FCC SAR Test Report

APPLICANT	:	**ZTE CORPORATION**
EQUIPMENT	:	**LTE AND CDMA mobile hotspot**
BRAND NAME	:	**ZTE**
MODEL NAME	:	**EuFi891**
FCC ID	:	**Q78-EUFI891**
STANDARD	:	**FCC 47 CFR Part 2 (2.1093)** **ANSI/IEEE C95.1-1992** **IEEE 1528-2003** **FCC OET Bulletin 65 Supplement C (Edition 01-01)**

The product was received on Jun. 19, 2012 and completely tested on Dec. 10, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:

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ilac-MRA

TAF
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1190

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA261903-02	Rev. 01	Initial issue of report	Dec. 13, 2012

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **ZTE CORPORATION EUT: LTE AND CDMA mobile hotspot, Brand Name: ZTE, Model Name: EuFi891** are as follows.

Band	Position	Highest Reported 1g-SAR (W/kg)	Equipment Class	Highest Reported 1g-SAR (W/kg)
CDMA2000 BC0	Hotspot (1 cm)	0.63	PCB	1.33
CDMA2000 BC15	Hotspot (1 cm)	1.12		
CDMA2000 BC1	Hotspot (1 cm)	0.98		
LTE Band 12	Hotspot (1 cm)	1.33		
LTE Band 5	Hotspot (1 cm)	0.53		
LTE Band 4	Hotspot (1 cm)	0.83		
LTE Band 2	Hotspot (1 cm)	0.93		
WLAN 2.4G	Hotspot (1 cm)	0.12	DTS	0.12

Band	Position	Equipment Class	Highest Reported Simultaneous Transmission 1g-SAR (W/kg)
LTE Band 12	Hotspot (1 cm)	PCB	1.39
WLAN 2.4G		DTS	

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

2. Administration Data

2.1 Testing Laboratory

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

2.2 Applicant

Company Name	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	Jun. 21, 2012
Date of End during the Test	Dec. 10, 2012

3. General Information

3.1 Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT	LTE AND CDMA mobile hotspot
Brand Name	ZTE
Model Name	EuFi891
FCC ID	Q78-EUFI891
Tx Frequency	CDMA2000 BC0 : 824.70 MHz ~ 848.31 MHz CDMA2000 BC1 : 1851.25 MHz ~ 1908.75 MHz CDMA2000 BC15 : 1711.25 ~ 1753.75 MHz LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz WLAN 2.4G : 2412 MHz ~ 2462 MHz
Rx Frequency	CDMA2000 BC0 : 869.70 MHz ~ 893.31 MHz CDMA2000 BC1 : 1931.25 MHz ~ 1988.75 MHz CDMA2000 BC15 : 2111.25 ~ 2153.75 MHz LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz WLAN 2.4G : 2412 MHz ~ 2462 MHz
Maximum Average Output Power to Antenna	CDMA2000 BC0 : 23.88 dBm CDMA2000 BC1 : 23.90 dBm CDMA2000 BC15 : 24.10 dBm LTE Band 2 : 22.89 dBm LTE Band 4 : 23.90 dBm LTE Band 5 : 23.48 dBm LTE Band 12 : 23.20 dBm 802.11b : 14.08 dBm 802.11g : 11.44 dBm 802.11n-HT20 (2.4GHz) : 12.06 dBm
Antenna Type	WWAN : IFA Antenna WLAN : PCB Antenna
HW Version	xh7C_V1.0
SW Version	USCC_EuFi891V1.0.0B02
Type of Modulation	CDMA2000 : QPSK LTE: QPSK / 16QAM (Uplink) 802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype
Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

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

FCC ID	Q78-EUFI891
EUT Type	LTE AND CDMA mobile hotspot
Operating Frequency Range of each LTE transmission band	Band 2: Tx: 1850.7 MHz ~ 1909.3 MHz / Rx: 1930.7 MHz ~ 1989.3 MHz Band 4: Tx: 1710.7 MHz ~ 1754.3 MHz / Rx: 2110.7 MHz ~ 2154.3 MHz Band 5: Tx: 824.7 MHz ~ 848.3 MHz / Rx: 869.7 MHz ~ 893.3 MHz Band 12: Tx: 699.7 MHz ~ 715.3 MHz / Rx: 729.7 MHz ~ 745.3 MHz
Channel Bandwidth	Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz Band 12: 1.4MHz, 3MHz, 5MHz, 10MHz

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

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq.(MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq.(MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq.(MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 5

	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	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 12

	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	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

UE category, uplink modulations used	Category 3, QPSK and 16QAM	
LTE transmitter and antenna implementation (standalone or sharing hardware components / antennas)	Main Antenna: LTE share the antenna with CDMA.	
LTE Voice / Data requirements	Data only	
LTE MPR permanently built-in by design	Yes	
LTE A-MPR	Disabled during SAR testing. With CMW500, set NS value to NS_01 to disable A-MPR.	
LTE maximum averaged conducted output power	LTE Band 2 : 22.89 dBm LTE Band 4 : 22.90 dBm LTE Band 5 : 23.48 dBm LTE Band 12 : 23.20 dBm	
Other U.S. wireless operating modes / bands	CDMA2000 1xRTT/1xEVDO	BC0: UL: 824.70 ~ 848.31 MHz / DL: 869.70 ~ 893.31 MHz BC1: UL: 1851.25~1908.75MHz / DL: 1931.25~1988.75MHz BC15: UL: 1711.25~1753.75MHz / DL: 2111.25 ~ 2153.75 MHz
	WLAN	2.4G: 2412 MHz ~ 2462 MHz
Simultaneous transmission configurations	In Section 11.5	
Base station simulator used for Testing	Anritsu MT8820C	
Power reduction applied to satisfy SAR compliance	No.	

3.2 Maximum RF output power among production units

Mode	CDMA BC0	CDMA BC1	CDMA BC15
1xRTT RC1+SO55	24.5	24.5	24.5
1xRTT RC3+SO55	24.5	24.5	24.5
1xRTT RC3+SO32 (FCH)	24.5	24.5	24.5
1xRTT RC3+SO32 (FCH+SCH)	24.5	24.5	24.5
1xEVDO RTAP 153.6	24.5	24.5	24.5
1xEVDO RETAP 4096	24.5	24.5	24.5

BW (MHz)	Modulation	RB size	LTE Band 2	LTE Band 4	LTE Band 5	LTE Band 12
20	QPSK	≤ 18	24	24		
		> 18	23	23		
	16QAM	≤ 18	23	23		
		> 18	22	22		
15	QPSK	≤ 16	24	24		
		> 16	23	23		
	16QAM	≤ 16	23	23		
		> 16	22	22		
10	QPSK	≤ 12	24	24	24.5	24.5
		> 12	23	23	23.5	23.5
	16QAM	≤ 12	23	23	23.5	23.5
		> 12	22	22	22.5	22.5
5	QPSK	≤ 8	24	24	24.5	24.5
		> 8	23	23	23.5	23.5
	16QAM	≤ 8	23	23	23.5	23.5
		> 8	22	22	22.5	22.5
3	QPSK	≤ 4	24	24	24.5	24.5
		> 4	23	23	23.5	23.5
	16QAM	≤ 4	23	23	23.5	23.5
		> 4	22	22	22.5	22.5
1.4	QPSK	≤ 5	24	24	24.5	24.5
		> 5	23	23	23.5	23.5
	16QAM	≤ 5	23	23	23.5	23.5
		> 5	22	22	22.5	22.5

IEEE 802.11				
Mode/Band	a	b	g	n
2.4 GHz WiFi		14.5	11.5	12.5

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 941225 D01 v02
- FCC KDB 941225 D05 v02
- FCC KDB 941225 D06 v01
- FCC KDB 865664 D01v01
- FCC KDB 248227 D01 v01r02

3.5 Device Category and SAR Limits

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

3.6 Test Conditions

3.5.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.5.2 Test Configuration

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

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
Duty factor observed as below:
802.11b, 1Mbps: 100%

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

4. Specific Absorption Rate (SAR)

4.1 Introduction

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

4.2 SAR Definition

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

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

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

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

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

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

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

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

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

5. SAR Measurement System

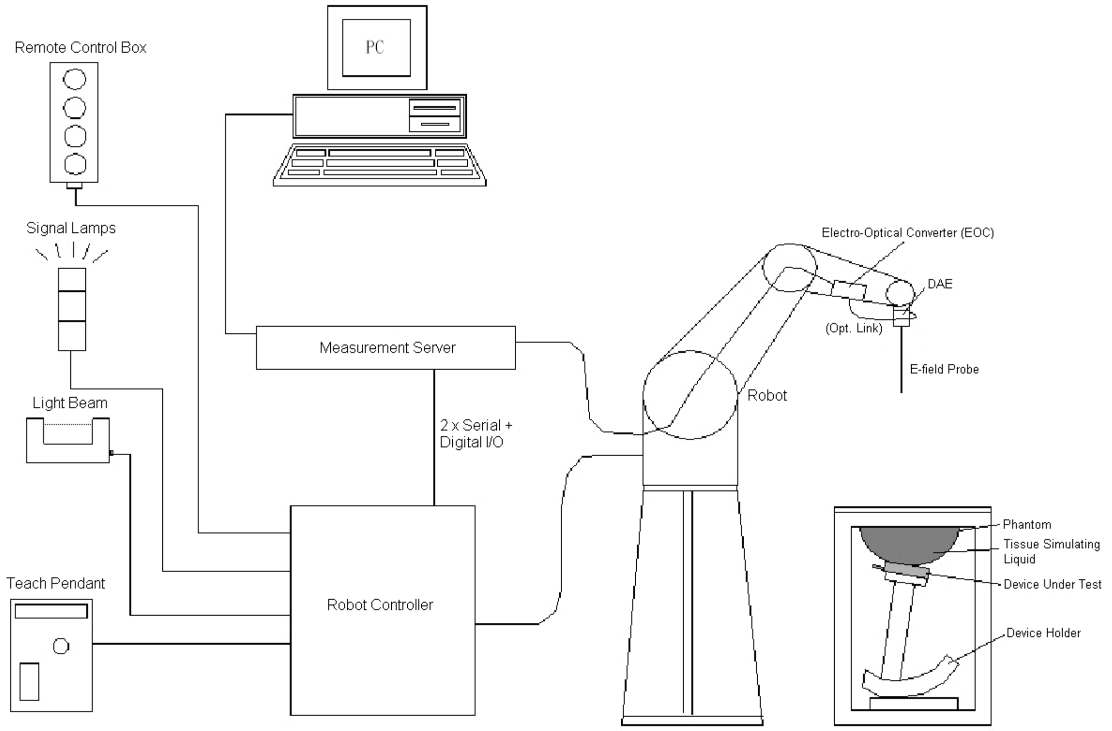


Fig 5.1 SPEAG DASY System Configurations

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

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

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

5.1 E-Field Probe

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

5.1.1 E-Field Probe Specification

< ET3DV6 / ET3DV6R Probe >

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 2.3 GHz; Linearity: ± 0.2 dB
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 µW/g to 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 16 mm) Tip diameter: 6.8 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.7 mm

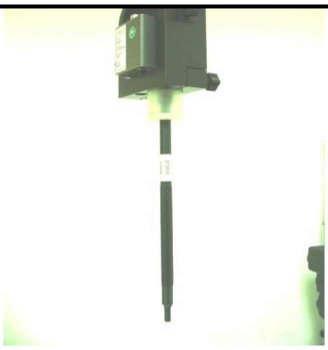


Fig 5.2 Photo of ET3DV6/ET3DV6

< EX3DV4 / ES3DV4 Probe >

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 10 mm) Typical distance from probe tip to dipole centers: 1 mm

Fig 5.3 Photo of EX3DV4/ES3DV4

<ES3DV3 Probe>

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 µW/g to 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 10 mm) Tip diameter: 3.9 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 2 mm

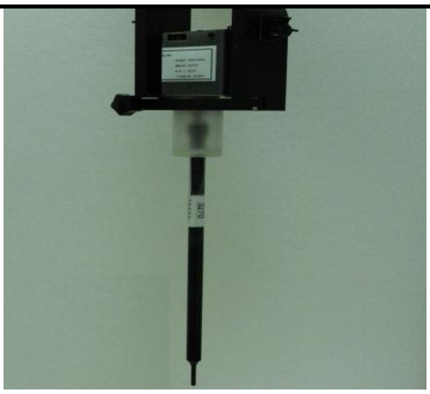


Fig 5.4 Photo of ES3DV3

5.1.2 E-Field Probe Calibration

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

5.1.3 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 5.5 Photo of DAE

5.2 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 5.6 Photo of DASY5

5.3 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 5.7 Photo of Server for DASY5

