FCC SAR Test Report

APPLICANT	:	**ZTE CORPORATION**
EQUIPMENT	:	**CDMA/LTE Multi-Mode Digital Mobile Phone**
BRAND NAME	:	**ZTE**
MODEL NAME	:	**ZTE N9810**
FCC ID	:	**Q78-ZTEN9810**
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 Jan. 24, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:

Jones Tsai / Manager

Testing Laboratory
1190

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

Table of Contents

1. Statement of Compliance **4**
2. Administration Data **6**
2.1 Testing Laboratory 6
2.2 Applicant 6
2.3 Manufacturer 6
2.4 Application Details 6
3. General Information **7**
3.1 Description of Equipment Under Test (EUT) 7
3.2 Maximum RF output power among production units 8
3.3 Product Photos 11
3.4 Applied Standard 11
3.5 Device Category and SAR Limits 11
3.6 Test Conditions 11
4. Specific Absorption Rate (SAR) **12**
4.1 Introduction 12
4.2 SAR Definition 12
5. SAR Measurement System **13**
5.1 E-Field Probe 14
5.2 Data Acquisition Electronics (DAE) 14
5.3 Robot 15
5.4 Measurement Server 15
5.5 Phantom 16
5.6 Device Holder 16
5.7 Data Storage and Evaluation 17
5.8 Test Equipment List 19
6. Tissue Simulating Liquids **20**
7. SAR System Verification **22**
7.1 Purpose of System Performance check 22
7.2 System Setup 22
7.3 SAR System Verification Results 23
8. EUT Testing Position **24**
8.1 Define two imaginary lines on the handset 24
8.2 Cheek Position 25
8.3 Tilted Position 25
8.4 Body Worn Position 26
9. Measurement Procedures **27**
9.1 Spatial Peak SAR Evaluation 27
9.2 Power Reference Measurement 28
9.3 Area & Zoom Scan Procedures 28
9.4 Volume Scan Procedures 29
9.5 SAR Averaged Methods 29
9.6 Power Drift Monitoring 29
10. Conducted RF Output Power (Unit: dBm) **30**
11. Exposure Positions Consideration **35**
12. SAR Test Results **37**
12.1 Test Records for Head SAR Test 37
12.2 Test Records for Hotspot SAR Test 39
12.3 Test Records for Body-worn SAR Test 41
12.4 Repeated SAR Measurement 43
12.5 Highest SAR Plot 44
12.6 Simultaneous Multi-band Transmission Analysis 51
12.7 Simultaneous analysis - SPLSR calculation 64
12.8 Volume scan test results 91
13. Uncertainty Assessment **92**
14. References **95**
Appendix A. Plots of System Performance Check
Appendix B. Plots of SAR Measurement
Appendix C. DASY Calibration Certificate

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA2D1804	Rev. 01	Initial issue of report	Feb. 19, 2013

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **ZTE CORPORATION CDMA/LTE Multi-Mode Digital Mobile Phone, ZTE N9810** are as follows.

<Highest Reported Standalone SAR Summary>

Exposure Position	Frequency Band	Highest Reported 1g-SAR (W/kg)	Equipment Class	Highest Reported 1g-SAR (W/kg)
Head	CDMA2000 BC0	0.44	PCE	1.38
	CDMA2000 BC1	0.24		
	CDMA2000 BC10	0.53		
	LTE Band 25	1.38		
	WLAN 2.4GHz, 2412~2462 MHz	0.26	DTS	0.26
	WLAN 5GHz, 5745~5805 MHz	0.15		
	WLAN 5GHz, 5180~5240 MHz	0.03	NII	0.03
Hotspot (1cm Gap)	CDMA2000 BC0	0.65	PCE	1.50
	CDMA2000 BC1	1.50		
	CDMA2000 BC10	0.66		
	LTE Band 25	1.32		
	WLAN 2.4GHz, 2412~2462 MHz	0.07	DTS	0.07
Body-worn (1cm Gap)	CDMA2000 BC0	0.57	PCE	1.32
	CDMA2000 BC1	1.30		
	CDMA2000 BC10	0.62		
	LTE Band 25	1.32		
	WLAN 2.4GHz, 2412~2462 MHz	0.07	DTS	0.34
	WLAN 5GHz, 5745~5805 MHz	0.34		
	WLAN 5GHz, 5180~5240 MHz	0.11	NII	0.11

<Highest Simultaneous transmission SAR>

Frequency Band	Equipment Class	Exposure Position	Highest Reported Simultaneous Transmission 1g-SAR (W/kg)
CDMA2000 BC0	PCE	Head	1.59
LTE Band 25			
WLAN 2.4GHz, 2412~2462 MHz	DTS		

Frequency Band	Equipment Class	Exposure Position	Highest Reported Simultaneous Transmission 1g-SAR (W/kg)
CDMA2000 BC1	PCE	Hotspot (1cm Gap)	1.54
Bluetooth	DSS		

Frequency Band	Equipment Class	Exposure Position	Highest Reported Simultaneous Transmission 1g-SAR (W/kg)
CDMA2000 BC1	PCE	Body Worn (1cm Gap)	1.58
LTE Band 25			
WLAN 2.4GHz, 2412~2462 MHz	DTS		

Remark:
The highest simultaneous transmission is scalar summation of reported standalone SAR per FCC KDB 690783 D01 v01r02. Simultaneous transmission SAR measurement is exempted according to the SPLSR analysis per KDB 447498 D01 v05.

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

2. Administration Data

2.1 Testing Laboratory

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

2.2 Applicant

Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

2.3 Manufacturer

Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

2.4 Application Details

Date of Start during the Test	Dec. 29, 2012
Date of End during the Test	Jan. 24, 2013

3. General Information

3.1 Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT	CDMA/LTE Multi-Mode Digital Mobile Phone
Brand Name	ZTE
Model Name	ZTE N9810
FCC ID	Q78-ZTEN9810
Tx Frequency	CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz CDMA2000 BC10: 817.90 MHz ~ 823.10 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz WLAN 2.4GHz: 2412 MHz ~ 2462 MHz WLAN 5GHz: 5180 MHz ~ 5240 MHz; 5745 MHz ~ 5805 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Antenna Type	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna NFC: Coil Antenna
HW Version	c9zB
SW Version	N9810V1.0.0B01
Uplink Modulations	CDMA2000 1xRTT: QPSK CDMA2000 1xEV-DO: 8PSK LTE: QPSK / 16QAM 802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth BDR (1Mbps): GFSK Bluetooth EDR (2Mbps): π /4-DQPSK Bluetooth EDR (3Mbps): 8-DPSK Bluetooth v4.0 - LE: GFSK NFC: ASK
Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

3.2 Maximum RF output power among production units

Maximum Average Power for Production Unit						
Band	CDMA BC0 (dBm)		CDMA BC1 (dBm)		CDMA BC10 (dBm)	
Mode	Normal	Reduced	Normal	Reduced	Normal	Reduced
1xRTT RC1 SO55	24.5	16.5	24	16.5	24.5	16.5
1xRTT RC3 SO55	24.5	16.5	24	16.5	24.5	16.5
1xRTT RC3 SO32(+ F-SCH)	24.5	16.5	24	16.5	24.5	16.5
1xRTT RC3 SO32(+SCH)	24.5	16.5	24	16.5	24.5	16.5
1xEV-DO Rev 0	24.5	16.5	24	16.5	24.5	16.5
1xEV-DO Rev A	24.5	16.5	24	16.5	24.5	16.5

LTE Band 25					
Modulation	BW (MHz)	RB size	Target MPR	Normal Power	Reduced Power
QPSK	10	≤ 12	0	24	18
QPSK	10	> 12	1	23	17
16QAM	10	≤ 12	1	23	17
16QAM	10	> 12	2	22	16
QPSK	5	≤ 8	0	24	18
QPSK	5	> 8	1	23	17
16QAM	5	≤ 8	1	23	17
16QAM	5	> 8	2	22	16
QPSK	3	≤ 4	0	24	18
QPSK	3	> 4	1	23	17
16QAM	3	≤ 4	1	23	17
16QAM	3	> 4	2	22	16
QPSK	1.4	≤ 5	0	24	18
QPSK	1.4	> 5	1	23	17
16QAM	1.4	≤ 5	1	23	17
16QAM	1.4	> 5	2	22	16

Remark:

1. By design, other RB configurations and higher-order modulation RF output power will never exceed maximum output power listed above, detailed information is included in “tune-up procedure” exhibit.
2. LTE MPR implementation is the same for normal mode and power reduction mode.

IEEE 802.11 maximum power(dBm)				
Mode/Band	a	b	g	n-HT20
WLAN 2.4GHz		14.5	14	13.5
WLAN 5GHz Band 1	7			7
WLAN 5GHz Band 4	15.5			15.5

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

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

FCC ID				Q78-ZTEN9810				
DUT Type				CDMA/LTE Digital Mobile Handset				
Operating Frequency Range of each LTE transmission band				Band 25: 1850.7 MHz ~ 1914.3 MHz				
Channel Bandwidth				Band 25: 1.4MHz, 3MHz, 5MHz, 10MHz				
Transmission (H, M, L) channel numbers and frequencies in each LTE band								
Band 25								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855
M	26365	1882.5	26365	1882.5	26365	1882.5	26365	1882.5
H	26683	1914.3	26675	1913.5	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 / antennas)				LTE owns standalone transmitter and antenna.				
LTE Voice / Data requirements				Data only				
LTE MPR permanently built-in by design				Yes, per 3GPP TS 36.101 v11.0.0				

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

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

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
Power reduction applied to satisfy SAR compliance	Yes, SVLTE mode (1xRTT and LTE simultaneously) power reduction.

The SVLTE operating mode, which means CDMA 1x RTT(voice) and LTE (data) transmitting simultaneously, the power reduction is implemented on this device and cannot be changed by end users or overridden by power control command from base stations.
The power reduction implementation is defined as following table.

CDMA2000 1x voice BC0/BC1/BC10	LTE data mode Band 25
P ≥ 16.5	18
P < 16.5	24

Table 3.1-A: Power Reduction Implementation (Unit: dBm)

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 447498 D01 v05
- FCC KDB 648474 D04v01
- FCC KDB 248227 D01 v01r02
- 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

3.6.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.6.2 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, and the transmission duty factor was monitored on the spectrum analyzer with zero-span setting

For WLAN SAR testing, WLAN engineering testing software installed on the EUT can provide continuous transmitting RF signal.

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

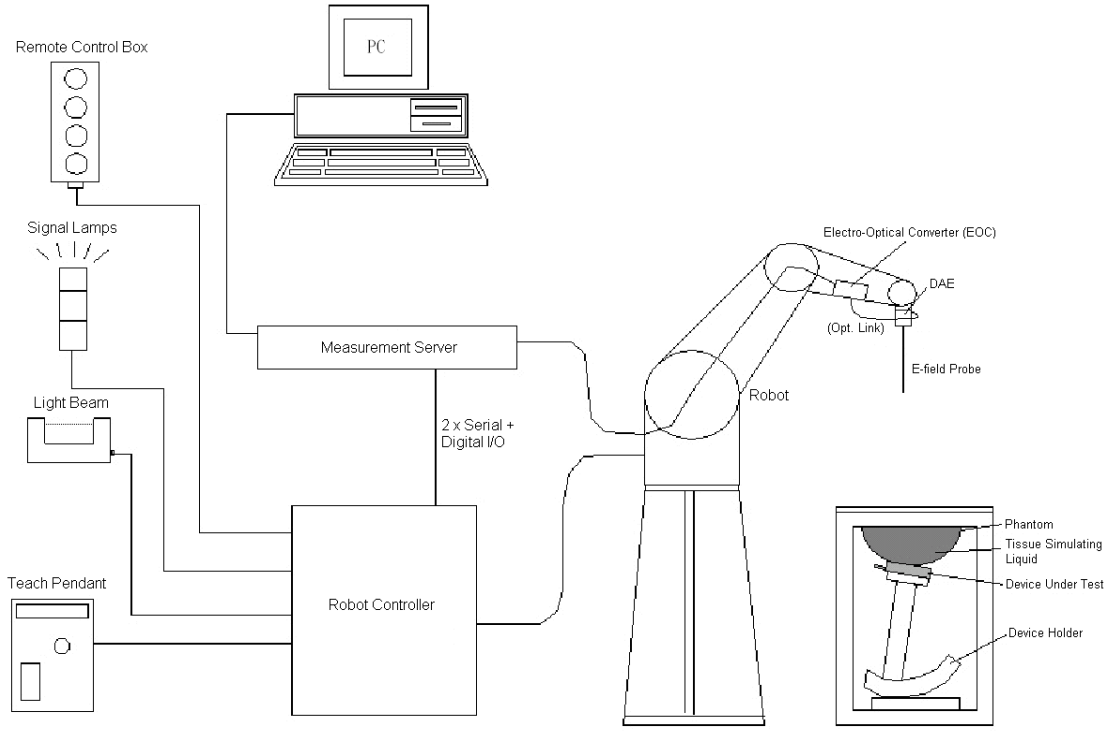


Fig 5.1 SPEAG DASY System Configurations

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

<EX3DV4 Probe>

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	 **Fig 5.2 Photo of EX3DV4**
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	

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 ± 0.25dB. The sensitivity parameters (NormX, NormY, and NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested. The calibration data can be referred to appendix C of this report.

5.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.3 Photo of DAE

5.3 Robot

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

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

Fig 5.4 Photo of DASY5

5.4 Measurement Server

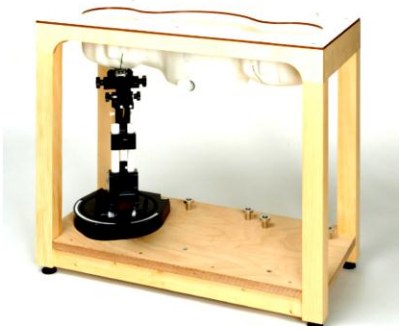
The measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5: 128 MB), RAM (DASY5: 128 MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface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

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

Fig 5.5 Photo of Server for DASY5

5.5 Phantom

<SAM Twin Phantom>

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

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

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 5.7 Device Holder

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	4d091	Nov. 18, 2011	Nov. 16, 2013
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	Nov. 21, 2011	Nov. 16, 2013
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 25, 2011	Jul. 24, 2013
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Dec. 11, 2012	Dec. 10, 2013
SPEAG	Data Acquisition Electronics	DAE4	1210	Dec. 05, 2012	Dec. 04, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	Jun. 20, 2012	Jun. 19, 2013
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1477	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1479	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201074235	Nov. 29, 2012	Nov. 28, 2013
Agilent	Wireless Communication Test Set	E5515C	MY48367160	Oct. 25, 2012	Oct. 24, 2013
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	Apr. 13, 2012	Apr. 12, 2013
R&S	Signal Generator	SMR40	100455	Dec. 29, 2012	Dec. 30 2013
Agilent	Power Meter	E4416A	MY45101555	Aug. 22, 2012	Aug. 21, 2013
Agilent	Power Sensor	E9327A	MY44421198	Aug. 22, 2012	Aug. 21, 2013
Woken	Attenuator 1	WK0602-XX	N/A	Note 4	
PE	Attenuator 2	PE7005-10	N/A	Note 4	
PE	Attenuator 3	PE7005- 3	N/A	Note 4	
Agilent	Dual Directional Coupler	778D	50422	Note 4	
Agilent	Dielectric Probe Kit	85070D	US01440205	Note 5	
AR	Power Amplifier	5S1G4M2	0328767	Note 6	
R&S	Spectrum Analyzer	FSP30	101399	Jun. 01, 2012	May 31, 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: 4d091, D1900V2, SN: 5d118, 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.
4. The Insertion Loss calibration of Dual Directional Coupler and Attenuator were characterized via the network analyzer and compensated during system check.
5. The dielectric probe kit was calibrated via the network analyzer, with the specified procedure (calibrated in pure water) and calibration kit (standard) short circuit, before the dielectric measurement. The specific procedure and calibration kit are provided by Agilent.
6. In system check we need to monitor the level on the power meter, and adjust the power amplifier level to have precise power level to the dipole; the measured SAR will be normalized to 1W input power according to the ratio of 1W to the input power to the dipole. For system check, the calibration of the power amplifier is deemed not critically required for correct measurement; the power meter is critical and we do have calibration for it
7. Attenuator 1 insertion loss is calibrated by the network Analyzer, which the calibration is valid, before system check.

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.

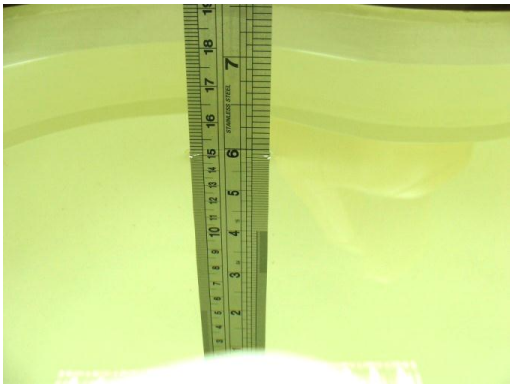


Fig 6.1 Photo of Liquid Height for Head SAR

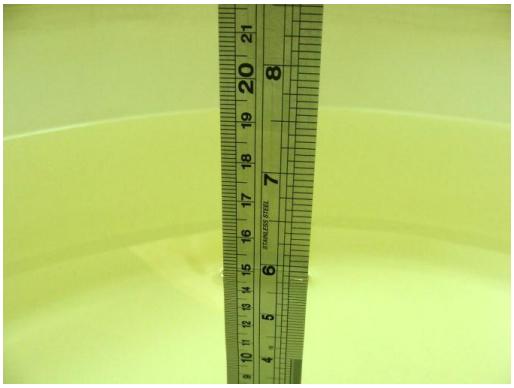


Fig 6.2 Photo of Liquid Height for Body SAR

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.

Frequency (MHz)	Liquid Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Head	21.5	0.885	41.087	0.9	41.5	-1.67	-1.00	±5	Dec. 29, 2012
1900	Head	21.2	1.423	39.002	1.4	40	1.64	-2.49	±5	Dec. 29, 2012
2450	Head	21.1	1.834	39.654	1.8	39.2	1.89	1.16	±5	Jan. 11, 2013
5200	Head	21.2	4.814	35.458	4.66	36	3.30	-1.51	±5	Jan. 22, 2013
5800	Head	21.2	5.423	34.346	5.27	35.3	2.90	-2.70	±5	Jan. 22, 2013
835	Body	21.3	0.979	54.09	0.97	55.2	0.93	-2.01	±5	Jan. 10, 2013
835	Body	21.2	0.98	54.478	0.97	55.2	1.03	-1.31	±5	Jan. 24, 2013
1900	Body	21.1	1.55	53.37	1.52	53.3	1.97	0.13	±5	Dec. 30, 2012
1900	Body	21.3	1.551	53.293	1.52	53.3	2.04	-0.01	±5	Jan. 24, 2013
2450	Body	21.4	1.939	53.98	1.95	52.7	-0.56	2.43	±5	Jan. 11, 2013
5200	Body	21.5	5.264	48.303	5.3	49	-0.68	-1.42	±5	Jan. 23, 2013
5800	Body	21.5	6.096	46.929	6	48.2	1.60	-2.64	±5	Jan. 23, 2013

Table 6.2 Measuring Results for Simulating Liquid

7. SAR System Verification

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:

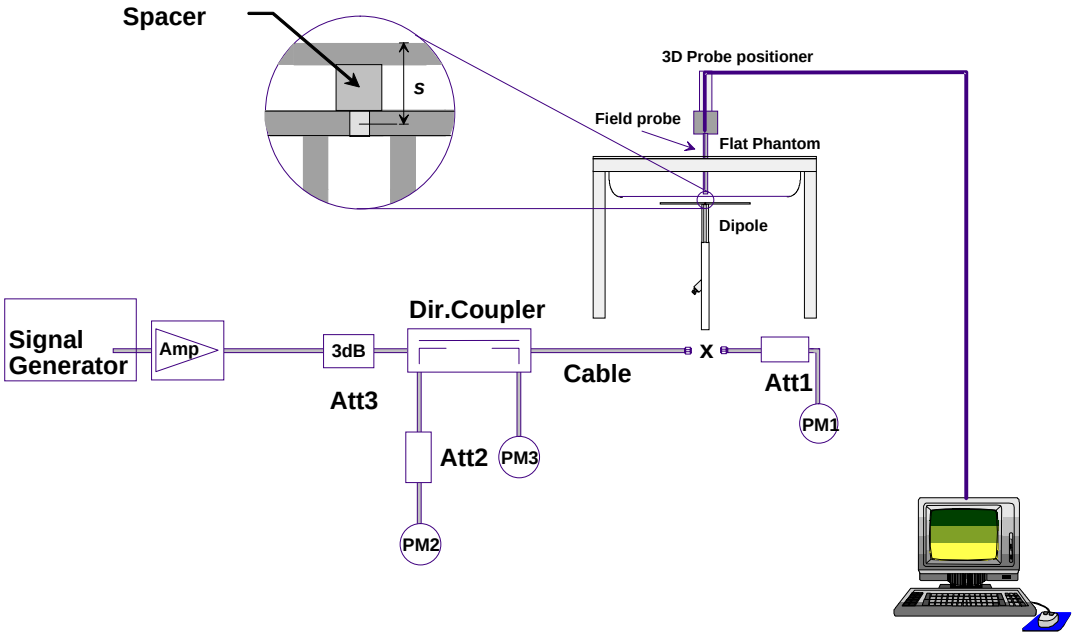


Fig 7.1 System Setup for System Evaluation

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

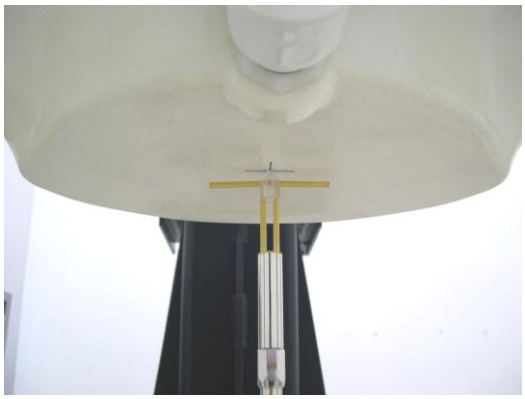


Fig 7.2 Photo of Dipole Setup

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.

Frequency (MHz)	Liquid Type	Power fed onto reference dipole (mW)	Target SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	Normalized SAR_{1g} (W/kg)	Deviation (%)
835	Head	250	9.4	2.29	9.16	-2.55
1900	Head	250	40.3	10	40	-0.74
2450	Head	250	54.8	13.5	54	-1.46
5200	Head	100	79.8	8.2	82	2.76
5800	Head	100	78.9	7.95	79.5	0.76
835	Body	250	9.42	2.28	9.12	-3.18
835	Body	250	9.42	2.25	9	-4.46
1900	Body	250	41.8	10.6	42.4	1.44
1900	Body	250	41.8	10.3	41.2	-1.44
2450	Body	250	52.3	13	52	-0.57
5200	Body	100	71.4	7.64	76.4	7.00
5800	Body	100	71.7	7.69	76.9	7.25

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.

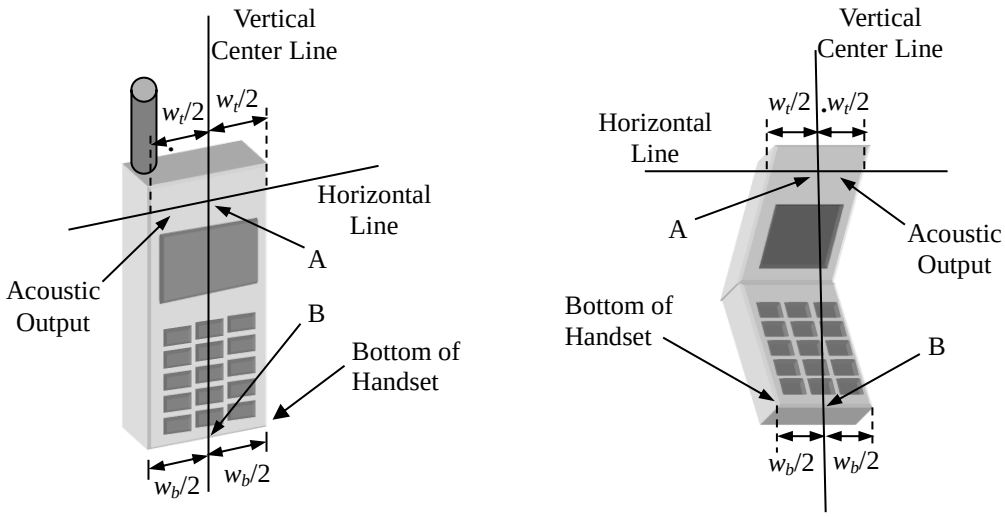


Fig 8.1 Illustration for Handset Vertical and Horizontal Reference Lines

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).

