FCC SAR Test Report

APPLICANT : D-Link Corporation

EQUIPMENT : DC-HSPA+ Mobile Router

BRAND NAME : D-Link

MODEL NAME : DWR-830

FCC ID : KA2WR830A1

STANDARD : FCC 47 CFR Part 2 (2.1093)
ANSI/IEEE C95.1-1992
IEEE 1528-2003

The product was completely tested on Sep. 27, 2013. 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: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA371811-01	Rev. 01	Initial issue of report	Oct. 28, 2013

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **D-Link Corporation DUT: DC-HSPA+ Mobile Router**, **Brand Name: D-Link**, **Model Name: DWR-830** are as follows.

<Highest SAR Summary>

Exposure Position	Frequency Band	Reported 1g-SAR (W/kg)	Equipment Class	Highest Reported 1g-SAR (W/kg)
Body	GSM 850	0.86	PCB	0.86
	GSM 1900	0.35		
	WCDMA Band V	0.61		
	WCDMA Band II	0.22		
	WLAN 2.4GHz Band	0.35	DTS	0.35

<Highest Simultaneous transmission SAR>

Frequency Band	Equipment Class	Exposure Position	Highest Reported Simultaneous Transmission 1g-SAR (W/kg)
GSM850	PCB	Body	1.21
WLAN 2.4GHz Band	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.

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	D-Link Corporation
Address	No.289, Sinhu 3rd rd., Neihu District, Taipei City 114, Taiwan

2.3 Manufacturer

Company Name	D-Link Corporation
Address	No.289, Sinhu 3rd rd., Neihu District, Taipei City 114, Taiwan

2.4 Application Details

Date of Start during the Test	Sep. 24, 2013
Date of End during the Test	Sep. 27, 2013

3. General Information

3.1 Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT	DC-HSPA+ Mobile Router
Brand Name	D-Link
Model Name	DWR-830
FCC ID	KA2WR830A1
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz
Mode	• GPRS/EGPRS • WCDMA RMC 12.2Kbps Rel 99 • HSDPA Rel 7, Cat14 • HSUPA Rel 6, Cat6 • DC-HSDPA Rel 8, Cat24 • HSPA+ Rel 7, Cat7 • 802.11b/g/n HT20/HT40
Antenna Type	WWAN: Monopole Antenna WLAN: Fixed Internal Antenna
HW Version	A1
SW Version	1.00_DI
EUT Stage	Identical Prototype

Remark:
1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. Voice call is not supported.
3. This device, WLAN 2.4GHz supports hotspot operation.

3.2 Maximum RF output power among production units

Mode	GSM 850	GSM 1900
	Burst average power(dBm)	
GPRS/EDGE (GMSK, 1 Tx slot)	31	28.5
GPRS/EDGE (GMSK, 2 Tx slots)	30	27.5
GPRS/EDGE (GMSK, 3 Tx slots)	29	25.5
GPRS/EDGE (GMSK, 4 Tx slots)	28	25.5
EDGE (8PSK, 1 Tx slot)	26	24
EDGE (8PSK, 2 Tx slots)	22	21
EDGE (8PSK, 3 Tx slots)	21	19.5
EDGE (8PSK, 4 Tx slots)	20	19

Mode	WCDMA Band V	WCDMA Band II
	Average power(dBm)	
RMC 12.2Kbps	23	21.5
HSDPA Subtest-1	22	21
HSDPA Subtest-2	22	21
HSDPA Subtest-3	21.5	20.5
HSDPA Subtest-4	21.5	20.5
DC-HSDPA Subtest-1	22	21
DC-HSDPA Subtest-2	22	21
DC-HSDPA Subtest-3	21.5	20.5
DC-HSDPA Subtest-4	21.5	20.5
HSUPA Subtest-1	21	20
HSUPA Subtest-2	21	20
HSUPA Subtest-3	22	21
HSUPA Subtest-4	20	19
HSUPA Subtest-5	22	21
HSPA+ (16QAM) Subtest-1	21	20

WLAN 2.4GHz	Average Power (dBm)			
	IEEE 802.11			
Channel	11b	11g	HT20	HT40
Ch1	17	16	15	
Ch3				14
Ch6	17	15	14	14
Ch9				14
Ch11	17	13	13	

3.3 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 KDB 865664 D01 v01r01
- FCC KDB 865664 D02 v01r01
- FCC KDB 447498 D01 v05r01
- FCC KDB 248227 D01 v01r02
- FCC KDB 941225 D01 v02
- FCC KDB 941225 D02 v02r02
- FCC KDB 941225 D03 v01
- FCC KDB 941225 D06 v01r01

3.4 Device Category and SAR Limits

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

3.5 Test Conditions

3.5.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.5.2 Test Configuration

For WWAN SAR testing, the device was controlled by using a base station emulator. Communication between the device and the emulator was established by air link. The distance between the EUT and the antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT.

During WLAN SAR testing EUT is configured with the WLAN continuous TX tool, and the transmission duty factor was monitored on the spectrum analyzer with zero-span setting

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

4. Specific Absorption Rate (SAR)

4.1 Introduction

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

4.2 SAR Definition

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

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

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

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

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

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

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

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

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

5. SAR Measurement System

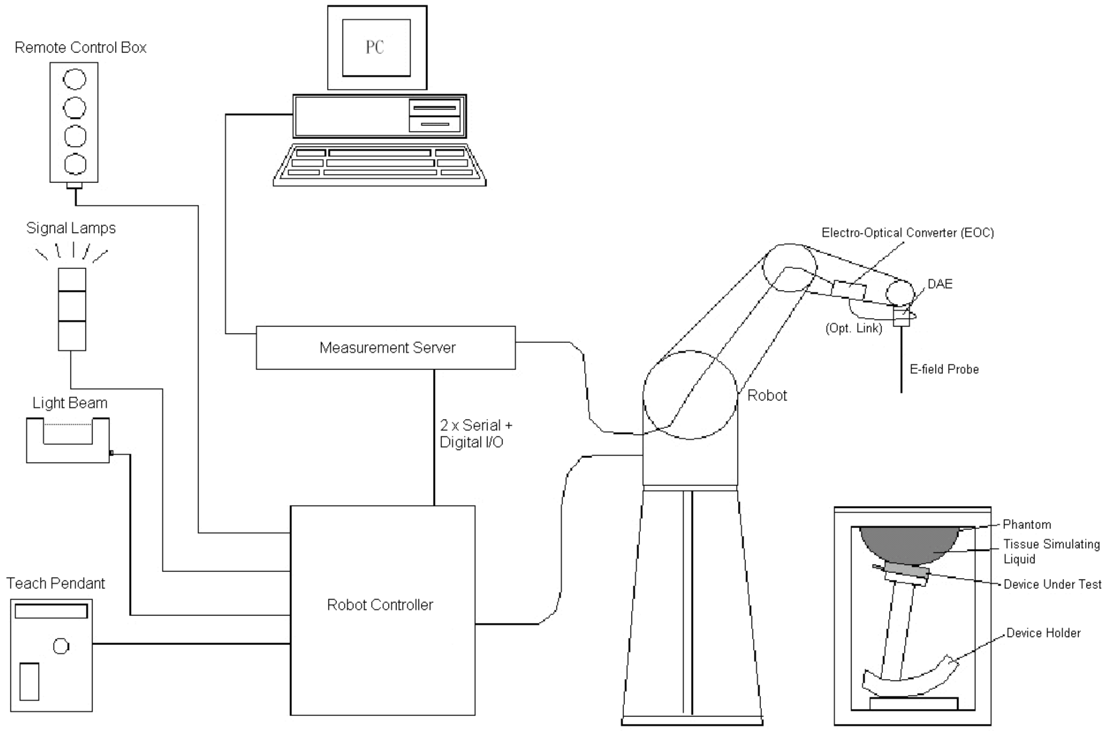


Fig 5.1 SPEAG DASY System Configurations

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

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

Component details are described in in the following sub-sections.

5.1 E-Field Probe

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

5.1.1 E-Field Probe Specification

<EX3DV4 Probe>

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

Fig 5.2 Photo of EX3DV4

5.1.2 E-Field Probe Calibration

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

5.2 Data Acquisition Electronics (DAE)

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

Fig 5.3 Photo of DAE

5.3 Robot

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

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

Fig 5.4 Photo of DASY5

5.4 Measurement Server

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

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

Fig 5.5 Photo of Server for DASY5

5.5 Phantom

<SAM Twin Phantom>

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

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

5.6 Device Holder

<Device Holder for SAM Twin Phantom>

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

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

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

Fig 5.7 Device Holder

5.7 Data Storage and Evaluation

5.7.1 Data Storage

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

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

5.7.2 Data Evaluation

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

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

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

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

The formula for each channel can be given as：

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

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

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

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

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

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

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

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

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

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

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

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

5.8 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	4d091	Nov. 18, 2011	Nov. 16, 2013
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	Nov. 21, 2011	Nov. 16, 2013
SPEAG	2450MHz System Validation Kit	D2450V2	840	Mar. 26, 2013	Mar. 25, 2014
SPEAG	Data Acquisition Electronics	DAE4	1210	Jun. 19, 2013	Jun. 18, 2014
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	Jun. 20, 2013	Jun. 19, 2014
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1477	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1479	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Agilent	Wireless Communication Test Set	E5515C	MY48367160	Oct. 25, 2012	Oct. 24, 2013
Agilent	Wireless Communication Test Set	E5515E	MY52112100	Oct. 25, 2012	Oct. 24, 2013
Agilent	ENA Series Network Analyzer	E5071C	MY46106933	Aug. 13, 2013	Aug. 12, 2014
R&S	Network Analyzer	ZVB8	100106	Nov. 20, 2012	Nov. 19, 2013
SPEAG	Dielectric Assessment KIT	DAK-3.5	1032	NCR	NCR
R&S	Signal Generator	SMR40	100455	Jan. 18, 2013	Jan. 17, 2014
Anritsu	Power Meter	ML2495A	1218010	Mar. 28, 2013	Mar. 27, 2014
Anritsu	Power Sensor	MA2411B	1207253	Mar. 28, 2013	Mar. 27, 2014
SPEAG	Device Holder	N/A	N/A	NCR	NCR
Agilent	Dual Directional Coupler	778D	50422	Note 4	
Woken	Attenuator 1	WK0602-XX	N/A	Note 4	
PE	Attenuator 2	PE7005-10	N/A	Note 4	
PE	Attenuator 3	PE7005- 3	N/A	Note 4	
AR	Power Amplifier	5S1G4M2	328767	Note 5	
R&S	Spectrum Analyzer	FSP30	101399	May 23, 2013	May 22, 2014

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 D01v01r01, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole D835V2, SN: 4D091, D1900V2 and SN: 5d118 can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.
4. The Insertion Loss calibration of Dual Directional Coupler and Attenuator were characterized via the network analyzer and compensated during system check.
5. In system check we need to monitor the level on the power meter, and adjust the power amplifier level to have precise power level to the dipole; the measured SAR will be normalized to 1W input power according to the ratio of 1W to the input power to the dipole. For system check, the calibration of the power amplifier is deemed not critically required for correct measurement; the power meter is critical and we do have calibration for it
6. Attenuator 1 insertion loss is calibrated by the network Analyzer, which the calibration is valid, before system check.

6. Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For 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. 6.1.

Fig 6.1 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)
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 a SPEAG DAK-3.5 Dielectric Probe Kit and a R&S ZVB8 Network Analyzer.

The following table shows the measuring results for simulating liquid.

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Body	22.6	0.983	55.18	0.97	55.2	1.34	-0.04	±5	Sep. 24, 2013
1900	Body	22.5	1.55	53.363	1.52	53.3	1.97	0.12	±5	Sep. 25, 2013
2450	Body	22.5	1.933	51.282	1.95	52.7	-0.87	-2.69	±5	Sep. 27, 2013

Table 6.2 Measuring Results for Simulating Liquid

7. System Verification Procedures

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

7.1 Purpose of System Performance check

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

7.2 System Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:

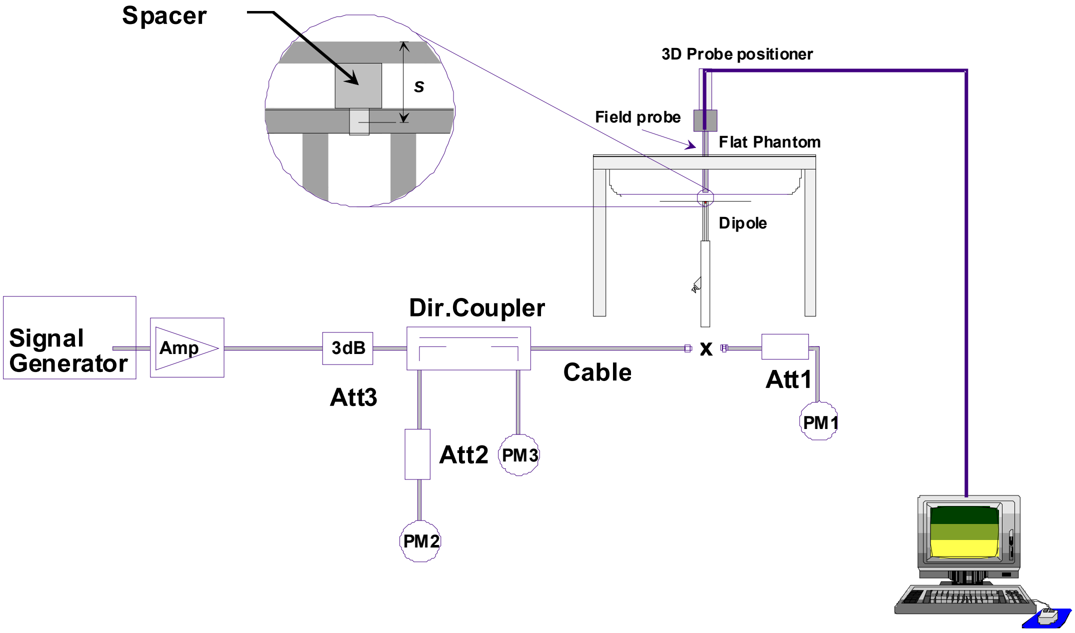


Fig 7.1 System Setup for System Evaluation

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

Fig 7.2 Photo of Dipole Setup

7.3 SAR System Verification Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Table 7.1 shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Date	Frequency (MHz)	Liquid Type	Power fed onto reference dipole (mW)	Target SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	Normalized SAR_{1g} (W/kg)	Deviation (%)
Sep. 24, 2013	835	Body	250	9.42	2.24	8.96	-4.88
Sep. 25, 2013	1900	Body	250	41.8	10.3	41.2	-1.44
Sep. 27, 2013	2450	Body	250	50.4	12.4	49.6	-1.59

Table 7.1 Target and Measurement SAR after Normalized

8. EUT Testing Position

This EUT was tested in six different positions. They are Front, Back, Right Side, Left Side, Top Side, Bottom Side of the EUT with phantom 0.5 cm gap, as illustrated below.

8.1 Hotspot Position

(a) To position the device parallel to the phantom surface with all sides and either keypad up or down.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device and the flat phantom to 0.5cm. For Hotspot SAR testing, per KDB 941225 D06v01r01, for EUT dimension ≥ 9cm*5cm, the test distance is 1cm. But according to the customer's requirement , the conservative test distance 0.5cm is applied for SAR test.

<EUT Setup Photos>

Please refer to Appendix D for the test setup photos.

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

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

9.2 Power Reference Measurement

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

9.3 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r01 quoted below.

When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

<table>
<tr><th colspan="3"></th><th>$\leq$ 3 GHz</th><th>> 3 GHz</th></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>$\leq$ 2 GHz: $\leq$ 15 mm
2 – 3 GHz: $\leq$ 12 mm</td><td>3 – 4 GHz: $\leq$ 12 mm
4 – 6 GHz: $\leq$ 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 $\leq$ 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>$\leq$ 2 GHz: $\leq$ 8 mm
2 – 3 GHz: $\leq$ 5 mm*</td><td>3 – 4 GHz: $\leq$ 5 mm*
4 – 6 GHz: $\leq$ 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>$\leq$ 5 mm</td><td>3 – 4 GHz: $\leq$ 4 mm
4 – 5 GHz: $\leq$ 3 mm
5 – 6 GHz: $\leq$ 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>$\leq$ 4 mm</td><td>3 – 4 GHz: $\leq$ 3 mm
4 – 5 GHz: $\leq$ 2.5 mm
5 – 6 GHz: $\leq$ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>$\geq$ 30 mm</td><td>3 – 4 GHz: $\geq$ 28 mm
4 – 5 GHz: $\geq$ 25 mm
5 – 6 GHz: $\geq$ 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 reported SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is $\leq$ 1.4 W/kg, $\leq$ 8 mm, $\leq$ 7 mm and $\leq$ 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>

9.4 Volume Scan Procedures

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

9.5 SAR Averaged Methods

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

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

9.6 Power Drift Monitoring

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

10. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

Note:

1. Per KDB 447498 D01v05r01, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. For hotspot SAR testing, the EUT was set in GPRS 4 Tx slots for GSM850 and GSM1900 due to its highest frame-average power.

Band GSM850	Burst Average Power (dBm)			Frame-Average Power (dBm)		
Channel	128	189	251	128	189	251
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8
GPRS (GMSK, 1 Tx slot) – CS1	30.46	30.53	**30.65**	21.46	21.53	21.65
GPRS (GMSK, 2 Tx slots) – CS1	29.17	29.24	29.36	23.17	23.24	23.36
GPRS (GMSK, 3 Tx slots) – CS1	28.41	28.47	28.58	24.15	24.21	24.32
GPRS (GMSK, 4 Tx slots) – CS1	27.43	27.50	27.61	24.43	24.50	**24.61**
EDGE (GMSK, 1 Tx slot) – MCS1	30.44	30.52	30.64	21.44	21.52	21.64
EDGE (GMSK, 2 Tx slots) – MCS1	29.17	29.23	29.35	23.17	23.23	23.35
EDGE (GMSK, 3 Tx slots) – MCS1	28.40	28.45	28.58	24.14	24.19	24.32
EDGE (GMSK, 4 Tx slots) – MCS1	27.42	27.49	27.60	24.42	24.49	24.60
EDGE (8PSK, 1 Tx slot) – MCS5	25.07	25.14	25.16	16.07	16.14	16.16
EDGE (8PSK, 2 Tx slots) – MCS5	21.79	21.83	21.87	15.79	15.83	15.87
EDGE (8PSK, 3 Tx slots) – MCS5	20.66	20.71	20.73	16.40	16.45	16.47
EDGE (8PSK, 4 Tx slots) – MCS5	19.59	19.61	19.64	16.59	16.61	16.64
Band GSM1900	Burst Average Power (dBm)			Frame-Average Power (dBm)		
Channel	512	661	810	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8	1850.2	1880.0	1909.8
GPRS (GMSK, 1 Tx slot) – CS1	27.67	28.11	**28.16**	18.67	19.11	19.16
GPRS (GMSK, 2 Tx slots) – CS1	25.83	26.35	26.37	19.83	20.35	20.37
GPRS (GMSK, 3 Tx slots) – CS1	24.49	25.04	25.08	20.23	20.78	20.82
GPRS (GMSK, 4 Tx slots) – CS1	24.47	25.03	25.07	21.47	22.03	**22.07**
EDGE (GMSK, 1 Tx slot) – MCS1	27.63	28.08	28.13	18.63	19.08	19.13
EDGE (GMSK, 2 Tx slots) – MCS1	25.79	26.31	26.34	19.79	20.31	20.34
EDGE (GMSK, 3 Tx slots) – MCS1	24.46	25.00	25.05	20.20	20.74	20.79
EDGE (GMSK, 4 Tx slots) – MCS1	24.44	25.01	25.04	21.44	22.01	22.04
EDGE (8PSK, 1 Tx slot) – MCS5	22.69	23.23	23.64	13.69	14.23	14.64
EDGE (8PSK, 2 Tx slots) – MCS5	19.06	19.81	20.45	13.06	13.81	14.45
EDGE (8PSK, 3 Tx slots) – MCS5	17.56	19.19	18.71	13.30	14.93	14.45
EDGE (8PSK, 4 Tx slots) – MCS5	17.33	18.01	18.56	14.33	15.01	15.56

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<WCDMA Conducted Power>

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} *(Note1, Note 2)*	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