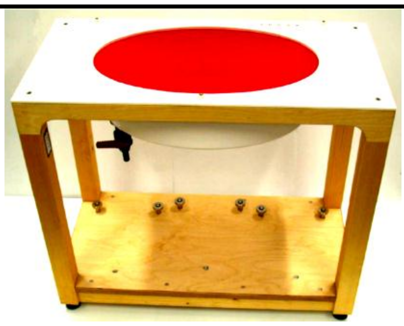
5.4 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	 **Fig 5.8 Photo of SAM Phantom**
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

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

<ELI4 Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	 Fig 5.9 Photo of ELI4 Phantom
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

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

5.5 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 5.10 **Device Holder**

<Laptop Extension Kit>

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

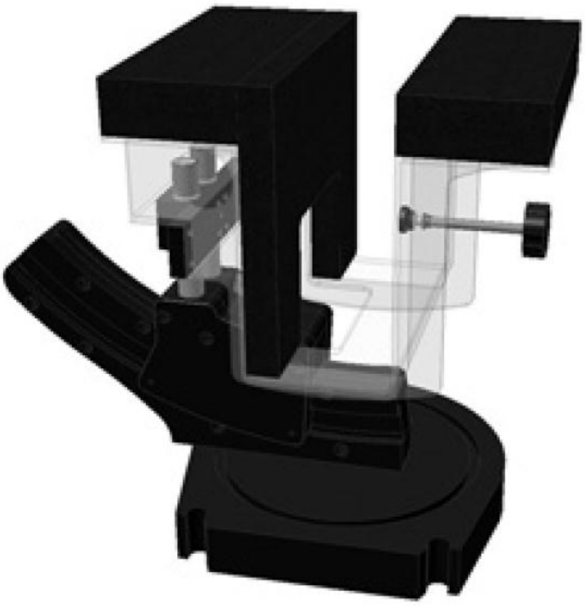


Fig 5.11 **Laptop Extension Kit**

5.6 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.

5.7 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1012	Jun. 11, 2010	Jun. 10, 2013
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 22, 2010	Mar. 21, 2013
SPEAG	1750MHz System Validation Kit	D1750V2	1068	Jun. 20, 2012	Jun. 19, 2013
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 23, 2010	Mar. 22, 2013
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 25, 2011	Jul. 24, 2013
SPEAG	Data Acquisition Electronics	DAE4	778	Aug. 27, 2012	Aug. 26, 2013
SPEAG	Data Acquisition Electronics	DAE3	495	Apr. 23, 2012	Apr. 22, 2013
SPEAG	Data Acquisition Electronics	DAE4	1279	May. 03, 2012	May. 02, 2013
SPEAG	Dosimetric E-Field Probe	ET3DV6	1787	May. 29, 2012	May. 28, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3697	Sep. 28, 2012	Sep. 27, 2013
SPEAG	Dosimetric E-Field Probe	ES3DV3	3270	Sep. 28, 2012	Sep. 27, 2013
Wisewind	Thermometer	ETP-101	TM560	Nov. 13, 2012	Nov. 12, 2013
Wisewind	Thermometer	ETP-101	TM685	Nov. 13, 2012	Nov. 12, 2013
Wisewind	Thermometer	HTC-1	TM642	Nov. 13, 2012	Nov. 12, 2013
SPEAG	Device Holder	N/A	N/A	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 CD	TP-1718	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 CD	TP-1719	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1446	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1478	NCR	NCR
SPEAG	SAM Phantom	QD 000 P41 C	TP-1150	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 CD	TP-1644	NCR	NCR
SPEAG	SAM Phantom	SM 000 T01 DA	TP-1542	NCR	NCR
Agilent	Network Analyzer	E5071C	MY46101588	May. 11, 2012	May. 10, 2013
Agilent	ESG Vector Series Signal Generator	E4438C	MY49070755	Oct. 02, 2012	Oct. 01, 2013
Anritsu	Power Meter	ML2495A	1132003	Aug. 14, 2012	Aug. 13, 2013
Anritsu	Radio Communication Analyzer	MT8820C	6201074414	Dec. 21, 2011	Dec. 20, 2012
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 05, 2012	Jan. 04, 2014
Agilent	Wireless Communication Test Set	E5515C	GB46311322	Mar. 23, 2011	Mar. 22, 2013
R&S	Spectrum Analyzer	FSP	101131	Jul. 23, 2012	Jul. 22, 2013

Table 5.1 Test Equipment List

Note:

1. The calibration certificate of DASY can be referred to appendix C of this report.
2. Referring to KDB 865664 D01v01, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole D835V2, SN: 499, D1900V2, SN: 5d041, D750V3_SN1012, D2450V2, SN: 736 can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

6. Tissue Simulating Liquids

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

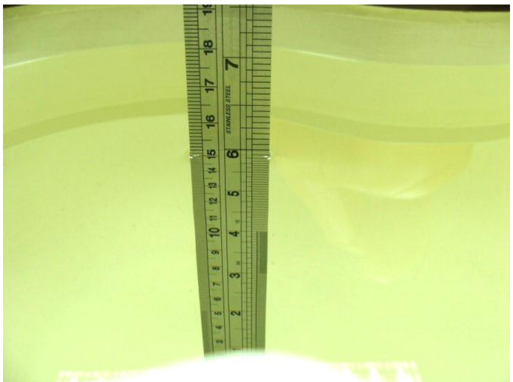


Fig 6.1 Photo of Liquid Height for Head SAR

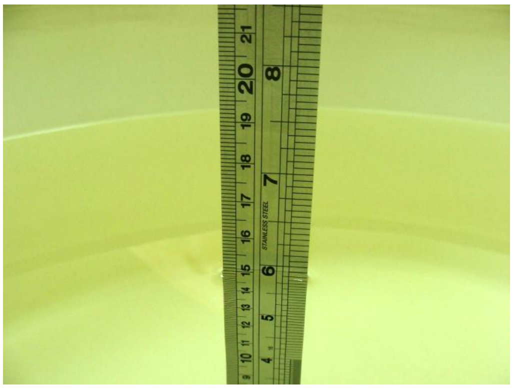


Fig 6.2 Photo of Liquid Height for Body SAR

The following table gives the recipes for tissue simulating liquid.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ε_r)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
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								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7

Table 6.1 Recipes of Tissue Simulating Liquid

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

The following table shows the measuring results for simulating liquid.

Freq. (MHz)	Liquid Type	Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Body	21.5	0.961	53.917	0.96	55.5	0.10	-2.85	±5	Dec. 10, 2012
835	Body	21.7	0.997	55.12	0.97	55.2	2.78	-0.14	±5	Dec. 09, 2012
1750	Body	21.6	1.501	51.984	1.52	53.3	-1.25	-2.47	±5	Nov. 09, 2012
1750	Body	21.4	1.48	53.474	1.52	53.3	-2.63	-0.32	±5	Dec. 09, 2012
1900	Body	21.7	1.514	54.141	1.52	53.3	-0.39	1.58	±5	Dec. 08, 2012
1900	Body	21.6	1.539	54.55	1.52	53.3	1.25	2.35	±5	Dec. 09, 2012
2450	Body	21.5	2.015	53.957	1.95	52.7	3.33	2.39	±5	Dec. 10, 2012

Table 6.2 Measuring Results for Simulating Liquid

7. SAR Measurement Evaluation

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

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:

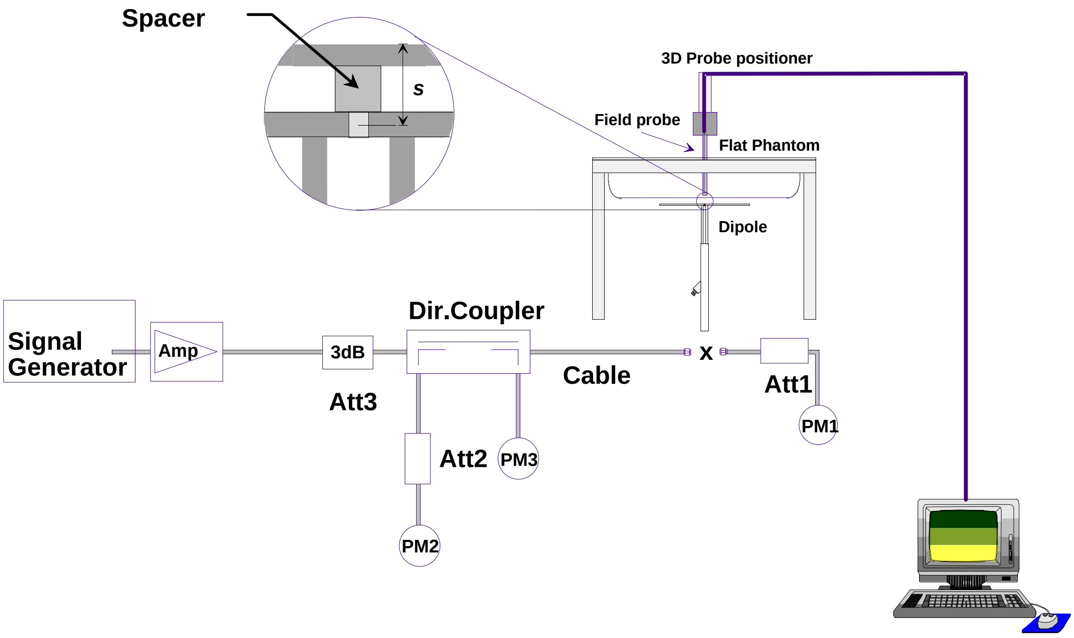


Fig 7.1 System Setup for System Evaluation

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

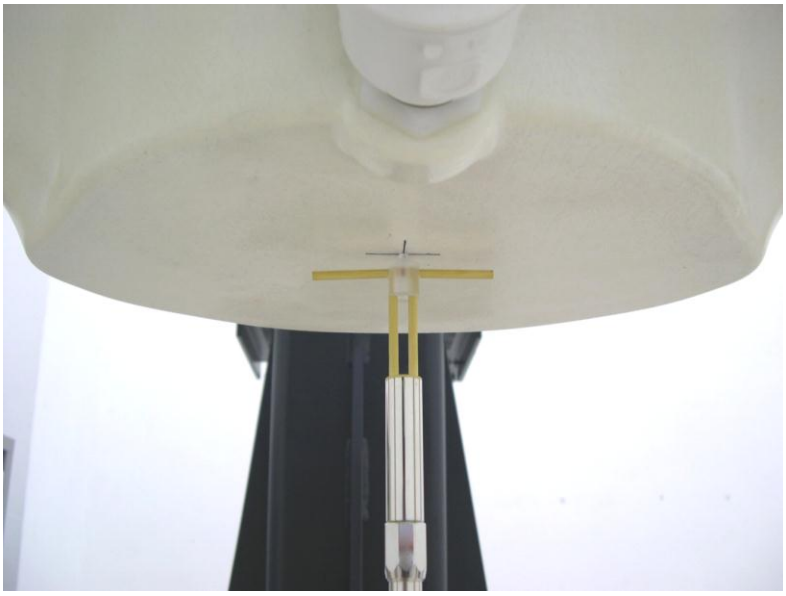


Fig 7.2 Photo of Dipole Setup

7.3 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.

Measurement Date	Frequency (MHz)	Liquid Type	Power fed onto reference dipole (mW)	Targeted SAR1g (W/kg)	Measured SAR1g (W/kg)	Normalized SAR1g (W/kg)	Deviation (%)
Dec. 10, 2012	750	Body	250	8.86	2.21	8.84	-0.23
Dec. 09, 2012	835	Body	250	9.82	2.63	10.52	7.13
Nov. 09, 2012	1750	Body	250	36.8	8.64	34.56	-6.09
Dec. 09, 2012	1750	Body	250	36.8	8.78	35.12	-4.57
Dec. 08, 2012	1900	Body	250	40	9.66	38.64	-3.40
Dec. 09, 2012	1900	Body	250	40	9.6	38.40	-4.00
Dec. 10, 2012	2450	Body	250	52.3	12.9	51.60	-1.34

Table 7.1 Target and Measurement SAR after Normalized

8. EUT Testing Position

This EUT was tested in five different positions. They are Front of the EUT with phantom 1 cm gap, Back 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.

<EUT Setup Photos>

Please refer to Appendix E for the test setup photos.