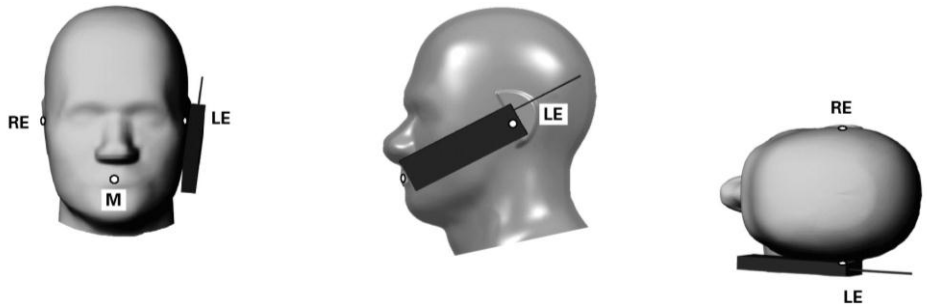


Fig 8.2 Illustration for Cheek Position

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).

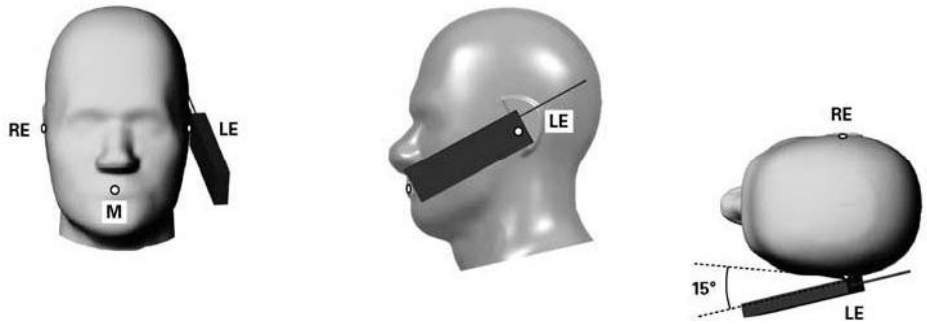


Fig 8.3 Illustration for Tilted Position

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.

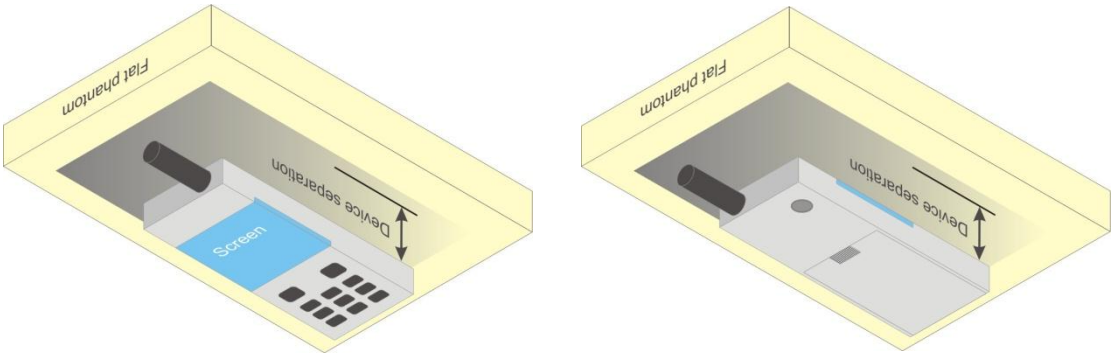


Fig 8.4 Illustration for Body Worn Position

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 cm.

<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 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

9.3 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.

For any secondary peaks found in the area scan which are within 2 dB of the maximum peak and are not within this zoom scan, the zoom scan should be repeated

			≤ 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.

9.4 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.

9.5 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.

9.6 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. Conducted RF Output Power (Unit: dBm)

<CDMA2000 Conducted Power>

General 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. Considering VOIP capability, EVDO Rev A SAR was repeated on the worst position of 1xRTT head SAR and body SAR.

<1xRTT>

Band	CDMA2000 BC0			CDMA2000 BC1			CDMA2000 BC10		
Channel	1013	384	777	25	600	1175	476	580	684
Frequency	824.7	836.52	848.31	1851.25	1880	1908.75	817.9	820.5	823.1
1x Voice Mode	Full Power (24.5dBm)			Full Power (24dBm)			Full Power (24.5dBm)		
1xRTT RC1 SO55	23.73	23.98	23.81	23.50	23.52	23.53	23.86	23.78	23.89
1xRTT RC3 SO55	23.75	23.95	23.83	23.48	23.49	23.50	23.81	23.82	23.87
1xRTT RC3 SO32(+ F-SCH)	23.78	23.99	23.85	23.49	23.51	23.54	23.88	23.84	23.91
1xRTT RC3 SO32(+SCH)	23.74	23.92	23.78	23.48	23.50	23.52	23.78	23.80	23.88
1x Voice Mode	Reduced Power (16.5dBm)			Reduced Power (16.5dBm)			Reduced Power (16.5dBm)		
1xRTT RC1 SO55	16.32	16.35	16.28	16.27	16.32	16.34	16.32	16.30	16.38
1xRTT RC3 SO55	16.31	16.33	16.27	16.25	16.33	16.37	16.31	16.29	16.33
1xRTT RC3 SO32(+ F-SCH)	16.34	16.36	16.33	16.28	16.34	16.39	16.38	16.35	16.40
1xRTT RC3 SO32(+SCH)	16.35	16.35	16.34	16.21	16.28	16.37	16.32	16.33	16.37

<1xEVDO>

Band		CDMA2000 BC0			CDMA2000 BC1			CDMA2000 BC10		
Channel		1013	384	777	25	600	1175	476	580	684
Frequency		824.7	836.52	848.31	1851.25	1880	1908.75	817.9	820.5	823.1
EVDO data mode		Full Power (24.5dBm)			Full Power (24dBm)			Full Power (24.5dBm)		
EVDO Rev.0	1xEVDO RTAP 153.6	23.79	23.96	23.83	23.41	23.47	23.53	23.79	23.83	23.89
EVDO Rev.A	1xEVDO RETAP 4096	23.73	23.93	23.77	23.42	23.44	23.48	23.71	23.76	23.86

<LTE Conducted Power>

General 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 Conducted Power>

		Full Power (24dBm)							Reduced Power (18dBm)						
BW [MHz]	Mod / RB (Size - Offset)	Average Power. (dBm)			3GPP MPR	MPR Result (dB)			Average Power. (dBm)			3GPP MPR	MPR Result (dB)		
		Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch	Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch
Channel		26090	26365	26640		26090	26365	26640	26090	26365	26640		26090	26365	26640
Frequency (MHz)		1855	1882.5	1910		1855	1882.5	1910	1855	1882.5	1910		1855	1882.5	1910
10	QPSK 1-0	23.85	23.87	23.74	0	0.00	0.00	0.00	17.75	17.80	17.77	0	0.01	0.00	0.00
10	QPSK 1-24	23.84	23.83	23.65		0.01	0.04	0.09	17.70	17.77	17.76		0.06	0.03	0.01
10	QPSK 1-49	23.78	23.78	23.69		0.07	0.09	0.05	17.76	17.66	17.71		0.00	0.14	0.06
10	QPSK 25-0	22.81	22.84	22.69	≤ 1	1.04	1.03	1.05	16.68	16.51	16.73	≤ 1	1.08	1.29	1.04
10	QPSK 25-12	22.78	22.77	22.75		1.07	1.10	0.99	16.63	16.67	16.67		1.13	1.13	1.10
10	QPSK 25-24	22.76	22.74	22.76		1.09	1.13	0.98	16.73	16.56	16.78		1.03	1.24	0.99
10	QPSK 50-0	22.63	22.65	22.60		1.22	1.22	1.14	16.65	16.55	16.73		1.11	1.25	1.04
10	16QAM 1-0	22.81	22.87	22.86	≤ 1	1.04	1.00	0.88	16.68	16.54	16.76	≤ 1	1.08	1.26	1.01
10	16QAM 1-24	22.85	22.86	22.84		1.00	1.01	0.90	16.69	16.64	16.70		1.07	1.16	1.07
10	16QAM 1-49	22.79	22.76	22.82		1.06	1.11	0.92	16.72	16.80	16.65		1.04	1.00	1.12
10	16QAM 25-0	21.68	21.60	21.72	≤ 2	2.17	2.27	2.02	15.66	15.47	15.70	≤ 2	2.10	2.33	2.07
10	16QAM 25-12	21.61	21.66	21.66		2.24	2.21	2.08	15.67	15.49	15.59		2.09	2.31	2.18
10	16QAM 25-24	21.78	21.58	21.78		2.07	2.29	1.96	15.64	15.47	15.71		2.12	2.33	2.06
10	16QAM 50-0	21.53	21.51	21.57		2.32	2.36	2.17	15.63	15.54	15.64		2.13	2.26	2.13
Channel		26065	26365	26665		26065	26365	26665	26065	26365	26665		26065	26365	26665
Frequency (MHz)		1852.5	1882.5	1912.5		1852.5	1882.5	1912.5	1852.5	1882.5	1912.5		1852.5	1882.5	1912.5
5	QPSK 1-0	23.86	23.69	23.87	0	0.00	0.00	0.00	17.68	17.66	17.84	0	0.04	0.00	0.00
5	QPSK 1-12	23.81	23.63	23.76		0.05	0.06	0.11	17.72	17.39	17.79		0.00	0.27	0.05
5	QPSK 1-24	23.78	23.65	23.73		0.08	0.04	0.14	17.60	17.58	17.75		0.12	0.08	0.09
5	QPSK 12-0	22.87	22.80	22.84	≤ 1	0.99	0.89	1.03	16.81	16.57	16.81	≤ 1	0.91	1.09	1.03
5	QPSK 12-6	22.85	22.81	22.81		1.01	0.88	1.06	16.72	16.50	16.85		1.00	1.16	0.99
5	QPSK 12-11	22.88	22.76	22.79		0.98	0.93	1.08	16.78	16.46	16.71		0.94	1.20	1.13
5	QPSK 25-0	22.73	22.72	22.83		1.13	0.97	1.04	16.70	16.47	16.71		1.02	1.19	1.13
5	16QAM 1-0	22.71	22.55	22.78	≤ 1	1.15	1.14	1.09	16.71	16.78	16.73	≤ 1	1.01	0.88	1.11
5	16QAM 1-12	22.69	22.53	22.73		1.17	1.16	1.14	16.81	16.50	16.71		0.91	1.16	1.13
5	16QAM 1-24	22.58	22.46	22.69		1.28	1.23	1.18	16.79	16.68	16.83		0.93	0.98	1.01
5	16QAM 12-0	21.86	21.74	21.88	≤ 2	2.00	1.95	1.99	15.74	15.52	15.81	≤ 2	1.98	2.14	2.03
5	16QAM 12-6	21.83	21.68	21.82		2.03	2.01	2.05	15.66	15.50	15.71		2.06	2.16	2.13
5	16QAM 12-11	21.78	21.63	21.76		2.08	2.06	2.11	15.71	15.49	15.80		2.01	2.17	2.04
5	16QAM 25-0	21.69	21.65	21.78		2.17	2.04	2.09	15.66	15.44	15.76		2.06	2.22	2.08
Channel		26055	26365	26675		26055	26365	26675	26055	26365	26675		26055	26365	26675
Frequency (MHz)		1851.5	1882.5	1913.5		1851.5	1882.5	1913.5	1851.5	1882.5	1913.5		1851.5	1882.5	1913.5
3	QPSK 1-0	23.85	23.78	23.86	0	0.00	0.00	0.00	17.73	17.61	17.75	0	0.00	0.00	0.03
3	QPSK 1-7	23.83	23.65	23.81		0.02	0.13	0.05	17.72	17.45	17.78		0.01	0.16	0.00
3	QPSK 1-14	23.76	23.71	23.75		0.09	0.07	0.11	17.69	17.51	17.76		0.04	0.10	0.02
3	QPSK 8-0	22.87	22.82	22.89	≤ 1	0.98	0.96	0.97	16.71	16.54	16.80	≤ 1	1.02	1.07	0.98
3	QPSK 8-4	22.83	22.87	22.87		1.02	0.91	0.99	16.68	16.53	16.77		1.05	1.08	1.01
3	QPSK 8-7	22.80	22.76	22.83		1.05	1.02	1.03	16.76	16.48	16.76		0.97	1.13	1.02
3	QPSK 15-0	22.85	22.83	22.79		1.00	0.95	1.07	16.70	16.48	16.72		1.03	1.13	1.06
3	16QAM 1-0	22.83	22.57	22.79	≤ 1	1.02	1.21	1.07	16.64	16.50	16.67	≤ 1	1.09	1.11	1.11
3	16QAM 1-7	22.76	22.42	22.72		1.09	1.36	1.14	16.57	16.67	16.70		1.16	0.94	1.08
3	16QAM 1-14	22.71	22.38	22.65		1.14	1.40	1.21	16.71	16.37	16.69		1.02	1.24	1.09
3	16QAM 8-0	21.79	21.70	21.86	≤ 2	2.06	2.08	2.00	15.68	15.50	15.74	≤ 2	2.05	2.11	2.04
3	16QAM 8-4	21.73	21.76	21.82		2.12	2.02	2.04	15.52	15.55	15.73		2.21	2.06	2.05
3	16QAM 8-7	21.75	21.64	21.75		2.10	2.14	2.11	15.60	15.43	15.75		2.13	2.18	2.03
3	16QAM 15-0	21.78	21.72	21.68		2.07	2.06	2.18	15.62	15.54	15.76		2.11	2.07	2.02
Channel		26047	26365	26683		26047	26365	26683	26047	26365	26683		26047	26365	26683
Frequency (MHz)		1850.7	1882.5	1914.3		1850.7	1882.5	1914.3	1850.7	1882.5	1914.3		1850.7	1882.5	1914.3
1.4	QPSK 1-0	23.89	23.85	23.87	0	0.00	0.00	0.00	17.73	17.66	17.74	0	0.03	0.01	0.01
1.4	QPSK 1-2	23.85	23.81	23.86		0.04	0.04	0.01	17.66	17.67	17.73		0.10	0.00	0.02
1.4	QPSK 1-5	23.83	23.76	23.79		0.06	0.09	0.08	17.76	17.60	17.69		0.00	0.07	0.06
1.4	QPSK 3-0	23.81	23.80	23.86		0.08	0.05	0.01	17.74	17.65	17.73		0.02	0.02	0.02
1.4	QPSK 3-1	23.86	23.75	23.82		0.03	0.10	0.05	17.67	17.62	17.75		0.09	0.05	0.00
1.4	QPSK 3-2	23.84	23.81	23.84		0.05	0.04	0.03	17.70	17.62	17.71		0.06	0.05	0.04
1.4	QPSK 6-0	22.96	22.80	22.87	≤ 1	0.93	1.05	1.00	16.69	16.66	16.71	≤ 1	1.07	1.01	1.04
1.4	16QAM 1-0	22.91	22.85	22.79	≤ 1	0.98	1.00	1.08	16.84	16.59	16.76	≤ 1	0.92	1.08	0.99
1.4	16QAM 1-2	22.86	22.73	22.72		1.03	1.12	1.15	16.83	16.65	16.79		0.93	1.02	0.96
1.4	16QAM 1-5	22.79	22.68	22.70		1.10	1.17	1.17	16.73	16.55	16.70		1.03	1.12	1.05
1.4	16QAM 3-0	22.84	22.81	22.65		1.05	1.04	1.22	16.65	16.59	16.78		1.11	1.08	0.97
1.4	16QAM 3-1	22.82	22.83	22.53		1.07	1.02	1.34	16.75	16.67	16.76		1.01	1.00	0.99
1.4	16QAM 3-2	22.85	22.69	22.50		1.04	1.16	1.37	16.76	16.65	16.80		1.00	1.02	0.95
1.4	16QAM 6-0	21.86	21.73	21.86	≤ 2	2.03	2.12	2.01	15.66	15.68	15.70	≤ 2	2.10	1.99	2.05

<WLAN 2.4GHz Conducted Power>

General 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-HT20 output power is less than 1/4dB 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 1/4dB higher than those measured at the lowest data rate. 2.4GHz WLAN SAR was tested on 802.11b 1Mbps.

WLAN 2.4GHz 802.11b Average Power (dBm)					
Channel	Frequency (MHz)	Data Rate (bps)			
		1M bps	2M bps	5.5M bps	11M bps
CH 01	2412	13.97	13.34	13.44	13.41
CH 06	2437	14.16	13.76	13.51	13.71
CH 11	2462	**14.18**	13.49	13.62	13.68

WLAN 2.4GHz 802.11g Average Power (dBm)									
Channel	Frequency (MHz)	Data Rate (bps)							
		6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
CH 01	2412	13.82	13.82	13.82	13.81	12.84	13.79	13.47	13.07
CH 06	2437	**13.85**	13.57	13.43	13.46	12.61	13.23	13.73	13.15
CH 11	2462	13.07	13.12	12.98	13.21	13.02	13.72	13.74	13.77

WLAN 2.4GHz 802.11n-HT20 Average Power (dBm)									
Channel	Frequency (MHz)	MCS Index							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	12.97	13.02	13.00	13.07	12.01	12.52	12.58	12.77
CH 06	2437	**13.07**	12.38	12.44	12.16	12.72	13.02	12.60	12.27
CH 11	2462	12.61	12.11	12.11	12.05	12.16	12.23	12.06	11.63

<Bluetooth Conducted Power>

Bluetooth Average Power (dBm)										
Channel	Frequency (MHz)	Data Rate								
		DH1	DH3	DH5	2DH1	2DH3	2DH5	3DH1	3DH3	3DH5
CH 00	2402	1.28	1.56	1.99	1.18	1.12	1.68	0.13	0.19	0.28
CH 39	2441	2.17	2.31	**2.32**	1.37	1.28	1.90	0.85	0.86	0.94
CH 78	2480	0.84	1.10	1.12	-0.17	0.12	0.11	-0.25	-0.30	-0.19

Channel	Frequency (MHz)	Average power (dBm)
		Mode
		BT v4.0 LE, GFSK
CH 00	2402	**-2.12**
CH 19	2440	-2.51
CH 39	2480	-3.49

<WLAN 5GHz Conducted Power>

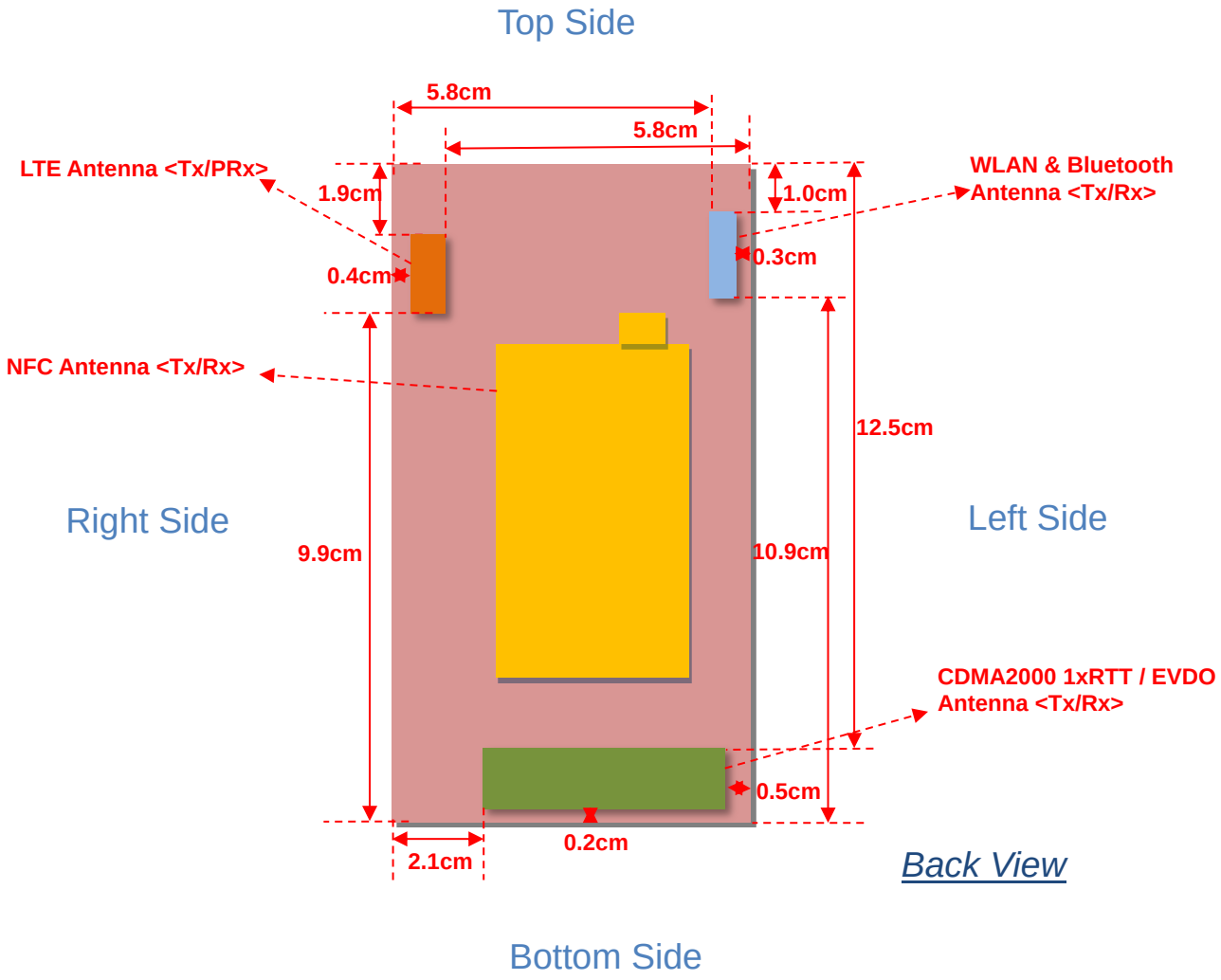
General Note:

1. Per KDB 248227, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227 D01 v01r02, 11n-HT20 output power is less than 1/4dB higher than 802.11b 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. 5GHz WLAN SAR was tested on 802.11a 6Mbps.

