	1	-0.0255	-0.0355	-0.203	38.0	0.80	0.02	Not required
	#117	WLAN 2.4G		0.172	1	-0.0386	0.000191	-0.203				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	59.6	0.99	0.02	Not required
	#117	WLAN 2.4G		0.172	1	-0.0386	0.000191	-0.203				



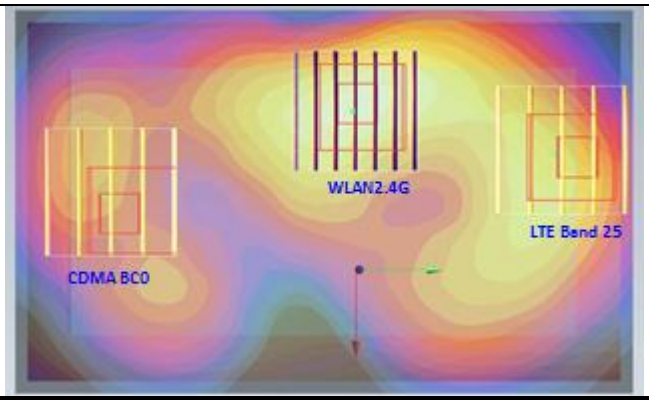
Case No.	Cube 0											
#3	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#63	CDMA BC10	Back	0.882	1	-0.017	-0.014	-0.203	75.2	1.70	0.03	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#63	CDMA BC10	Back	0.882	1	-0.017	-0.014	-0.203	33.3	1.05	0.03	Not required
	#117	WLAN 2.4G		0.172	1	-0.0374	0.0122	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	59.6	0.99	0.02	Not required
	#117	WLAN 2.4G		0.172	1	-0.0386	0.000191	-0.203				
	Cube 1											
	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#63	CDMA BC10	Back	0.682	1	-0.016	-0.034	-0.203	95.0	1.50	0.02	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#63	CDMA BC10	Back	0.682	1	-0.016	-0.034	-0.203	41.0	0.85	0.02	Not required
	#117	WLAN 2.4G		0.172	1	-0.0386	0.000191	-0.203				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	59.6	0.99	0.02	Not required
	#117	WLAN 2.4G		0.172	1	-0.0386	0.000191	-0.203				



Case No.	Cube 0											
#4	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#63	CDMA BC10	Back	0.882	1	-0.017	-0.014	-0.203	75.2	1.70	0.03	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#63	CDMA BC10	Back	0.882	1	-0.017	-0.014	-0.203	33.3	1.05	0.03	Not required
	#117	WLAN 2.4G		0.172	1	-0.0374	0.0122	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	59.6	0.99	0.02	Not required
	#117	WLAN 2.4G		0.172	1	-0.0386	0.000191	-0.203				
	Cube 1											
	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#63	CDMA BC10	Back	0.682	1	-0.016	-0.034	-0.203	95.0	1.50	0.02	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#63	CDMA BC10	Back	0.682	1	-0.016	-0.034	-0.203	41.0	0.85	0.02	Not required
	#117	WLAN 2.4G		0.172	1	-0.0386	0.000191	-0.203				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	59.6	0.99	0.02	Not required
	#117	WLAN 2.4G		0.172	1	-0.0386	0.000191	-0.203				