9. Measurement Procedures

The measurement procedures are as follows:

(a) Use base station simulator (if applicable) or engineering software to transmit RF power continuously (continuous Tx) in the highest power channel.
(b) Keep EUT to radiate maximum output power or 100% duty factor (if applicable)
(c) Measure output power through RF cable and power meter.
(d) Place the EUT in the positions as Appendix E demonstrates.
(e) Set scan area, grid size and other setting on the DASY software.
(f) Measure SAR results for the highest power channel on each testing position.
(g) Find out the largest SAR result on these testing positions of each band
(h) Measure SAR results for other channels in worst SAR testing position if the *reported* SAR of highest power channel is larger than 0.8 W/kg

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

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

9.2 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

Area scan and zoom scan resolution setting follows KDB 865664 D01v01 quoted below.

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ $1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">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 <u>reported</u> 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.</td></tr>
</table>

9.3 Volume Scan Procedures

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

9.4 SAR Averaged Methods

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

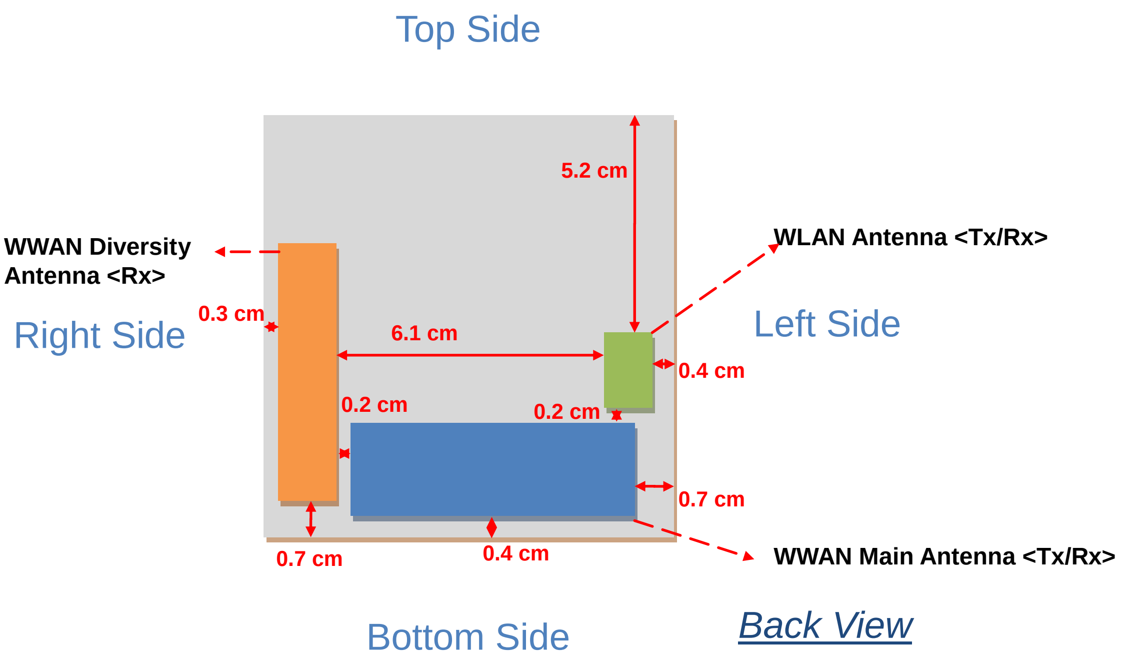
Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty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

9.5 Power Drift Monitoring

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

10. SAR Test Configurations

10.1 Exposure Positions Consideration



Antennas	Wireless Interface
WWAN Main Antenna (Tx / Rx)	LTE: band 2/4/5/12 CDMA2000: BC0/BC1/BC15
WWAN Diversity ANT (Rx Only)	LTE: band 2/4/5/12 CDMA2000: BC0/BC1/BC15
WLAN Antenna (Tx / Rx)	WLAN 2.4GHz

Sides for SAR tests; Hotspot mode Test distance: 10 mm						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	YES	YES	NO	YES	YES	YES
WLAN	YES	YES	NO	YES	NO	YES

Note:

1. Referring to KDB 941225 D06, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.
2. For WWAN Main antenna, SAR measurements at Top side are not required since the distance between EUT and flat phantom > 25mm.
3. For WLAN antenna, SAR measurements Top/Right sides are not required since the distance between EUT and flat phantom > 25mm.

11. SAR Test Results

11.1 Conducted Power (Unit: dBm)

<CDMA2000>

Conducted Power (*Unit: dBm)									
Band	CDMA2000 BC0			CDMA2000 BC1			CDMA2000 BC15		
Channel	1013	384	777	25	600	1175	25	425	875
Frequency	824.7	836.52	848.31	1851.25	1880	1908.75	1711.25	1731.25	1753.75
1xRTT RC1+SO55	23.65	23.78	**23.88**	**23.90**	23.88	23.62	**24.10**	23.81	23.67
1xRTT RC3+SO55	23.55	23.64	23.73	23.81	23.72	23.54	23.92	23.71	23.54
1xRTT RC3+SO32(+ F-SCH)	23.54	23.63	23.72	23.83	23.73	23.55	23.62	23.70	23.56
1xRTT RC3+SO32(+SCH)	23.53	23.61	23.70	23.82	23.73	23.54	23.56	23.71	23.57
1xEVDO RTAP 153.6	23.66	23.73	23.86	23.85	23.75	23.54	24.09	23.96	23.68
1xEVDO RETAP 4096	23.64	23.62	23.85	23.89	23.89	23.77	24.03	23.90	23.78

Note: Referring to KDB 941225 D01, in Hotspot mode EUT is treated as data device and SAR is tested with RTAP 153.6kbps (EVDO Rev0). If 1xRTT and EVDO RevA power is less than 1/4dB higher than EVDO Rev0, SAR tests with those modes are not necessary.

<LTE Band 12 Conducted Power >

BW [MHz]	Mod / RB (Size - Offset)	Average Power. (dBm)			3GPP MPR	MPR Result (dB)		
		Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch
	Channel	23060	23095	23130		23060	23095	23130
	Frequency (MHz)	704	707.5	711		704	707.5	711
10	QPSK 1-0	22.79	23.20	23.13	0	0.00	0.00	0.00
10	QPSK 1-24	22.67	23.10	23.12		0.12	0.10	0.01
10	QPSK 1-49	22.66	23.01	23.12		0.13	0.19	0.01
10	QPSK 25-0	22.17	22.48	22.31	≤ 1	0.62	0.72	0.82
10	QPSK 25-12	22.14	22.37	22.27		0.65	0.83	0.86
10	QPSK 25-24	22.13	22.31	22.15		0.66	0.89	0.98
10	QPSK 50-0	21.85	22.02	22.10		0.94	1.18	1.03
10	16QAM 1-0	22.46	22.42	22.45	≤ 1	0.33	0.78	0.68
10	16QAM 1-24	22.36	22.40	22.42		0.43	0.80	0.71
10	16QAM 1-49	22.33	22.33	22.41		0.46	0.87	0.72
10	16QAM 25-0	21.45	21.70	21.55	≤ 2	1.34	1.50	1.58
10	16QAM 25-12	21.43	21.59	21.48		1.36	1.61	1.65
10	16QAM 25-24	21.39	21.57	21.42		1.40	1.63	1.71
10	16QAM 50-0	21.37	21.33	21.13		1.42	1.87	2.00
	Channel	23035	23095	23155		23035	23095	23155
	Frequency (MHz)	701.5	707.5	713.5		701.5	707.5	713.5
5	QPSK 1-0	23.11	23.18	23.01	0	0.00	0.00	0.00
5	QPSK 1-12	22.85	23.11	22.89		0.26	0.07	0.12
5	QPSK 1-24	23.08	22.95	22.98		0.03	0.23	0.03
5	QPSK 12-0	22.56	22.12	22.11	≤ 1	0.55	1.06	0.90
5	QPSK 12-6	22.48	22.03	22.02		0.63	1.15	0.99
5	QPSK 12-11	22.45	22.01	22.01		0.66	1.17	1.00
5	QPSK 25-0	21.97	22.07	21.98		1.14	1.11	1.03
5	16QAM 1-0	22.58	22.65	22.36	≤ 1	0.53	0.53	0.65
5	16QAM 1-12	22.51	22.61	22.32		0.60	0.57	0.69
5	16QAM 1-24	22.47	22.60	22.43		0.64	0.58	0.58
5	16QAM 12-0	21.19	21.13	21.44	≤ 2	1.92	2.05	1.57
5	16QAM 12-6	21.11	21.05	21.36		2.00	2.13	1.65
5	16QAM 12-11	21.05	21.02	21.32		2.06	2.16	1.69
5	16QAM 25-0	20.95	21.14	21.09		2.16	2.04	1.92
	Channel	23025	23095	23165		23025	23095	23165
	Frequency (MHz)	700.5	707.5	714.5		700.5	707.5	714.5
3	QPSK 1-0	23.02	23.18	23.05	0	0.00	0.00	0.00
3	QPSK 1-7	22.88	23.15	23.02		0.14	0.03	0.03
3	QPSK 1-14	22.99	22.97	22.96		0.03	0.21	0.09
3	QPSK 8-0	22.11	22.22	22.93	≤ 1	0.91	0.96	0.12
3	QPSK 8-4	21.97	22.17	22.51		1.05	1.01	0.54
3	QPSK 8-7	21.90	22.14	22.45		1.12	1.04	0.60
3	QPSK 15-0	21.80	21.98	22.37		1.22	1.20	0.68
3	16QAM 1-0	22.51	22.53	22.28	≤ 1	0.51	0.65	0.77
3	16QAM 1-7	22.42	22.50	22.33		0.60	0.68	0.72
3	16QAM 1-14	22.36	22.18	22.42		0.66	1.00	0.63
3	16QAM 8-0	21.43	21.34	21.72	≤ 2	1.59	1.84	1.33
3	16QAM 8-4	21.34	21.27	21.60		1.68	1.91	1.45
3	16QAM 8-7	21.32	21.21	21.53		1.70	1.97	1.52
3	16QAM 15-0	21.06	20.95	21.39		1.96	2.23	1.66
	Channel	23017	23095	23173		23017	23095	23173
	Frequency (MHz)	699.7	707.5	715.3		699.7	707.5	715.3
1.4	QPSK 1-0	23.01	23.04	23.17	0	0.00	0.00	0.00
1.4	QPSK 1-2	22.96	22.94	23.13		0.05	0.10	0.04
1.4	QPSK 1-5	22.93	22.91	23.13		0.08	0.13	0.04
1.4	QPSK 3-0	22.95	22.67	23.09		0.06	0.37	0.08
1.4	QPSK 3-1	22.92	22.62	23.09		0.09	0.42	0.08
1.4	QPSK 3-2	22.87	22.58	23.05		0.14	0.46	0.12
1.4	QPSK 6-0	22.19	21.93	22.28	≤ 1	0.82	1.11	0.89
1.4	16QAM 1-0	22.48	22.33	22.66	≤ 1	0.53	0.71	0.51
1.4	16QAM 1-2	22.41	22.27	22.60		0.60	0.77	0.57
1.4	16QAM 1-5	22.36	22.24	22.55		0.65	0.80	0.62
1.4	16QAM 3-0	21.88	21.93	21.85		1.13	1.11	1.32
1.4	16QAM 3-1	21.85	21.89	21.83		1.16	1.15	1.34
1.4	16QAM 3-2	21.72	21.82	21.79		1.29	1.22	1.38
1.4	16QAM 6-0	21.29	21.12	21.78	≤ 2	1.72	1.92	1.39