WLAN 5GHz 802.11a Average Power (dBm)									
Channel	Frequency (MHz)	Average Power (dBm)							
		Data Rate (bps)							
		6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
CH 036	5180	**6.83**	6.09	6.81	6.49	6.81	6.30	6.61	6.79
CH 040	5200	6.40	6.02	6.00	6.09	6.18	6.03	6.18	6.38
CH 044	5220	6.07	5.90	5.80	6.03	6.04	6.01	6.03	5.94
CH 048	5240	5.81	5.73	5.71	5.80	5.79	5.74	5.76	5.74
CH 149	5745	**14.90**	14.75	14.64	14.67	14.68	14.89	14.55	14.86
CH 153	5765	14.11	13.78	13.74	14.05	13.87	13.92	14.08	14.03
CH 157	5785	14.37	14.06	13.80	14.08	13.18	14.28	14.24	14.35
CH 161	5805	14.32	14.04	14.00	14.15	14.09	14.24	14.28	13.88

WLAN 5GHz 802.11n-HT20 Average Power (dBm)									
Channel	Frequency (MHz)	Average Power (dBm)							
		Data Rate (bps)							
		6.5M bps	13M bps	19.5M bps	26M bps	39M bps	52M bps	58.5M bps	65M bps
CH 036	5180	**6.80**	6.28	6.77	6.77	6.74	6.51	6.75	6.50
CH 040	5200	6.30	6.20	6.03	6.13	6.17	6.13	6.25	6.27
CH 044	5220	6.21	5.80	6.10	6.15	6.20	6.20	6.10	6.16
CH 048	5240	6.07	6.04	6.04	5.84	5.65	6.00	5.82	6.01
CH 149	5745	**15.06**	14.82	14.90	14.93	14.83	15.02	14.99	14.84
CH 153	5765	14.16	13.86	13.96	14.02	14.05	14.12	14.10	14.12
CH 157	5785	14.66	14.27	14.24	14.22	14.27	14.53	14.48	14.24
CH 161	5805	14.53	14.17	14.24	14.11	14.34	14.54	14.09	14.25

11. Exposure Positions Consideration



Antennas	Wireless Interface
LTE Antenna <Tx / PRx>	LTE: band 25
CDMA2000 1xRTT / EVDO <Tx / Rx>	CDMA2000 1xRTT and EVDO BC 0/1/10
WLAN&Bluetooth Antenna <Tx / Rx>	WLAN 2.4GHz, WLAN 5GHz Bluetooth
NFC Antenna <Tx / Rx>	NFC

Distance of the Antenna to the EUT surface/edge Test distance: 10 mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
CDMA 1xRTT / EVDO	≤ 25mm	≤ 25mm	125mm	≤ 25mm	≤ 25mm	≤ 25mm
LTE	≤ 25mm	≤ 25mm	≤ 25mm	99mm	≤ 25mm	58mm
WLAN & Bluetooth	≤ 25mm	≤ 25mm	≤ 25mm	109mm	58mm	≤ 25mm

Positions for SAR tests; Hotspot mode Test distance: 10 mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
CDMA 1xRTT / EVDO	Yes	Yes	NO	Yes	Yes	Yes
LTE	Yes	Yes	Yes	NO	Yes	NO
WLAN & Bluetooth	Yes	Yes	Yes	NO	NO	Yes

Note:

1. Head/Body-worn/Hotspot mode SAR assessments are required.
2. Referring to KDB 941225 D06 v01, 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. 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.
4. If the test separation distance (antenna-user) is < 5mm, 5mm is used for excluded SAR calculation
5. For minimum test separation distance ≤50mm, Bluetooth standalone SAR test exclusion power threshold is determined by:[(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. The formula sets the maximum RF power threshold, and the transmitter with RF power equal or less than the power threshold, SAR testing is not required

	Wireless Interface	Bluetooth
Tune-up Maximum power (dBm)		3
Tune-up Maximum rated power (mW)		2
Head	Antenna to user (mm)	5
	SAR exclusion threshold (mW)	10
	SAR testing required?	**NO**
Body	Antenna to user (mm)	10
	SAR exclusion threshold (mW)	19
	SAR testing required?	**NO**

12. SAR Test Results

General 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. For Hotspot SAR testing, 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.
4. Considering the possibility of VOIP operation, per KDB 941225 D01 1xEv-Do RevA (4096 bits) SAR for the head exposure positions and body-worn positions are performed.

12.1 Test Records for Head SAR Test

<CDMA2000>

Plot No.	Antenna	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#01	1xRTT/EVDO	CDMA2000 BC0	RC3 SO55	Right Cheek	384	836.52	23.95	24.5	1.135	0.370	0.420	0.04	0
#02	1xRTT/EVDO	CDMA2000 BC0	RC3 SO55	Right Tilted	384	836.52	23.95	24.5	1.135	0.231	0.262	0.14	0
#03	1xRTT/EVDO	CDMA2000 BC0	RC3 SO55	Left Cheek	384	836.52	23.95	24.5	1.135	0.351	0.398	0.05	0
#140	1xRTT/EVDO	CDMA2000 BC0	RC3 SO55	Left Cheek	384	836.52	16.33	16.5	1.040	0.055	0.057	0.04	8
#04	1xRTT/EVDO	CDMA2000 BC0	RC3 SO55	Left Tilted	384	836.52	23.95	24.5	1.135	0.248	0.281	0.09	0
#05	**1xRTT/EVDO**	**CDMA2000 BC0**	**RETAP 4096**	**Right Cheek**	**384**	**836.52**	**23.93**	**24.5**	**1.140**	**0.383**	**0.437**	**-0.09**	**0**
#06	1xRTT/EVDO	CDMA2000 BC1	RC3 SO55	Right Cheek	1175	1908.75	23.5	24	1.122	0.191	0.214	0.02	0
#07	1xRTT/EVDO	CDMA2000 BC1	RC3 SO55	Right Tilted	1175	1908.75	23.5	24	1.122	0.046	0.052	0.04	0
#08	1xRTT/EVDO	CDMA2000 BC1	RC3 SO55	Left Cheek	1175	1908.75	23.5	24	1.122	0.210	0.236	-0.02	0
#09	1xRTT/EVDO	CDMA2000 BC1	RC3 SO55	Left Tilted	1175	1908.75	23.5	24	1.122	0.051	0.057	0.03	0
#10	**1xRTT/EVDO**	**CDMA2000 BC1**	**RETAP 4096**	**Right Cheek**	**1175**	**1908.75**	**23.48**	**24**	**1.127**	**0.211**	**0.238**	**0.01**	**0**
#14	1xRTT/EVDO	CDMA2000 BC10	RC3 SO55	Right Cheek	684	823.1	23.87	24.5	1.156	0.433	0.501	0.03	0
#15	1xRTT/EVDO	CDMA2000 BC10	RC3 SO55	Right Tilted	684	823.1	23.87	24.5	1.156	0.286	0.331	0.06	0
#16	1xRTT/EVDO	CDMA2000 BC10	RC3 SO55	Left Cheek	684	823.1	23.87	24.5	1.156	0.420	0.486	0.08	0
#142	1xRTT/EVDO	CDMA2000 BC10	RC3 SO55	Left Cheek	684	823.1	16.33	16.5	1.040	0.050	0.052	0.06	8
#17	1xRTT/EVDO	CDMA2000 BC10	RC3 SO55	Left Tilted	684	823.1	23.87	24.5	1.156	0.307	0.355	0.07	0
#18	**1xRTT/EVDO**	**CDMA2000 BC10**	**RETAP 4096**	**Right Cheek**	**684**	**823.1**	**23.86**	**24.5**	**1.159**	**0.455**	**0.527**	**0.05**	**0**

<LTE>

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#19	LTE	LTE Band 25	QPSK	10	1	0	Right Cheek	26365	1882.5	23.87	24	1.030	0.746	0.769	0.02	0
#20	LTE	LTE Band 25	QPSK	10	25	0	Right Cheek	26365	1882.5	22.84	24	1.306	0.570	0.745	0.034	0
#21	LTE	LTE Band 25	QPSK	10	50	0	Right Cheek	26365	1882.5	22.65	24	1.365	0.521	0.711	0.02	0
#22	LTE	LTE Band 25	QPSK	10	1	0	Right Tilted	26365	1882.5	23.87	24	1.030	0.825	0.850	0.07	0
#23	LTE	LTE Band 25	QPSK	10	1	0	Right Tilted	26090	1855	23.85	24	1.035	0.684	0.708	0.06	0
#24	LTE	LTE Band 25	QPSK	10	1	0	Right Tilted	26640	1910	23.74	24	1.062	0.722	0.767	-0.05	0
#25	LTE	LTE Band 25	QPSK	10	25	0	Right Tilted	26365	1882.5	22.84	24	1.306	0.621	0.811	0.02	0
#26	LTE	LTE Band 25	QPSK	10	25	0	Right Tilted	26090	1855	22.81	24	1.315	0.542	0.713	0.03	0
#27	LTE	LTE Band 25	QPSK	10	25	0	Right Tilted	26640	1910	22.69	24	1.352	0.582	0.787	0.02	0
#28	LTE	LTE Band 25	QPSK	10	50	0	Right Tilted	26365	1882.5	22.65	24	1.365	0.586	0.800	-0.04	0
#29	**LTE**	**LTE Band 25**	**QPSK**	**10**	**1**	**0**	**Left Cheek**	**26365**	**1882.5**	**23.87**	**24**	**1.030**	**1.340**	**1.381**	**0.04**	**0**
#143	LTE	LTE Band 25	QPSK	10	1	0	Left Cheek	26365	1882.5	17.8	18	1.047	0.351	0.368	0.14	6
#31	LTE	LTE Band 25	QPSK	10	1	0	Left Cheek	26090	1855	23.85	24	1.035	1.190	1.232	0.06	0
#32	LTE	LTE Band 25	QPSK	10	1	0	Left Cheek	26640	1910	23.74	24	1.062	1.170	1.242	0.10	0
#33	LTE	LTE Band 25	QPSK	10	25	0	Left Cheek	26365	1882.5	22.84	24	1.306	0.984	1.285	0.11	0
#34	LTE	LTE Band 25	QPSK	10	25	0	Left Cheek	26090	1855	22.81	24	1.315	0.909	1.196	0.05	0
#35	LTE	LTE Band 25	QPSK	10	25	0	Left Cheek	26640	1910	22.69	24	1.352	0.904	1.222	0.07	0
#36	LTE	LTE Band 25	QPSK	10	50	0	Left Cheek	26365	1882.5	22.65	24	1.365	0.912	1.244	0.12	0
#37	LTE	LTE Band 25	QPSK	10	1	0	Left Tilted	26365	1882.5	23.87	24	1.030	0.747	0.770	0.04	0
#38	LTE	LTE Band 25	QPSK	10	25	0	Left Tilted	26365	1882.5	22.84	24	1.306	0.575	0.751	-0.01	0
#39	LTE	LTE Band 25	QPSK	10	50	0	Left Tilted	26365	1882.5	22.65	24	1.365	0.533	0.727	-0.044	0

Note:

1. 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.
2. 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.
3. Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth.

<WLAN 2.4GHz>

Plot No.	Antenna	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#40	**WLAN/BT**	**WLAN 2.4GHz**	**802.11b**	**Right Cheek**	**11**	**2462**	**14.18**	**14.5**	**1.076**	**0.242**	**0.261**	**-0.08**	**0**
#41	WLAN/BT	WLAN 2.4GHz	802.11b	Right Tilted	11	2462	14.18	14.5	1.076	0.163	0.175	-0.13	0
#42	WLAN/BT	WLAN 2.4GHz	802.11b	Left Cheek	11	2462	14.18	14.5	1.076	0.137	0.147	-0.020	0
#43	WLAN/BT	WLAN 2.4GHz	802.11b	Left Tilted	11	2462	14.18	14.5	1.076	0.115	0.124	0.05	0

<WLAN 5GHz>

Plot No.	Antenna	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#122	**WLAN/BT**	**WLAN 5GHz**	**802.11a**	**Right Cheek**	**36**	**5180**	**6.83**	**7**	**1.040**	**0.031**	**0.032**	**0.04**	**0**
#123	WLAN/BT	WLAN 5GHz	802.11a	Right Tilted	36	5180	6.83	7	1.040	0.022	0.023	0.05	0
#124	WLAN/BT	WLAN 5GHz	802.11a	Left Cheek	36	5180	6.83	7	1.040	0.026	0.027	0.06	0
#125	WLAN/BT	WLAN 5GHz	802.11a	Left Tilted	36	5180	6.83	7	1.040	0.025	0.026	0.09	0
#126	**WLAN/BT**	**WLAN 5GHz**	**802.11a**	**Right Cheek**	**149**	**5745**	**14.9**	**15.5**	**1.148**	**0.131**	**0.150**	**0.04**	**0**
#127	WLAN/BT	WLAN 5GHz	802.11a	Right Tilted	149	5745	14.9	15.5	1.148	0.081	0.093	0.05	0
#128	WLAN/BT	WLAN 5GHz	802.11a	Left Cheek	149	5745	14.9	15.5	1.148	0.054	0.062	0.02	0
#129	WLAN/BT	WLAN 5GHz	802.11a	Left Tilted	149	5745	14.9	15.5	1.148	0.038	0.044	0.09	0

12.2 Test Records for Hotspot SAR Test

<CDMA2000>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#50	1xRTT/EVDO	CDMA2000 BC0	RTAP 153.6	Front	1	384	836.52	23.96	24.5	1.132	0.390	0.442	0.04	0
#51	1xRTT/EVDO	CDMA2000 BC0	RTAP 153.6	Back	1	384	836.52	23.96	24.5	1.132	0.510	0.578	0.03	0
#52	1xRTT/EVDO	CDMA2000 BC0	RTAP 153.6	Left Side	1	384	836.52	23.96	24.5	1.132	0.413	0.468	-0.033	0
#53	**1xRTT/EVDO**	**CDMA2000 BC0**	**RTAP 153.6**	**Right Side**	**1**	**384**	**836.52**	**23.96**	**24.5**	**1.132**	**0.571**	**0.647**	**0.07**	**0**
#54	1xRTT/EVDO	CDMA2000 BC0	RTAP 153.6	Bottom Side	1	384	836.52	23.96	24.5	1.132	0.119	0.135	0.04	0
#71	1xRTT/EVDO	CDMA2000 BC1	RTAP 153.6	Front	1	1175	1908.75	23.53	24	1.114	0.631	0.703	-0.035	0
#72	1xRTT/EVDO	CDMA2000 BC1	RTAP 153.6	Back	1	1175	1908.75	23.53	24	1.114	1.040	1.159	-0.03	0
#73	1xRTT/EVDO	CDMA2000 BC1	RTAP 153.6	Back	1	25	1851.25	23.41	24	1.146	1.010	1.157	-0.05	0
#74	1xRTT/EVDO	CDMA2000 BC1	RTAP 153.6	Back	1	600	1880	23.47	24	1.130	1.050	1.186	-0.04	0
#75	1xRTT/EVDO	CDMA2000 BC1	RTAP 153.6	Left Side	1	1175	1908.75	23.53	24	1.114	0.121	0.135	0.02	0
#76	1xRTT/EVDO	CDMA2000 BC1	RTAP 153.6	Right Side	1	1175	1908.75	23.53	24	1.114	0.128	0.143	0.08	0
#77	1xRTT/EVDO	CDMA2000 BC1	RTAP 153.6	Bottom Side	1	1175	1908.75	23.53	24	1.114	1.150	1.281	0.12	0
#83	**1xRTT/EVDO**	**CDMA2000 BC1**	**RTAP 153.6**	**Bottom Side**	**1**	**25**	**1851.25**	**23.41**	**24**	**1.146**	**1.310**	**1.501**	**0.11**	**0**
#79	1xRTT/EVDO	CDMA2000 BC1	RTAP 153.6	Bottom Side	1	600	1880	23.47	24	1.130	1.230	1.390	0.10	0
#86	1xRTT/EVDO	CDMA2000 BC10	RTAP 153.6	Front	1	684	823.1	23.89	24.5	1.151	0.408	0.470	0.02	0
#87	1xRTT/EVDO	CDMA2000 BC10	RTAP 153.6	Back	1	684	823.1	23.89	24.5	1.151	0.536	0.617	-0.01	0
#88	1xRTT/EVDO	CDMA2000 BC10	RTAP 153.6	Left Side	1	684	823.1	23.89	24.5	1.151	0.469	0.540	-0.04	0
#89	**1xRTT/EVDO**	**CDMA2000 BC10**	**RTAP 153.6**	**Right Side**	**1**	**684**	**823.1**	**23.89**	**24.5**	**1.151**	**0.574**	**0.661**	**-0.04**	**0**
#90	1xRTT/EVDO	CDMA2000 BC10	RTAP 153.6	Bottom Side	1	684	823.1	23.89	24.5	1.151	0.124	0.143	0.07	0

<LTE>

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#91	LTE	LTE Band 25	QPSK	10	1	0	Front	1	26365	1882.5	23.87	24	1.030	0.447	0.461	0.09	0
#92	LTE	LTE Band 25	QPSK	10	25	0	Front	1	26365	1882.5	22.84	24	1.306	0.335	0.438	-0.03	0
#93	LTE	LTE Band 25	QPSK	10	50	0	Front	1	26365	1882.5	22.65	24	1.365	0.321	0.438	0.019	0
#94	LTE	LTE Band 25	QPSK	10	1	0	Back	1	26365	1882.5	23.87	24	1.030	1.210	1.247	0.10	0
#95	**LTE**	**LTE Band 25**	**QPSK**	**10**	**1**	**0**	**Back**	**1**	**26090**	**1855**	**23.85**	**24**	**1.035**	**1.270**	**1.315**	**0.12**	**0**
#148	LTE	LTE Band 25	QPSK	10	1	0	Back	1	26090	1855	17.75	18	1.059	0.287	0.304	0.03	6
#96	LTE	LTE Band 25	QPSK	10	1	0	Back	1	26640	1910	23.74	24	1.062	1.120	1.189	0.15	0
#100	LTE	LTE Band 25	QPSK	10	25	0	Back	1	26365	1882.5	22.84	24	1.306	0.897	1.172	0.07	0
#101	LTE	LTE Band 25	QPSK	10	25	0	Back	1	26090	1855	22.81	24	1.315	0.932	1.226	0.08	0
#102	LTE	LTE Band 25	QPSK	10	25	0	Back	1	26640	1910	22.69	24	1.352	0.837	1.132	0.06	0
#106	LTE	LTE Band 25	QPSK	10	50	0	Back	1	26365	1882.5	22.65	24	1.365	0.860	1.174	0.11	0
#107	LTE	LTE Band 25	QPSK	10	1	0	Right Side	1	26365	1882.5	23.87	24	1.030	0.833	0.858	0.01	0
#108	LTE	LTE Band 25	QPSK	10	1	0	Right Side	1	26090	1855	23.85	24	1.035	0.710	0.735	0.078	0
#109	LTE	LTE Band 25	QPSK	10	1	0	Right Side	1	26640	1910	23.74	24	1.062	0.751	0.797	0.04	0
#110	LTE	LTE Band 25	QPSK	10	25	0	Right Side	1	26365	1882.5	22.84	24	1.306	0.631	0.824	0.06	0
#111	LTE	LTE Band 25	QPSK	10	25	0	Right Side	1	26090	1855	22.81	24	1.315	0.523	0.688	-0.04	0
#112	LTE	LTE Band 25	QPSK	10	25	0	Right Side	1	26640	1910	22.69	24	1.352	0.563	0.761	-0.041	0
#113	LTE	LTE Band 25	QPSK	10	50	0	Right Side	1	26365	1882.5	22.65	24	1.365	0.586	0.800	0.058	0
#114	LTE	LTE Band 25	QPSK	10	1	0	Top Side	1	26365	1882.5	23.87	24	1.030	0.417	0.430	-0.03	0
#115	LTE	LTE Band 25	QPSK	10	25	0	Top Side	1	26365	1882.5	22.84	24	1.306	0.323	0.422	0.05	0
#116	LTE	LTE Band 25	QPSK	10	50	0	Top Side	1	26365	1882.5	22.65	24	1.365	0.309	0.422	-0.04	0

<WLAN 2.4GHz>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#117	WLAN/BT	WLAN 2.4GHz	802.11b	Front	1	11	2462	14.18	14.5	1.076	0.057	0.061	0.054	0
#118	**WLAN/BT**	**WLAN 2.4GHz**	**802.11b**	**Back**	**1**	**11**	**2462**	**14.18**	**14.5**	**1.076**	**0.067**	**0.072**	**0.17**	**0**
#119	WLAN/BT	WLAN 2.4GHz	802.11b	Left Side	1	11	2462	14.18	14.5	1.076	0.062	0.067	-0.027	0
#120	WLAN/BT	WLAN 2.4GHz	802.11b	Top Side	1	11	2462	14.18	14.5	1.076	0.00688	0.007	0.14	0

12.3 Test Records for Body-worn SAR Test

General Note:

1. For Body-worn SAR testing: "V" in the Headset column means the Headset is plugged during SAR testing
2. Body-worn SAR testing was performed at 10mm separation, and this distance is determined by the handset manufacturer that there will be body-worn accessories that users may acquire at the time of equipment certification, to enable users to purchase aftermarket body-worn accessories with the required minimum separation.
3. Per KDB 648474 D04v01, when the *reported* SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
4. Though per KDB 648474 D04v01, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, the SAR testing with a headset connected to the handset is not required, but considered the simultaneous SAR for body-worn, we still perform the WLAN SAR with headset mode.

<CDMA2000>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#44	1xRTT/EVDO	CDMA2000 BC0	RC3 SO32	Front	1	-	384	836.52	23.99	24.5	1.125	0.391	0.440	0.02	0
#45	**1xRTT/EVDO**	**CDMA2000 BC0**	**RC3 SO32**	**Back**	**1**	**-**	**384**	**836.52**	**23.99**	**24.5**	**1.125**	**0.510**	**0.574**	**-0.057**	**0**
#144	1xRTT/EVDO	CDMA2000 BC0	RC3 SO32	Back	1	-	384	836.52	16.36	16.5	1.033	0.088	0.091	0.02	8
#49	1xRTT/EVDO	CDMA2000 BC0	RETAP 4096	Back	1	-	384	836.52	23.93	24.5	1.140	0.503	0.574	-0.0016	0
#55	1xRTT/EVDO	CDMA2000 BC1	RC3 SO32	Front	1	-	1175	1908.75	23.54	24	1.112	0.622	0.691	0.02	0
#56	1xRTT/EVDO	CDMA2000 BC1	RC3 SO32	Back	1	-	1175	1908.75	23.54	24	1.112	0.981	1.091	-0.07	0
#57	1xRTT/EVDO	CDMA2000 BC1	RC3 SO32	Back	1	-	25	1851.25	23.49	24	1.125	0.934	1.050	-0.05	0
#58	1xRTT/EVDO	CDMA2000 BC1	RC3 SO32	Back	1	-	600	1880	23.51	24	1.119	0.969	1.085	-0.03	0
#59	1xRTT/EVDO	CDMA2000 BC1	RC3 SO32	Back	1	V	1175	1908.75	23.54	24	1.112	0.969	1.077	-0.10	0
#146	1xRTT/EVDO	CDMA2000 BC1	RC3 SO32	Back	1	V	1175	1908.75	16.39	16.5	1.026	0.187	0.192	-0.04	7.5
#60	1xRTT/EVDO	CDMA2000 BC1	RC3 SO32	Back	1	V	25	1851.25	23.49	24	1.125	0.935	1.052	0.07	0
#61	1xRTT/EVDO	CDMA2000 BC1	RC3 SO32	Back	1	V	600	1880	23.51	24	1.119	0.950	1.063	-0.13	0
#62	**1xRTT/EVDO**	**CDMA2000 BC1**	**RETAP 4096**	**Back**	**1**	**-**	**1175**	**1908.75**	**23.48**	**24**	**1.127**	**1.150**	**1.296**	**-0.0051**	**0**
#145	1xRTT/EVDO	CDMA2000 BC1	RETAP 4096	Back	1	-	1175	1908.75	16.39	16.5	1.026	0.187	0.192	-0.09	7.5
#63	1xRTT/EVDO	CDMA2000 BC1	RETAP 4096	Back	1	-	25	1851.25	23.42	24	1.143	1.110	1.269	0.04	0
#64	1xRTT/EVDO	CDMA2000 BC1	RETAP 4096	Back	1	-	600	1880	23.44	24	1.138	1.130	1.286	-0.05	0
#80	1xRTT/EVDO	CDMA2000 BC10	RC3 SO32	Front	1	-	684	823.1	23.91	24.5	1.146	0.426	0.488	-0.02	0
#81	**1xRTT/EVDO**	**CDMA2000 BC10**	**RC3 SO32**	**Back**	**1**	**-**	**684**	**823.1**	**23.91**	**24.5**	**1.146**	**0.538**	**0.616**	**0.06**	**0**
#147	1xRTT/EVDO	CDMA2000 BC10	RC3 SO32	Back	1	-	684	823.1	16.4	16.5	1.023	0.091	0.093	0.07	8
#82	1xRTT/EVDO	CDMA2000 BC10	RETAP 4096	Back	1	-	684	820.5	23.86	24.5	1.159	0.531	0.615	-0.04	0