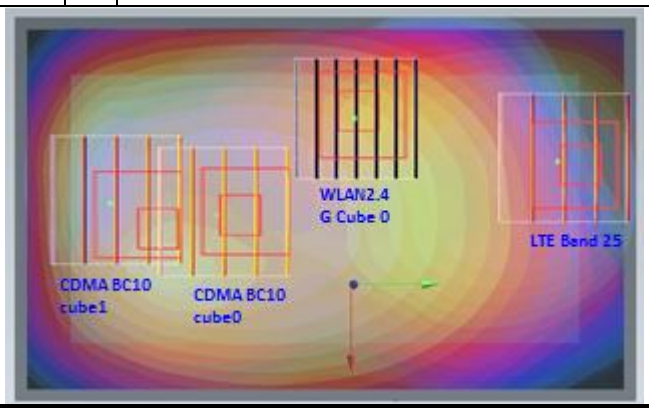


Case No.	Cube 0											
#5	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#49	CDMA BC0	Back (w/ Headset)	0.786	1	-0.0195	-0.0545	-0.203	114.6	1.60	0.02	Not required
	#96	LTE Band 25		0.815	1	-0.0315	0.0595	-0.204				
	#49	CDMA BC0	Back (w/ Headset)	0.786	1	-0.0195	-0.0545	-0.203	65.0	0.93	0.01	Not required
	#122	WLAN 2.4G		0.146	1	-0.0398	0.00721	-0.203				
	#96	LTE Band 25	Back (w/ Headset)	0.815	1	-0.0315	0.0595	-0.204	53.0	0.96	0.02	Not required
	#122	WLAN 2.4G		0.146	1	-0.0398	0.00721	-0.203				

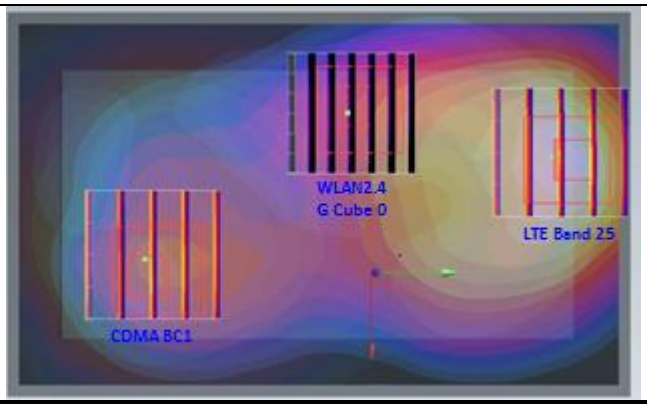


Case No.	Cube 0											
#6	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#61	CDMA BC10	Back (w/ Headset)	0.656	1	-0.0165	-0.026	-0.203	86.8	1.47	0.02	Not required
	#96	LTE Band 25		0.815	1	-0.0315	0.0595	-0.204				
	#61	CDMA BC10	Back (w/ Headset)	0.656	1	-0.0165	-0.026	-0.203	40.6	0.80	0.020	Not required
	#122	WLAN 2.4G		0.146	1	-0.0398	0.00721	-0.203				
	#96	LTE Band 25	Back (w/ Headset)	0.815	1	-0.0315	0.0595	-0.204	53.0	0.96	0.02	Not required
	#122	WLAN 2.4G		0.146	1	-0.0398	0.00721	-0.203				

Cube 1					
Plot No	Band	Position	SAR (W/kg)	Gap (cm)	Pair SAR sum (W/kg)	Simultaneous SAR
#61	CDMA BC10	Back (w/ Headset)	0.569	1	1.53	Not required
#96	LTE Band 25		0.815	1		
#122	WLAN 2.4G		0.146	1		