HSPA+ 3GPP release 7 (uplink category 7) 16QAM, Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2E:HSPA+:UL with 16QAM
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.4, quoted from the TS 34.121-1 s5.2E
   iii. Set Channel Parms
   iv. Set Cell Power = -86 dBm
   v. Set Channel Type = HSPA
   vi. Set UE Target Power =21 dBm
   vii. Power Ctrl Mode= All Up Bits
   viii. Set Manual Uplink DPCH Bc/Bd = Manual
   ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 table C11.1.4 sub-test 1)
   x. Set HSPA Conn DL Channel Levels
   xi. Set HS-SCCH Configs
   xii. Set RB Test Mode Setup
   xiii. Set Common HSUPA Parameters
   xiv. Set Serving Grant
   xv. Confirm that E-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set RMC 12.2Kbps + HSDPA mode.
   ii. Set Cell Power = -25 dBm
   iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
   iv. Select HSDPA Uplink Parameters
   v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
      a). Subtest 1: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_d=15/4
   vi. Set Delta ACK, Delta NACK and Delta CQI = 8
   vii. Set Ack-Nack Repetition Factor to 3
   viii. Set CQI Feedback Cycle (k) to 4 ms
   ix. Set CQI Repetition Factor to 2
   x. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
A summary of these settings are illustrated below:

C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

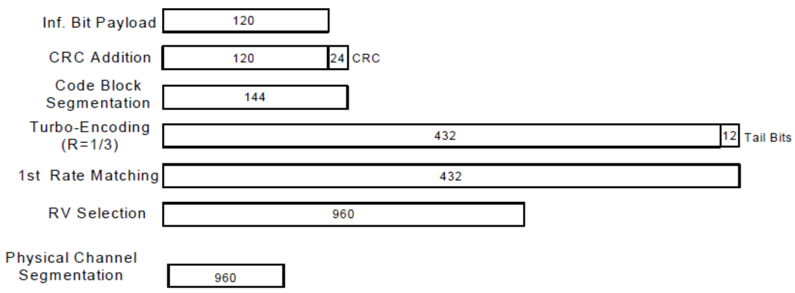


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

Note:

1. Applying the subtest setup in Table C.11.1.3 of 3GPP TS 34.121-1 V9.1.0 to Rel. 6 HSPA, and the subtest setup in Table C.11.1.4 to Rel. 7 HSPA+ and Table C10.1.4 to Rel. 8 DC-HSPA.
2. By design, DC-HSDPA/HSDPA/HSUPA and HSPA+ (16QAM in uplink) RF power will not be larger than RMC 12.2kbps., detailed information is included in Tune-up Procure exhibit.
3. It is expected by the manufacturer that MPR for some HSDPA/DC-HSDPA/HSUPA, HSPA+ (16QAM in uplink) subtests may differ from the specification of 3GPP, according to the chipset implementation in this model. The implementation and expected deviation are detailed in tune-up procedure exhibit.

Band		WCDMA Band V			WCDMA Band II		
Tx Channel		4132	4182	4233	9262	9400	9538
Rx Channel		4357	4407	4458	9662	9800	9938
Frequency (MHz)		826.4	836.4	846.6	1852.4	1880	1907.6
3GPP Rel 99	RMC 12.2kbps	22.52	**22.57**	22.49	20.81	21.03	**21.07**
3GPP Rel 6	HSDPA Subtest-1	21.56	21.56	21.55	20.25	20.48	20.55
3GPP Rel 6	HSDPA Subtest-2	21.52	21.53	21.51	20.28	20.52	20.56
3GPP Rel 6	HSDPA Subtest-3	21.10	21.12	21.06	19.85	20.01	20.08
3GPP Rel 6	HSDPA Subtest-4	21.08	21.10	21.02	19.82	19.99	20.05
3GPP Rel 8	DC-HSDPA Subtest-1	21.43	21.47	21.44	20.18	20.40	20.46
3GPP Rel 8	DC-HSDPA Subtest-2	21.41	21.42	21.41	20.19	20.43	20.48
3GPP Rel 8	DC-HSDPA Subtest-3	20.93	21.03	20.93	19.75	19.90	19.95
3GPP Rel 8	DC-HSDPA Subtest-4	20.90	20.99	20.91	19.72	19.89	19.94
3GPP Rel 6	HSUPA Subtest-1	20.03	20.09	20.06	18.75	19.10	18.87
3GPP Rel 6	HSUPA Subtest-2	20.05	20.07	20.06	18.77	19.08	18.89
3GPP Rel 6	HSUPA Subtest-3	21.08	21.07	21.06	19.81	20.08	19.88
3GPP Rel 6	HSUPA Subtest-4	19.50	19.54	19.49	18.25	18.53	18.35
3GPP Rel 6	HSUPA Subtest-5	21.56	21.55	21.54	20.29	20.59	20.39
3GPP Rel 7	HSPA+ (16QAM) Subtest-1	20.03	20.05	20.01	19.26	19.38	19.31
3GPP MPR specification	MPR result	WCDMA Band V			WCDMA Band II		
0	HSDPA Subtest-1	0.00	0.00	0.00	0.00	0.00	0.00
0	HSDPA Subtest-2	0.04	0.03	0.04	-0.03	-0.04	-0.01
≦0.5	HSDPA Subtest-3	0.46	0.44	0.49	0.40	0.47	0.47
≦0.5	HSDPA Subtest-4	0.48	0.46	0.53	0.43	0.49	0.50
0	DC-HSDPA Subtest-1	0.00	0.00	0.00	0.00	0.00	0.00
0	DC-HSDPA Subtest-2	0.02	0.05	0.03	-0.01	-0.03	-0.02
≦0.5	DC-HSDPA Subtest-3	0.50	0.44	0.51	0.43	0.50	0.51
≦0.5	DC-HSDPA Subtest-4	0.53	0.48	0.53	0.46	0.51	0.52
≦0	HSUPA Subtest-1	1.53	1.46	1.48	1.54	1.49	1.52
≦2	HSUPA Subtest-2	1.51	1.48	1.48	1.52	1.51	1.50
≦1	HSUPA Subtest-3	0.48	0.48	0.48	0.48	0.51	0.51
≦2	HSUPA Subtest-4	2.06	2.01	2.05	2.04	2.06	2.04
≦0	HSUPA Subtest-5	0.00	0.00	0.00	0.00	0.00	0.00
≦2.5	HSPA+ (16QAM) Subtest-1	1.53	1.50	1.53	1.03	1.21	1.08

<WLAN 2.4GHz Band Conducted Power>

General Note:

1. Per KDB 248227 D01 v01r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4dB higher than those measured at the lowest data rate.
3. Per KDB 248227 D01 v01r02, 11g, 11n-HT20 and 11n-HT40 output power is less than 1/4dB higher than 11b mode, thus the SAR can be excluded. WLAN SAR was tested on 802.11b 1Mbps.

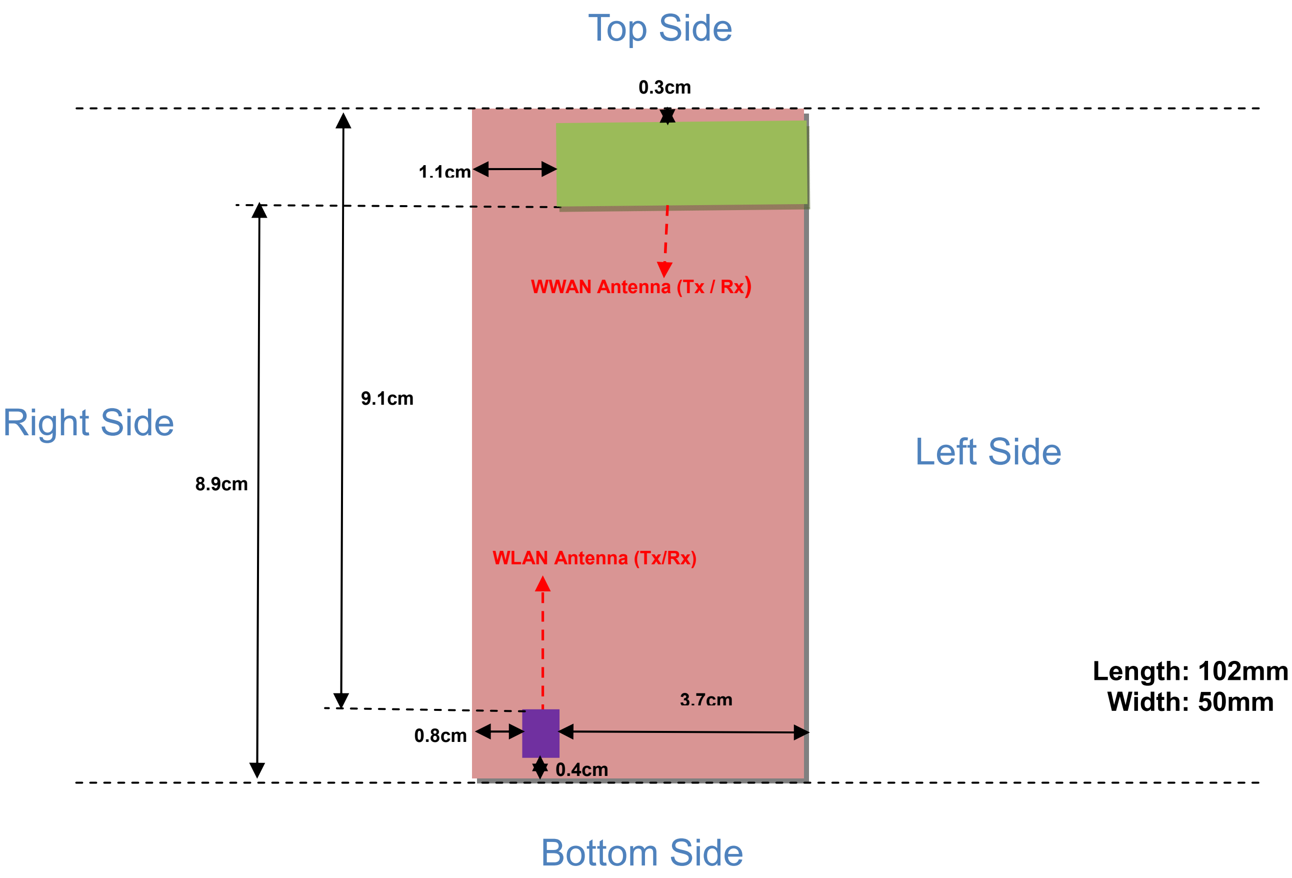
WLAN 2.4GHz 802.11b Average Power (dBm)							Tune up Limite (dBm)
Power vs. Channel			Power vs. Data Rate				
Channel	Frequency (MHz)	Data Rate 1Mbps	Channel	2Mbps	5.5Mbps	11Mbps	
CH 1	2412	16.48	CH 1	16.46	16.45	16.43	17
CH 6	2437	16.19					17
CH 11	2462	16.12					17