<LTE>

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#91	LTE	LTE Band 25	QPSK	10	1	0	Front	1	-	26365	1882.5	23.87	24	1.030	0.447	0.461	0.09	0
#92	LTE	LTE Band 25	QPSK	10	25	0	Front	1	-	26365	1882.5	22.84	24	1.306	0.335	0.438	-0.03	0
#93	LTE	LTE Band 25	QPSK	10	50	0	Front	1	-	26365	1882.5	22.65	24	1.365	0.321	0.438	0.019	0
#94	LTE	LTE Band 25	QPSK	10	1	0	Back	1	-	26365	1882.5	23.87	24	1.030	1.210	1.247	0.10	0
#95	**LTE**	**LTE Band 25**	**QPSK**	**10**	**1**	**0**	**Back**	**1**	**-**	**26090**	**1855**	**23.85**	**24**	**1.035**	**1.270**	**1.315**	**0.12**	**0**
#148	LTE	LTE Band 25	QPSK	10	1	0	Back	1	-	26090	1855	17.75	18	1.059	0.287	0.304	0.03	6
#96	LTE	LTE Band 25	QPSK	10	1	0	Back	1	-	26640	1910	23.74	24	1.062	1.120	1.189	0.15	0
#100	LTE	LTE Band 25	QPSK	10	25	0	Back	1	-	26365	1882.5	22.84	24	1.306	0.897	1.172	0.07	0
#101	LTE	LTE Band 25	QPSK	10	25	0	Back	1	-	26090	1855	22.81	24	1.315	0.932	1.226	0.08	0
#102	LTE	LTE Band 25	QPSK	10	25	0	Back	1	-	26640	1910	22.69	24	1.352	0.837	1.132	0.06	0
#106	LTE	LTE Band 25	QPSK	10	50	0	Back	1	-	26365	1882.5	22.65	24	1.365	0.860	1.174	0.11	0
#97	LTE	LTE Band 25	QPSK	10	1	0	Back	1	V	26090	1855	23.85	24	1.035	1.020	1.056	0.09	0
#98	LTE	LTE Band 25	QPSK	10	1	0	Back	1	V	26365	1882.5	23.87	24	1.030	1.070	1.103	0.04	0
#149	LTE	LTE Band 25	QPSK	10	1	0	Back	1	V	26365	1882.5	17.8	18	1.047	0.247	0.259	-0.11	6
#99	LTE	LTE Band 25	QPSK	10	1	0	Back	1	V	26640	1910	23.74	24	1.062	0.917	0.974	0.09	0
#103	LTE	LTE Band 25	QPSK	10	25	0	Back	1	V	26090	1855	22.81	24	1.315	0.770	1.013	0.03	0
#104	LTE	LTE Band 25	QPSK	10	25	0	Back	1	V	26365	1882.5	22.84	24	1.306	0.831	1.085	0.16	0
#105	LTE	LTE Band 25	QPSK	10	25	0	Back	1	V	26640	1910	22.69	24	1.352	0.705	0.953	0.02	0

<WLAN 2.4GHz>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#117	WLAN/BT	WLAN 2.4GHz	802.11b	Front	1	-	11	2462	14.18	14.5	1.076	0.057	0.061	0.054	0
#118	**WLAN/BT**	**WLAN 2.4GHz**	**802.11b**	**Back**	**1**	**-**	**11**	**2462**	**14.18**	**14.5**	**1.076**	**0.067**	**0.072**	**0.17**	**0**
#121	WLAN/BT	WLAN 2.4GHz	802.11b	Back	1	V	11	2462	14.18	14.5	1.076	0.062	0.067	-0.05	0

<WLAN 5GHz>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
#130	WLAN/BT	WLAN 5GHz	802.11a	Front	1	-	36	5180	6.83	7	1.040	0.00649	0.007	0.09	0
#131	WLAN/BT	WLAN 5GHz	802.11a	Back	1	-	36	5180	6.83	7	1.040	0.097	0.101	0.09	0
#134	**WLAN/BT**	**WLAN 5GHz**	**802.11a**	**Back**	**1**	**V**	**36**	**5180**	**6.83**	**7**	**1.040**	**0.105**	**0.109**	**0.01**	**0**
#135	WLAN/BT	WLAN 5GHz	802.11a	Front	1	-	149	5745	14.9	15.5	1.148	0.026	0.030	0.01	0
#136	WLAN/BT	WLAN 5GHz	802.11a	Back	1	-	149	5745	14.9	15.5	1.148	0.288	0.331	0.09	0
#139	**WLAN/BT**	**WLAN 5GHz**	**802.11a**	**Back**	**1**	**V**	**149**	**5745**	**14.9**	**15.5**	**1.148**	**0.293**	**0.336**	**0.09**	**0**

12.4 Repeated SAR Measurement

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Ratio	Reported SAR_{1g} (W/kg)	Power Drift (dB)
#83	1xRTT/ EVDO	CDMA2000 BC1	RTAP 153.6	-	-	-	Bottom Side	1	-	25	1851.25	23.41	24	1.146	1.310	1	1.501	0.11
#78	1xRTT/ EVDO	CDMA2000 BC1	RTAP 153.6	-	-	-	Bottom Side	1	-	25	1851.25	23.41	24	1.146	1.260	1.040	1.443	0.03
#29	LTE	LTE Band 25	QPSK	10	1	0	Left Cheek	-	-	26365	1882.5	23.87	24	1.030	1.340	1	1.381	0.04
#30	LTE	LTE Band 25	QPSK	10	1	0	Left Cheek	-	-	26365	1882.5	23.87	24	1.030	1.330	1.008	1.370	0.08

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.

12.5 Highest SAR Plot

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Power Drift (dB)
#53	1xRTT/ EVDO	CDMA2000 BC0	RTAP 153.6	-	-	-	Right Side	1	-	384	836.52	23.96	24.5	1.132	0.571	0.647	0.07
#83	1xRTT/ EVDO	CDMA2000 BC1	RTAP 153.6	-	-	-	Bottom Side	1	-	25	1851.25	23.41	24	1.146	1.310	1.501	0.11
#89	1xRTT/ EVDO	CDMA2000 BC10	RTAP 153.6	-	-	-	Right Side	1	-	684	823.1	23.89	24.5	1.151	0.574	0.661	-0.04
#29	LTE	LTE Band 25	QPSK	10	1	0	Left Cheek	-	-	26365	1882.5	23.87	24	1.030	1.340	1.381	0.04
#40	WLAN/BT	WLAN 2.4GHz	802.11b	-	-	-	Right Side	1	-	11	2462	14.18	14.5	1.076	0.242	0.261	-0.08
#139	WLAN/BT	WLAN 5GHz	802.11a	-	-	-	Back	1	V	149	5745	14.9	15.5	1.148	0.293	0.336	0.09

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013-1-10

#53 CDMA2000 BC0_RTAP 153.6_Right Side 1cm_Ch384

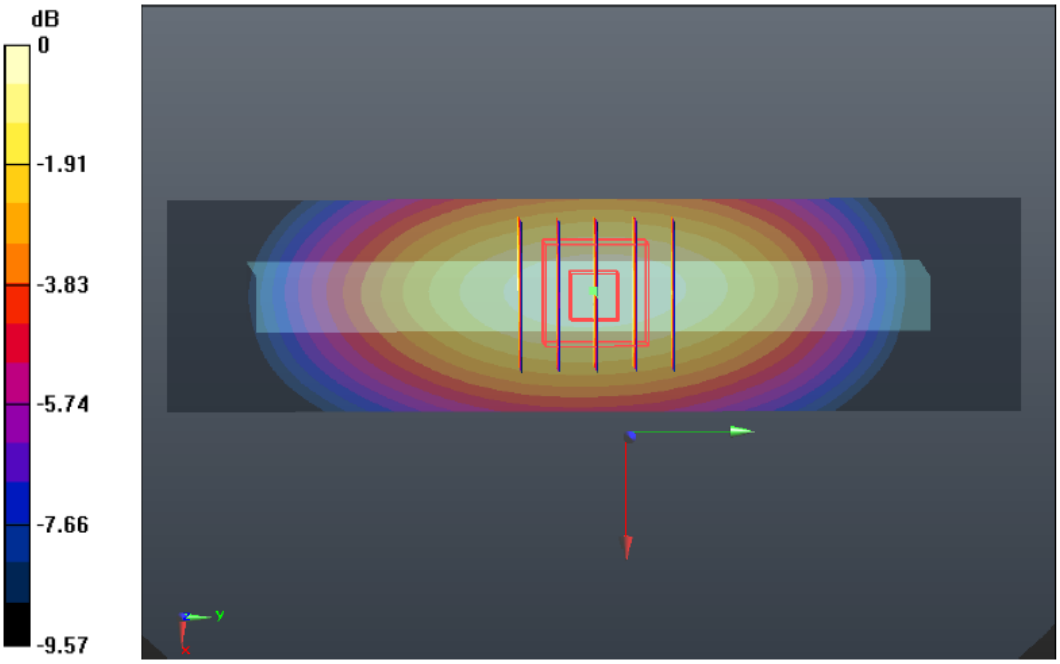
DUT: 2D1804

Communication System: CDMA2000; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: MSL_835_130110 Medium parameters used: f = 837 MHz; σ = 0.981 mho/m; ε_r = 54.067; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.98, 8.98, 8.98); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Ch384/Area Scan (31x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.685 mW/g

Ch384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.728 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.796 W/kg
SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.394 mW/g
Maximum value of SAR (measured) = 0.699 mW/g



0 dB = 0.700mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012-12-30

#83 CDMA2000 BC1_RTAP 153.6_Bottom Side 1cm_Ch25

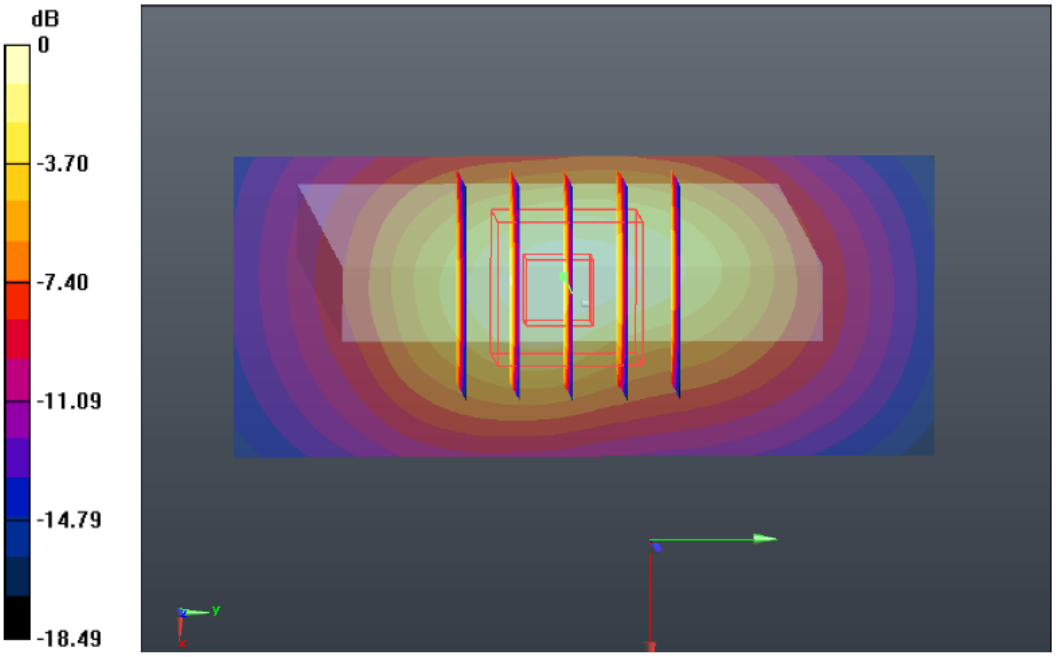
DUT: 2D1804

Communication System: CDMA2000; Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium: MSL_1900_121230 Medium parameters used: f = 1851.25 MHz; σ = 1.49 mho/m; ε_r = 53.485; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：21.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.35, 7.35, 7.35); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Ch25/Area Scan (31x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.705 mW/g

Ch25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.492 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 2.206 W/kg
SAR(1 g) = 1.310 mW/g; SAR(10 g) = 0.689 mW/g
Maximum value of SAR (measured) = 1.805 mW/g



0 dB = 1.800mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013-1-10

#89 CDMA2000 BC10_RTAP 153.6_Right Side 1cm_Ch684

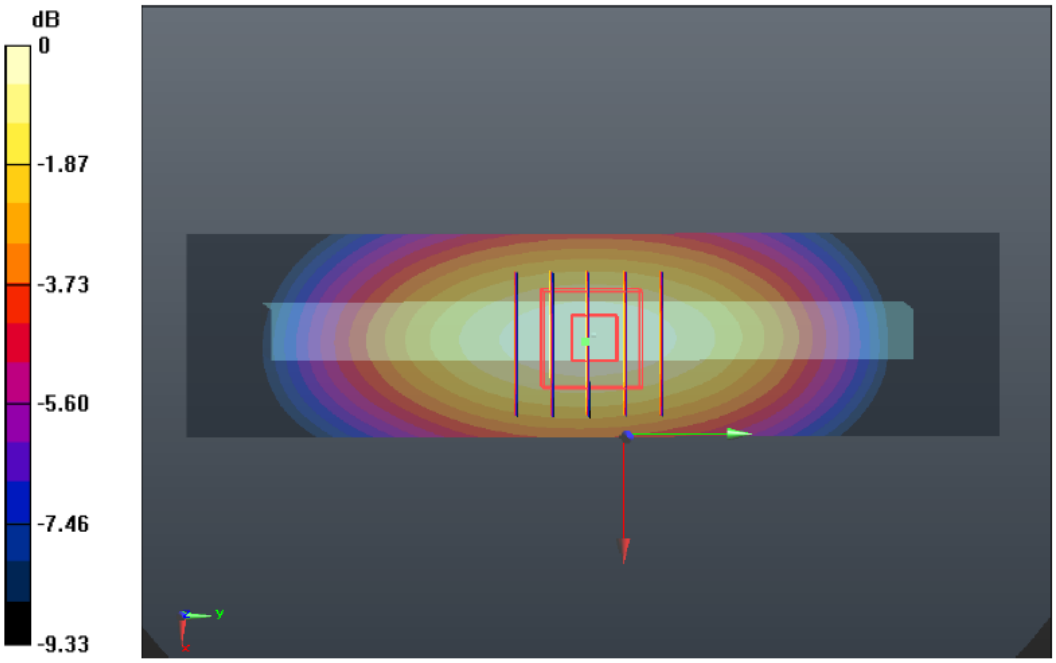
DUT: 2D1804

Communication System: CDMA2000; Frequency: 823.1 MHz;Duty Cycle: 1:1
Medium: MSL_835_130110 Medium parameters used: f = 823.1 MHz; σ = 0.967 mho/m; ε_r = 54.206; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.98, 8.98, 8.98); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Ch684/Area Scan (31x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.692 mW/g

Ch684/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.266 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.799 W/kg
SAR(1 g) = 0.574 mW/g; SAR(10 g) = 0.398 mW/g
Maximum value of SAR (measured) = 0.702 mW/g



0 dB = 0.700mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012-12-29

#29 LTE Band 25_10M QPSK 1RB 0offset_Left Cheek_Ch26365

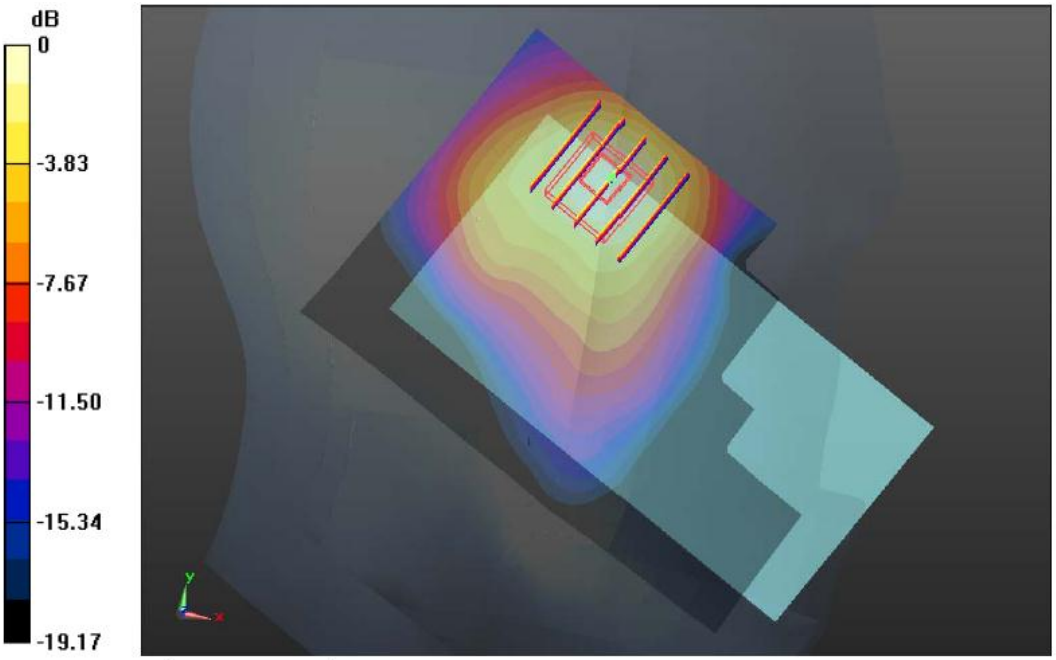
DUT: 2D1804

Communication System: LTE; Frequency: 1882.5 MHz;Duty Cycle: 1:1
Medium: HSL_1900_121229 Medium parameters used: f = 1882.5 MHz; σ = 1.405 mho/m; ε_r = 39.081; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.84, 7.84, 7.84); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Ch26365/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.975 mW/g

Ch26365/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.338 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 2.334 W/kg
SAR(1 g) = 1.340 mW/g; SAR(10 g) = 0.734 mW/g
Maximum value of SAR (measured) = 1.874 mW/g



0 dB = 1.870mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013-1-11

#40 802.11b_1M_Right Cheek_Ch11

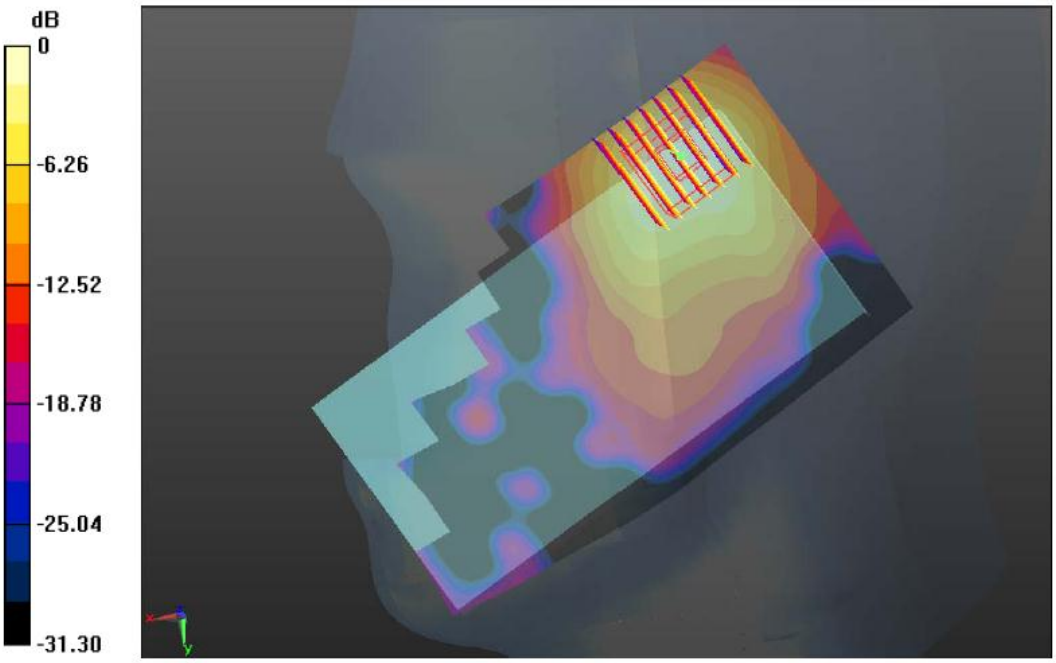
DUT: 2D1804

Communication System: WIFI; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: HSL_2450_130111 Medium parameters used: f = 2462 MHz; σ = 1.847 mho/m; ε_r = 39.609; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：21.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(6.87, 6.87, 6.87); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Ch11/Area Scan (81x141x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.385 mW/g

Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.196 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.491 W/kg
SAR(1 g) = 0.242 mW/g; SAR(10 g) = 0.119 mW/g
Maximum value of SAR (measured) = 0.351 mW/g



0 dB = 0.350mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013-1-23

#139 802.11a_6M_Back 1cm_Ch149_Headset

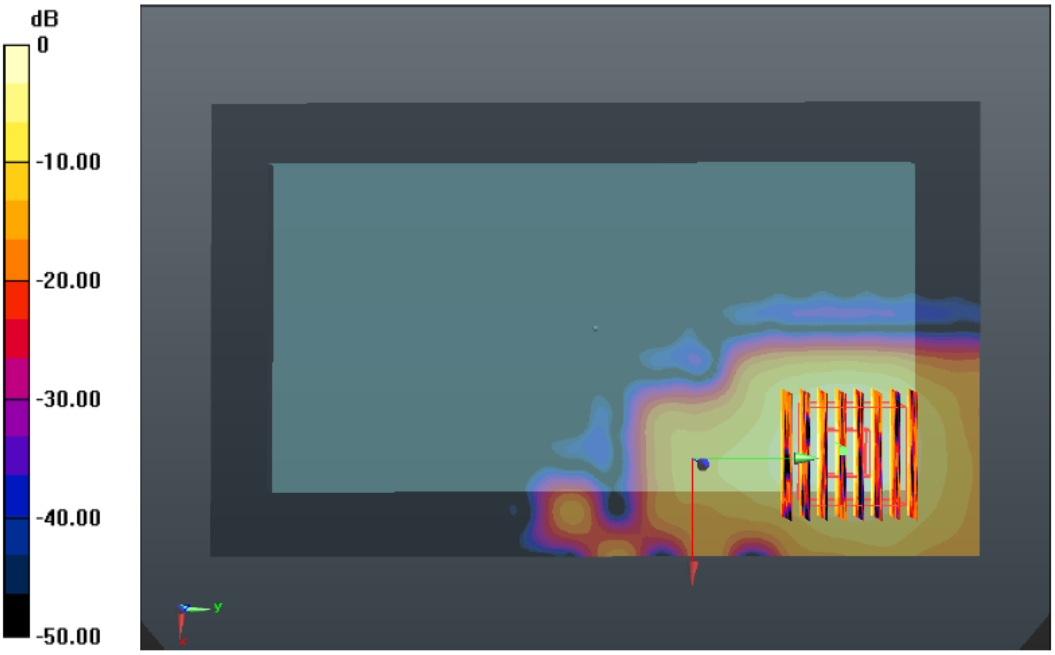
DUT: 2D1804

Communication System: WIFI; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: MSL_5000_130123 Medium parameters used: f = 5745 MHz; σ = 6.035 mho/m; ε_r = 47.138; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(3.99, 3.99, 3.99); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Ch149/Area Scan (101x171x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.600 mW/g

Ch149/Zoom Scan (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.209 W/kg
SAR(1 g) = 0.293 mW/g; SAR(10 g) = 0.088 mW/g
Maximum value of SAR (measured) = 0.568 mW/g



0 dB = 0.570mW/g

12.6 Simultaneous Multi-band Transmission Analysis

	Position	Applicable Combination
Simultaneous Transmission	Head	1x CDMA (voice) + WLAN 2.4GHz/5GHz
		1x CDMA (voice) + LTE (data) + WLAN 2.4GHz/5GHz
		1x CDMA (voice) + BT
		1x CDMA (voice) + LTE (data) + BT
	Hotspot	1x CDMA (data) + WLAN 2.4GHz
		LTE (data) + WLAN 2.4GHz
		1x CDMA (data) + BT
		LTE (data) + BT
	Body-worn	1x CDMA (voice) + WLAN 2.4GHz/5GHz
		1x CDMA (voice) + LTE (data) + WLAN 2.4GHz/5GHz
		1x CDMA (voice) + BT
		1x CDMA (voice) + LTE (data) + BT

Note:

1. WLAN 2.4GHz and Bluetooth 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. This device, WLAN 2.4GHz support hotspot operation; WLAN 5GHz does not support those operations. WWAN transmitter would transmit simultaneously with WLAN 2.4GHz.
4. CDMA2000 1XRTT and EVDO share the same antenna, and cannot transmit simultaneously.
5. The reported SAR summation is calculated based on the same configuration and test position.
6. 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.
7. 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.