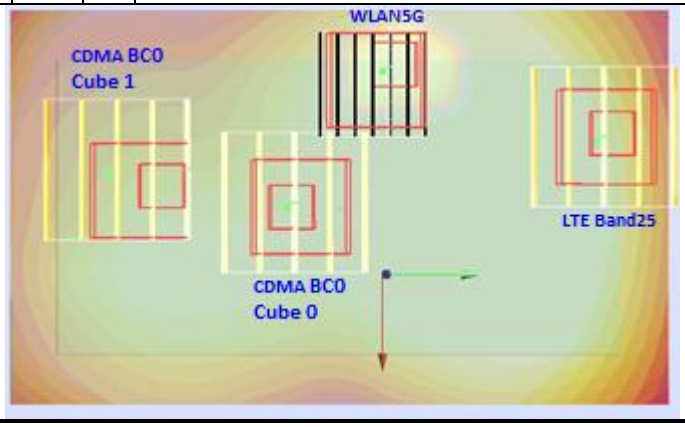


Case No.	Cube 0											
#7	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#23	CDMA BC1	Back (w/ Headset)	0.978	1	0.00352	-0.0425	-0.204	107.8	1.79	0.02	Not required
	#96	LTE Band 25		0.815	1	-0.0315	0.0595	-0.204				
	#23	CDMA BC1	Back (w/ Headset)	0.978	1	0.00352	-0.0425	-0.204	65.9	1.12	0.020	Not required
	#122	WLAN 2.4G		0.146	1	-0.0398	0.00721	-0.203				
	#96	LTE Band 25	Back (w/ Headset)	0.815	1	-0.0315	0.0595	-0.204	53.0	0.96	0.02	Not required
	#122	WLAN 2.4G		0.146	1	-0.0398	0.00721	-0.203				



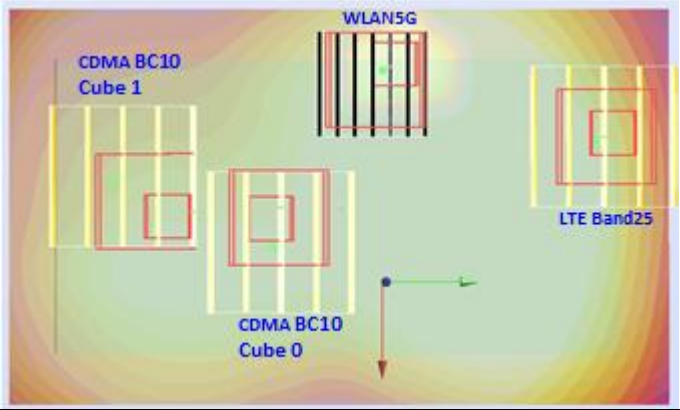
Case No.	Cube 0											
#8	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#47	CDMA BC0	Back	0.928	1	-0.018	-0.011	-0.203	72.1	1.75	0.03	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#47	CDMA BC0	Back	0.928	1	-0.018	-0.011	-0.203	38.1	0.97	0.030	Not required
	#107	WLAN5G		0.04	1	-0.049	0.011	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	51.1	0.86	0.02	Not required
	#107	WLAN5G		0.04	1	-0.049	0.011	-0.205				

Cube 1						
Plot No	Band	Position	SAR (W/kg)	Gap (cm)	Pair SAR sum (W/kg)	Simultaneous SAR
#47	CDMA BC0	Back	0.623	1	1.48	Not required
#83	LTE Band 25		0.817	1		
#107	WLAN5G		0.04	1		



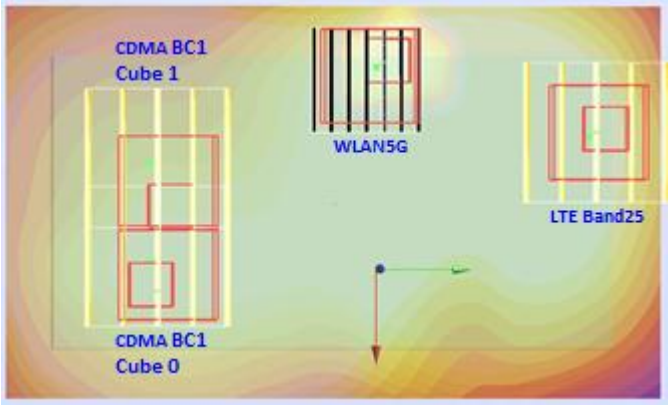
Case No.	Cube 0											
#9	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#63	CDMA BC10	Back	0.882	1	-0.017	-0.014	-0.203	75.2	1.70	0.03	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#63	CDMA BC10	Back	0.882	1	-0.017	-0.014	-0.203	40.7	0.92	0.020	Not required
	#107	WLAN5G		0.04	1	-0.049	0.011	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	51.1	0.86	0.02	Not required
	#107	WLAN5G		0.04	1	-0.049	0.011	-0.205				