<LTE Band 5 Conducted Power >

BW [MHz]	Mod / RB (Size - Offset)	Average Power. (dBm) Low Ch	Mid Ch	High Ch	3GPP MPR	MPR Result (dB) Low Ch	Mid Ch	High Ch
	Channel	20450	20525	20600		20450	20525	20600
	Frequency (MHz)	829	836.5	844		829	836.5	844
10	QPSK 1-0	23.29	23.39	23.21	0	0.00	0.00	0.00
10	QPSK 1-24	23.24	23.34	23.19		0.05	0.05	0.02
10	QPSK 1-49	23.26	23.14	23.10		0.03	0.25	0.11
10	QPSK 25-0	22.66	22.51	22.35	≤ 1	0.63	0.88	0.86
10	QPSK 25-12	22.63	22.46	22.34		0.66	0.93	0.87
10	QPSK 25-24	22.57	22.41	22.30		0.72	0.98	0.91
10	QPSK 50-0	22.42	22.33	22.17		0.87	1.06	1.04
10	16QAM 1-0	22.86	22.90	22.66	≤ 1	0.43	0.49	0.55
10	16QAM 1-24	22.79	22.84	22.64		0.50	0.55	0.57
10	16QAM 1-49	22.66	22.65	22.38		0.63	0.74	0.83
10	16QAM 25-0	21.80	21.65	21.80	≤ 2	1.49	1.74	1.41
10	16QAM 25-12	21.77	21.63	21.74		1.52	1.76	1.47
10	16QAM 25-24	21.64	21.48	21.65		1.65	1.91	1.56
10	16QAM 50-0	21.45	21.29	21.65		1.84	2.10	1.56
	Channel	20425	20525	20625		20425	20525	20625
	Frequency (MHz)	826.5	836.5	846.5		826.5	836.5	846.5
5	QPSK 1-0	23.25	23.44	**23.48**	0	0.00	0.00	0.00
5	QPSK 1-12	23.13	23.33	23.35		0.12	0.11	0.13
5	QPSK 1-24	23.21	23.32	23.22		0.04	0.12	0.26
5	QPSK 12-0	22.60	22.52	22.52	≤ 1	0.65	0.92	0.96
5	QPSK 12-6	22.51	22.49	22.49		0.74	0.95	0.99
5	QPSK 12-11	22.48	22.44	22.40		0.77	1.00	1.08
5	QPSK 25-0	22.46	22.37	22.26		0.79	1.07	1.22
5	16QAM 1-0	22.47	23.03	22.90	≤ 1	0.78	0.41	0.58
5	16QAM 1-12	22.46	22.97	22.84		0.79	0.47	0.64
5	16QAM 1-24	22.44	22.77	22.82		0.81	0.67	0.66
5	16QAM 12-0	22.00	21.73	21.50	≤ 2	1.25	1.71	1.98
5	16QAM 12-6	21.55	21.69	21.44		1.70	1.75	2.04
5	16QAM 12-11	21.60	21.59	21.39		1.65	1.85	2.09
5	16QAM 25-0	21.63	21.38	21.32		1.62	2.06	2.16
	Channel	20415	20525	20635		20415	20525	20635
	Frequency (MHz)	825.5	836.5	847.5		825.5	836.5	847.5
3	QPSK 1-0	23.36	23.25	23.39	0	0.00	0.00	0.00
3	QPSK 1-7	23.24	23.19	23.32		0.12	0.06	0.07
3	QPSK 1-14	23.28	23.21	23.26		0.08	0.04	0.13
3	QPSK 8-0	22.50	22.50	22.58	≤ 1	0.86	0.75	0.81
3	QPSK 8-4	22.47	22.29	22.55		0.89	0.96	0.84
3	QPSK 8-7	22.39	22.20	22.50		0.97	1.05	0.89
3	QPSK 15-0	22.33	22.18	22.16		1.03	1.07	1.23
3	16QAM 1-0	22.78	22.73	22.89	≤ 1	0.58	0.52	0.50
3	16QAM 1-7	22.70	22.66	22.86		0.66	0.59	0.53
3	16QAM 1-14	22.37	22.48	22.72		0.99	0.77	0.67
3	16QAM 8-0	21.46	21.71	21.64	≤ 2	1.90	1.54	1.75
3	16QAM 8-4	21.38	21.65	21.59		1.98	1.60	1.80
3	16QAM 8-7	21.43	21.68	21.48		1.93	1.57	1.91
3	16QAM 15-0	21.14	21.16	21.43		2.22	2.09	1.96
	Channel	20407	20525	20643		20407	20525	20643
	Frequency (MHz)	824.7	836.5	848.3		824.7	836.5	848.3
1.4	QPSK 1-0	23.33	23.06	23.35	0	0.00	0.12	0.00
1.4	QPSK 1-2	23.11	22.99	23.28		0.22	0.19	0.07
1.4	QPSK 1-5	23.21	23.18	23.19		0.12	0.00	0.16
1.4	QPSK 3-0	22.89	22.97	22.90		0.44	0.21	0.45
1.4	QPSK 3-1	22.85	22.83	22.89		0.48	0.35	0.46
1.4	QPSK 3-2	22.88	22.75	22.87		0.45	0.43	0.48
1.4	QPSK 6-0	22.32	22.23	22.06	≤ 1	1.01	0.95	1.29
1.4	16QAM 1-0	22.72	22.66	22.76	≤ 1	0.61	0.52	0.59
1.4	16QAM 1-2	21.99	22.57	22.50		1.34	0.61	0.85
1.4	16QAM 1-5	22.30	22.42	22.63		1.03	0.76	0.72
1.4	16QAM 3-0	22.17	21.85	22.58		1.16	1.33	0.77
1.4	16QAM 3-1	21.85	21.82	21.86		1.48	1.36	1.49
1.4	16QAM 3-2	21.95	21.83	21.90		1.38	1.35	1.45
1.4	16QAM 6-0	21.14	21.14	21.55	≤ 2	2.19	2.04	1.80

<LTE Band 4 Conducted Power >

BW [MHz]	Mod / RB (Size - Offset)	Average Power. (dBm)			3GPP MPR	MPR Result (dB)		
		Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch
	Channel	20050	20175	20300		20050	20175	20300
	Frequency (MHz)	1720	1732.5	1745		1720	1732.5	1745
20	QPSK 1-0	22.83	**22.90**	22.75	0	0.00	0.00	0.00
20	QPSK 1-49	22.64	22.75	22.66		0.19	0.15	0.09
20	QPSK 1-99	22.46	22.59	22.42		0.37	0.31	0.33
20	QPSK 50-0	21.97	22.53	21.95	≤ 1	0.86	0.37	0.80
20	QPSK 50-24	21.95	22.43	21.91		0.88	0.47	0.84
20	QPSK 50-49	21.85	22.33	21.88		0.98	0.57	0.87
20	QPSK 100-0	21.58	21.78	21.76		1.25	1.12	0.99
20	16QAM 1-0	22.34	22.35	22.23	≤ 1	0.49	0.55	0.52
20	16QAM 1-49	22.31	22.23	22.13		0.52	0.67	0.62
20	16QAM 1-99	22.15	22.17	21.95		0.68	0.73	0.80
20	16QAM 50-0	20.98	20.88	20.94	≤ 2	1.85	2.02	1.81
20	16QAM 50-24	20.95	20.78	20.84		1.88	2.12	1.91
20	16QAM 50-49	20.88	20.75	20.73		1.95	2.15	2.02
20	16QAM 100-0	20.84	20.62	20.65		1.99	2.28	2.10
	Channel	20025	20175	20325		20025	20175	20325
	Frequency (MHz)	1717.5	1732.5	1747.5		1717.5	1732.5	1747.5
15	QPSK 1-0	22.79	22.66	22.83	0	0.00	0.00	0.00
15	QPSK 1-37	22.68	22.54	22.79		0.11	0.12	0.04
15	QPSK 1-74	22.51	22.51	22.46		0.28	0.15	0.37
15	QPSK 36-0	21.99	21.95	21.95	≤ 1	0.80	0.71	0.88
15	QPSK 36-19	21.95	21.90	21.90		0.84	0.76	0.93
15	QPSK 36-39	21.87	21.84	21.85		0.92	0.82	0.98
15	QPSK 75-0	21.88	21.71	21.73		0.91	0.95	1.10
15	16QAM 1-0	22.47	22.19	22.23	≤ 1	0.32	0.47	0.60
15	16QAM 1-37	22.37	22.15	22.13		0.42	0.51	0.70
15	16QAM 1-74	22.16	21.83	22.10		0.63	0.83	0.73
15	16QAM 38-0	21.12	20.99	20.98	≤ 2	1.67	1.67	1.85
15	16QAM 38-18	21.04	20.95	20.92		1.75	1.71	1.91
15	16QAM 38-37	21.01	20.84	20.84		1.78	1.82	1.99
15	16QAM 75-0	20.66	20.54	20.38		2.13	2.12	2.45
	Channel	20000	20175	20350		20000	20175	20350
	Frequency (MHz)	1715	1732.5	1750		1715	1732.5	1750
10	QPSK 1-0	22.84	22.63	22.86	0	0.00	0.00	0.00
10	QPSK 1-24	22.74	22.54	22.76		0.10	0.09	0.10
10	QPSK 1-49	22.65	22.55	22.60		0.19	0.08	0.26
10	QPSK 25-0	21.95	21.89	22.05	≤ 1	0.89	0.74	0.81
10	QPSK 25-12	21.90	21.77	22.01		0.94	0.86	0.85
10	QPSK 25-24	21.86	21.70	21.89		0.98	0.93	0.97
10	QPSK 50-0	21.84	21.64	21.68		1.00	0.99	1.18
10	16QAM 1-0	22.51	22.07	22.10	≤ 1	0.33	0.56	0.76
10	16QAM 1-24	22.35	22.05	22.05		0.49	0.58	0.81
10	16QAM 1-49	22.15	21.83	21.97		0.69	0.80	0.89
10	16QAM 25-0	21.12	21.73	21.12	≤ 2	1.72	0.90	1.74
10	16QAM 25-12	21.09	20.89	21.05		1.75	1.74	1.81
10	16QAM 25-24	21.02	20.79	20.88		1.82	1.84	1.98
10	16QAM 50-0	20.87	20.73	20.81		1.97	1.90	2.05
	Channel	19975	20175	20375		19975	20175	20375
	Frequency (MHz)	1712.5	1732.5	1752.5		1712.5	1732.5	1752.5
5	QPSK 1-0	22.84	22.58	22.87	0	0.00	0.00	0.00
5	QPSK 1-12	22.77	22.51	22.85		0.07	0.07	0.02
5	QPSK 1-24	22.75	22.43	22.61		0.09	0.15	0.26
5	QPSK 12-0	21.88	21.88	21.73	≤ 1	0.96	0.70	1.14
5	QPSK 12-6	21.78	21.76	21.53		1.06	0.82	1.34
5	QPSK 12-11	21.68	21.66	21.51		1.16	0.92	1.36
5	QPSK 25-0	22.03	21.64	21.42		0.81	0.94	1.45
5	16QAM 1-0	22.17	22.18	22.15	≤ 1	0.67	0.40	0.72
5	16QAM 1-12	22.08	22.08	22.14		0.76	0.50	0.73
5	16QAM 1-24	22.01	21.73	21.73		0.83	0.85	1.14
5	16QAM 12-0	21.02	20.62	20.62	≤ 2	1.82	1.96	2.25
5	16QAM 12-6	20.95	20.59	20.55		1.89	1.99	2.32
5	16QAM 12-11	20.89	20.61	20.45		1.95	1.97	2.42
5	16QAM 25-0	20.84	21.05	20.91		2.00	1.53	1.96

	Channel	19965	20175	20385		19965	20175	20385
	Frequency (MHz)	1711.5	1732.5	1753.5		1711.5	1732.5	1753.5
3	QPSK 1-0	22.82	22.61	22.86	0	0.00	0.00	0.00
3	QPSK 1-7	22.78	22.59	22.80		0.04	0.02	0.06
3	QPSK 1-14	22.74	22.55	22.47		0.08	0.06	0.39
3	QPSK 8-0	21.99	21.73	21.75	≤ 1	0.83	0.88	1.11
3	QPSK 8-4	21.94	21.63	21.64		0.88	0.98	1.22
3	QPSK 8-7	21.84	21.53	21.54		0.98	1.08	1.32
3	QPSK 15-0	21.85	21.52	21.47		0.97	1.09	1.39
3	16QAM 1-0	22.14	22.16	22.01	≤ 1	0.68	0.45	0.85
3	16QAM 1-7	22.08	22.05	21.92		0.74	0.56	0.94
3	16QAM 1-14	21.91	22.09	21.97		0.91	0.52	0.89
3	16QAM 8-0	21.88	21.02	20.89	≤ 2	0.94	1.59	1.97
3	16QAM 8-4	21.15	20.96	20.79		1.67	1.65	2.07
3	16QAM 8-7	21.04	20.84	20.88		1.78	1.77	1.98
3	16QAM 15-0	20.97	20.64	20.52		1.85	1.97	2.34
	Channel	19957	20175	20393		19957	20175	20393
	Frequency (MHz)	1710.7	1732.5	1754.3		1710.7	1732.5	1754.3
1.4	QPSK 1-0	22.85	22.86	22.60	0	0.00	0.00	0.00
1.4	QPSK 1-2	22.75	22.84	22.54		0.10	0.02	0.06
1.4	QPSK 1-5	22.63	22.55	22.35		0.22	0.31	0.25
1.4	QPSK 3-0	22.50	22.48	22.44		0.35	0.38	0.16
1.4	QPSK 3-1	22.49	22.45	22.45		0.36	0.41	0.15
1.4	QPSK 3-2	22.48	22.49	22.46		0.37	0.37	0.14
1.4	QPSK 6-0	21.97	21.68	21.63	≤ 1	0.88	1.18	0.97
1.4	16QAM 1-0	22.15	22.08	22.02	≤ 1	0.70	0.78	0.58
1.4	16QAM 1-2	22.08	22.05	22.01		0.77	0.81	0.59
1.4	16QAM 1-5	21.88	21.86	21.75		0.97	1.00	0.85
1.4	16QAM 3-0	22.22	21.88	21.83		0.63	0.98	0.77
1.4	16QAM 3-1	22.16	21.85	21.78		0.69	1.01	0.82
1.4	16QAM 3-2	22.14	21.72	21.73		0.71	1.14	0.87
1.4	16QAM 6-0	20.96	20.85	20.65	≤ 2	1.89	2.01	1.95