Max Power	Exposure Position	Head	Body 1cm
	Test separation	0 mm	10 mm
3 dBm	Estimated SAR (W/kg)	0.084W/kg	0.042W/kg

8. Per KDB 447498 D01v05, simultaneous transmission SAR is compliant if,
   (i) Scalar SAR summation < 1.6W/kg.
   (ii) SPLSR = (SAR1 + SAR2)1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) 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.

The implemented power combinations

SVLTE Mode	
Voice Mode	**Data Mode: Maximum power**
1xRTT BC0/BC1/BC10	**LTE Band 25 BW=1.4/3/5/10MHz QPSK 1RB**
≤16.5 dBm	24 dBm
>16.5 dBm	18 dBm

Alternative combinations (Unit: dBm) – For analysis purpose only

Power combination	CDMA2000 1x voice	LTE data mode
#1	**Full Power** BC0/BC10: 24.5 BC1: 24	**Full Power** 24
#2	**Reduced Power** BC0/BC10: 16.5 BC1: 16.5	**Full Power** 24
#3	**Full Power** BC0/BC10: 24.5 BC1: 24	**Reduced Power** 18

Note:

1. For SVLTE mode which means LTE (data) and CDMA 1xRTT (voice) transmitting simultaneously, power reduction is implemented.
2. When EUT 1xRTT output power is > 16.5dBm, LTE maximum output power is limited to 18dBm regardless of the power control command from the base station.

Analysis Procedure:

Step1

1. Per KDB 941225 D05, maximum power standalone SAR of 1xRTT/EVDO/LTE is used for simultaneous transmission analysis.
2. Start analysis from full power combination (Alternative Power combination #1).
3. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement and further evaluations are not necessary.
4. If 1g-SAR summation >1.6W/kg, SPLSR calculation is necessary.
5. If resulting SPLSR ≤ 0.04, further evaluation is not required.
6. If resulting SPLSR > 0.04, step2 analysis is required.

Step2

7. For the cases from step1, power combinations #2/#3 are used in further step2 analysis.
8. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement and further evaluations are not necessary.
9. If resulting SPLSR ≤ 0.04, further evaluation is not required.
10. If resulting SPLSR > 0.04, volume scan measurement is required.

Table 12.6-A1: Head SAR analysis <Step1>

	Position	Applicable Combination
Simultaneous Transmission	Head	1x CDMA (voice) + WLAN
		1x CDMA (voice) + LTE (data) + WLAN
		1x CDMA (voice) + BT
		1x CDMA (voice) + LTE (data) + BT

	WWAN (voice)				WWAN (data)				WLAN 2.4GHz			WWAN + WLAN 2.4GHz (W/kg)	SPLSR	Case No
Position	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Right Cheek	CDMA2000 BC0	#05	23.93	0.437	LTE Band 25	#19	23.87	0.769	#40	14.18	0.261	1.47	-	-
	CDMA2000 BC1	#10	23.48	0.238	LTE Band 25	#19	23.87	0.769	#40	14.18	0.261	1.27	-	-
	CDMA2000 BC10	#18	23.86	0.527	LTE Band 25	#19	23.87	0.769	#40	14.18	0.261	1.56	-	-
Right Tilted	CDMA2000 BC0	#02	23.95	0.262	LTE Band 25	#22	23.87	0.850	#41	14.18	0.175	1.29	-	-
	CDMA2000 BC1	#07	23.50	0.052	LTE Band 25	#22	23.87	0.850	#41	14.18	0.175	1.08	-	-
	CDMA2000 BC10	#15	23.87	0.331	LTE Band 25	#22	23.87	0.850	#41	14.18	0.175	1.36	-	-
Left Cheek	CDMA2000 BC0	#03	23.95	0.398	LTE Band 25	#29	23.87	1.381	#42	14.18	0.147	**1.93**	0.05	#A1-1
	CDMA2000 BC1	#08	23.50	0.236	LTE Band 25	#29	23.87	1.381	#42	14.18	0.147	**1.76**	0.04	#A1-2
	CDMA2000 BC10	#16	23.87	0.486	LTE Band 25	#29	23.87	1.381	#42	14.18	0.147	**2.01**	0.05	#A1-3
Left Tilted	CDMA2000 BC0	#04	23.95	0.281	LTE Band 25	#37	23.87	0.770	#43	14.18	0.124	1.18	-	-
	CDMA2000 BC1	#09	23.50	0.057	LTE Band 25	#37	23.87	0.770	#43	14.18	0.124	0.95	-	-
	CDMA2000 BC10	#17	23.87	0.355	LTE Band 25	#37	23.87	0.770	#43	14.18	0.124	1.25	-	-

	WWAN (voice)				WWAN (data)				WLAN 5GHz			WWAN + WLAN 5GHz (W/kg)	SPLSR	Case No
Position	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Right Cheek	CDMA2000 BC0	#05	23.93	0.437	LTE Band 25	#19	23.87	0.769	#126	14.9	0.150	1.36	-	-
	CDMA2000 BC1	#10	23.48	0.238	LTE Band 25	#19	23.87	0.769	#126	14.9	0.150	1.16	-	-
	CDMA2000 BC10	#18	23.86	0.527	LTE Band 25	#19	23.87	0.769	#126	14.9	0.150	1.45	-	-
Right Tilted	CDMA2000 BC0	#02	23.95	0.262	LTE Band 25	#22	23.87	0.850	#127	14.9	0.093	1.21	-	-
	CDMA2000 BC1	#07	23.50	0.052	LTE Band 25	#22	23.87	0.850	#127	14.9	0.093	1.00	-	-
	CDMA2000 BC10	#15	23.87	0.331	LTE Band 25	#22	23.87	0.850	#127	14.9	0.093	1.27	-	-
Left Cheek	CDMA2000 BC0	#03	23.95	0.398	LTE Band 25	#29	23.87	1.381	#128	14.9	0.062	**1.84**	0.05	#A1-4
	CDMA2000 BC1	#08	23.50	0.236	LTE Band 25	#29	23.87	1.381	#128	14.9	0.062	**1.68**	0.03	#A1-5
	CDMA2000 BC10	#16	23.87	0.486	LTE Band 25	#29	23.87	1.381	#128	14.9	0.062	**1.93**	0.05	#A1-6
Left Tilted	CDMA2000 BC0	#04	23.95	0.281	LTE Band 25	#37	23.87	0.770	#129	14.9	0.044	1.10	-	-
	CDMA2000 BC1	#09	23.50	0.057	LTE Band 25	#37	23.87	0.770	#129	14.9	0.044	0.87	-	-
	CDMA2000 BC10	#17	23.87	0.355	LTE Band 25	#37	23.87	0.770	#129	14.9	0.044	1.17	-	-

Position	WWAN (voice)				WWAN (data)				Bluetooth		WWAN + Bluetooth (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Average Power (dBm)	Estimated Bluetooth SAR (W/kg)			
Right Cheek	CDMA2000 BC0	#05	23.93	0.437	LTE Band 25	#19	23.87	0.769	2.32	0.084	1.29	-	-
	CDMA2000 BC1	#10	23.48	0.238	LTE Band 25	#19	23.87	0.769	2.32	0.084	1.09	-	-
	CDMA2000 BC10	#18	23.86	0.527	LTE Band 25	#19	23.87	0.769	2.32	0.084	1.38	-	-
Right Tilted	CDMA2000 BC0	#02	23.95	0.262	LTE Band 25	#22	23.87	0.850	2.32	0.084	1.20	-	-
	CDMA2000 BC1	#07	23.50	0.052	LTE Band 25	#22	23.87	0.850	2.32	0.084	0.99	-	-
	CDMA2000 BC10	#15	23.87	0.331	LTE Band 25	#22	23.87	0.850	2.32	0.084	1.27	-	-
Left Cheek	CDMA2000 BC0	#03	23.95	0.398	LTE Band 25	#29	23.87	1.381	2.32	0.084	**1.86**	0.05	#A1-7
	CDMA2000 BC1	#08	23.50	0.236	LTE Band 25	#29	23.87	1.381	2.32	0.084	**1.70**	0.04	#A1-8
	CDMA2000 BC10	#16	23.87	0.486	LTE Band 25	#29	23.87	1.381	2.32	0.084	**1.95**	0.05	#A1-9
Left Tilted	CDMA2000 BC0	#04	23.95	0.281	LTE Band 25	#37	23.87	0.770	2.32	0.084	1.14	-	-
	CDMA2000 BC1	#09	23.50	0.057	LTE Band 25	#37	23.87	0.770	2.32	0.084	0.91	-	-
	CDMA2000 BC10	#17	23.87	0.355	LTE Band 25	#37	23.87	0.770	2.32	0.084	1.21	-	-

Remark:

1. #A1-1, #A1-3, #A1-4, #A1-6, #A1-7 and #A1-9 resulting SPLSR > 0.04, step2 analysis is required.
2. The SAR summation represents the simultaneous transmission of, a WWAN voice call and WWAN data transmission and WLAN as hotspot router; 3 transmitters operating at the same time.
3. The ananlysis above will represent the compliance of the simultaneous transmission of a WWAN voice call and WWAN data transmission, since the possible WWAN output power configuration in SVLTE mode(2 transmitters) is exactly the same as the configuration in SVLTE+WLAN (3 transmitters).

Position	WWAN (voice)				WLAN 2.4GHz			WWAN + WLAN 2.4GHz (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Right Cheek	CDMA2000 BC0	#05	23.93	0.437	#40	14.18	0.261	0.70	-	-
	CDMA2000 BC1	#10	23.48	0.238	#40	14.18	0.261	0.50	-	-
	CDMA2000 BC10	#18	23.86	0.527	#40	14.18	0.261	0.79	-	-
	LTE Band 25	#19	23.87	0.769	#40	14.18	0.261	1.03	-	-
Right Tilted	CDMA2000 BC0	#02	23.95	0.262	#41	14.18	0.175	0.44	-	-
	CDMA2000 BC1	#07	23.50	0.052	#41	14.18	0.175	0.23	-	-
	CDMA2000 BC10	#15	23.87	0.331	#41	14.18	0.175	0.51	-	-
	LTE Band 25	#22	23.87	0.850	#41	14.18	0.175	1.03	-	-
Left Cheek	CDMA2000 BC0	#03	23.95	0.398	#42	14.18	0.147	0.55	-	-
	CDMA2000 BC1	#08	23.50	0.236	#42	14.18	0.147	0.38	-	-
	CDMA2000 BC10	#16	23.87	0.486	#42	14.18	0.147	0.63	-	-
	LTE Band 25	#29	23.87	1.381	#42	14.18	0.147	1.53	-	-
Left Tilted	CDMA2000 BC0	#04	23.95	0.281	#43	14.18	0.124	0.41	-	-
	CDMA2000 BC1	#09	23.50	0.057	#43	14.18	0.124	0.18	-	-
	CDMA2000 BC10	#17	23.87	0.355	#43	14.18	0.124	0.48	-	-
	LTE Band 25	#37	23.87	0.770	#43	14.18	0.124	0.89	-	-

Position	WWAN (voice)				WLAN 5GHz			WWAN + WLAN 5GHz (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Right Cheek	CDMA2000 BC0	#05	23.93	0.437	#126	14.9	0.150	0.59	-	-
	CDMA2000 BC1	#10	23.48	0.238	#126	14.9	0.150	0.39	-	-
	CDMA2000 BC10	#18	23.86	0.527	#126	14.9	0.150	0.68	-	-
	LTE Band 25	#19	23.87	0.769	#126	14.9	0.150	0.92	-	-
Right Tilted	CDMA2000 BC0	#02	23.95	0.262	#127	14.9	0.093	0.36	-	-
	CDMA2000 BC1	#07	23.50	0.052	#127	14.9	0.093	0.15	-	-
	CDMA2000 BC10	#15	23.87	0.331	#127	14.9	0.093	0.42	-	-
	LTE Band 25	#22	23.87	0.850	#127	14.9	0.093	0.94	-	-
Left Cheek	CDMA2000 BC0	#03	23.95	0.398	#128	14.9	0.062	0.46	-	-
	CDMA2000 BC1	#08	23.50	0.236	#128	14.9	0.062	0.30	-	-
	CDMA2000 BC10	#16	23.87	0.486	#128	14.9	0.062	0.55	-	-
	LTE Band 25	#29	23.87	1.381	#128	14.9	0.062	1.44	-	-
Left Tilted	CDMA2000 BC0	#04	23.95	0.281	#129	14.9	0.044	0.33	-	-
	CDMA2000 BC1	#09	23.50	0.057	#129	14.9	0.044	0.10	-	-
	CDMA2000 BC10	#17	23.87	0.355	#129	14.9	0.044	0.40	-	-
	LTE Band 25	#37	23.87	0.770	#129	14.9	0.044	0.81	-	-

Position	WWAN (voice)				Bluetooth		WWAN + Bluetooth (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Right Cheek	CDMA2000 BC0	#05	23.93	0.437	2.32	0.084	0.52	-	-
	CDMA2000 BC1	#10	23.48	0.238	2.32	0.084	0.32	-	-
	CDMA2000 BC10	#18	23.86	0.527	2.32	0.084	0.61	-	-
	LTE Band 25	#19	23.87	0.769	2.32	0.084	0.85	-	-
Right Tilted	CDMA2000 BC0	#02	23.95	0.262	2.32	0.084	0.35	-	-
	CDMA2000 BC1	#07	23.50	0.052	2.32	0.084	0.14	-	-
	CDMA2000 BC10	#15	23.87	0.331	2.32	0.084	0.42	-	-
	LTE Band 25	#22	23.87	0.850	2.32	0.084	0.93	-	-
Left Cheek	CDMA2000 BC0	#03	23.95	0.398	2.32	0.084	0.48	-	-
	CDMA2000 BC1	#08	23.50	0.236	2.32	0.084	0.32	-	-
	CDMA2000 BC10	#16	23.87	0.486	2.32	0.084	0.57	-	-
	LTE Band 25	#29	23.87	1.381	2.32	0.084	1.47	-	-
Left Tilted	CDMA2000 BC0	#04	23.95	0.281	2.32	0.084	0.37	-	-
	CDMA2000 BC1	#09	23.50	0.057	2.32	0.084	0.14	-	-
	CDMA2000 BC10	#17	23.87	0.355	2.32	0.084	0.44	-	-
	LTE Band 25	#37	23.87	0.770	2.32	0.084	0.85	-	-

Remark: The SAR summation represents the simultaneous transmission of a WWAN voice call and WLAN data transmission.

Table 12.6-A2: Head SAR analysis <Step2>

	WWAN (voice)				WWAN (data)				WLAN 2.4GHz			WWAN + WLAN 2.4GHz (W/kg)	SPLSR	Case No
Position	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Left Cheek	CDMA2000 BC0	#03	23.95	0.398	LTE Band 25	#29	23.87	1.381	#42	14.18	0.147	**1.93**	0.05	#A1-1
	CDMA2000 BC0	#140	16.33	0.057	LTE Band 25	#29	23.87	1.381	#42	14.18	0.147	1.59	-	-
	CDMA2000 BC0	#03	23.95	0.398	LTE Band 25	#143	17.80	0.368	#42	14.18	0.147	0.91	-	-
	CDMA2000 BC10	#16	23.87	0.486	LTE Band 25	#29	23.87	1.381	#42	14.18	0.147	**2.01**	0.05	#A1-3
	CDMA2000 BC10	#142	16.33	0.052	LTE Band 25	#29	23.87	1.381	#42	14.18	0.147	1.58	-	-
	CDMA2000 BC10	#16	23.87	0.486	LTE Band 25	#143	17.80	0.368	#42	14.18	0.147	1.00	-	-

	WWAN (voice)				WWAN (data)				WLAN 5GHz			WWAN + WLAN 5GHz (W/kg)	SPLSR	Case No
Position	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Left Cheek	CDMA2000 BC0	#03	23.95	0.398	LTE Band 25	#29	23.87	1.381	#128	14.9	0.062	**1.84**	0.05	#A1-4
	CDMA2000 BC0	#140	16.33	0.057	LTE Band 25	#29	23.87	1.381	#128	14.9	0.062	1.50	-	-
	CDMA2000 BC0	#03	23.95	0.398	LTE Band 25	#143	17.80	0.368	#128	14.9	0.062	0.83	-	-
	CDMA2000 BC10	#16	23.87	0.486	LTE Band 25	#29	23.87	1.381	#128	14.9	0.062	**1.93**	0.05	#A1-6
	CDMA2000 BC10	#142	16.33	0.052	LTE Band 25	#29	23.87	1.381	#128	14.9	0.062	1.50	-	-
	CDMA2000 BC10	#16	23.87	0.486	LTE Band 25	#143	17.80	0.368	#128	14.9	0.062	0.92	-	-

	WWAN (voice)				WWAN (data)				Bluetooth		WWAN + Bluetooth (W/kg)	SPLSR	Case No
Position	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Average Power (dBm)	Estimated Bluetooth SAR (W/kg)			
Left Cheek	CDMA2000 BC0	#03	23.95	0.398	LTE Band 25	#29	23.87	1.381	2.32	0.084	**1.86**	0.05	#A1-7
	CDMA2000 BC0	#140	16.33	0.057	LTE Band 25	#29	23.87	1.381	2.32	0.084	1.52	-	-
	CDMA2000 BC0	#03	23.95	0.398	LTE Band 25	#143	17.80	0.368	2.32	0.084	0.85	-	-
	CDMA2000 BC10	#16	23.87	0.486	LTE Band 25	#29	23.87	1.381	2.32	0.084	**1.95**	0.05	#A1-9
	CDMA2000 BC10	#142	16.33	0.052	LTE Band 25	#29	23.87	1.381	2.32	0.084	1.52	-	-
	CDMA2000 BC10	#16	23.87	0.486	LTE Band 25	#143	17.80	0.368	2.32	0.084	0.94	-	-

Table 12.6-B1: Hotspot mode SAR analysis <Step 1>

Refer to Exposure Positions Consideration in section 11

Positions for SAR tests; Hotspot mode Test distance: 10 mm						
Antennas	**Front**	**Back**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
CDMA 1xRTT / EVDO	Yes	Yes	NO	Yes	Yes	Yes
LTE	Yes	Yes	Yes	NO	Yes	NO
WLAN & Bluetooth	Yes	Yes	Yes	NO	NO	Yes

	Position	**Applicable Combination**
Simultaneous Transmission	**Hotspot**	1x CDMA (data) + WLAN 2.4Ghz
		LTE (data) + WLAN 2.4GHz
		1x CDMA (data) + BT
		LTE (data) + BT

	WWAN (data)				**WLAN 2.4GHz**			**WWAN + WLAN 2.4GHz (W/kg)**	**SPLSR**	**Case No**
Position	**WWAN Band**	**Plot No**	**Average Power (dBm)**	**Max. WWAN SAR (W/kg)**	**Plot No**	**Average Power (dBm)**	**Max. WLAN SAR (W/kg)**			
Front	CDMA2000 BC0	#50	23.96	0.442	#117	14.18	0.061	0.50	-	-
	CDMA2000 BC1	#71	23.53	0.703	#117	14.18	0.061	0.76	-	-
	CDMA2000 BC10	#86	23.89	0.470	#117	14.18	0.061	0.53	-	-
	LTE Band 25	#91	23.87	0.461	#117	14.18	0.061	0.52	-	-
Back	CDMA2000 BC0	#51	23.96	0.578	#118	14.18	0.072	0.65	-	-
	CDMA2000 BC1	#74	23.47	1.186	#118	14.18	0.072	1.26	-	-
	CDMA2000 BC10	#87	23.89	0.617	#118	14.18	0.072	0.69	-	-
	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	1.39	-	-
Left Side	CDMA2000 BC0	#52	23.96	0.468	#119	14.18	0.067	0.54	-	-
	CDMA2000 BC1	#75	23.53	0.135	#119	14.18	0.067	0.20	-	-
	CDMA2000 BC10	#88	23.89	0.540	#119	14.18	0.067	0.61	-	-
	LTE Band 25	-	-	-	#119	14.18	0.067	0.07	-	-
Right Side	CDMA2000 BC0	#53	23.96	0.647	-	-	-	0.65	-	-
	CDMA2000 BC1	#76	23.53	0.143	-	-	-	0.14	-	-
	CDMA2000 BC10	#89	23.89	0.661		-	-	0.66	-	-
	LTE Band 25	#107	23.87	0.858	-	-	-	0.86	-	-
Top Side	CDMA2000 BC0	-	-	-	#120	14.18	0.007	0.01	-	-
	CDMA2000 BC1	-	-	-	#120	14.18	0.007	0.01	-	-
	CDMA2000 BC10		-		#120	14.18	0.007	0.01	-	-
	LTE Band 25	#114	23.87	0.430	#120	14.18	0.007	0.44	-	-
Bottom Side	CDMA2000 BC0	#54	23.96	0.135	-	-	-	0.14	-	-
	CDMA2000 BC1	#83	23.41	1.501	-	-	-	1.50	-	-
	CDMA2000 BC10	#90	23.89	0.143	-	-	-	0.14	-	-
	LTE Band 25	-	-	-	-	-	-	-	-	-

Position	WWAN (data)				Bluetooth		WWAN + Bluetooth (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Average Power (dBm)	Estimated Bluetooth SAR (W/kg)			
Front	CDMA2000 BC0	#50	23.96	0.442	2.32	0.042	0.48	-	-
	CDMA2000 BC1	#71	23.53	0.703	2.32	0.042	0.75	-	-
	CDMA2000 BC10	#86	23.89	0.470	2.32	0.042	0.51	-	-
	LTE Band 25	#91	23.87	0.461	2.32	0.042	0.50	-	-
Back	CDMA2000 BC0	#51	23.96	0.578	2.32	0.042	0.62	-	-
	CDMA2000 BC1	#74	23.47	1.186	2.32	0.042	1.23	-	-
	CDMA2000 BC10	#87	23.89	0.617	2.32	0.042	0.66	-	-
	LTE Band 25	#95	23.85	1.315	2.32	0.042	1.36	-	-
Left Side	CDMA2000 BC0	#52	23.96	0.468	2.32	0.042	0.51	-	-
	CDMA2000 BC1	#75	23.53	0.135	2.32	0.042	0.18	-	-
	CDMA2000 BC10	#88	23.89	0.540	2.32	0.042	0.58	-	-
	LTE Band 25	-	-	-	2.32	0.042	0.04	-	-
Right Side	CDMA2000 BC0	#53	23.96	0.647	2.32	0.042	0.69	-	-
	CDMA2000 BC1	#76	23.53	0.143	2.32	0.042	0.19	-	-
	CDMA2000 BC10	#89	23.89	0.661	2.32	0.042	0.70	-	-
	LTE Band 25	#107	23.87	0.858	2.32	0.042	0.90	-	-
Top Side	CDMA2000 BC0	-	-	-	2.32	0.042	0.04	-	-
	CDMA2000 BC1	-	-	-	2.32	0.042	0.04	-	-
	CDMA2000 BC10		-		2.32	0.042	0.04	-	-
	LTE Band 25	#114	23.87	0.430	2.32	0.042	0.47	-	-
Bottom Side	CDMA2000 BC0	#54	23.96	0.135	2.32	0.042	0.18	-	-
	CDMA2000 BC1	#83	23.41	1.501	2.32	0.042	1.54	-	-
	CDMA2000 BC10	#90	23.89	0.143	2.32	0.042	0.19	-	-
	LTE Band 25	-	-	-	2.32	0.042	0.04	-	-

Table 12.6-C1: Body-worn mode SAR analysis <Step1>

	Position	Applicable Combination
Simultaneous Transmission	Body-worn	1x CDMA (voice) + WLAN2.4GHz/5GHz
		1x CDMA (voice) + LTE (data) + WLAN2.4GHz/5GHz
		1x CDMA (voice) + BT
		1x CDMA (voice) + LTE (data) + BT

	WWAN (voice)				WWAN (data)				WLAN 2.4GHz			WWAN + WLAN 2.4GHz (W/kg)	SPLSR	Case No
Position	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Front	CDMA2000 BC0	#44	23.99	0.440	LTE Band 25	#91	23.87	0.461	#117	14.18	0.061	0.96	-	-
	CDMA2000 BC1	#55	23.54	0.691	LTE Band 25	#91	23.87	0.461	#117	14.18	0.061	1.21	-	-
	CDMA2000 BC10	#80	23.91	0.488	LTE Band 25	#91	23.87	0.461	#117	14.18	0.061	1.01	-	-
Back	CDMA2000 BC0	#45	23.99	0.574	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	**1.96**	0.06	#C1-1
	CDMA2000 BC1	#62	23.48	1.296	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	**2.68**	0.06	#C1-2
	CDMA2000 BC10	#81	23.91	0.616	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	**2.00**	0.06	#C1-3
Back (w/ headset)	CDMA2000 BC0	-	-	-	LTE Band 25	#98	23.87	1.103	#121	14.18	0.067	1.17	-	-
	CDMA2000 BC1	#59	23.54	1.077	LTE Band 25	#98	23.87	1.103	#121	14.18	0.067	**2.25**	0.03	#C1-4
	CDMA2000 BC10	-	-	-	LTE Band 25	#98	23.87	1.103	#121	14.18	0.067	1.17	-	-