WLAN 2.4GHz 802.11g Average Power (dBm)											Tune up Limite (dBm)
Power vs. Channel			Power vs. Data Rate								
Channel	Frequency (MHz)	Data Rate 6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps	
CH 1	2412	15.47	CH 1	15.43	15.43	15.42	15.39	15.35	15.34	15.28	16
CH 6	2437	14.74									15
CH 11	2462	12.70									13

WLAN 2.4GHz 802.11n-HT20 Average Power (dBm)											Tune up Limite (dBm)
Power vs. Channel			Power vs. MCS Index								
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	
CH 1	2412	14.02	CH 1	14.01	14	13.97	13.94	13.95	13.89	13.89	15
CH 6	2437	13.50									14
CH 11	2462	12.65									13

WLAN 2.4GHz 802.11n-HT40 Average Power (dBm)											Tune up Limite (dBm)
Power vs. Channel			Power vs. MCS Index								
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	
CH 3	2422	13.52	CH 3	13.48	13.36	13.3	13.2	13.15	13.16	13.14	14
CH 6	2437	13.31									14
CH 9	2452	12.82									14

11. Antenna Location



Back View

Antennas	Wireless Interface
WWAN Main Antenna (Tx / Rx)	GSM850 GSM1900 WCDMA Band V WCDMA Band II
WLAN Antenna (Tx / Rx)	WLAN 2.4GHz

Distance of the Antenna to the EUT surface/edge						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
WWAN Main	≤ 25mm	≤ 25mm	≤ 25mm	89mm	≤ 25mm	≤ 25mm
WLAN	≤ 25mm	≤ 25mm	91mm	≤ 25mm	≤ 25mm	37mm

Positions for SAR tests; Hotspot mode Test distance: 5 mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
WWAN Main	Yes	Yes	Yes	NO	Yes	Yes
WLAN	Yes	Yes	NO	Yes	Yes	NO

1. Hotspot mode SAR assessments are required.
2. Referring to KDB 941225 D06 v01r01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. But according to the customer's requirement , the conservative test distance 0.5cm is applied for SAR test. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge

12. SAR Test Results

Note:

1. Per KDB 447498 D01v05r01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For WWAN/WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
2. Per KDB 447498 D01v05r01, for each exposure position, if the highest output channel reported SAR ≤0.8W/kg, other channels SAR testing is not necessary.
3. For Hotspot SAR testing, per KDB 941225 D06v01r01, for EUT dimension ≥ 9cm*5cm, the test distance is 1cm. But according to the customer's requirement , the conservative test distance 0.5cm is applied for SAR test SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.
4. Per KDB 941225 D02v02r02, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA/HSUPA, HSPA+ (16QAM in uplink) output power is < 0.25dB higher than RMC12.2Kbps, or reported SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA/HSUPA and HSPA+ (16QAM in uplink) SAR evaluation can be excluded. DC-HSDPA 4 subtests SAR test exclusion follows HSPA procedure in KDB 941225 D01v02 according to 2012-Oct TCB workshop RF exposure update.

12.1 Test Results for Body SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
#01	GSM850	GPRS (4 Tx Slots)	Front	0.5	251	848.8	27.61	28	0.0063	0.699	0.765
#02	GSM850	GPRS (4 Tx Slots)	Back	0.5	251	848.8	27.61	28	-0.02	0.733	0.802
#03	GSM850	GPRS (4 Tx Slots)	Right Side	0.5	251	848.8	27.61	28	0.0031	0.443	0.485
#04	GSM850	GPRS (4 Tx Slots)	Left Side	0.5	251	848.8	27.61	28	0.03	0.438	0.479
#05	GSM850	GPRS (4 Tx Slots)	Top Side	0.5	251	848.8	27.61	28	0.09	0.138	0.151
#06	GSM850	GPRS (4 Tx Slots)	Back	0.5	128	824.2	27.43	28	0.03	0.756	**0.862**
#07	GSM850	GPRS (4 Tx Slots)	Back	0.5	189	836.4	27.5	28	-0.0041	0.744	0.835
#08	GSM1900	GPRS (4 Tx Slots)	Front	0.5	810	1909.8	25.07	25.5	-0.16	0.250	0.276
#09	GSM1900	GPRS (4 Tx Slots)	Back	0.5	810	1909.8	25.07	25.5	0.1	0.319	**0.352**
#10	GSM1900	GPRS (4 Tx Slots)	Right Side	0.5	810	1909.8	25.07	25.5	0.0015	0.117	0.129
#11	GSM1900	GPRS (4 Tx Slots)	Left Side	0.5	810	1909.8	25.07	25.5	-0.07	0.178	0.197
#12	GSM1900	GPRS (4 Tx Slots)	Top Side	0.5	810	1909.8	25.07	25.5	0.01	0.132	0.146

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
#13	WCDMA Band V	RMC12.2K	Front	0.5	4182	836.4	22.57	23	0.03	0.486	0.537
#14	WCDMA Band V	RMC12.2K	Back	0.5	4182	836.4	22.57	23	-0.03	0.550	**0.607**
#15	WCDMA Band V	RMC12.2K	Right Side	0.5	4182	836.4	22.57	23	0.0061	0.311	0.343
#16	WCDMA Band V	RMC12.2K	Left Side	0.5	4182	836.4	22.57	23	0.02	0.291	0.321
#17	WCDMA Band V	RMC12.2K	Top Side	0.5	4182	836.4	22.57	23	0.14	0.102	0.113
#18	WCDMA Band II	RMC12.2K	Front	0.5	9538	1907.6	21.07	21.5	-0.14	0.171	0.189
#19	WCDMA Band II	RMC12.2K	Back	0.5	9538	1907.6	21.07	21.5	-0.0024	0.203	**0.224**
#20	WCDMA Band II	RMC12.2K	Right Side	0.5	9538	1907.6	21.07	21.5	0.04	0.076	0.084
#21	WCDMA Band II	RMC12.2K	Left Side	0.5	9538	1907.6	21.07	21.5	0.05	0.112	0.124
#22	WCDMA Band II	RMC12.2K	Top Side	0.5	9538	1907.6	21.07	21.5	0.01	0.093	0.103

<WLAN2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Data Rate	Average Power (dBm)	Tune-Up Limit (dBm)	Power Drift (dB)	Measured SAR_{1g} (W/kg)	Reported SAR_{1g} (W/kg)
#23	WLAN 2.4GHz	802.11b	Front	0.5	1	2412	1M	16.48	17	0.022	0.228	0.257
#24	WLAN 2.4GHz	802.11b	Back	0.5	1	2412	1M	16.48	17	0.02	0.310	**0.349**
#25	WLAN 2.4GHz	802.11b	Right Side	0.5	1	2412	1M	16.48	17	0.0033	0.062	0.070
#26	WLAN 2.4GHz	802.11b	Bottom Side	0.5	1	2412	1M	16.48	17	-0.1	0.210	0.237

12.2 Highest SAR Plot

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.24

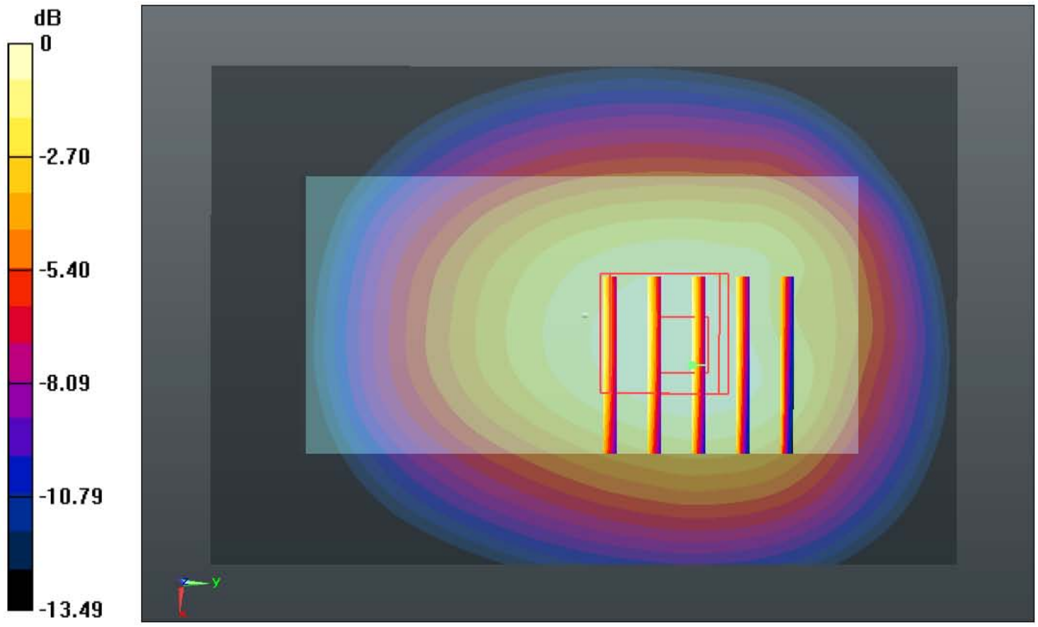
#06_GSM850_GPRS (4 Tx slots)_Back 0.5cm_Ch128

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 824.2 MHz;Duty Cycle: 1:2.08
Medium: MSL_835_130924 Medium parameters used: f = 824.2 MHz; σ = 0.972 mho/m; ε_r = 55.281; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch128/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.925 mW/g

Ch128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.680 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.054 W/kg
SAR(1 g) = 0.756 mW/g; SAR(10 g) = 0.531 mW/g
Maximum value of SAR (measured) = 0.909 mW/g



0 dB = 0.910mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.25

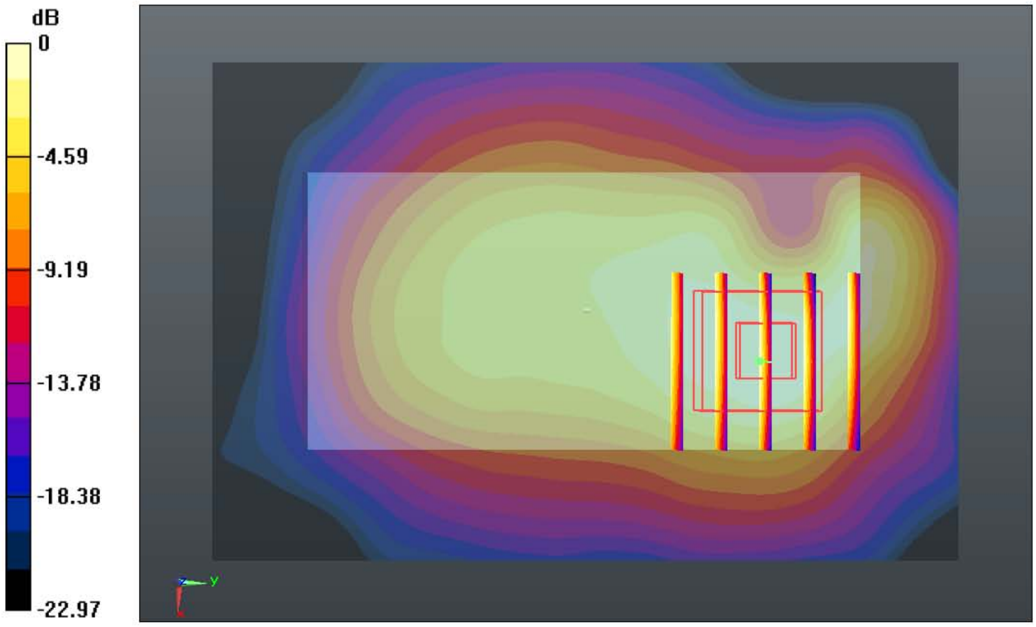
#09_GSM1900_GPRS (4 Tx slots)_Back 0.5cm_Ch810