<LTE Band 2 Conducted Power >

BW [MHz]	Mod / RB (Size - Offset)	Average Power. (dBm)			3GPP MPR	MPR Result (dB)		
		Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch
	Channel	18700	18900	19100		18700	18900	19100
	Frequency (MHz)	1860	1880	1900		1860	1880	1900
20	QPSK 1-0	22.57	**22.89**	22.63	0	0.00	0.00	0.00
20	QPSK 1-49	22.53	22.85	22.56		0.04	0.04	0.07
20	QPSK 1-99	22.56	22.56	22.57		0.01	0.33	0.06
20	QPSK 50-0	21.54	21.73	21.99	≤ 1	1.03	1.16	0.64
20	QPSK 50-24	21.55	22.72	22.17		1.02	0.17	0.46
20	QPSK 50-49	21.53	22.70	22.14		1.04	0.19	0.49
20	QPSK 100-0	21.50	21.67	21.78		1.07	1.22	0.85
20	16QAM 1-0	22.04	22.22	22.20	≤ 1	0.53	0.67	0.43
20	16QAM 1-49	22.01	22.18	22.05		0.56	0.71	0.58
20	16QAM 1-99	22.02	22.14	22.04		0.55	0.75	0.59
20	16QAM 50-0	20.73	20.92	20.89	≤ 2	1.84	1.97	1.74
20	16QAM 50-24	20.71	20.87	20.85		1.86	2.02	1.78
20	16QAM 50-49	20.72	20.82	20.79		1.85	2.07	1.84
20	16QAM 100-0	20.63	20.80	20.74		1.94	2.09	1.89
	Channel	18675	18900	19125		18675	18900	19125
	Frequency (MHz)	1857.5	1880	1902.5		1857.5	1880	1902.5
15	QPSK 1-0	22.85	22.80	22.85	0	0.00	0.00	0.00
15	QPSK 1-37	22.75	22.79	22.75		0.10	0.01	0.10
15	QPSK 1-74	22.64	22.60	22.60		0.21	0.20	0.25
15	QPSK 36-0	22.52	22.13	21.95	≤ 1	0.33	0.67	0.90
15	QPSK 36-19	22.50	22.08	21.91		0.35	0.72	0.94
15	QPSK 36-39	22.53	22.06	21.90		0.32	0.74	0.95
15	QPSK 75-0	21.92	22.01	21.83		0.93	0.79	1.02
15	16QAM 1-0	22.28	22.57	22.48	≤ 1	0.57	0.23	0.37
15	16QAM 1-37	22.15	22.50	22.38		0.70	0.30	0.47
15	16QAM 1-74	21.92	22.43	22.13		0.93	0.37	0.72
15	16QAM 38-0	21.23	21.09	20.96	≤ 2	1.62	1.71	1.89
15	16QAM 38-18	21.21	21.08	20.93		1.64	1.72	1.92
15	16QAM 38-37	21.18	21.02	20.89		1.67	1.78	1.96
15	16QAM 75-0	20.74	20.97	20.62		2.11	1.83	2.23
	Channel	18650	18900	19150		18650	18900	19150
	Frequency (MHz)	1855	1880	1905		1855	1880	1905
10	QPSK 1-0	22.63	22.86	22.84	0	0.00	0.00	0.00
10	QPSK 1-24	22.53	22.83	22.80		0.10	0.03	0.04
10	QPSK 1-49	22.41	22.76	22.71		0.22	0.10	0.13
10	QPSK 25-0	21.97	22.71	21.86	≤ 1	0.66	0.15	0.98
10	QPSK 25-12	21.95	22.01	21.85		0.68	0.85	0.99
10	QPSK 25-24	21.86	22.10	21.83		0.77	0.76	1.01
10	QPSK 50-0	21.64	21.98	21.73		0.99	0.88	1.11
10	16QAM 1-0	22.27	22.24	22.02	≤ 1	0.36	0.62	0.82
10	16QAM 1-24	22.22	22.15	22.01		0.41	0.71	0.83
10	16QAM 1-49	22.18	22.13	21.85		0.45	0.73	0.99
10	16QAM 25-0	21.23	21.38	20.99	≤ 2	1.40	1.48	1.85
10	16QAM 25-12	21.21	21.35	20.98		1.42	1.51	1.86
10	16QAM 25-24	21.18	21.25	20.88		1.45	1.61	1.96
10	16QAM 50-0	21.13	21.13	20.92		1.50	1.73	1.92
	Channel	18625	18900	19175		18625	18900	19175
	Frequency (MHz)	1852.5	1880	1907.5		1852.5	1880	1907.5
5	QPSK 1-0	22.71	22.62	22.79	0	0.00	0.03	0.00
5	QPSK 1-12	22.68	22.61	22.75		0.03	0.04	0.04
5	QPSK 1-24	22.66	22.65	22.32		0.05	0.00	0.47
5	QPSK 12-0	21.66	21.89	21.80	≤ 1	1.05	0.76	0.99
5	QPSK 12-6	21.65	21.88	21.70		1.06	0.77	1.09
5	QPSK 12-11	21.54	21.87	21.75		1.17	0.78	1.04
5	QPSK 25-0	21.81	22.05	21.79		0.90	0.60	1.00
5	16QAM 1-0	22.17	22.16	22.15	≤ 1	0.54	0.49	0.64
5	16QAM 1-12	22.13	22.08	22.04		0.58	0.57	0.75
5	16QAM 1-24	22.07	21.94	21.90		0.64	0.71	0.89
5	16QAM 12-0	20.84	20.93	20.85	≤ 2	1.87	1.72	1.94
5	16QAM 12-6	20.76	20.83	20.75		1.95	1.82	2.04
5	16QAM 12-11	20.65	20.78	20.80		2.06	1.87	1.99
5	16QAM 25-0	20.68	20.77	20.91		2.03	1.88	1.88

	Channel	18615	18900	19185		18615	18900	19185
	Frequency (MHz)	1851.5	1880	1908.5		1851.5	1880	1908.5
3	QPSK 1-0	22.62	22.66	22.59	0	0.00	0.00	0.00
3	QPSK 1-7	22.55	22.65	22.49		0.07	0.01	0.10
3	QPSK 1-14	22.50	22.54	22.45		0.12	0.12	0.14
3	QPSK 8-0	21.84	21.86	21.54	≤ 1	0.78	0.80	1.05
3	QPSK 8-4	21.73	21.79	21.64		0.89	0.87	0.95
3	QPSK 8-7	21.69	21.77	21.55		0.93	0.89	1.04
3	QPSK 15-0	21.66	21.72	21.57		0.96	0.94	1.02
3	16QAM 1-0	22.19	22.08	22.28	≤ 1	0.43	0.58	0.31
3	16QAM 1-7	22.15	22.02	22.18		0.47	0.64	0.41
3	16QAM 1-14	22.07	21.92	21.91		0.55	0.74	0.68
3	16QAM 8-0	21.10	21.03	20.91	≤ 2	1.52	1.63	1.68
3	16QAM 8-4	21.02	21.02	20.92		1.60	1.64	1.67
3	16QAM 8-7	21.01	21.05	20.88		1.61	1.61	1.71
3	16QAM 15-0	20.64	20.73	20.84		1.98	1.93	1.75
	Channel	18607	18900	19193		18607	18900	19193
	Frequency (MHz)	1850.7	1880	1909.3		1850.7	1880	1909.3
1.4	QPSK 1-0	22.82	22.88	22.88	0	0.00	0.00	0.00
1.4	QPSK 1-2	22.72	22.75	22.75		0.10	0.13	0.13
1.4	QPSK 1-5	22.65	22.68	22.58		0.17	0.20	0.30
1.4	QPSK 3-0	22.61	22.67	22.70		0.21	0.21	0.18
1.4	QPSK 3-1	22.68	22.66	22.69		0.14	0.22	0.19
1.4	QPSK 3-2	22.66	22.62	22.66		0.16	0.26	0.22
1.4	QPSK 6-0	21.97	21.87	21.72	≤ 1	0.85	1.01	1.16
1.4	16QAM 1-0	22.14	22.15	21.97	≤ 1	0.68	0.73	0.91
1.4	16QAM 1-2	22.12	22.12	21.85		0.70	0.76	1.03
1.4	16QAM 1-5	22.08	21.98	21.91		0.74	0.90	0.97
1.4	16QAM 3-0	21.98	22.02	21.75		0.84	0.86	1.13
1.4	16QAM 3-1	21.95	21.98	21.68		0.87	0.90	1.20
1.4	16QAM 3-2	21.94	21.94	21.73		0.88	0.94	1.15
1.4	16QAM 6-0	20.92	21.16	21.05	≤ 2	1.90	1.72	1.83

Note:

1. 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*.
2. Per KDB 941225 D05v02, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure
3. 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK
4. 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 Conducted Power>

WLAN 2.4G 802.11b Average Power (dBm)					
Channel	Frequency (MHz)	Data Rate (bps)			
		1M	2M	5.5M	11M
CH 01	2412	14.06	14.02	14.03	14.05
CH 06	2437	13.97	13.87	13.95	13.93
CH 11	2462	14.08	13.95	14.06	14.02

WLAN 2.4G 802.11g Average Power (dBm)									
Channel	Frequency (MHz)	Data Rate (bps)							
		6M	9M	12M	18M	24M	36M	48M	54M
CH 01	2412	11.44	11.41	11.36	11.43	11.40	11.19	11.11	11.37
CH 06	2437	11.28	11.15	11.10	11.17	11.24	11.26	10.70	10.97
CH 11	2462	11.27	11.25	11.34	11.25	11.23	11.34	10.90	11.30

WLAN 2.4G 802.11n (BW 20MHz) Average Power (dBm)									
Channel	Frequency (MHz)	MCS Index							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	12.06	11.56	12.05	12.02	12.05	12.05	12.03	12.05
CH 06	2437	11.86	11.67	11.83	11.96	11.92	11.92	11.88	11.86
CH 11	2462	11.98	11.98	11.97	11.96	11.92	11.82	12.06	11.80

Note:

1. Per KDB 248227, choose the highest output power channel to test SAR and determine further SAR exclusion.
2. Per KDB 248227, 11g and 11n output power is less than 1/4 dB higher than 11b mode, thus the SAR can be excluded.
3. For each frequency band, testing at higher data rates and higher order modulations is not requirement 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.

11.2 Test Records for Hotspot SAR Test

<General Note>

1. Per KDB 447498 D01v05, for each exposure position, if the highest output channel reported SAR<0.8 W/kg other channels SAR testing are not necessary.