	WWAN (voice)				WWAN (data)				WLAN 5GHz			WWAN + WLAN 5GHz (W/kg)	SPLSR	Case No
Position	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Front	CDMA2000 BC0	#44	23.99	0.440	LTE Band 25	#91	23.87	0.461	#135	14.9	0.030	0.93	-	-
	CDMA2000 BC1	#55	23.54	0.691	LTE Band 25	#91	23.87	0.461	#135	14.9	0.030	1.18	-	-
	CDMA2000 BC10	#80	23.91	0.488	LTE Band 25	#91	23.87	0.461	#135	14.9	0.030	0.98	-	-
Back	CDMA2000 BC0	#45	23.99	0.574	LTE Band 25	#95	23.85	1.315	#136	14.9	0.331	**2.22**	0.04	#C1-5
	CDMA2000 BC1	#62	23.48	1.296	LTE Band 25	#95	23.85	1.315	#136	14.9	0.331	**2.94**	0.04	#C1-6
	CDMA2000 BC10	#81	23.91	0.616	LTE Band 25	#95	23.85	1.315	#136	14.9	0.331	**2.26**	0.05	#C1-7
Back (w/ headset)	CDMA2000 BC0	-	-	-	LTE Band 25	#98	23.87	1.103	#139	14.9	0.336	1.44	-	-
	CDMA2000 BC1	#59	23.54	1.077	LTE Band 25	#98	23.87	1.103	#139	14.9	0.336	**2.52**	0.05	#C1-8
	CDMA2000 BC10	-	-	-	LTE Band 25	#98	23.87	1.103	#139	14.9	0.336	1.44	-	-

Position	WWAN (voice)				WWAN (data)				Bluetooth		WWAN + Bluetooth (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Average Power (dBm)	Estimated Bluetooth SAR (W/kg)			
Front	CDMA2000 BC0	#44	23.99	0.440	LTE Band 25	#91	23.87	0.461	2.32	0.042	0.94	-	-
	CDMA2000 BC1	#55	23.54	0.691	LTE Band 25	#91	23.87	0.461	2.32	0.042	1.19	-	-
	CDMA2000 BC10	#80	23.91	0.488	LTE Band 25	#91	23.87	0.461	2.32	0.042	0.99	-	-
Back	CDMA2000 BC0	#45	23.99	0.574	LTE Band 25	#95	23.85	1.315	2.32	0.042	**1.93**	0.06	#C1-9
	CDMA2000 BC1	#62	23.48	1.296	LTE Band 25	#95	23.85	1.315	2.32	0.042	**2.65**	0.06	#C1-10
	CDMA2000 BC10	#81	23.91	0.616	LTE Band 25	#95	23.85	1.315	2.32	0.042	**1.97**	0.06	#C1-11
Back (w/ headset)	CDMA2000 BC0	-	-	-	LTE Band 25	#98	23.87	1.103	2.32	0.042	1.15	-	-
	CDMA2000 BC1	#59	23.54	1.077	LTE Band 25	#98	23.87	1.103	2.32	0.042	**2.22**	0.03	#C1-12
	CDMA2000 BC10	-	-	-	LTE Band 25	#98	23.87	1.103	2.32	0.042	1.15	-	-

Remark:

1. #C1-1, #C1-2, #C1-3, #C1-7, #C1-8, #C1-9, #C1-10, and #C1-11 resulting SPLSR > 0.04, step2 analysis is required.
2. The SAR summation represents the simultaneous transmission of, a WWAN voice call and WWAN data transmission and WLAN as hotspot router; 3 transmitters operating at the same time.
3. The ananlysis above will represent the compliance of the simultaneous transmission of a WWAN voice call and WWAN data transmission, since the possible WWAN output power configuration in SVLTE mode(2 transmitters) is exactly the same as the configuration in SVLTE+WLAN (3 transmitters).

Position	WWAN (voice)				WLAN 2.4GHz			WWAN + WLAN 2.4GHz (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Front	CDMA2000 BC0	#44	23.99	0.440	#117	14.18	0.061	0.50	-	-
	CDMA2000 BC1	#55	23.54	0.691	#117	14.18	0.061	0.75	-	-
	CDMA2000 BC10	#80	23.91	0.488	#117	14.18	0.061	0.55	-	-
	LTE Band 25	#91	23.87	0.461	#117	14.18	0.061	0.52	-	-
Back	CDMA2000 BC0	#45	23.99	0.574	#118	14.18	0.072	0.65	-	-
	CDMA2000 BC1	#62	23.48	1.296	#118	14.18	0.072	1.37	-	-
	CDMA2000 BC10	#81	23.91	0.616	#118	14.18	0.072	0.69	-	-
	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	1.39	-	-
Back (w/ headset)	CDMA2000 BC0	-	-	-	#121	14.18	0.067	0.07	-	-
	CDMA2000 BC1	#59	23.54	1.077	#121	14.18	0.067	1.14	-	-
	CDMA2000 BC10	-	-	-	#121	14.18	0.067	0.07	-	-
	LTE Band 25	#98	23.87	1.103	#121	14.18	0.067	1.17	-	-

Position	WWAN (voice)				WLAN 5GHz			WWAN + WLAN 5GHz (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Front	CDMA2000 BC0	#44	23.99	0.440	#135	14.9	0.030	0.47	-	-
	CDMA2000 BC1	#55	23.54	0.691	#135	14.9	0.030	0.72	-	-
	CDMA2000 BC10	#80	23.91	0.488	#135	14.9	0.030	0.52	-	-
	LTE Band 25	#91	23.87	0.461	#135	14.9	0.030	0.49	-	-
Back	CDMA2000 BC0	#45	23.99	0.574	#136	14.9	0.331	0.91	-	-
	CDMA2000 BC1	#62	23.48	1.296	#136	14.9	0.331	**1.63**	0.02	#C1-13
	CDMA2000 BC10	#81	23.91	0.616	#136	14.9	0.331	0.95	-	-
	LTE Band 25	#95	23.85	1.315	#136	14.9	0.331	**1.65**	0.04	#B1-1
Back (w/ headset)	CDMA2000 BC0	-	-	-	#139	14.9	0.336	0.34	-	-
	CDMA2000 BC1	#59	23.54	1.077	#139	14.9	0.336	1.41	-	-
	CDMA2000 BC10	-	-	-	#139	14.9	0.336	0.34	-	-
	LTE Band 25	#98	23.87	1.103	#139	14.9	0.336	1.44	-	-

Position	WWAN (voice)				Bluetooth		WWAN + Bluetooth (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Front	CDMA2000 BC0	#44	23.99	0.440	2.32	0.042	0.48	-	-
	CDMA2000 BC1	#55	23.54	0.691	2.32	0.042	0.73	-	-
	CDMA2000 BC10	#80	23.91	0.488	2.32	0.042	0.53	-	-
	LTE Band 25	#91	23.87	0.461	2.32	0.042	0.50	-	-
Back	CDMA2000 BC0	#45	23.99	0.574	2.32	0.042	0.62	-	-
	CDMA2000 BC1	#62	23.48	1.296	2.32	0.042	1.34	-	-
	CDMA2000 BC10	#81	23.91	0.616	2.32	0.042	0.66	-	-
	LTE Band 25	#95	23.85	1.315	2.32	0.042	1.36	-	-
Back (w/ headset)	CDMA2000 BC0	-	-	-	2.32	0.042	0.04	-	-
	CDMA2000 BC1	#59	23.54	1.077	2.32	0.042	1.12	-	-
	CDMA2000 BC10	-	-	-	2.32	0.042	0.04	-	-
	LTE Band 25	#98	23.87	1.103	2.32	0.042	1.15	-	-

Remark: The SAR summation represents the simultaneous transmission of a WWAN voice call and WLAN data transmission.

Table 12.6-C2: Body-worn mode SAR analysis <Step2>

Position	WWAN (voice)				WWAN (data)				WLAN 2.4GHz			WWAN + WLAN 2.4GHz (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Back	CDMA2000 BC0	#45	23.99	0.574	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	**1.96**	0.06	#C1-1
	CDMA2000 BC0	#144	16.36	0.091	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	1.48	-	-
	CDMA2000 BC0	#45	23.99	0.574	LTE Band 25	#148	17.75	0.304	#118	14.18	0.072	0.95	-	-
	CDMA2000 BC1	#62	23.48	1.296	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	**2.68**	0.06	#C1-2
	CDMA2000 BC1	#145	16.39	0.192	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	1.58	-	-
	CDMA2000 BC1	#62	23.48	1.296	LTE Band 25	#148	17.75	0.304	#118	14.18	0.072	**1.67**	0.02	#C2-1
	CDMA2000 BC10	#81	23.91	0.616	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	**2.00**	0.06	#C1-3
	CDMA2000 BC10	#147	16.40	0.093	LTE Band 25	#95	23.85	1.315	#118	14.18	0.072	1.48	-	-
	CDMA2000 BC10	#81	23.91	0.616	LTE Band 25	#148	17.75	0.304	#118	14.18	0.072	0.99	-	-

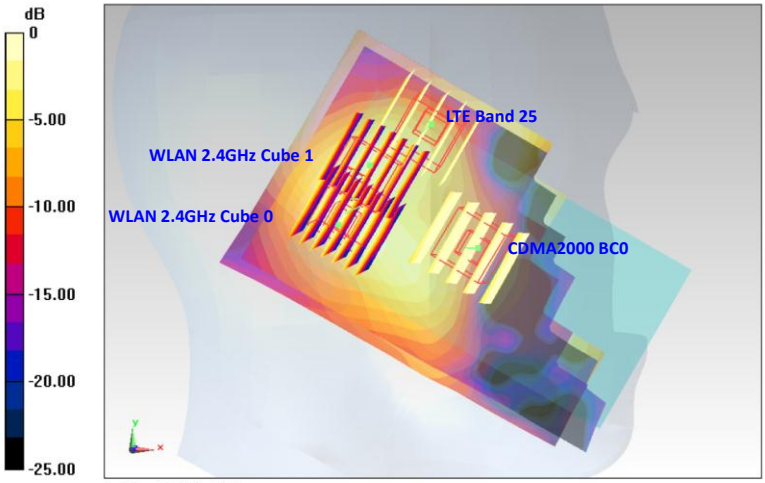
Position	WWAN (voice)				WWAN (data)				WLAN 5GHz			WWAN + WLAN 5GHz (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Plot No	Average Power (dBm)	Max. WLAN SAR (W/kg)			
Back	CDMA2000 BC10	#81	23.91	0.616	LTE Band 25	#95	23.85	1.315	#136	14.9	0.331	**2.26**	0.05	#C1-7
	CDMA2000 BC10	#147	16.4	0.093	LTE Band 25	#95	23.85	1.315	#136	14.9	0.331	**1.74**	0.04	#C2-2
	CDMA2000 BC10	#81	23.91	0.616	LTE Band 25	#148	17.75	0.304	#136	14.9	0.331	1.25	-	-
Back (w/ headset)	CDMA2000 BC1	#59	23.54	1.077	LTE Band 25	#98	23.87	1.103	#139	14.9	0.336	**2.52**	0.05	#C1-8
	CDMA2000 BC1	#146	16.39	0.192	LTE Band 25	#98	23.87	1.103	#139	14.9	0.336	**1.63**	0.05	#C2-3
	CDMA2000 BC1	#59	23.54	1.077	LTE Band 25	#149	17.80	0.259	#139	14.9	0.336	**1.67**	0.02	#C2-4

Position	WWAN (voice)				WWAN (data)				Bluetooth		WWAN + Bluetooth (W/kg)	SPLSR	Case No
	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	WWAN Band	Plot No	Average Power (dBm)	Max. WWAN SAR (W/kg)	Average Power (dBm)	Estimated Bluetooth SAR (W/kg)			
Back	CDMA2000 BC0	#45	23.99	0.574	LTE Band 25	#95	23.85	1.315	2.32	0.042	**1.93**	0.06	#C1-9
	CDMA2000 BC0	#144	16.36	0.091	LTE Band 25	#95	23.85	1.315	2.32	0.042	1.45	-	-
	CDMA2000 BC0	#45	23.99	0.574	LTE Band 25	#148	17.75	0.304	2.32	0.042	0.92	-	-
	CDMA2000 BC1	#62	23.48	1.296	LTE Band 25	#95	23.85	1.315	2.32	0.042	**2.65**	0.06	#C1-10
	CDMA2000 BC1	#145	16.39	0.192	LTE Band 25	#95	23.85	1.315	2.32	0.042	1.55	-	-
	CDMA2000 BC1	#62	23.48	1.296	LTE Band 25	#148	17.75	0.304	2.32	0.042	**1.64**	0.02	#C2-5
	CDMA2000 BC10	#81	23.91	0.616	LTE Band 25	#95	23.85	1.315	2.32	0.042	**1.97**	0.06	#C1-11
	CDMA2000 BC10	#147	16.40	0.093	LTE Band 25	#95	23.85	1.315	2.32	0.042	1.45	-	-
	CDMA2000 BC10	#81	23.91	0.616	LTE Band 25	#148	17.75	0.304	2.32	0.042	0.96	-	-

Remark: #C2-3 resulting SPLSR > 0.04, volume scan analysis is required.

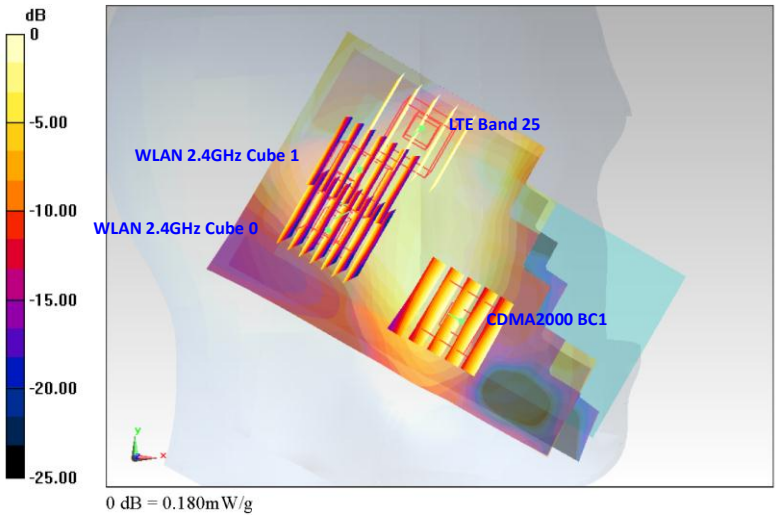
12.7 Simultaneous analysis - SPLSR calculation

Case No #A1-1 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#03	CDMA2000 BC0	Left Cheek	0.398	0	0.0687	0.279	-0.173	52.4	1.78	0.05	**Step 2**
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#03	CDMA2000 BC0		0.398	0	0.0687	0.279	-0.173	54.0	0.55	0.01	Not required
#42, cube 0	WLAN 2.4GHz		0.147	0	0.0141	0.289	-0.171				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	53.2	1.53	0.04	Not required
#42 cube 0	WLAN 2.4GHz		0.147	0	0.0141	0.289	-0.171				
#03	CDMA2000 BC0		0.398	0	0.0687	0.279	-0.173	52.4	1.78	0.05	**Step 2**
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#03	CDMA2000 BC0		0.398	0	0.0687	0.279	-0.173	53.8	0.53	0.01	Not required
#42 cube 1	WLAN 2.4GHz		0.129	0	0.0188	0.299	-0.172				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	42.8	1.51	0.04	Not required
#4 cube 1	WLAN 2.4GHz		0.129	0	0.0188	0.299	-0.172				

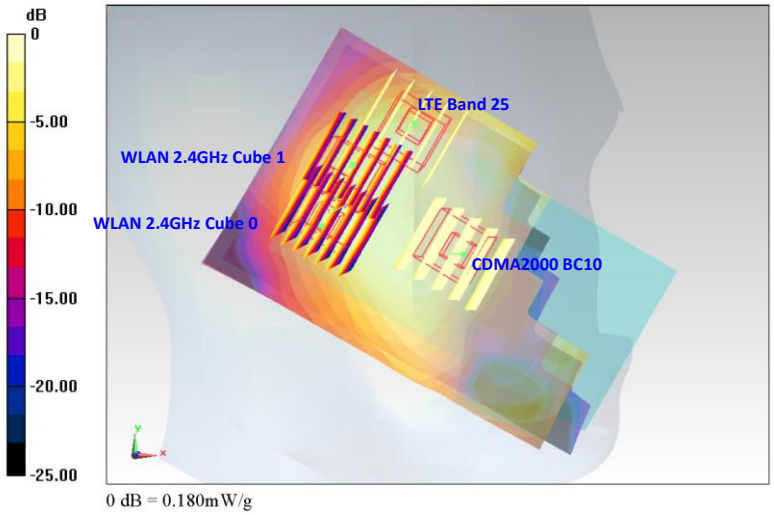


0 dB = 0.180mW/g

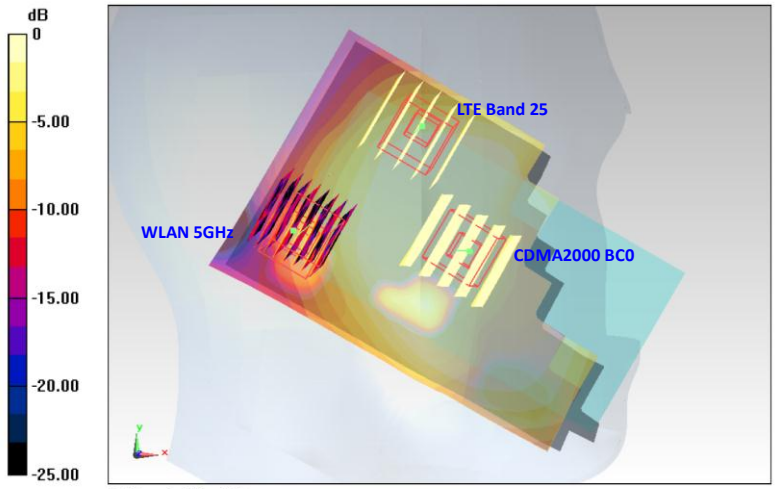
Case No #A1-2 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#08	CDMA2000 BC1	Left Cheek	0.236	0	0.0657	0.254	-0.172	75.6	1.62	0.03	Not required
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#08	CDMA2000 BC1		0.236	0	0.0657	0.254	-0.172	62.4	0.38	0.00	Not required
#42 cube 0	WLAN 2.4GHz		0.147	0	0.0141	0.289	-0.171				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	53.2	1.53	0.04	Not required
#42 cube 0	WLAN 2.4GHz		0.147	0	0.0141	0.289	-0.171				
#08	CDMA2000 BC1		0.236	0	0.0657	0.254	-0.172	75.6	1.62	0.03	Not required
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#08	CDMA2000 BC1		0.236	0	0.0657	0.254	-0.172	65.0	0.37	0.00	Not required
#42 cube 1	WLAN 2.4GHz		0.129	0	0.0188	0.299	-0.172				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	42.8	1.51	0.04	Not required
#42 cube 1	WLAN 2.4GHz		0.129	0	0.0188	0.299	-0.172				



Case No #A1-3 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#16	CDMA2000 BC10	Left Cheek	0.486	0	0.0692	0.277	-0.173	54.4	1.87	0.05	**Step 2**
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#16	CDMA2000 BC10		0.486	0	0.0692	0.277	-0.173	62.4	0.63	0.01	Not required
#42 cube 0	WLAN 2.4GHz		0.147	0	0.0141	0.289	-0.171				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	53.2	1.53	0.04	Not required
#42 cube 0	WLAN 2.4GHz		0.147	0	0.0141	0.289	-0.171				
#16	CDMA2000 BC10		0.486	0	0.0692	0.277	-0.173	54.4	1.87	0.05	**Step 2**
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#16	CDMA2000 BC10		0.486	0	0.0692	0.277	-0.173	55.0	0.62	0.01	Not required
#42 cube 1	WLAN 2.4GHz		0.129	0	0.0188	0.299	-0.172				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	42.8	1.51	0.04	Not required
#42 cube 1	WLAN 2.4GHz		0.129	0	0.0188	0.299	-0.172				

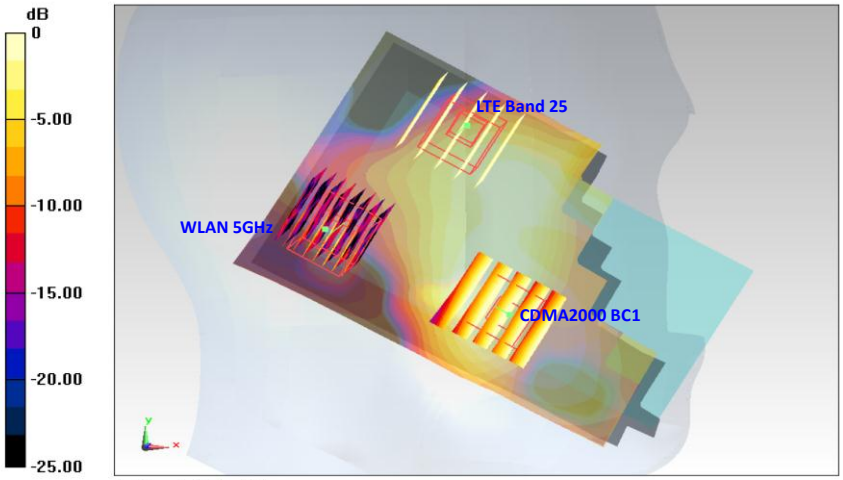


Case No #A1-4 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
#03	CDMA2000 BC0	Left Cheek	0.398	0	0.0687	0.279	-0.173	52.4	1.78	0.05	**Step 2**
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#03	CDMA2000 BC0		0.398	0	0.0687	0.279	-0.173	68.3	0.46	0.00	Not required
#128	WLAN 5GHz		0.062	0	0.000923	0.285	-0.167				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	65.7	1.44	0.03	Not required
#128	WLAN 5GHz		0.062	0	0.000923	0.285	-0.167				



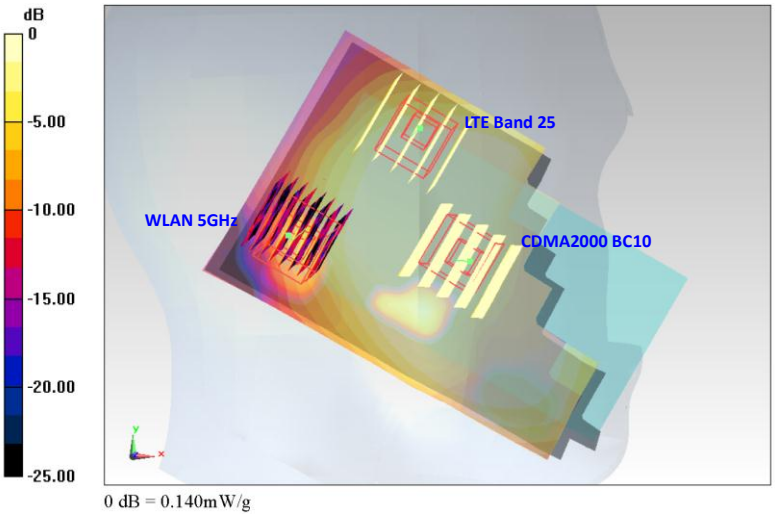
0 dB = 0.140mW/g

Case No #A1-5 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
#08	CDMA2000 BC1	Left Cheek	0.236	0	0.0657	0.254	-0.172	75.6	1.62	0.03	Not required
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#08	CDMA2000 BC1		0.236	0	0.0657	0.254	-0.172	72.0	0.30	0.00	Not required
#128	WLAN 5GHz		0.062	0	0.000923	0.285	-0.167				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	65.7	1.44	0.03	Not required
#128	WLAN 5GHz		0.062	0	0.000923	0.285	-0.167				