Cube 1						
Plot No	Band	Position	SAR (W/kg)	Gap (cm)	Pair SAR sum (W/kg)	Simultaneous SAR
#63	CDMA BC10	Back	0.682	1	1.54	Not required
#83	LTE Band 25		0.817	1		
#107	WLAN5G		0.04	1		



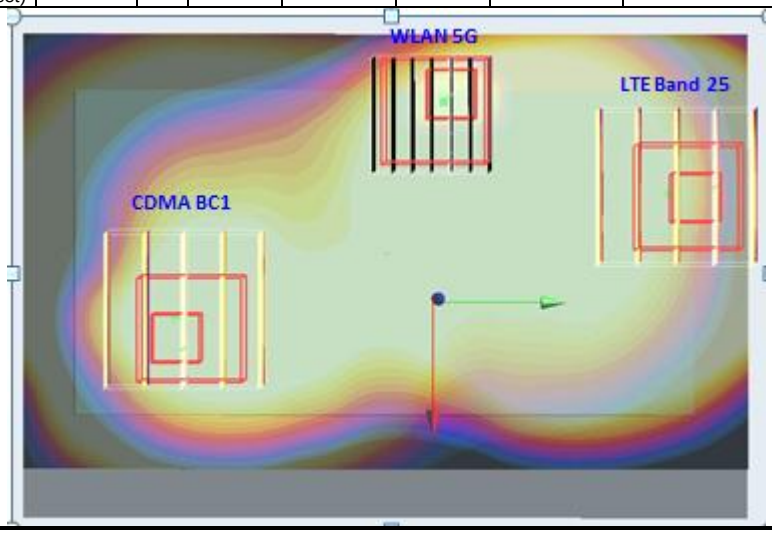
Case No.	Cube 0											
#10	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#14	CDMA BC1	Back	0.883	1	0.00354	-0.041	-0.204	106.9	1.70	0.02	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#14	CDMA BC1	Back	0.883	1	0.00354	-0.041	-0.204	73.9	0.92	0.010	Not required
	#107	WLAN5G		0.04	1	-0.049	0.011	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	51.1	0.86	0.02	Not required
	#107	WLAN5G		0.04	1	-0.049	0.011	-0.205				

Cube 1						
Plot No	Band	Position	SAR (W/kg)	Gap (cm)	Pair SAR sum (W/kg)	Simultaneous SAR
#14	CDMA BC1	Back	0.721	1	1.58	Not required
#83	LTE Band 25		0.817	1		
#107	WLAN5G		0.04	1		



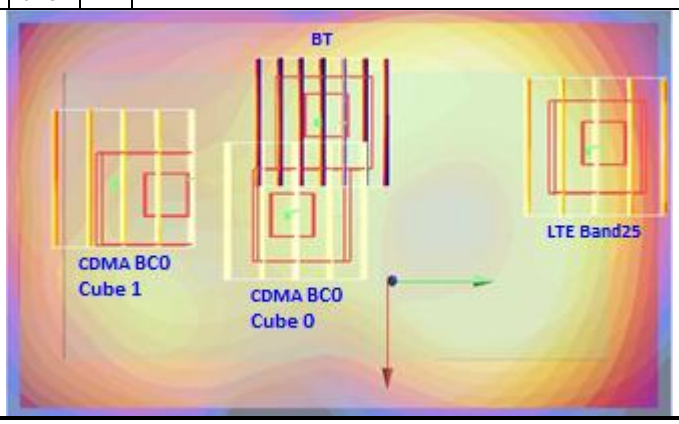
Case No #11	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
	#49	CDMA BC0	Back (w/ Headset)	0.786	1	-0.0195	-0.0545	-0.203	114.6	1.75	0.02	Not required
	#96	LTE Band 25		0.966	1	-0.0315	0.0595	-0.204				
	#49	CDMA BC0	Back (w/ Headset)	0.786	1	-0.0195	-0.0545	-0.203	73.7	0.83	0.010	Not required
	#108	WLAN 5GHz		0.039	1	-0.049	0.013	-0.205				
	#96	LTE Band 25	Back (w/ Headset)	0.966	1	-0.0315	0.0595	-0.204	49.7	1.01	0.02	Not required
	#108	WLAN 5GHz		0.039	1	-0.049	0.013	-0.205				