<CDMA2000 SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
118	CDMA BC0	RTAP153.6	Front	1cm	777	848.31	23.86	24.5	1.159	0	0.467	0.541
119	**CDMA BC0**	**RTAP153.6**	**Back**	**1cm**	**777**	**848.31**	**23.86**	**24.5**	**1.159**	**0.01**	**0.539**	**0.625**
120	CDMA BC0	RTAP153.6	Left Side	1cm	777	848.31	23.86	24.5	1.159	0.01	0.206	0.239
121	CDMA BC0	RTAP153.6	Right Side	1cm	777	848.31	23.86	24.5	1.159	-0.03	0.065	0.075
122	CDMA BC0	RTAP153.6	Bottom Side	1cm	777	848.31	23.86	24.5	1.159	-0.01	0.177	0.205
109	CDMA BC15	RTAP153.6	Front	1cm	25	1711.25	24.09	24.5	1.099	0.18	0.817	0.898
110	CDMA BC15	RTAP153.6	Front	1cm	425	1731.25	23.96	24.5	1.132	0.02	0.675	0.764
111	CDMA BC15	RTAP153.6	Front	1cm	875	1753.75	23.68	24.5	1.208	-0.01	0.762	0.920
112	CDMA BC15	RTAP153.6	Back	1cm	25	1711.25	24.09	24.5	1.099	-0.01	0.882	0.969
113	CDMA BC15	RTAP153.6	Back	1cm	425	1731.25	23.96	24.5	1.132	-0.07	0.829	0.939
114	**CDMA BC15**	**RTAP153.6**	**Back**	**1cm**	**875**	**1753.75**	**23.68**	**24.5**	**1.208**	**0.03**	**0.923**	**1.115**
115	CDMA BC15	RTAP153.6	Left Side	1cm	25	1711.25	24.09	24.5	1.099	0.18	0.366	0.402
116	CDMA BC15	RTAP153.6	Right Side	1cm	25	1711.25	24.09	24.5	1.099	-0.12	0.251	0.276
117	CDMA BC15	RTAP153.6	Bottom Side	1cm	25	1711.25	24.09	24.5	1.099	0.03	0.406	0.446
100	CDMA BC1	RTAP153.6	Front	1cm	25	1851.25	23.85	24.5	1.161	0.13	0.789	0.916
101	**CDMA BC1**	**RTAP153.6**	**Front**	**1cm**	**600**	**1880**	**23.75**	**24.5**	**1.189**	**-0.01**	**0.82**	**0.975**
102	CDMA BC1	RTAP153.6	Front	1cm	1175	1908.75	23.54	24.5	1.247	-0.04	0.748	0.933
103	CDMA BC1	RTAP153.6	Back	1cm	25	1851.25	23.85	24.5	1.161	0.18	0.703	0.816
104	CDMA BC1	RTAP153.6	Back	1cm	600	1880	23.75	24.5	1.189	0	0.782	0.929
105	CDMA BC1	RTAP153.6	Back	1cm	1175	1908.75	23.54	24.5	1.247	0	0.774	0.965
106	CDMA BC1	RTAP153.6	Left Side	1cm	25	1851.25	23.85	24.5	1.161	0.13	0.513	0.596
107	CDMA BC1	RTAP153.6	Right Side	1cm	25	1851.25	23.85	24.5	1.161	0.04	0.344	0.400
108	CDMA BC1	RTAP153.6	Bottom Side	1cm	25	1851.25	23.85	24.5	1.161	0.08	0.599	0.696

<LTE SAR>

General Note for LTE SAR:

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

Plot No.	Band	BW (MHz)	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
30	LTE Band 12	10M	QPSK 1RB 0offset	Front	1cm	23095	707.5	23.2	24.5	1.349	-0.14	0.66	0.890
31	LTE Band 12	10M	QPSK 1RB 0offset	Front	1cm	23060	704	22.79	24.5	1.483	-0.07	0.716	1.061
32	LTE Band 12	10M	QPSK 1RB 0offset	Front	1cm	23130	711	23.13	24.5	1.371	-0.07	0.681	0.934
33	LTE Band 12	10M	QPSK 25RB 0offset	Front	1cm	23095	707.5	22.48	23.5	1.265	0.07	0.543	0.687
34	LTE Band 12	10M	QPSK 50RB 0offset	Front	1cm	23130	711	22.1	23.5	1.380	-0.02	0.482	0.665
35	LTE Band 12	10M	QPSK 1RB 0offset	Back	1cm	23095	707.5	23.2	24.5	1.349	-0.09	0.782	1.055
36	**LTE Band 12**	**10M**	**QPSK 1RB 0offset**	**Back**	**1cm**	**23060**	**704**	**22.79**	**24.5**	**1.483**	**-0.03**	**0.9**	**1.334**
37	LTE Band 12	10M	QPSK 1RB 0offset	Back	1cm	23130	711	23.13	24.5	1.371	-0.07	0.837	1.147
38	LTE Band 12	10M	QPSK 25RB 0offset	Back	1cm	23095	707.5	22.48	23.5	1.265	-0.04	0.602	0.761
39	LTE Band 12	10M	QPSK 50RB 0offset	Back	1cm	23130	711	22.1	23.5	1.380	-0.01	0.52	0.718
40	LTE Band 12	10M	QPSK 1RB 0offset	Left Side	1cm	23095	707.5	23.2	24.5	1.349	-0.15	0.19	0.256
41	LTE Band 12	10M	QPSK 25RB 0offset	Left Side	1cm	23095	707.5	22.48	23.5	1.265	0	0.162	0.205
42	LTE Band 12	10M	QPSK 1RB 0offset	Right Side	1cm	23095	707.5	23.2	24.5	1.349	-0.07	0.097	0.131
43	LTE Band 12	10M	QPSK 25RB 0offset	Right Side	1cm	23095	707.5	22.48	23.5	1.265	0.12	0.078	0.099
44	LTE Band 12	10M	QPSK 1RB 0offset	Bottom Side	1cm	23095	707.5	23.2	24.5	1.349	-0.07	0.191	0.258
45	LTE Band 12	10M	QPSK 25RB 0offset	Bottom Side	1cm	23095	707.5	22.48	23.5	1.265	-0.11	0.154	0.195
51	LTE Band 5	10M	QPSK 1RB 0offset	Front	1cm	20525	836.5	23.39	24.5	1.291	-0.05	0.359	0.464
52	LTE Band 5	10M	QPSK 25RB 0offset	Front	1cm	20450	829	22.66	23.5	1.213	0	0.351	0.426
53	**LTE Band 5**	**10M**	**QPSK 1RB 0offset**	**Back**	**1cm**	**20525**	**836.5**	**23.39**	**24.5**	**1.291**	**-0.03**	**0.411**	**0.531**
54	LTE Band 5	10M	QPSK 25RB 0offset	Back	1cm	20450	829	22.66	23.5	1.213	0.04	0.428	0.519
55	LTE Band 5	10M	QPSK 1RB 0offset	Left Side	1cm	20525	836.5	23.39	24.5	1.291	-0.08	0.163	0.210
56	LTE Band 5	10M	QPSK 25RB 0offset	Left Side	1cm	20450	829	22.66	23.5	1.213	-0.05	0.165	0.200
57	LTE Band 5	10M	QPSK 1RB 0offset	Right Side	1cm	20525	836.5	23.39	24.5	1.291	0.04	0.064	0.0826
58	LTE Band 5	10M	QPSK 25RB 0offset	Right Side	1cm	20450	829	22.66	23.5	1.213	0	0.068	0.0825
59	LTE Band 5	10M	QPSK 1RB 0offset	Bottom Side	1cm	20525	836.5	23.39	24.5	1.291	0.02	0.125	0.161
60	LTE Band 5	10M	QPSK 25RB 0offset	Bottom Side	1cm	20450	829	22.66	23.5	1.213	0.02	0.112	0.136

Plot No.	Band	BW (MHz)	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
14	LTE Band 4	20M	QPSK 1RB 0offset	Front	1cm	20175	1732.5	22.9	24	1.288	-0.02	0.639	0.823
15	LTE Band 4	20M	QPSK 1RB 0offset	Front	1cm	20050	1720	22.83	24	1.309	-0.04	0.621	0.813
16	LTE Band 4	20M	QPSK 1RB 0offset	Front	1cm	20300	1745	22.75	24	1.334	-0.07	0.578	0.771
17	LTE Band 4	20M	QPSK 50RB 0offset	Front	1cm	20175	1732.5	22.53	23	1.114	-0.04	0.479	0.534
18	LTE Band 4	20M	QPSK 100RB 0offset	Front	1cm	20175	1732.5	21.78	23	1.324	-0.06	0.484	0.641
19	**LTE Band 4**	**20M**	**QPSK 1RB 0offset**	**Back**	**1cm**	**20175**	**1732.5**	**22.9**	**24**	**1.288**	**0.11**	**0.647**	**0.833**
20	LTE Band 4	20M	QPSK 1RB 0offset	Back	1cm	20050	1720	22.83	24	1.309	0.01	0.626	0.820
21	LTE Band 4	20M	QPSK 1RB 0offset	Back	1cm	20300	1745	22.75	24	1.334	-0.03	0.615	0.820
22	LTE Band 4	20M	QPSK 50RB 0offset	Back	1cm	20175	1732.5	22.53	23	1.114	0.03	0.508	0.566
23	LTE Band 4	20M	QPSK 100RB 0offset	Back	1cm	20175	1732.5	21.78	23	1.324	0.08	0.505	0.669
24	LTE Band 4	20M	QPSK 1RB 0offset	Left Side	1cm	20175	1732.5	22.9	24	1.288	-0.116	0.298	0.384
25	LTE Band 4	20M	QPSK 50RB 0offset	Left Side	1cm	20175	1732.5	22.53	23	1.114	0.02	0.22	0.245
26	LTE Band 4	20M	QPSK 1RB 0offset	Right Side	1cm	20175	1732.5	22.9	24	1.288	0.01	0.223	0.287
27	LTE Band 4	20M	QPSK 50RB 0offset	Right Side	1cm	20175	1732.5	22.53	23	1.114	0	0.169	0.188
28	LTE Band 4	20M	QPSK 1RB 0offset	Bottom Side	1cm	20175	1732.5	22.9	24	1.288	0.14	0.378	0.487
29	LTE Band 4	20M	QPSK 50RB 0offset	Bottom Side	1cm	20175	1732.5	22.53	23	1.114	0.02	0.279	0.311
1	LTE Band 2	20M	QPSK 1RB 0offset	Front	1cm	18900	1880	22.89	24	1.291	-0.02	0.662	0.855
5	LTE Band 2	20M	QPSK 1RB 0offset	Front	1cm	18700	1860	22.57	24	1.390	0	0.588	0.817
6	**LTE Band 2**	**20M**	**QPSK 1RB 0offset**	**Front**	**1cm**	**19100**	**1900**	**22.63**	**24**	**1.371**	**-0.02**	**0.68**	**0.932**
2	LTE Band 2	20M	QPSK 50RB 0offset	Front	1cm	18900	1880	21.73	23	1.340	0.02	0.505	0.677
7	LTE Band 2	20M	QPSK 100RB 0offset	Front	1cm	19100	1900	21.78	23	1.324	-0.01	0.524	0.694
3	LTE Band 2	20M	QPSK 1RB 0offset	Back	1cm	18900	1880	22.89	24	1.291	-0.07	0.537	0.693
4	LTE Band 2	20M	QPSK 50RB 0offset	Back	1cm	18900	1880	21.73	23	1.340	-0.03	0.457	0.612
8	LTE Band 2	20M	QPSK 1RB 0offset	Left Side	1cm	18900	1880	22.89	24	1.291	-0.02	0.352	0.455
9	LTE Band 2	20M	QPSK 50RB 0offset	Left Side	1cm	18900	1880	21.73	23	1.340	0.02	0.283	0.379
10	LTE Band 2	20M	QPSK 1RB 0offset	Right Side	1cm	18900	1880	22.89	24	1.291	-0.03	0.301	0.389
11	LTE Band 2	20M	QPSK 50RB 0offset	Right Side	1cm	18900	1880	21.73	23	1.340	-0.03	0.239	0.320
12	LTE Band 2	20M	QPSK 1RB 0offset	Bottom Side	1cm	18900	1880	22.89	24	1.291	0.06	0.517	0.668
13	LTE Band 2	20M	QPSK 50RB 0offset	Bottom Side	1cm	18900	1880	21.73	23	1.340	0.04	0.415	0.556

<WLAN>

Plot No.	Band	Mode	Data rate	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
123	WLAN2.4G	802.11b	1Mbps	Front	1cm	11	2462	14.08	14.5	1.101	-0.17	0.108	**0.119**
124	WLAN2.4G	802.11b	1Mbps	Back	1cm	11	2462	14.08	14.5	1.101	0.16	0.051	0.056
125	WLAN2.4G	802.11b	1Mbps	Left Side	1cm	11	2462	14.08	14.5	1.101	-0.02	0.06	0.066
126	WLAN2.4G	802.11b	1Mbps	Bottom Side	1cm	11	2462	14.08	14.5	1.101	-0.07	0.069	0.076

11.3 Repeated SAR Measurement

Plot No.	Band	BW (MHz)	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Tune-up Scaled 1g SAR
114	CDMA BC15		RTAP153.6	Back	1cm	875	1753.75	23.68	24.5	1.208	0.03	0.923	1.115
127	CDMA BC15		RTAP153.6	Back	1cm	875	1753.75	23.68	24.5	1.208	0.19	0.916	1.106
101	CDMA BC1		RTAP153.6	Front	1cm	600	1880	23.75	24.5	1.189	-0.01	0.82	0.975
128	CDMA BC1		RTAP153.6	Front	1cm	600	1880	23.75	24.5	1.189	0.03	0.814	0.967
36	LTE Band 12	10M	QPSK 1RB 0offset	Back	1cm	23060	704	22.79	24.5	1.483	-0.03	0.9	1.334
129	LTE Band 12	10M	QPSK 1RB 0offset	Back	1cm	23060	704	22.79	24.5	1.483	-0.05	0.857	1.271

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 measured SAR result is scaled-up to account for tune-up tolerance and is compliant.