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900_130925 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 53.334; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.430 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.521 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.537 W/kg
SAR(1 g) = 0.319 mW/g; SAR(10 g) = 0.178 mW/g
Maximum value of SAR (measured) = 0.421 mW/g



0 dB = 0.420mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.24

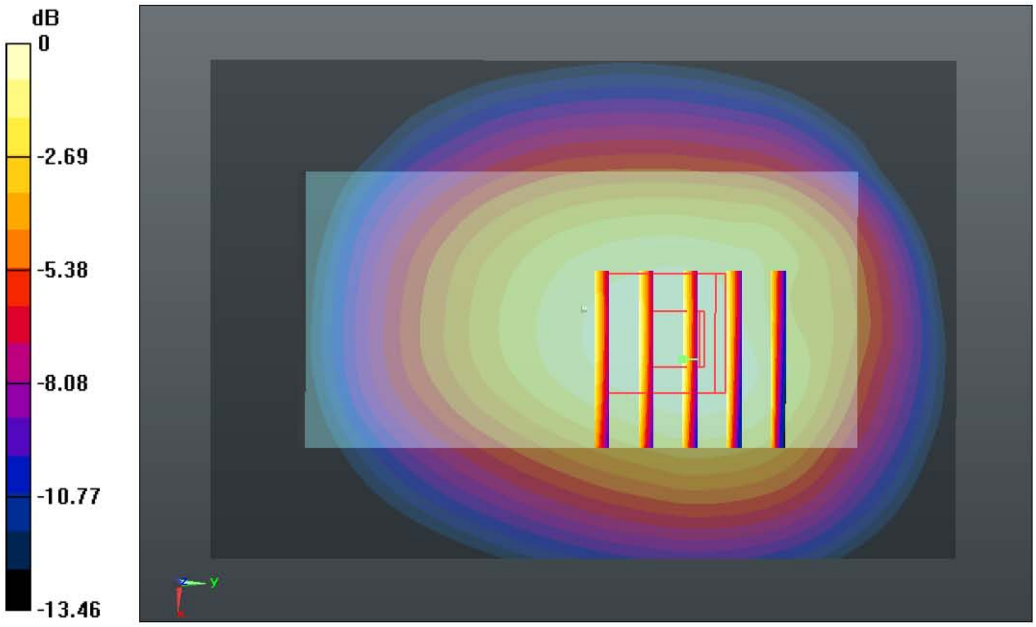
#14_WCDMA Band V_RMC12.2K_Back 0.5cm_Ch4182

Communication System: UMTS; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: MSL_835_130924 Medium parameters used: f = 836.4 MHz; σ = 0.985 mho/m; ε_r = 55.165; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch4182/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.681 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.980 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.768 W/kg
SAR(1 g) = 0.550 mW/g; SAR(10 g) = 0.386 mW/g
Maximum value of SAR (measured) = 0.662 mW/g



0 dB = 0.660mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.25

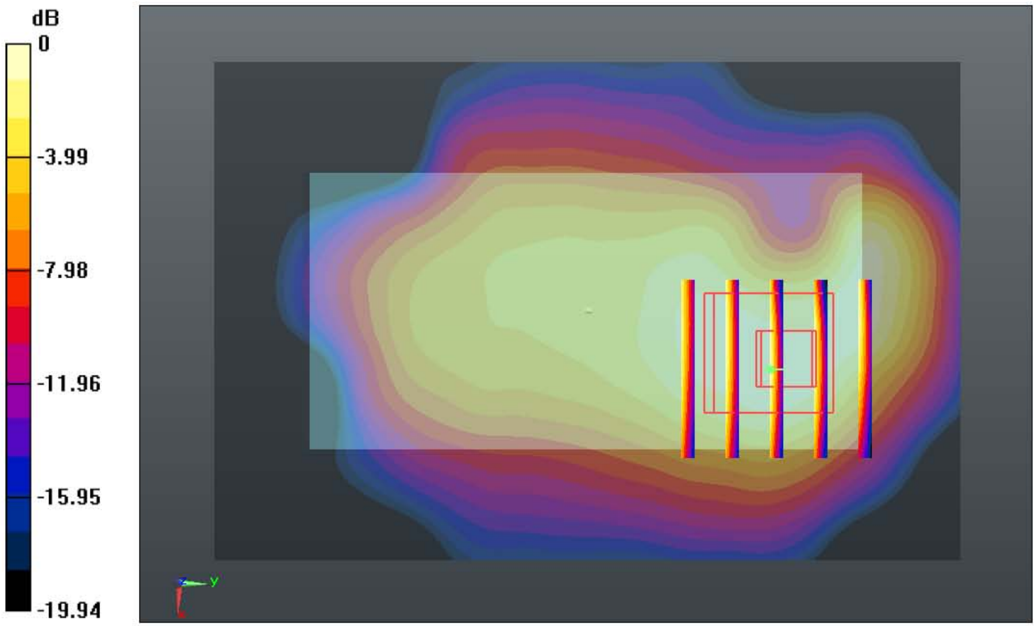
#19_WCDMA Band II_RMC12.2K_Back 0.5cm_Ch9538

Communication System: UMTS; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_130925 Medium parameters used: f = 1908 MHz; σ = 1.558 mho/m; ε_r = 53.34; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch9538/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.281 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.383 V/m; Power Drift = -0.0024 dB
Peak SAR (extrapolated) = 0.347 W/kg
SAR(1 g) = 0.203 mW/g; SAR(10 g) = 0.114 mW/g
Maximum value of SAR (measured) = 0.266 mW/g



0 dB = 0.270mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.27

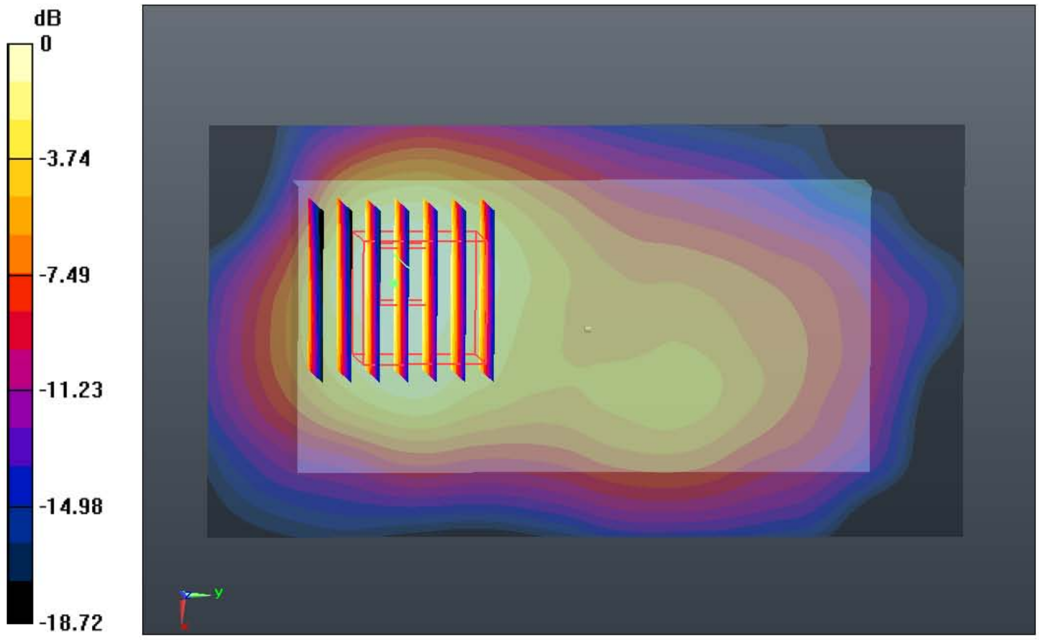
#24_WLAN 2.4GHz_802.11b_1M_Back 0.5cm_Ch1

Communication System: WIFI; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_130927 Medium parameters used: f = 2412 MHz; σ = 1.879 mho/m; ε_r = 51.45; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7, 7, 7); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch1/Area Scan (61x111x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.465 mW/g

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.467 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.613 W/kg
SAR(1 g) = 0.310 mW/g; SAR(10 g) = 0.169 mW/g
Maximum value of SAR (measured) = 0.447 mW/g



0 dB = 0.450mW/g

13. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Hotspot	Note
1.	GPRS (Data) + WLAN2.4GHz(data)	Yes	2.4GHz Hotspot
2.	WCDMA (Data) + WLAN2.4GHz(data)	Yes	2.4GHz Hotspot

Note:

1. EUT will choose either GSM or WCDMA according to the network signal condition; therefore, they will not transmit simultaneously.
2. The Reported SAR summation is calculated based on the same configuration and test position.
3. Per KDB 447498 D01v05r01, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*), and the peak separation distance is determined from the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where ($x_1$, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the zoom scan
   If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary
   iii) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg

13.1 Hotspot Exposure Conditions

< WWAN + WLAN >

	WWAN			WLAN		**WWAN+WLAN Summation SAR (W/kg)**
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	SAR (W/kg)	
Front	GSM850	#01	0.765	#23	0.257	1.02
	GSM1900	#08	0.276	#23	0.257	0.53
	WCDMA Band V	#13	0.537	#23	0.257	0.79
	WCDMA Band II	#18	0.189	#23	0.257	0.45
Back	GSM850	#06	0.862	#24	0.349	1.21
	GSM1900	#09	0.352	#24	0.349	0.70
	WCDMA Band V	#14	0.607	#24	0.349	0.96
	WCDMA Band II	#19	0.224	#24	0.349	0.57
Left Side	GSM850	#04	0.479			0.48
	GSM1900	#11	0.197			0.20
	WCDMA Band V	#16	0.321			0.32
	WCDMA Band II	#21	0.124			0.12
Right Side	GSM850	#03	0.485	#25	0.070	0.56
	GSM1900	#10	0.129	#25	0.070	0.20
	WCDMA Band V	#15	0.343	#25	0.070	0.41
	WCDMA Band II	#20	0.084	#25	0.070	0.15
Top Side	GSM850	#05	0.151			0.15
	GSM1900	#12	0.146			0.15
	WCDMA Band V	#17	0.113			0.11
	WCDMA Band II	#22	0.103			0.10
Bottom Side	GSM850			#26	0.237	0.24
	GSM1900			#26	0.237	0.24
	WCDMA Band V			#26	0.237	0.24
	WCDMA Band II			#26	0.237	0.24

Test Engineer： Bevis Chang

14. 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 14.1

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	1/√3	1/√6	1/√2

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

(b) κ is the coverage factor

Table 14.1. 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 14.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

15. 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] SPEAG DASY System Handbook

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

[6] FCC KDB 447498 D01 v05r01, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, May 2013

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

[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 D02 v02r02, “SAR Guidance for HSPA, HSPA+, DC-HSDPA and 1x-Advanced”, May 2013.