Case No #12	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
	#23	CDMA BC1	Back (w/ Headset)	0.978	1	0.00352	-0.0425	-0.204	107.8	1.79	0.02	Not required
	#96	LTE Band 25		0.815	1	-0.0315	0.0595	-0.204				
	#23	CDMA BC1	Back (w/ Headset)	0.978	1	0.00352	-0.0425	-0.204	76.4	1.02	0.010	Not required
	#108	WLAN 5GHz		0.041	1	-0.049	0.013	-0.205				
	#96	LTE Band 25	Back (w/ Headset)	0.815	1	-0.0315	0.0595	-0.204	49.7	0.86	0.02	Not required
	#108	WLAN 5GHz		0.041	1	-0.049	0.013	-0.205				

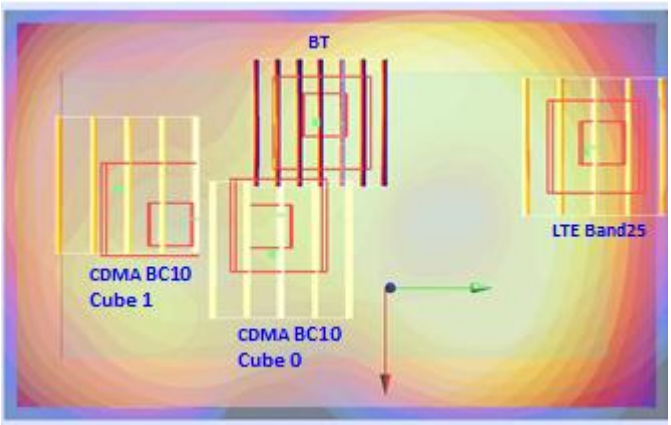


Case No.	Cube 0											
#13	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#47	CDMA BC0	Back	0.928	1	-0.018	-0.011	-0.203	72.1	1.75	0.03	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#47	CDMA BC0	Back	0.928	1	-0.018	-0.011	-0.203	30.3	1.06	0.036	Not required
		BT		0.132	1	-0.0374	0.0122	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	58.7	0.95	0.02	Not required
		BT		0.132	1	-0.0374	0.001	-0.205				

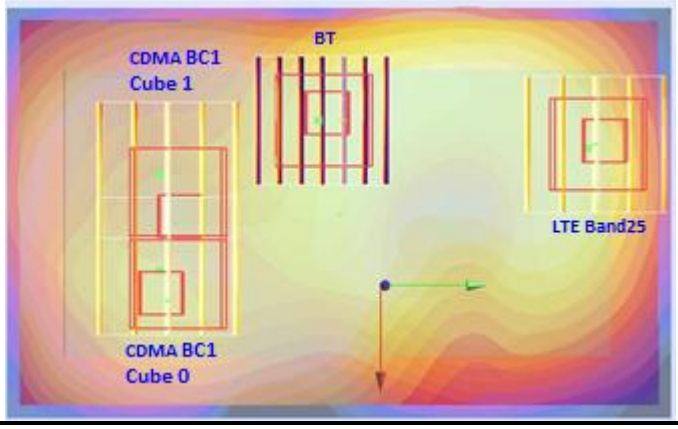
Cube 1						
Plot No	Band	Position	SAR (W/kg)	Gap (cm)	Pair SAR sum (W/kg)	Simultaneous SAR
#47	CDMA BC0	Back	0.623	1	1.57	Not required
#83	LTE Band 25		0.817	1		
	BT		0.132	1		