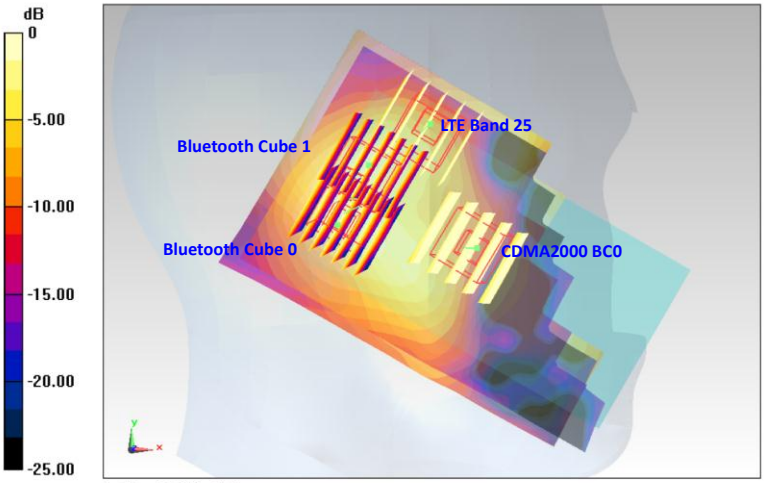


0 dB = 0.140mW/g

Case No #A1-6 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#16	CDMA2000 BC10	Left Cheek	0.486	0	0.0692	0.277	-0.173	54.4	1.87	0.05	**Step 2**
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#16	CDMA2000 BC10		0.486	0	0.0692	0.277	-0.173	72.0	0.55	0.01	Not required
#128	WLAN 5GHz		0.062	0	0.000923	0.285	-0.167				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	65.7	1.44	0.03	Not required
#128	WLAN 5GHz		0.062	0	0.000923	0.285	-0.167				

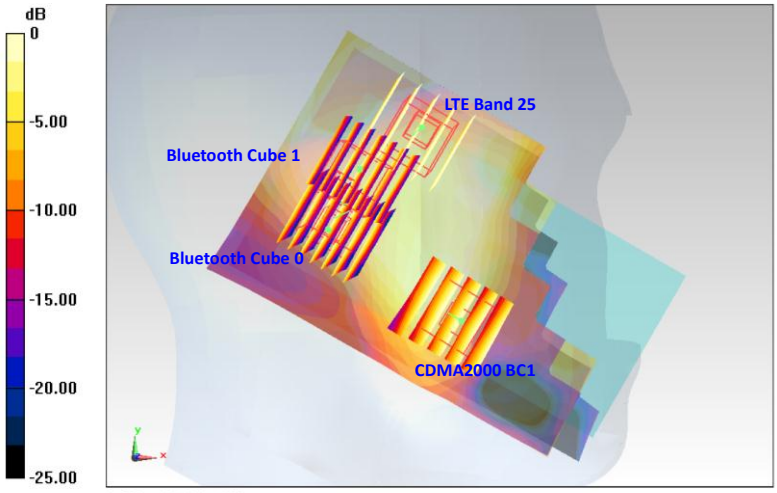


Case No #A1-7 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#03	CDMA2000 BC0	Left Cheek	0.398	0	0.0687	0.279	-0.173	52.4	1.78	0.05	**Step 2**
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#03	CDMA2000 BC0		0.398	0	0.0687	0.279	-0.173	54.0	0.48	0.01	Not required
Bluetooth cube 0			0.084	0	0.0141	0.289	-0.171				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	53.2	1.47	0.04	Not required
Bluetooth cube 0			0.084	0	0.0141	0.289	-0.171				
#03	CDMA2000 BC0		0.398	0	0.0687	0.279	-0.173	52.4	1.78	0.05	**Step 2**
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#03	CDMA2000 BC0		0.398	0	0.0687	0.279	-0.173	53.8	0.48	0.01	Not required
Bluetooth cube 1			0.084	0	0.0188	0.299	-0.172				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	42.8	1.47	0.04	Not required
Bluetooth cube 1			0.084	0	0.0188	0.299	-0.172				



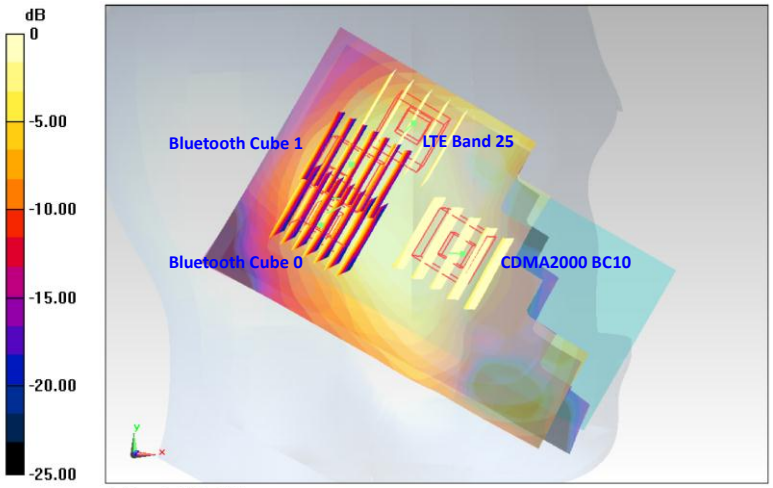
0 dB = 0.180mW/g

Case No #A1-8 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#08	CDMA2000 BC1	Left Cheek	0.236	0	0.0657	0.254	-0.172	75.6	1.62	0.03	Not required
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#08	CDMA2000 BC1		0.236	0	0.0657	0.254	-0.172	62.4	0.32	0.00	Not required
Bluetooth cube 0			0.084	0	0.0141	0.289	-0.171				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	53.2	1.47	0.04	Not required
Bluetooth cube 0			0.084	0	0.0141	0.289	-0.171				
#08	CDMA2000 BC1		0.236	0	0.0657	0.254	-0.172	75.6	1.62	0.03	Not required
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#08	CDMA2000 BC1		0.236	0	0.0657	0.254	-0.172	65.0	0.32	0.00	Not required
Bluetooth cube 1			0.084	0	0.0188	0.299	-0.172				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	42.8	1.47	0.04	Not required
Bluetooth cube 1			0.084	0	0.0188	0.299	-0.172				



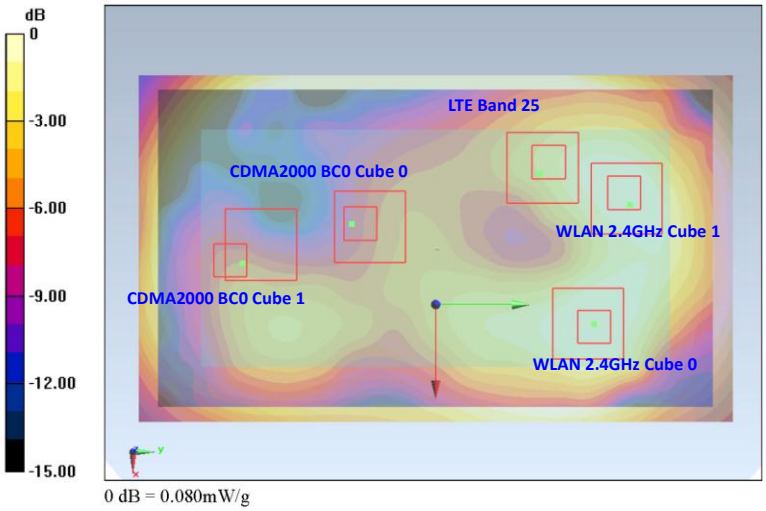
0 dB = 0.180mW/g

Case No #A1-9 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#16	CDMA2000 BC10	Left Cheek	0.486	0	0.0692	0.277	-0.173	54.4	1.87	0.05	**Step 2**
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#16	CDMA2000 BC10		0.486	0	0.0692	0.277	-0.173	62.4	0.57	0.01	Not required
Bluetooth cube 0			0.084	0	0.0141	0.289	-0.171				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	53.2	1.47	0.03	Not required
Bluetooth cube 0			0.084	0	0.0141	0.289	-0.171				
#16	CDMA2000 BC10		0.486	0	0.0692	0.277	-0.173	54.4	1.87	0.05	**Step 2**
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173				
#16	CDMA2000 BC10		0.486	0	0.0692	0.277	-0.173	55.0	0.57	0.01	Not required
Bluetooth cube 1			0.084	0	0.0188	0.299	-0.172				
#29	LTE Band 25		1.381	0	0.0502	0.328	-0.173	42.8	1.47	0.04	Not required
Bluetooth cube 1			0.084	0	0.0188	0.299	-0.172				

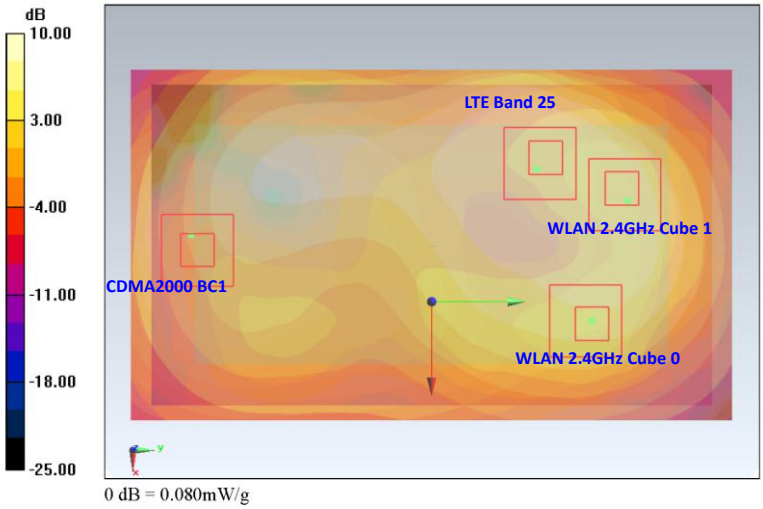


0 dB = 0.180mW/g

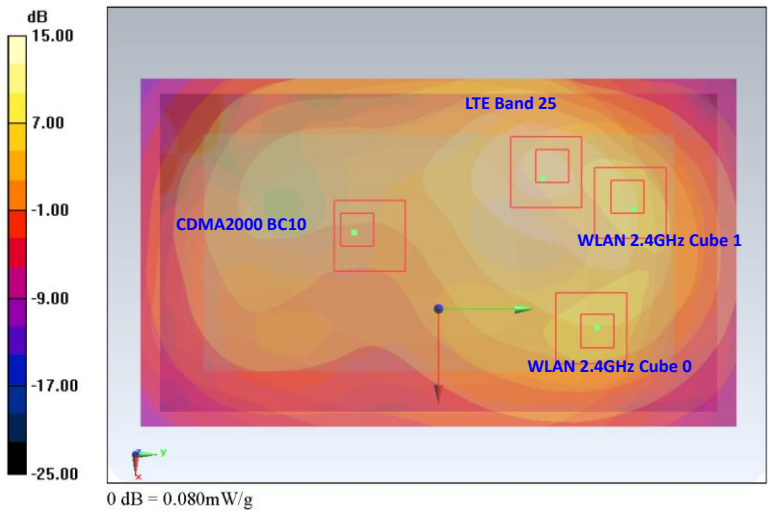
Case No #C1-1 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#45 cube 0	CDMA2000 BC0	Back	0.574	1	-0.0245	-0.0255	-0.205	58.9	1.89	0.04	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#45 cube 0	CDMA2000 BC0		0.574	1	-0.0245	-0.0255	-0.205	79.5	0.65	0.01	Not required
#118 cube 0	WLAN 2.4GHz		0.072	1	0.0058	0.048	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	48.2	1.39	0.03	Not required
#118 cube 0	WLAN 2.4GHz		0.072	1	0.0058	0.048	-0.205				
#45 cube 0	CDMA2000 BC0		0.574	1	-0.0245	-0.0255	-0.205	58.9	1.89	0.04	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#45 cube 0	CDMA2000 BC0		0.574	1	-0.0245	-0.0255	-0.205	84.5	0.64	0.01	Not required
#118 cube 1	WLAN 2.4GHz		0.064	1	-0.0302	0.0588	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	28.8	1.38	0.06	**Step 2**
#118 cube 1	WLAN 2.4GHz		0.064	1	-0.0302	0.0588	-0.205				
#45 cube 1	CDMA2000 BC0		0.457	1	-0.0125	-0.0665	-0.205	101.7	1.77	0.02	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#45 cube 1	CDMA2000 BC0		0.457	1	-0.0125	-0.0665	-0.205	116.0	0.53	0.00	Not required
#118 cube 0	WLAN 2.4GHz		0.072	1	0.0058	0.048	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	48.2	1.39	0.03	Not required
#118 cube 0	WLAN 2.4GHz		0.072	1	0.0058	0.048	-0.205				
#45 cube 1	CDMA2000 BC0		0.457	1	-0.0125	-0.0665	-0.205	101.7	1.77	0.02	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#45 cube 1	CDMA2000 BC0		0.457	1	-0.0125	-0.0665	-0.205	126.5	0.52	0.00	Not required
#118 cube 1	WLAN 2.4GHz		0.064	1	-0.0302	0.0588	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	28.8	1.38	0.06	**Step 2**
#118 cube 1	WLAN 2.4GHz		0.064	1	-0.0302	0.0588	-0.205				



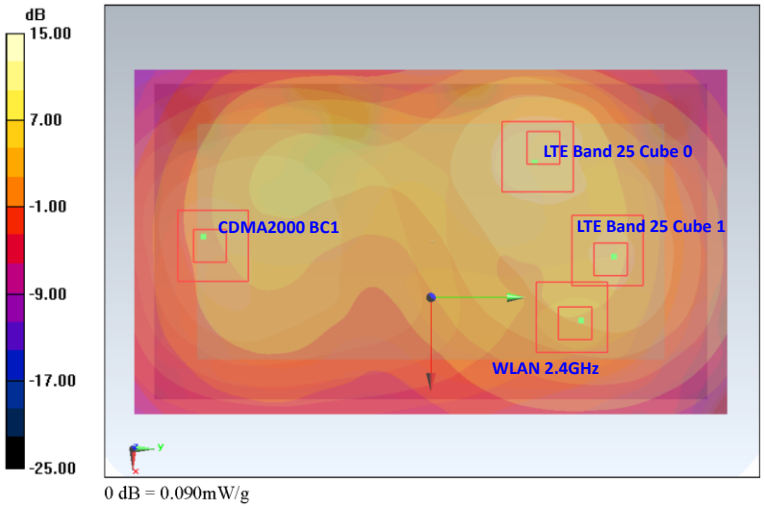
Case No #C1-2 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
#62	CDMA2000 BC1	Back	1.296	1	-0.02	-0.072	-0.205	105.3	2.61	0.04	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	122.7	1.37	0.01	Not required
#118-0	WLAN 2.4GHz		0.072	1	0.0058	0.048	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	48.2	1.39	0.03	Not required
#118-0	WLAN 2.4GHz		0.072	1	0.0058	0.048	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	105.3	2.61	0.04	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	131.2	1.36	0.01	Not required
#118-1	WLAN 2.4GHz		0.064	1	-0.0302	0.0588	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	28.8	1.38	0.06	**Step 2**
#118-1	WLAN 2.4GHz		0.064	1	-0.0302	0.0588	-0.205				



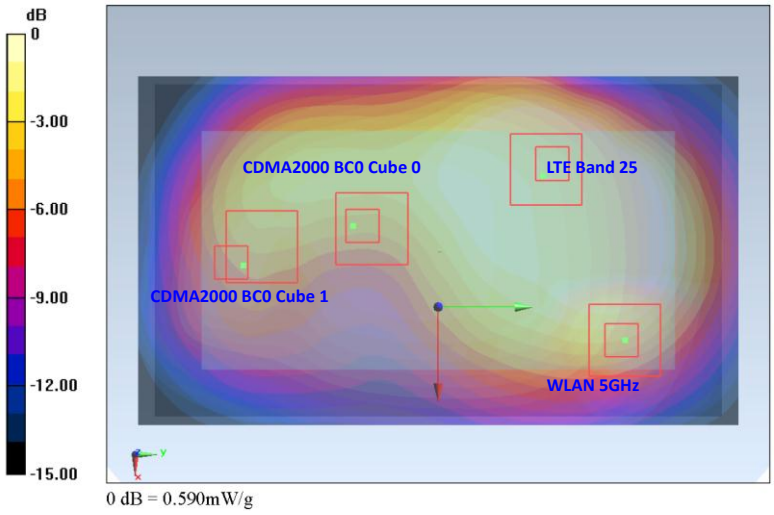
Case No #C1-3 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
#81	CDMA2000 BC10	Back	0.616	1	-0.023	-0.0255	-0.205	59.3	1.93	0.05	**Step 2**
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#81	CDMA2000 BC10		0.616	1	-0.023	-0.0255	-0.205	78.9	0.69	0.01	Not required
#118 cube 0	WLAN 2.4GHz		0.072	1	0.0058	0.048	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	48.2	1.39	0.03	Not required
#118 cube 0	WLAN 2.4GHz		0.072	1	0.0058	0.048	-0.205				
#81	CDMA2000 BC10		0.616	1	-0.023	-0.0255	-0.205	59.3	1.93	0.05	**Step 2**
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#81	CDMA2000 BC10		0.616	1	-0.023	-0.0255	-0.205	84.6	0.68	0.01	Not required
#118 cube 1	WLAN 2.4GHz		0.064	1	-0.0302	0.0588	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	28.8	1.38	0.06	**Step 2**
#118 cube 1	WLAN 2.4GHz		0.064	1	-0.0302	0.0588	-0.205				



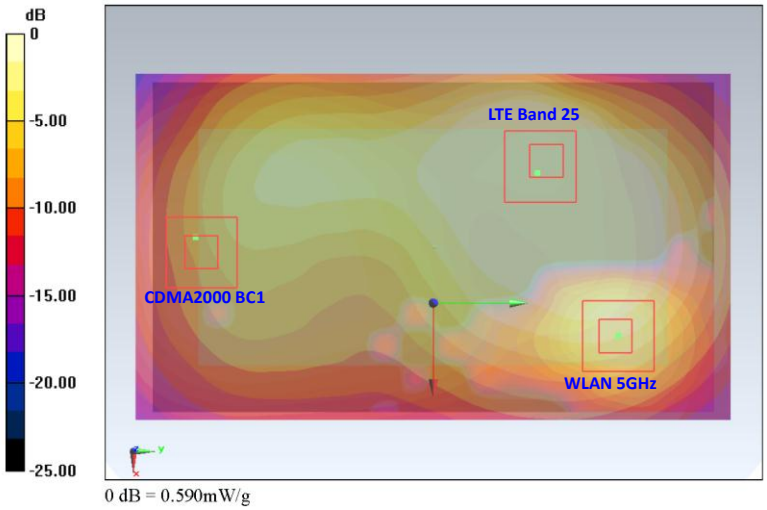
Case No #C1-4 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#59	CDMA2000 BC1	Back (w/ headset)	1.077	1	-0.0185	-0.069	-0.205	112.7	2.18	0.03	Not required
#98 cube 0	LTE Band 25		1.103	1	-0.049	0.0395	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	112.5	1.14	0.01	Not required
#121	WLAN 2.4GHz		0.067	1	0.007	0.0406	-0.205				
#98 cube 0	LTE Band 25		1.103	1	-0.049	0.0395	-0.205	56.0	1.17	0.02	Not required
#121	WLAN 2.4GHz		0.067	1	0.007	0.0406	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	124.6	1.79	0.02	Not required
#98 cube 1	LTE Band 25		0.710	1	-0.0125	0.0555	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	112.5	1.14	0.01	Not required
#121	WLAN 2.4GHz		0.067	1	0.007	0.0406	-0.205				
#98 cube 1	LTE Band 25		0.710	1	-0.0125	0.0555	-0.205	24.5	0.78	0.03	Not required
#121	WLAN 2.4GHz		0.067	1	0.007	0.0406	-0.205				



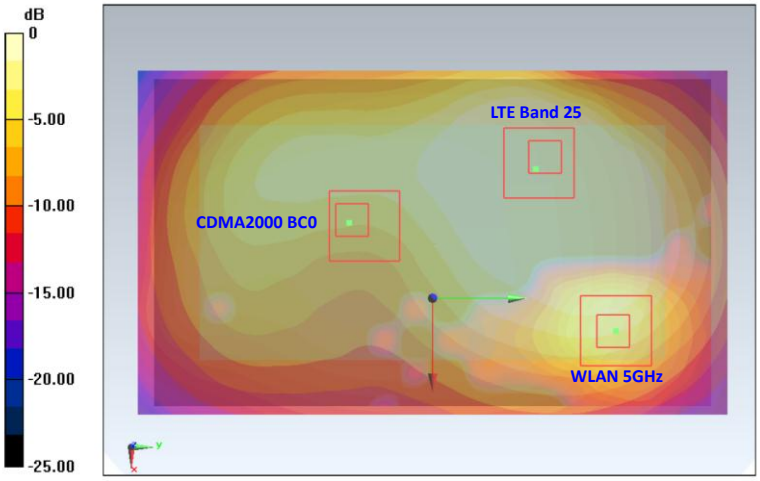
Case No #C1-5 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#45 cube 0	CDMA2000 BC0	Back	0.574	1	-0.0245	-0.0255	-0.205	58.9	1.89	0.04	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#45 cube 0	CDMA2000 BC0		0.574	1	-0.0245	-0.0255	-0.205	87.5	0.91	0.01	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	56.2	1.65	0.04	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				
#45 cube 1	CDMA2000 BC0		0.457	1	-0.0125	-0.0665	-0.205	101.7	1.77	0.02	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#45 cube 1	CDMA2000 BC0		0.457	1	-0.0125	-0.0665	-0.205	123.0	0.79	0.01	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	56.2	1.65	0.04	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				



Case No #C1-6 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
#62	CDMA2000 BC1	Back	1.296	1	-0.02	-0.072	-0.205	105.3	2.61	0.04	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	130.0	1.63	0.02	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	56.2	1.65	0.04	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				

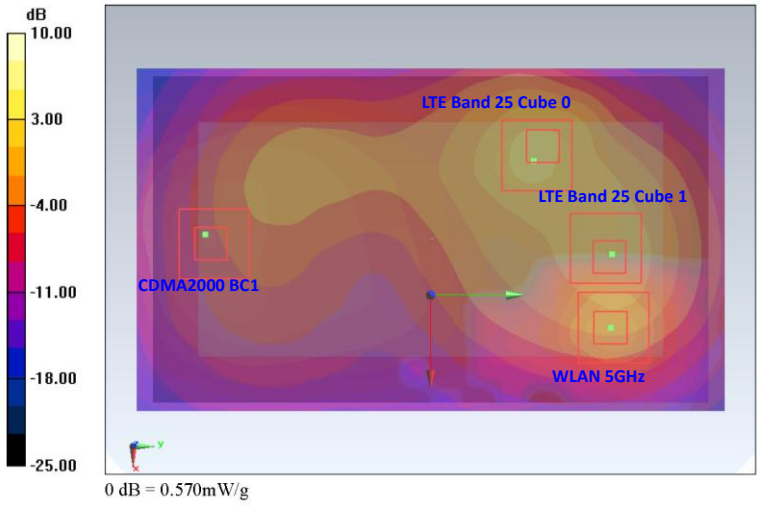


Case No #C1-7 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
#81	CDMA2000 BC10	Back	0.616	1	-0.023	-0.0255	-0.205	59.3	1.93	0.05	**Step 2**
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#81	CDMA2000 BC10		0.616	1	-0.023	-0.0255	-0.205	86.9	0.95	0.01	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	56.2	1.65	0.04	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				