[10] FCC KDB 941225 D06 v01r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", May 2013

[11] FCC KDB 865664 D01 v01r01, "SAR Measurement Requirements for 100 MHz to 6 GHz", May 2013.

[12] FCC KDB 865664 D02 v01r01, “RF Exposure Compliance Reporting and Documentation Considerations”, May 2013

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.24

System Check_Body_835MHz_130924

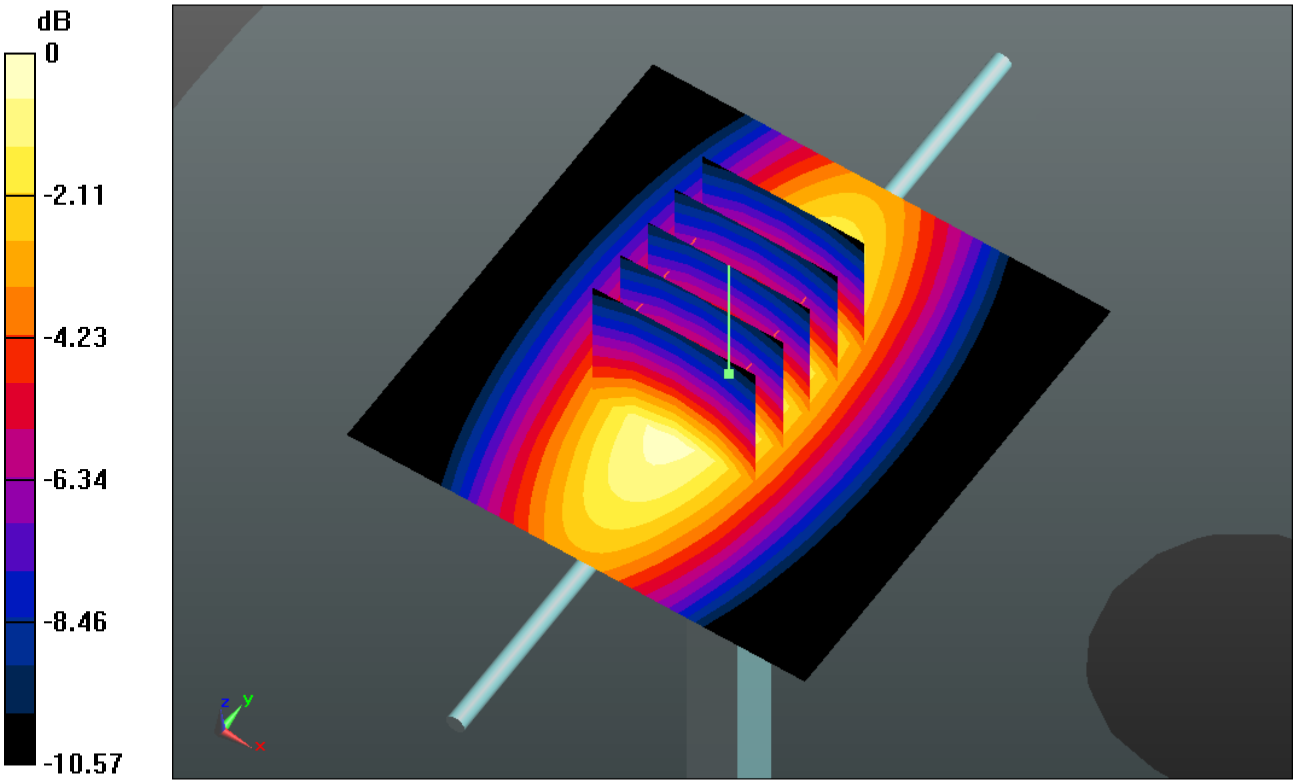
DUT: D835V2 - SN:4d091

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_835_130924 Medium parameters used: f = 835 MHz; σ = 0.983 mho/m; ε_r = 55.18; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.838 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.601 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 3.340 W/kg
SAR(1 g) = 2.24 mW/g; SAR(10 g) = 1.47 mW/g
Maximum value of SAR (measured) = 2.842 mW/g



0 dB = 2.840mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.25

System Check_Body_1900MHz_130925

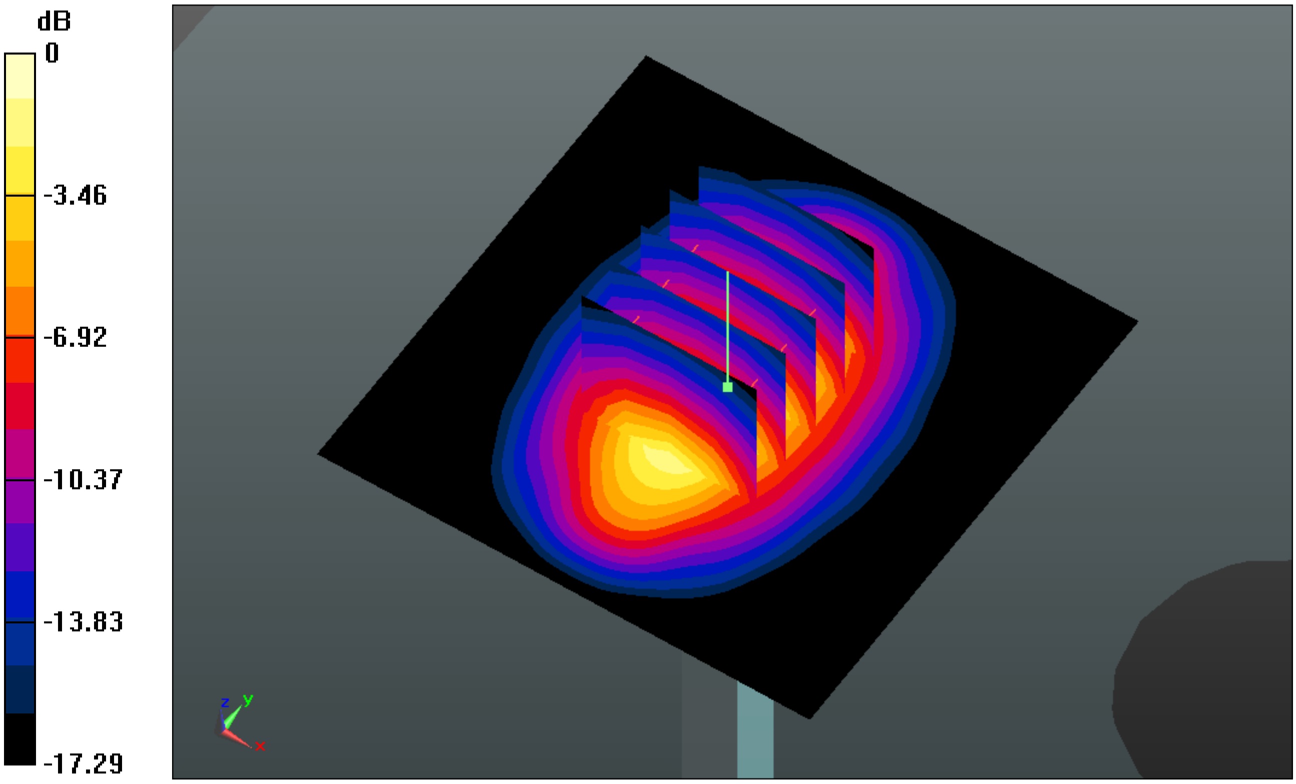
DUT: D1900V2 - SN:5d118

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_130925 Medium parameters used: f = 1900 MHz; σ = 1.55 mho/m; ε_r = 53.363; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 14.609 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 87.566 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 17.914 W/kg
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.38 mW/g
Maximum value of SAR (measured) = 14.565 mW/g