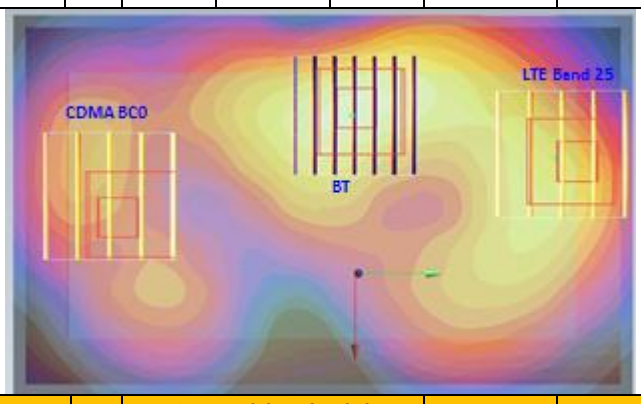
Case No.	Cube 0											
#14	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#63	CDMA BC10	Back	0.882	1	-0.017	-0.014	-0.203	75.2	1.70	0.03	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#63	CDMA BC10	Back	0.882	1	-0.017	-0.014	-0.203	33.3	1.01	0.031	Not required
		BT		0.132	1	-0.0374	0.0122	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	58.7	0.95	0.02	Not required
		BT		0.132	1	-0.0374	0.001	-0.205				
	Cube 1											
	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#63	CDMA BC10	Back	0.682	1	-0.016	-0.034	-0.203	95.0	1.50	0.02	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#63	CDMA BC10	Back	0.682	1	-0.016	-0.034	-0.203	41.1	0.81	0.020	Not required
		BT		0.132	1	-0.0374	0.001	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	58.7	0.95	0.02	Not required
		BT		0.132	1	-0.0374	0.001	-0.205				



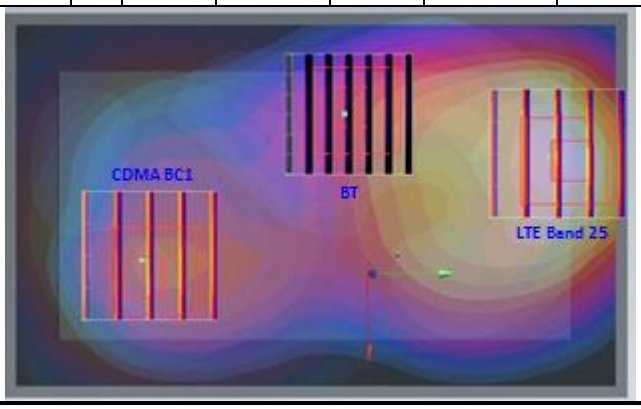
Case No.	Cube 0											
#15	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#14	CDMA BC1	Back	0.883	1	0.00354	-0.041	-0.204	106.9	1.70	0.02	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#14	CDMA BC1	Back	0.883	1	0.00354	-0.041	-0.204	58.7	1.02	0.020	Not required
		BT		0.132	1	-0.0374	0.001	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	58.7	0.95	0.02	Not required
		BT		0.132	1	-0.0374	0.001	-0.205				
	Cube 1											
	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#14	CDMA BC1	Back	0.721	1	-0.011	-0.041	-0.204	102.9	1.54	0.02	Not required
	#83	LTE Band 25		0.817	1	-0.0329	0.0595	-0.204				
	#14	CDMA BC1	Back	0.721	1	-0.011	-0.041	-0.204	49.6	0.85	0.020	Not required
		BT		0.132	1	-0.0374	0.001	-0.205				
	#83	LTE Band 25	Back	0.817	1	-0.0329	0.0595	-0.204	58.7	0.95	0.02	Not required
		BT		0.132	1	-0.0374	0.001	-0.205				



Case No #16	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#49	CDMA BC0	Back (w/ Headset)	0.786	1	-0.0195	-0.0545	-0.203	114.6	1.60	0.02	Not required
	#96	LTE Band 25		0.815	1	-0.0315	0.0595	-0.204				
	#49	CDMA BC0	Back (w/ Headset)	0.786	1	-0.0195	-0.0545	-0.203	65.0	0.92	0.010	Not required
		BT		0.132	1	-0.0398	0.00721	-0.203				
	#96	LTE Band 25	Back (w/ Headset)	0.815	1	-0.0315	0.0595	-0.204	53.0	0.95	0.02	Not required
		BT		0.132	1	-0.0398	0.00721	-0.203				