11.4 Highest SAR Plot

Plot No.	Band	BW (MHz)	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	SAR_{1g} (W/kg)	Tune-up Scaled 1g SAR
119	CDMA BC0		RTAP153.6	Back	1cm	777	848.31	23.86	24.5	1.159	0.01	0.539	0.625
114	CDMA BC15		RTAP153.6	Back	1cm	875	1753.75	23.68	24.5	1.208	0.03	0.923	1.115
101	CDMA BC1		RTAP153.6	Front	1cm	600	1880	23.75	24.5	1.189	-0.01	0.82	0.975
36	LTE Band 12	10M	QPSK 1RB 0offset	Back	1cm	23060	704	22.79	24.5	1.483	-0.03	0.9	1.334
6	LTE Band 2	20M	QPSK 1RB 0offset	Front	1cm	19100	1900	22.63	24	1.371	-0.02	0.68	0.932
19	LTE Band 4	20M	QPSK 1RB 0offset	Back	1cm	20175	1732.5	22.9	24	1.288	0.11	0.647	0.833
53	LTE Band 5	10M	QPSK 1RB 0offset	Back	1cm	20525	836.5	23.39	24.5	1.291	-0.03	0.411	0.531
123	WLAN2.4G		802.11b	Front	1cm	11	2462	14.08	14.5	1.101	-0.17	0.108	0.119

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/9

#119_CDMA BC0_RTAP153.6_Back_1cm_Ch777

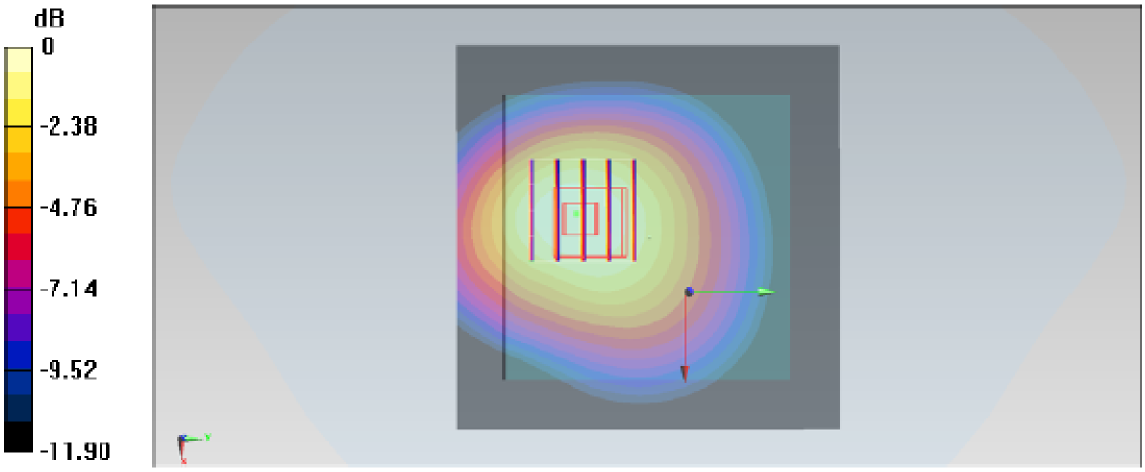
DUT: 261903-02

Communication System: CDMA ; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: MSL_850_121209 Medium parameters used: f = 848.31 MHz; σ = 1.01 mho/m; ε_r = 55.035; ρ = 1000 kg/m^3
Ambient Temperature : 22.7 ℃; Liquid Temperature : 21.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch777/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.628 mW/g

Configuration/Ch777/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.753 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.793 mW/g
SAR(1 g) = 0.539 mW/g; SAR(10 g) = 0.363 mW/g
Maximum value of SAR (measured) = 0.619 mW/g



0 dB = 0.619 mW/g = -4.17 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/9

#114_CDMA BC15_RTAP153.6_Back_1cm_Ch875

DUT: 261903-02

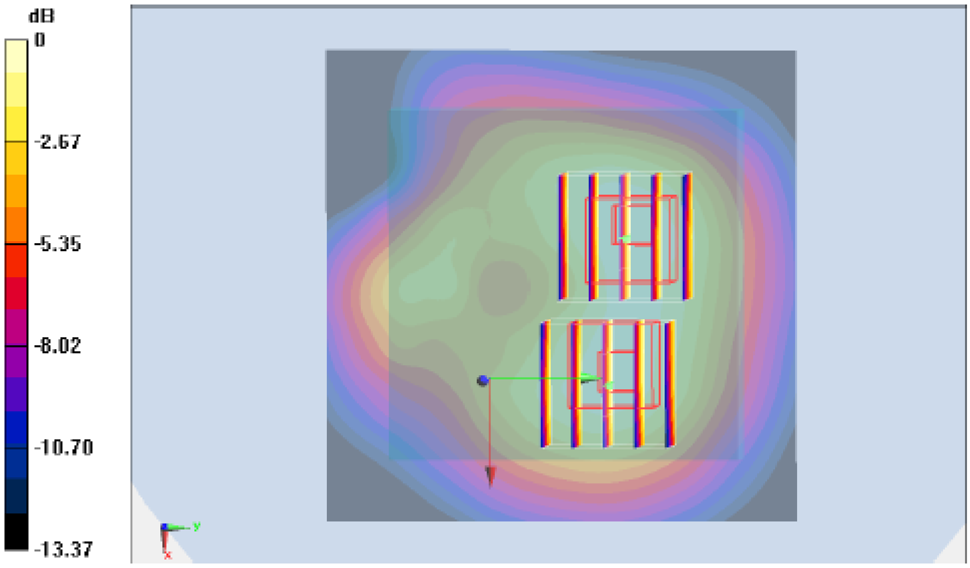
Communication System: CDMA ; Frequency: 1753.75 MHz;Duty Cycle: 1:1
Medium: MSL_1750_121209 Medium parameters used: f = 1754 MHz; σ = 1.495 mho/m; ε_r = 53.473; ρ = 1000 kg/m^3
Ambient Temperature : 22.4 ℃; Liquid Temperature : 21.4 ℃

DASY5 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.81, 4.81, 4.81); Calibrated: 2012/5/29;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (3); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch875/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.989 mW/g

Configuration/Ch875/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.474 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.260 mW/g
SAR(1 g) = 0.923 mW/g; SAR(10 g) = 0.606 mW/g
Maximum value of SAR (measured) = 0.988 mW/g

Configuration/Ch875/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.474 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.137 mW/g
SAR(1 g) = 0.903 mW/g; SAR(10 g) = 0.617 mW/g
Maximum value of SAR (measured) = 0.965 mW/g



0 dB = 0.965 mW/g = -0.31 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/9

#101_CDMA BC1_RTAP153.6_Front_1cm_Ch600

DUT: 261903-02

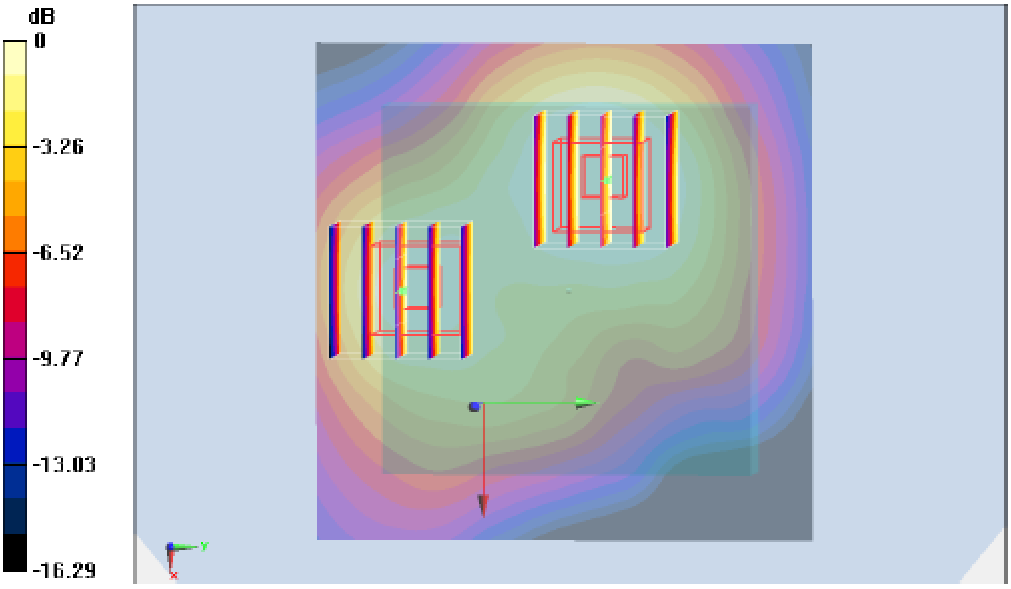
Communication System: CDMA ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900_121209 Medium parameters used: f = 1880 MHz; σ = 1.515 mho/m; ε_r = 54.657; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.58, 4.58, 4.58); Calibrated: 2012/5/29;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (3); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch600/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.917 mW/g

Configuration/Ch600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.352 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.192 mW/g
SAR(1 g) = 0.820 mW/g; SAR(10 g) = 0.522 mW/g
Maximum value of SAR (measured) = 0.880 mW/g

Configuration/Ch600/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.352 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.930 mW/g
SAR(1 g) = 0.588 mW/g; SAR(10 g) = 0.352 mW/g
Maximum value of SAR (measured) = 0.639 mW/g



0 dB = 0.639 mW/g = -3.89 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/10

#36_LTE Band 12_10M_QPSK 1RB 0offset_Back_1cm_Ch23060

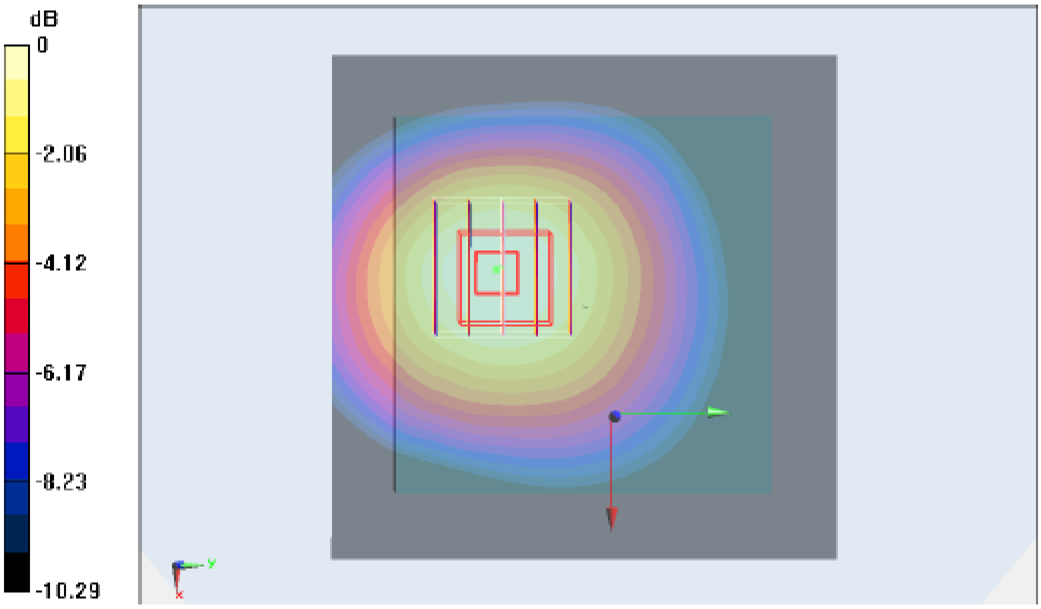
DUT: 261903-02

Communication System: LTE; Frequency: 704 MHz;Duty Cycle: 1:1
Medium: MSL_750_121210 Medium parameters used: f = 704 MHz; $\sigma = 0.927$ mho/m; $\varepsilon_r = 54.924$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/5/29;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (3); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch23060/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.986 mW/g

Configuration/Ch23060/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.305 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.209 mW/g
SAR(1 g) = 0.900 mW/g; SAR(10 g) = 0.633 mW/g
Maximum value of SAR (measured) = 0.957 mW/g



0 dB = 0.957 mW/g = -0.38 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/8