0 dB = 14.560mW/g

System Check_Body_2450MHz_130927

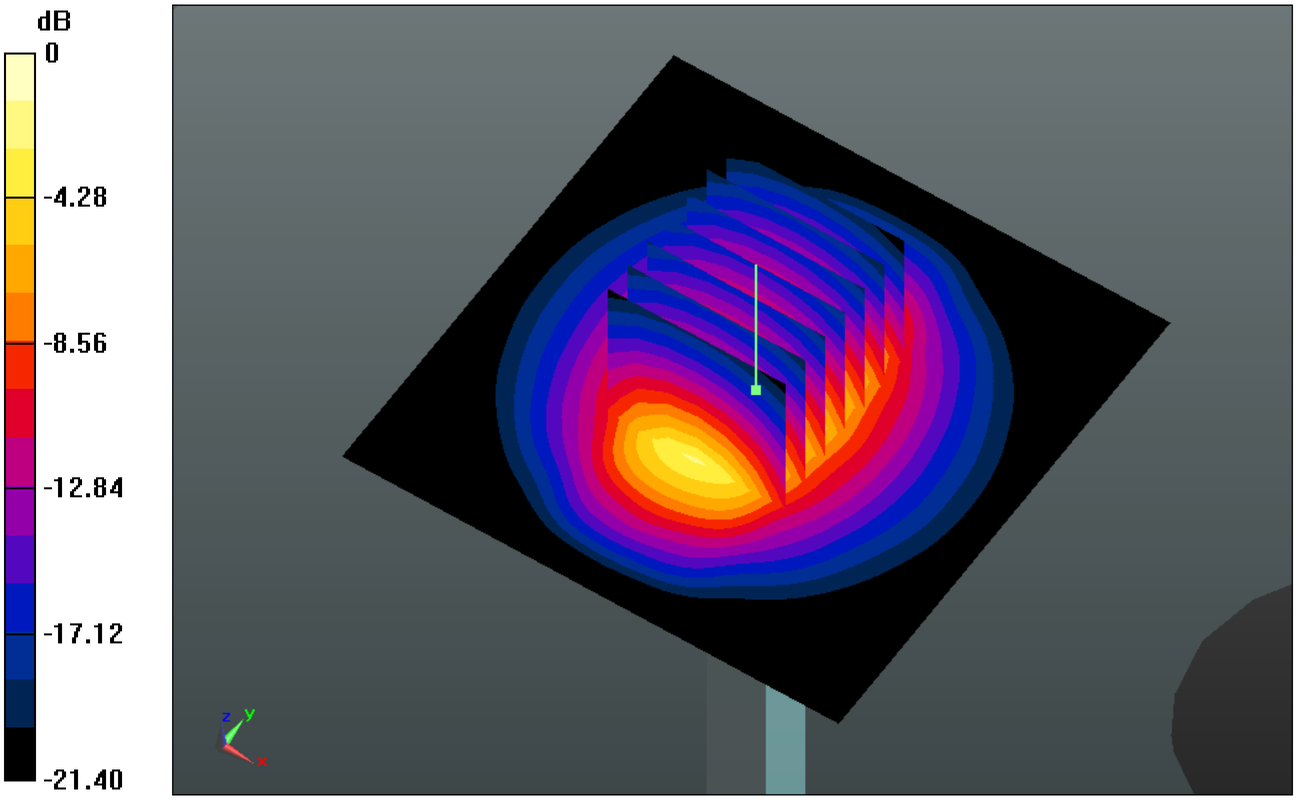
DUT: D2450V2 - SN:840

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_130927 Medium parameters used: f = 2450 MHz; σ = 1.933 mho/m; ε_r = 51.282; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7, 7, 7); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (71x71x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 19.397 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.944 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 25.441 W/kg
SAR(1 g) = 12.4 mW/g; SAR(10 g) = 5.75 mW/g
Maximum value of SAR (measured) = 18.922 mW/g



0 dB = 18.920mW/g

Appendix B. Plots of SAR Measurement

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.24

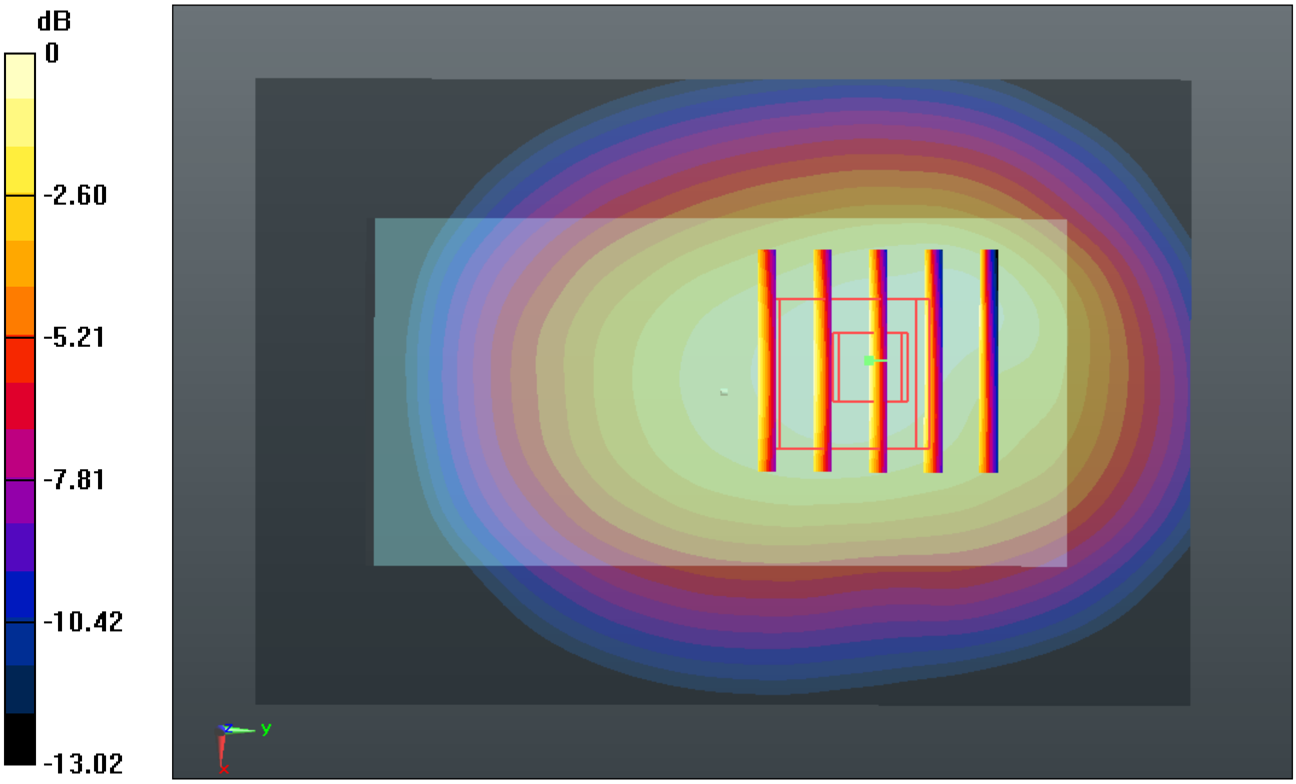
#01_GSM850_GPRS (4 Tx slots)_Front 0.5cm_Ch251

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 848.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_835_130924 Medium parameters used: f = 849 MHz; σ = 0.997 mho/m; ε_r = 55.038; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch251/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.853 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.204 V/m; Power Drift = 0.0063 dB
Peak SAR (extrapolated) = 0.992 W/kg
SAR(1 g) = 0.699 mW/g; SAR(10 g) = 0.489 mW/g
Maximum value of SAR (measured) = 0.836 mW/g



0 dB = 0.840mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.24

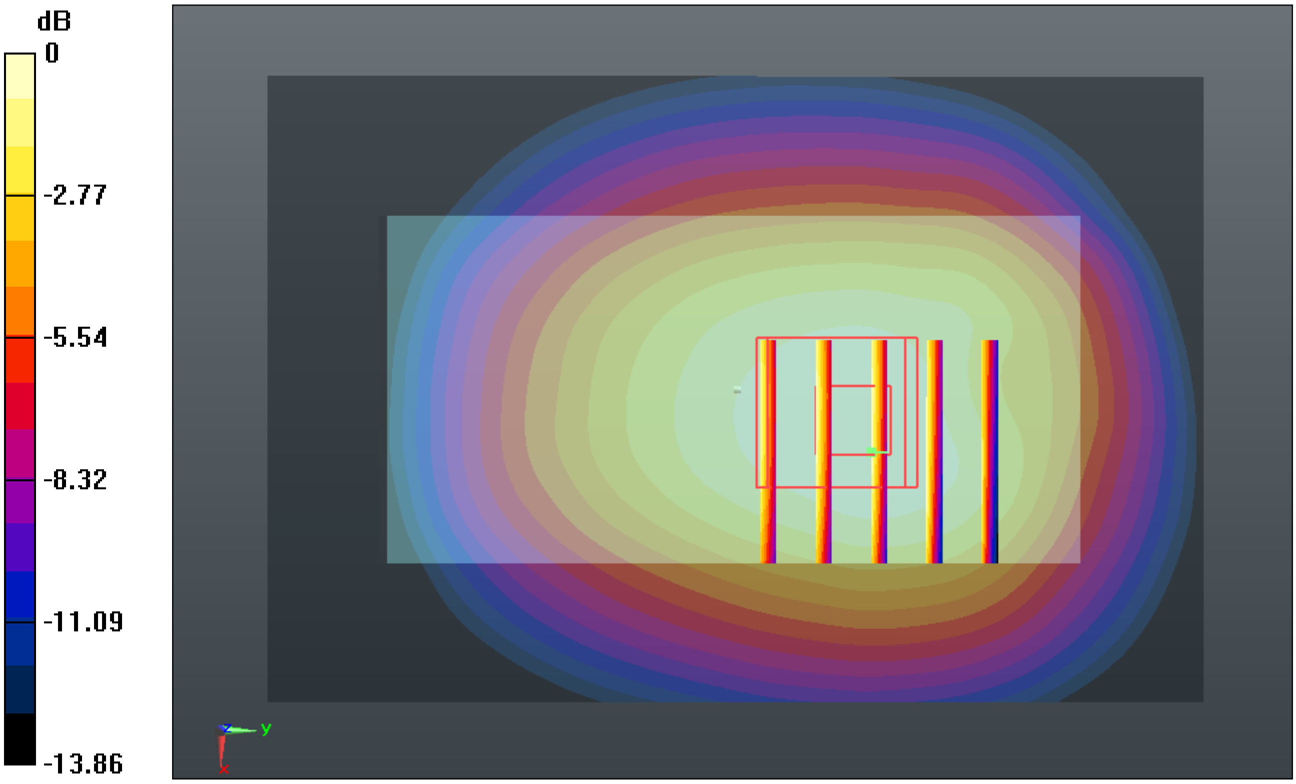
#02_GSM850_GPRS (4 Tx slots)_Back 0.5cm_Ch251

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 848.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_835_130924 Medium parameters used: f = 849 MHz; σ = 0.997 mho/m; ε_r = 55.038; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch251/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.908 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.334 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.022 W/kg
SAR(1 g) = 0.733 mW/g; SAR(10 g) = 0.515 mW/g
Maximum value of SAR (measured) = 0.876 mW/g