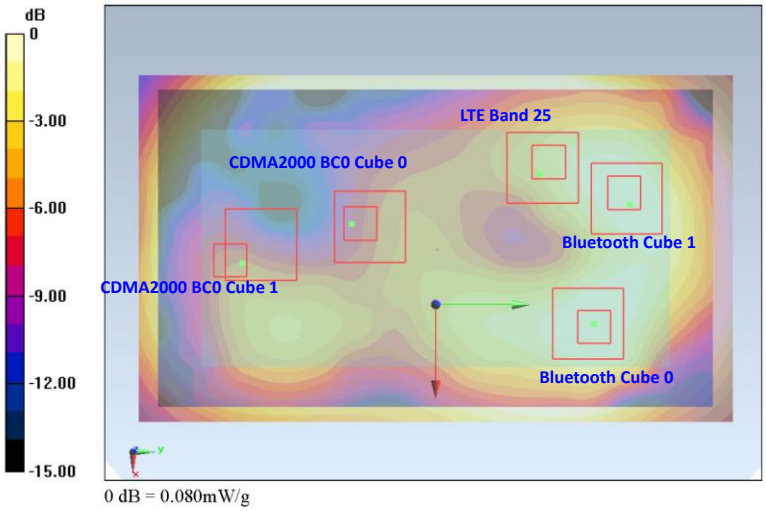


0 dB = 0.590mW/g

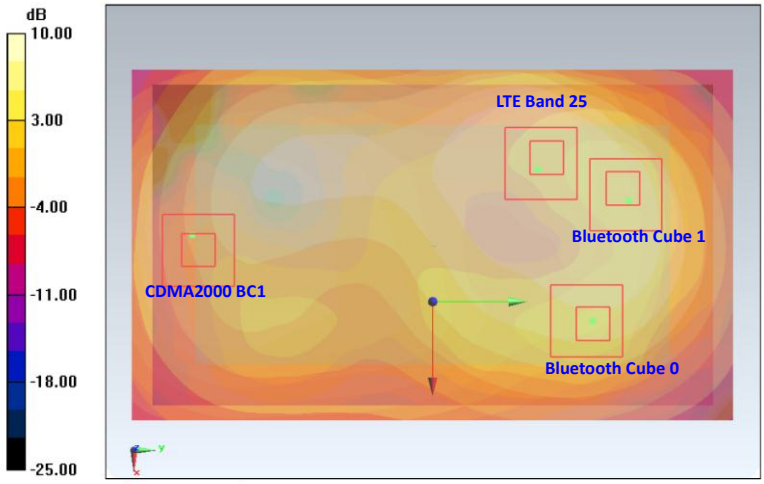
Case No #C1-8 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#59	CDMA2000 BC1	Back (w/ headset)	1.077	1	-0.0185	-0.069	-0.205	112.7	2.18	0.03	Not required
#98 cube 0	LTE Band 25		1.103	1	-0.049	0.0395	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	124.8	1.41	0.01	Not required
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				
#98 cube 0	LTE Band 25		1.103	1	-0.049	0.0395	-0.205	58.6	1.44	0.03	Not required
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	124.6	1.79	0.02	Not required
#98 cube 1	LTE Band 25		0.710	1	-0.0125	0.0555	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	124.8	1.41	0.01	Not required
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				
#98 cube 1	LTE Band 25		0.710	1	-0.0125	0.0555	-0.205	20.7	1.05	0.05	**Step 2**
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				



Case No #C1-9 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#45 cube 0	CDMA2000 BC0	Back	0.574	1	-0.0245	-0.0255	-0.205	58.9	1.89	0.04	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#45 cube 0	CDMA2000 BC0		0.574	1	-0.0245	-0.0255	-0.205	79.5	0.62	0.01	Not required
Bluetooth cube 0			0.042	1	0.0058	0.048	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	48.2	1.36	0.03	Not required
Bluetooth cube 0			0.042	1	0.0058	0.048	-0.205				
#45 cube 0	CDMA2000 BC0		0.574	1	-0.0245	-0.0255	-0.205	58.9	1.89	0.04	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#45 cube 0	CDMA2000 BC0		0.574	1	-0.0245	-0.0255	-0.205	84.5	0.62	0.01	Not required
Bluetooth cube 1			0.042	1	-0.0302	0.0588	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	28.8	1.36	0.06	**Step 2**
Bluetooth cube 1			0.042	1	-0.0302	0.0588	-0.205				
#45 cube 1	CDMA2000 BC0		0.457	1	-0.0125	-0.0665	-0.205	101.7	1.77	0.02	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#45 cube 1	CDMA2000 BC0		0.457	1	-0.0125	-0.0665	-0.205	116.0	0.50	0.00	Not required
Bluetooth cube 0			0.042	1	0.0058	0.048	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	48.2	1.36	0.03	Not required
Bluetooth cube 0			0.042	1	0.0058	0.048	-0.205				
#45 cube 1	CDMA2000 BC0		0.457	1	-0.0125	-0.0665	-0.205	101.7	1.77	0.02	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#45 cube 1	CDMA2000 BC0		0.457	1	-0.0125	-0.0665	-0.205	126.5	0.50	0.00	Not required
Bluetooth cube 1			0.042	1	-0.0302	0.0588	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	28.8	1.36	0.06	**Step 2**
Bluetooth cube 1			0.042	1	-0.0302	0.0588	-0.205				

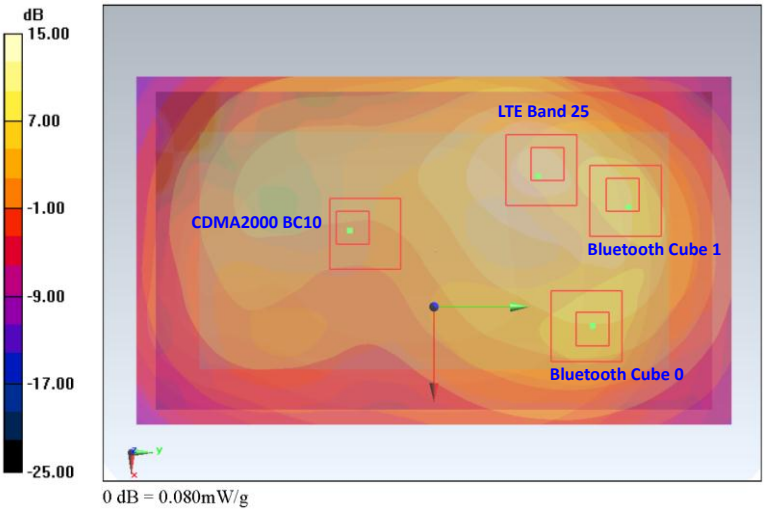


Case No #C1-10 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
#62	CDMA2000 BC1	Back	1.296	1	-0.02	-0.072	-0.205	105.3	2.61	0.04	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	122.7	1.34	0.01	Not required
Bluetooth cube 0			0.042	1	0.0058	0.048	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	48.2	1.36	0.03	Not required
Bluetooth cube 0			0.042	1	0.0058	0.048	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	105.3	2.61	0.04	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	131.2	1.34	0.01	Not required
Bluetooth cube 1			0.042	1	-0.0302	0.0588	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	28.8	1.36	0.06	**Step 2**
Bluetooth cube 1			0.042	1	-0.0302	0.0588	-0.205				

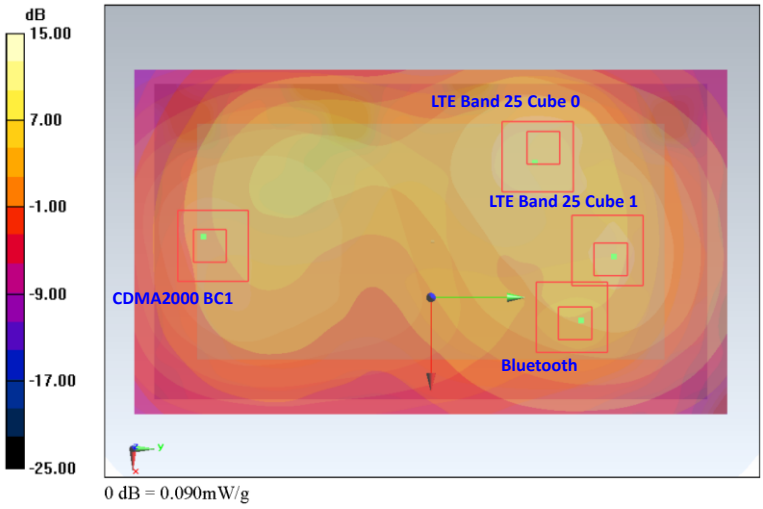


0 dB = 0.080mW/g

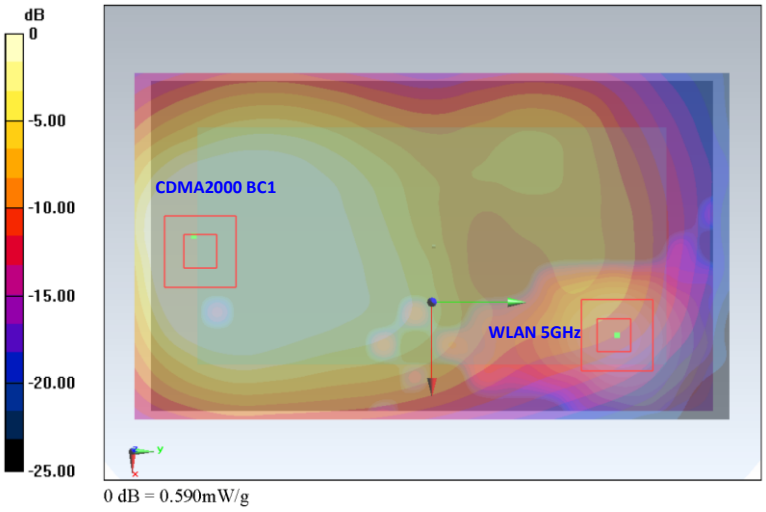
Case No #C1-11 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
#81	CDMA2000 BC10	Back	0.616	1	-0.023	-0.0255	-0.205	59.3	1.93	0.05	**Step 2**
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#81	CDMA2000 BC10		0.616	1	-0.023	-0.0255	-0.205	78.9	0.66	0.01	Not required
-Bluetooth cube 0			0.042	1	0.0058	0.048	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	48.2	1.36	0.03	Not required
-Bluetooth cube 0			0.042	1	0.0058	0.048	-0.205				
#81	CDMA2000 BC10		0.616	1	-0.023	-0.0255	-0.205	59.3	1.93	0.05	**Step 2**
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#81	CDMA2000 BC10		0.616	1	-0.023	-0.0255	-0.205	84.6	0.66	0.01	Not required
-Bluetooth cube 1			0.042	1	-0.0302	0.0588	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	28.8	1.36	0.06	**Step 2**
-Bluetooth cube 1			0.042	1	-0.0302	0.0588	-0.205				



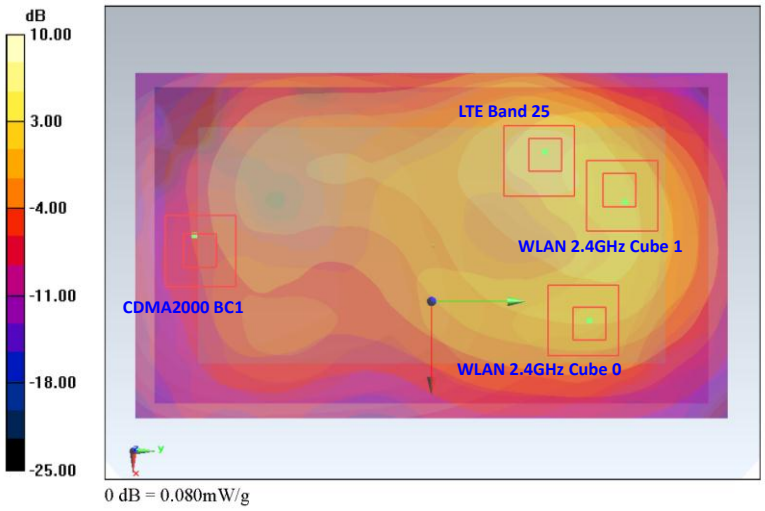
Case No #C1-12 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#59	CDMA2000 BC1	Back (w/ headset)	1.077	1	-0.0185	-0.069	-0.205	112.7	2.18	0.03	Not required
#98 cube 0	LTE Band 25		1.103	1	-0.049	0.0395	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	112.5	1.12	0.01	Not required
Bluetooth cube 0			0.042	1	0.007	0.0406	-0.205				
#98 cube 0	LTE Band 25		1.103	1	-0.049	0.0395	-0.205	56.0	1.15	0.02	Not required
Bluetooth cube 0			0.042	1	0.007	0.0406	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	124.6	1.79	0.02	Not required
#98 cube 1	LTE Band 25		0.710	1	-0.0125	0.0555	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	112.5	1.12	0.01	Not required
Bluetooth cube 1			0.042	1	0.007	0.0406	-0.205				
#98 cube 1	LTE Band 25		0.710	1	-0.0125	0.0555	-0.205	24.5	0.75	0.03	Not required
Bluetooth cube 1			0.042	1	0.007	0.0406	-0.205				



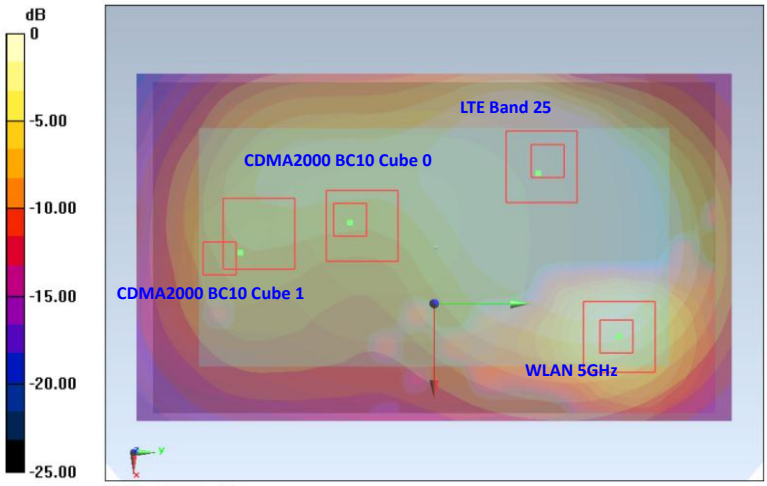
Case No #C1-13 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
#62	CDMA2000 BC1	Back	1.296	1	-0.02	-0.072	-0.205	130.0	1.63	0.02	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				



Case No #C2-1 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#62	CDMA2000 BC1	Back	1.296	1	-0.02	-0.072	-0.205	109.5	1.60	0.02	Not required
#148	LTE Band 25		0.304	1	-0.0455	0.0345	-0.205				
#62	CDMA20000 BC1		1.296	1	-0.02	-0.072	-0.205	122.7	1.37	0.01	Not required
#118 cube 0	WLAN 2.4GHz		0.072	1	0.0058	0.048	-0.205				
#148	LTE Band 25		0.304	1	-0.0455	0.0345	-0.205	53.0	0.38	0.00	Not required
#118 cube 0	WLAN 2.4GHz		0.072	1	0.0058	0.048	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	109.5	1.60	0.02	Not required
#148	LTE Band 25		0.304	1	-0.0455	0.0345	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	131.2	1.36	0.01	Not required
#118 cube 1	WLAN 2.4GHz		0.064	1	-0.0302	0.0588	-0.205				
#148	LTE Band 25		0.304	1	-0.0455	0.0345	-0.205	28.7	0.37	0.01	Not required
#118 cube 1	WLAN 2.4GHz		0.064	1	-0.0302	0.0588	-0.205				

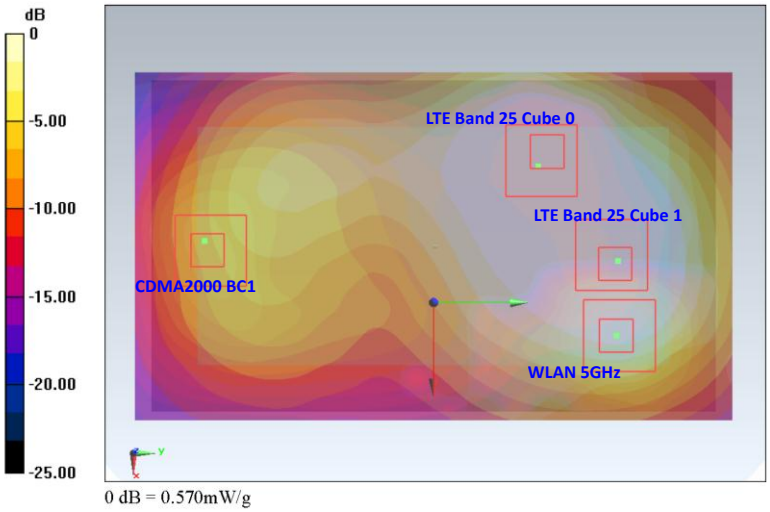


Case No #C2-2	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
Plot No					X	Y	Z				
#147 cube 0	CDMA2000 BC10	Back	0.093	1	-0.0245	-0.0255	-0.205	58.9	1.41	0.03	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#147 cube 0	CDMA20000 BC10		0.093	1	-0.0245	-0.0255	-0.205	87.5	0.42	0.00	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	56.2	1.65	0.04	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				
#147 cube 1	CDMA2000 BC10		0.078	1	-0.0155	-0.0665	-0.205	100.9	1.39	0.02	Not required
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205				
#147 cube 1	CDMA2000 BC10		0.078	1	-0.0155	-0.0665	-0.205	123.6	0.41	0.00	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				
#95	LTE Band 25		1.315	1	-0.0395	0.0315	-0.205	56.2	1.65	0.04	Not required
#136	WLAN 5GHz		0.331	1	0.012	0.054	-0.205				

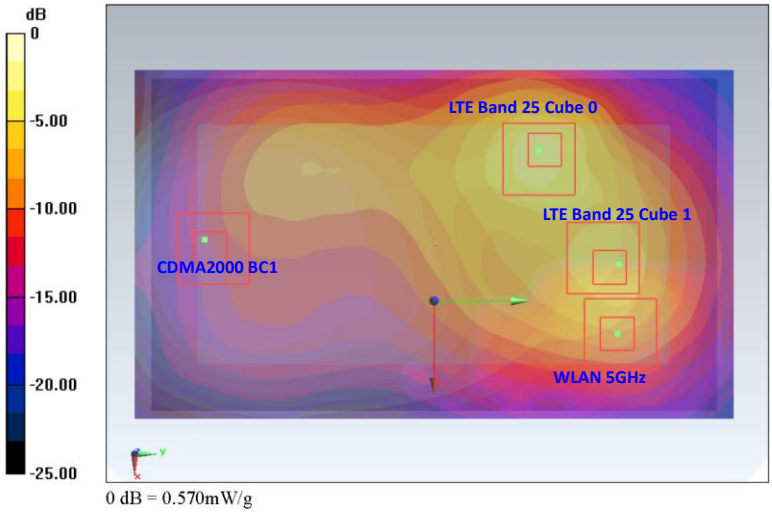


0 dB = 0.590mW/g

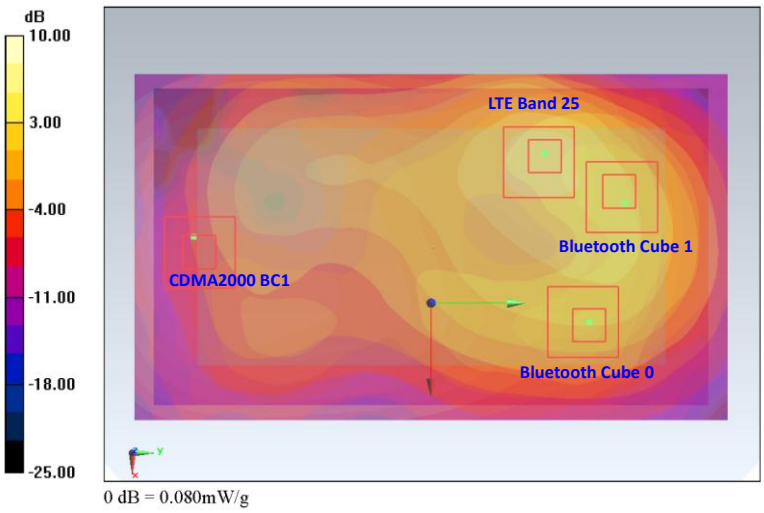
Case No #C2-3 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#146	CDMA2000 BC1	Back (w/ headset)	0.192	1	-0.0185	-0.069	-0.205	112.7	1.30	0.01	Not required
#98 cube 0	LTE Band 25		1.103	1	-0.049	0.0395	-0.205				
#146	CDMA2000 BC1		0.192	1	-0.0185	-0.069	-0.205	124.8	0.53	0.00	Not required
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				
#98 cube 0	LTE Band 25		1.103	1	-0.049	0.0395	-0.205	58.6	1.44	0.03	Not required
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				
#146	CDMA2000 BC1		0.192	1	-0.0185	-0.069	-0.205	124.6	0.90	0.01	Not required
#98 cube 1	LTE Band 25		0.710	1	-0.0125	0.0555	-0.205				
#146	CDMA2000 BC1		0.192	1	-0.0185	-0.069	-0.205	124.8	0.53	0.00	Not required
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				
#98 cube 1	LTE Band 25		0.710	1	-0.0125	0.0555	-0.205	20.7	1.05	0.05	**Volume Scan**
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				



Case No #C2-4 Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
#59	CDMA2000 BC1	Back (w/ headset)	1.077	1	-0.0185	-0.069	-0.205	124.6	1.34	0.01	Not required
#149 cube 0	LTE Band 25		0.259	1	-0.0125	0.0555	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	124.8	1.41	0.01	Not required
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				
#149 cube 0	LTE Band 25		0.259	1	-0.0125	0.0555	-0.205	20.7	0.60	0.02	Not required
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	124.7	1.25	0.01	Not required
#149 cube 1	LTE Band 25		0.177	1	-0.011	0.0555	-0.205				
#59	CDMA2000 BC1		1.077	1	-0.0185	-0.069	-0.205	124.8	1.41	0.01	Not required
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				
#149 cube 1	LTE Band 25		0.177	1	-0.011	0.0555	-0.205	19.2	0.51	0.02	Not required
#139	WLAN 5GHz		0.336	1	0.008	0.053	-0.205				



Case No #C2-5 / Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (mm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
					X	Y	Z				
#62	CDMA2000 BC1	Back	1.296	1	-0.02	-0.072	-0.205	109.5	1.60	0.02	Not required
#148	LTE Band 25		0.304	1	-0.0455	0.0345	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	122.7	1.34	0.01	Not required
Bluetooth cube 0			0.042	1	0.0058	0.048	-0.205				
#148	LTE Band 25		0.304	1	-0.0455	0.0345	-0.205	53.0	0.35	0.00	Not required
Bluetooth cube 0			0.042	1	0.0058	0.048	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	109.5	1.60	0.02	Not required
#148	LTE Band 25		0.304	1	-0.0455	0.0345	-0.205				
#62	CDMA2000 BC1		1.296	1	-0.02	-0.072	-0.205	131.2	1.34	0.01	Not required
Bluetooth cube 1			0.042	1	-0.0302	0.0588	-0.205				
#148	LTE Band 25		0.304	1	-0.0455	0.0345	-0.205	28.7	0.35	0.01	Not required
Bluetooth cube 1			0.042	1	-0.0302	0.0588	-0.205				



Remark:

1. Per KDB 447498 D01v05, SAR test exclusion is determined by the SAR to peak location separation ratio, SPLSR.
2. 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.
3. If SPLSR ≤ 0.04, simultaneously transmission SAR is not necessary.
4. If resulting SPLSR > 0.04, volume scan measurement is required.

12.8 Volume scan test results

Case No	Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)	Multi Band SAR_{1g} (W/kg)	Remark
#C2-3	#146	CDMA2000 BC1	RC3 SO32	Back (w/ headset)	1	1175	1908.75	16.39	16.5	1.026	0.183	0.188	1.3	Pass
	#98	LTE Band 25	1RB, 0 offset		1	26365	1882.50	23.87	24	1.030	1.23	1.267		
	#139	WLAN 5GHz	802.11a		1	149	5745.00	14.9	15.5	1.148	0.288	0.331		

Note:

1. The worst configuration on each position is used for the volume scan.
2. The scaling factor is applied in SEMCAD software in multi-band SAR combination procedure.

Test Engineer： Fulu Hu

13. 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/√3	1/√6	1/√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 13.1 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 13.2 Uncertainty Budget 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 13.3 Uncertainty Budget for frequency range 3 GHz to 6 GHz

14. 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 D01 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 D05 v02 ,SAR Evaluation Considerations for LTE Devices

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

[12] FCC KDB 865664 D01 v01, “SAR Measurement Requirements for 100MHz to 6 GHz”, October 2012

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.