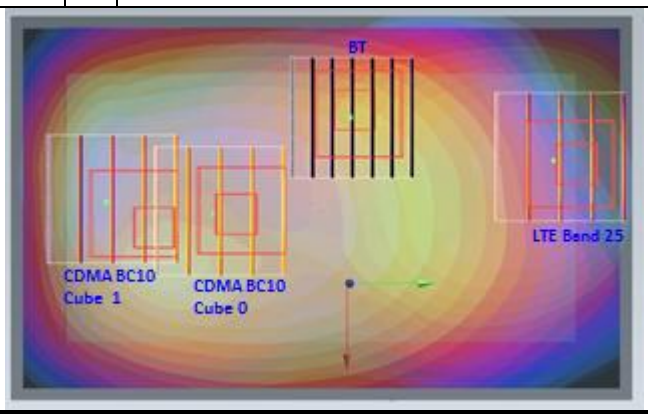


Case No #18	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#23	CDMA BC1	Back (w/ Headset)	0.978	1	0.00352	-0.0425	-0.204	107.8	1.79	0.02	Not required
	#96	LTE Band 25		0.815	1	-0.0315	0.0595	-0.204				
	#23	CDMA BC1	Back (w/ Headset)	0.978	1	0.00352	-0.0425	-0.204	65.9	1.11	0.020	Not required
		BT		0.132	1	-0.0398	0.00721	-0.203				
	#96	LTE Band 25	Back (w/ Headset)	0.815	1	-0.0315	0.0595	-0.204	53.0	0.95	0.02	Not required
		BT		0.132	1	-0.0398	0.00721	-0.203				



Case No.	Cube 0											
#17	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
	#61	CDMA BC10	Back (w/ Headset)	0.656	1	-0.0165	-0.026	-0.203	86.8	1.47	0.02	Not required
	#96	LTE Band 25		0.815	1	-0.0315	0.0595	-0.204				
	#61	CDMA BC10	Back (w/ Headset)	0.656	1	-0.0165	-0.026	-0.203	40.6	0.79	0.020	Not required
		BT		0.132	1	-0.0398	0.00721	-0.203				
	#96	LTE Band 25	Back (w/ Headset)	0.815	1	-0.0315	0.0595	-0.204	53.0	0.95	0.02	Not required
		BT		0.132	1	-0.0398	0.00721	-0.203				

Cube 1						
Plot No	Band	Position	SAR (W/kg)	Gap (cm)	Pair SAR sum (W/kg)	Simultaneous SAR
#61	CDMA BC10	Back (w/ Headset)	0.569	1	1.52	Not required
#96	LTE Band 25		0.815	1		
	BT		0.132	1		



Note:

1. If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.

Test Engineer： Michael Yang and Nick Yu

12. 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 12.1

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 12.1 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 shown in the following tables.

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 %	± 10.8 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 22.0 %**	**± 21.5 %**

Table 12.2 Uncertainty Budget of DASY for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.55	Normal	1	1	1	± 6.55 %	± 6.55 %
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	2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %
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	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Probe Positioning	9.9	Rectangular	√3	1	1	± 5.7 %	± 5.7 %
Max. SAR Eval.	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
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						± 12.8 %	± 12.6 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 25.6 %**	**± 25.2 %**

Table 12.3 Uncertainty Budget of DASY for frequency range 3 GHz to 6 GHz

13. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[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 v01r02, “SAR Measurement Procedures for 802.11 a/b/g Transmitters”, May 2007

[7] FCC KDB 447498 D01 v05, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, October 2012

[8] FCC KDB 648474 D04 v01, “SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas”, October 2012

[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 v02, “SAR Test Considerations for LTE Handsets and Data Modems”, October 24 2012

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

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Appendix B. Plots of SAR Measurement

The plots are shown as follows.

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.