#06_LTE Band 2_20M_QPSK 1RB 0offset_Front_1cm_Ch19100

DUT: 261903-02

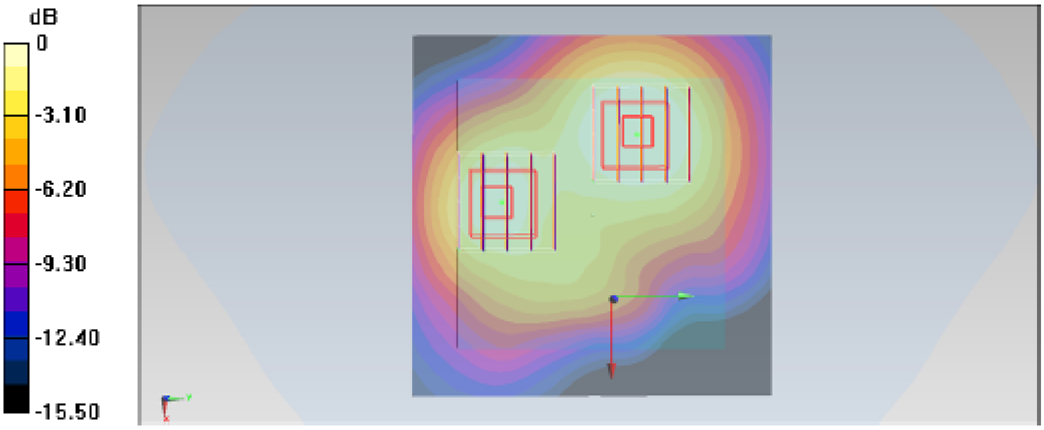
Communication System: LTE; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_121208 Medium parameters used: f = 1900 MHz; σ = 1.514 mho/m; ε_r = 54.141; ρ = 1000 kg/m^3
Ambient Temperature：22.7 ℃; Liquid Temperature：21.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch19100/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.814 mW/g

Configuration/Ch19100/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.701 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.051 mW/g
SAR(1 g) = 0.680 mW/g; SAR(10 g) = 0.431 mW/g
Maximum value of SAR (measured) = 0.797 mW/g

Configuration/Ch19100/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.701 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.957 mW/g
SAR(1 g) = 0.574 mW/g; SAR(10 g) = 0.338 mW/g
Maximum value of SAR (measured) = 0.679 mW/g



0 dB = 0.679 mW/g = -3.36 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/9

#19_LTE Band 4_20M_QPSK 1RB 0offset_Back_1cm_Ch20175

DUT: 261903-02

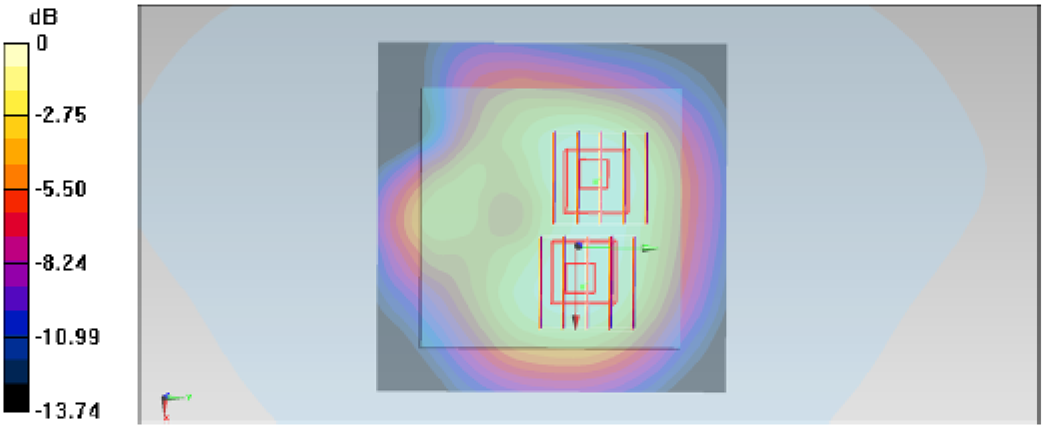
Communication System: LTE; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: MSL_1750_121209 Medium parameters used : f = 1732.5 MHz; σ = 1.482 mho/m; ε_r = 52.035; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.98, 4.98, 4.98); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch20175/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.759 mW/g

Configuration/Ch20175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.752 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.926 mW/g
SAR(1 g) = 0.647 mW/g; SAR(10 g) = 0.424 mW/g
Maximum value of SAR (measured) = 0.747 mW/g

Configuration/Ch20175/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.752 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.865 mW/g
SAR(1 g) = 0.603 mW/g; SAR(10 g) = 0.404 mW/g
Maximum value of SAR (measured) = 0.687 mW/g



0 dB = 0.687 mW/g = -3.26 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/9

#53_LTE Band 5_10M_QPSK 1RB 0offset_Back_1cm_Ch20525

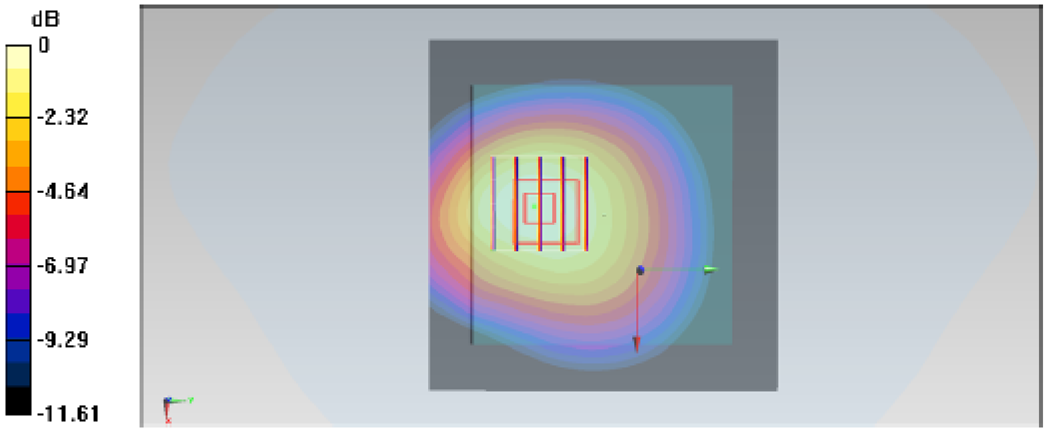
DUT: 261903-02

Communication System: LTE; Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: MSL_850_121209 Medium parameters used: f = 836.5 MHz; σ = 0.998 mho/m; ε_r = 55.123; ρ = 1000 kg/m^3
Ambient Temperature：22.7 ℃; Liquid Temperature：21.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch20525/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.479 mW/g

Configuration/Ch20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.597 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.598 mW/g
SAR(1 g) = 0.411 mW/g; SAR(10 g) = 0.279 mW/g
Maximum value of SAR (measured) = 0.475 mW/g



0 dB = 0.475 mW/g = -6.47 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/12/10

#123_WLAN2.4G_802.11b_Front_1cm_Ch11

DUT: 261903-02

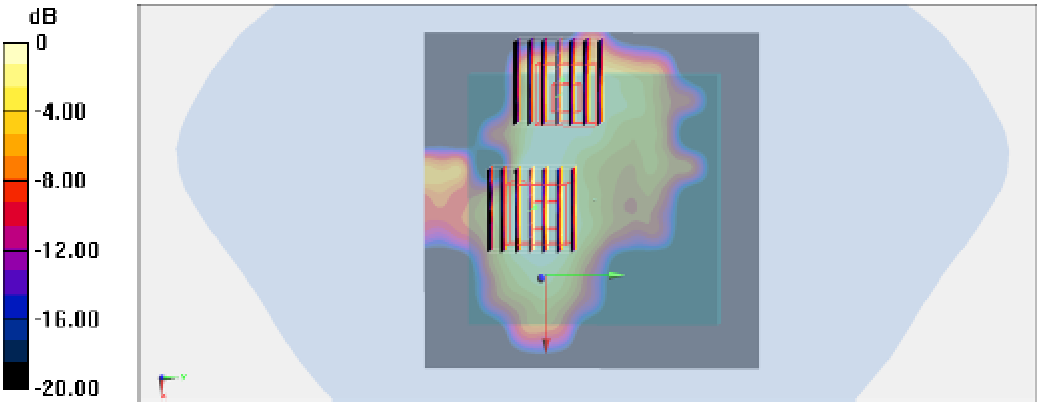
Communication System: 802.11b ; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: MSL_2450_121210 Medium parameters used: f = 2462 MHz; σ = 2.032 mho/m; ε_r = 53.942; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.57, 6.57, 6.57); Calibrated: 2012/9/28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: SAM LEFT; Type: QD000P40CD; Serial: TP:1718
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch11/Area Scan (101x101x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.134 mW/g

Configuration/Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.055 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.242 mW/g
SAR(1 g) = 0.108 mW/g; SAR(10 g) = 0.049 mW/g
Maximum value of SAR (measured) = 0.173 mW/g

Configuration/Ch11/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.055 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.132 mW/g
SAR(1 g) = 0.060 mW/g; SAR(10 g) = 0.029 mW/g
Maximum value of SAR (measured) = 0.0926 mW/g



0 dB = 0.0926 mW/g = -20.67 dB mW/g

11.5 Simultaneous Multi-band Transmission Analysis

No.	Applicable Simultaneous Transmission Combination
1.	LTE (data) + WLAN 2.4G (router)
2.	CDMA2000 (data) + WLAN 2.4G (router)

Note:
1. CDMA2000 and LTE share the same antenna, and cannot transmit simultaneously.
2. The reported SAR summation is calculated based on the same configuration and test position.
3. If reported 1g-SAR summation < 1.6W/kg, simultaneous SAR measurement is not necessary.

<Maximum SAR list for each band and position>

Position	WWAN Band	WWAN Plot No	Reported WWAN SAR (W/kg)	WLAN Plot No	Reported WLAN SAR (W/kg)	WWAN + WLAN	Result
Front	CDMA BC0	118	0.541	123	0.119	0.66	PASS
	CDMA BC15	109	0.898			1.02	PASS
	CDMA BC1	101	0.975			1.09	PASS
	LTE Band 12	31	1.061			1.18	PASS
	LTE Band 5	51	0.464			0.58	PASS
	LTE Band 4	14	0.823			0.94	PASS
	LTE Band 2	6	0.932			1.05	PASS
Back	CDMA BC0	119	0.625	124	0.056	0.68	PASS
	CDMA BC15	114	1.115			1.17	PASS
	CDMA BC1	105	0.965			1.02	PASS
	LTE Band 12	36	1.334			1.39	PASS
	LTE Band 5	53	0.531			0.59	PASS
	LTE Band 4	19	0.833			0.89	PASS
	LTE Band 2	3	0.693			0.75	PASS
Left Side	CDMA BC0	120	0.239	125	0.066	0.31	PASS
	CDMA BC15	115	0.402			0.47	PASS
	CDMA BC1	106	0.596			0.66	PASS
	LTE Band 12	40	0.256			0.32	PASS
	LTE Band 5	55	0.21			0.28	PASS
	LTE Band 4	24	0.384			0.45	PASS
	LTE Band 2	8	0.455			0.52	PASS
Right Side	CDMA BC0	121	0.075			0.08	PASS
	CDMA BC15	116	0.276			0.28	PASS
	CDMA BC1	107	0.4			0.40	PASS
	LTE Band 12	42	0.131			0.13	PASS
	LTE Band 5	57	0.0826			0.08	PASS
	LTE Band 4	26	0.287			0.29	PASS
	LTE Band 2	10	0.389			0.39	PASS
Bottom Side	CDMA BC0	122	0.205	126	0.076	0.28	PASS
	CDMA BC15	117	0.446			0.52	PASS
	CDMA BC1	108	0.696			0.77	PASS
	LTE Band 12	44	0.258			0.33	PASS
	LTE Band 5	59	0.161			0.24	PASS
	LTE Band 4	28	0.487			0.56	PASS
	LTE Band 2	13	0.556			0.63	PASS

Note:
1 The maximum SAR summation is calculated based on the same configuration and test position.
2 For 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary.

Test Engineer： Fulu Hu and Jimmy Cheng

12. Uncertainty Assessment

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

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

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table 12.1

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

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

(b) κ is the coverage factor

Table 12.1 Standard Uncertainty for Assumed Distribution

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

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

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.0	Normal	1	1	1	± 6.0 %	± 6.0 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.4	Rectangular	√3	1	1	± 0.2 %	± 0.2 %
Probe Positioning	2.9	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 11.0 %	± 10.8 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 22.0 %**	**± 21.5 %**

Table 12.2 Uncertainty Budget of DASY for frequency range 300 MHz to 3 GHz According to IEEE1528-2013

13. References

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

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

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

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

[5] SPEAG DASY System Handbook

[6] FCC KDB 248227 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 941225 D01 v02, “SAR Measurement Procedures for 3G Devices – CDMA 2000 / Ev-Do / WCDMA / HSDPA / HSPA”, October 2007

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

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

[11] FCC KDB 941225 D05 v02, “SAR Test Considerations for LTE Handsets and Data Modems”, October 24 2012

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

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Appendix B. Plots of SAR Measurement

The plots are shown as follows.

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.