0 dB = 0.880mW/g

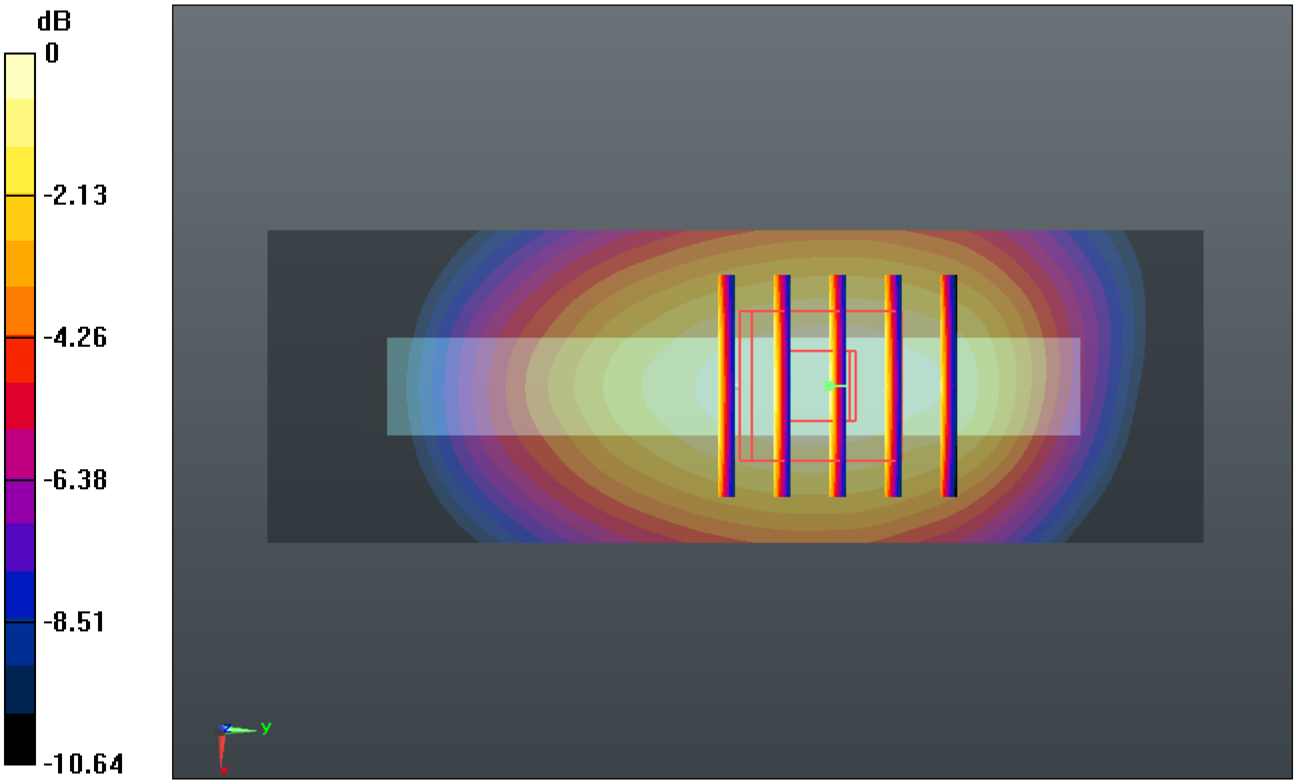
#03_GSM850_GPRS (4 Tx slots)_Right Side 0.5cm_Ch251

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 848.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_835_130924 Medium parameters used: f = 849 MHz; σ = 0.997 mho/m; ε_r = 55.038; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch251/Area Scan (31x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.541 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.099 V/m; Power Drift = 0.0031 dB
Peak SAR (extrapolated) = 0.653 W/kg
SAR(1 g) = 0.443 mW/g; SAR(10 g) = 0.300 mW/g
Maximum value of SAR (measured) = 0.554 mW/g



0 dB = 0.550mW/g

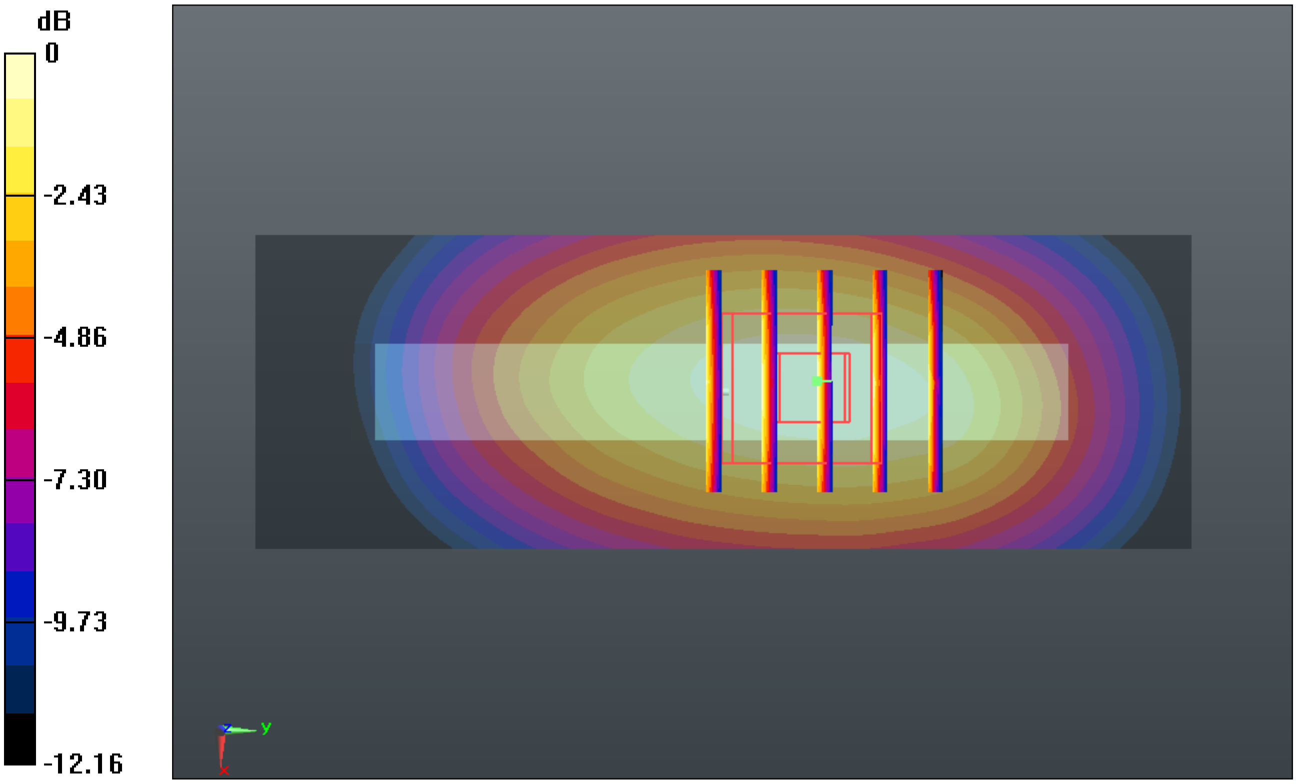
#04_GSM850_GPRS (4 Tx slots)_Left Side 0.5cm_Ch251

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 848.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_835_130924 Medium parameters used: f = 849 MHz; σ = 0.997 mho/m; ε_r = 55.038; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch251/Area Scan (31x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.546 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.944 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.665 W/kg
SAR(1 g) = 0.438 mW/g; SAR(10 g) = 0.284 mW/g
Maximum value of SAR (measured) = 0.560 mW/g



0 dB = 0.560mW/g

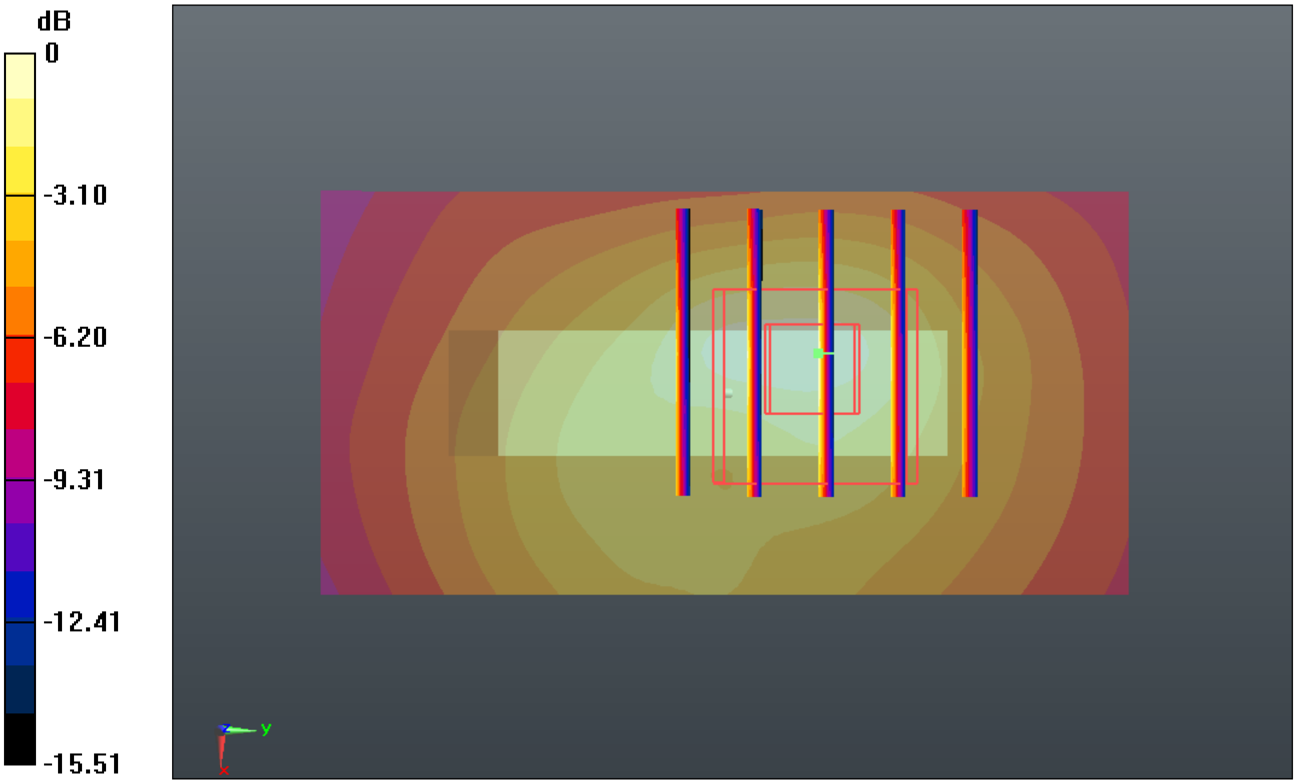
#05_GSM850_GPRS (4 Tx slots)_Top Side 0.5cm_Ch251

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 848.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_835_130924 Medium parameters used: f = 849 MHz; σ = 0.997 mho/m; ε_r = 55.038; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch251/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.188 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.099 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.283 W/kg
SAR(1 g) = 0.138 mW/g; SAR(10 g) = 0.074 mW/g
Maximum value of SAR (measured) = 0.205 mW/g



0 dB = 0.210mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.24

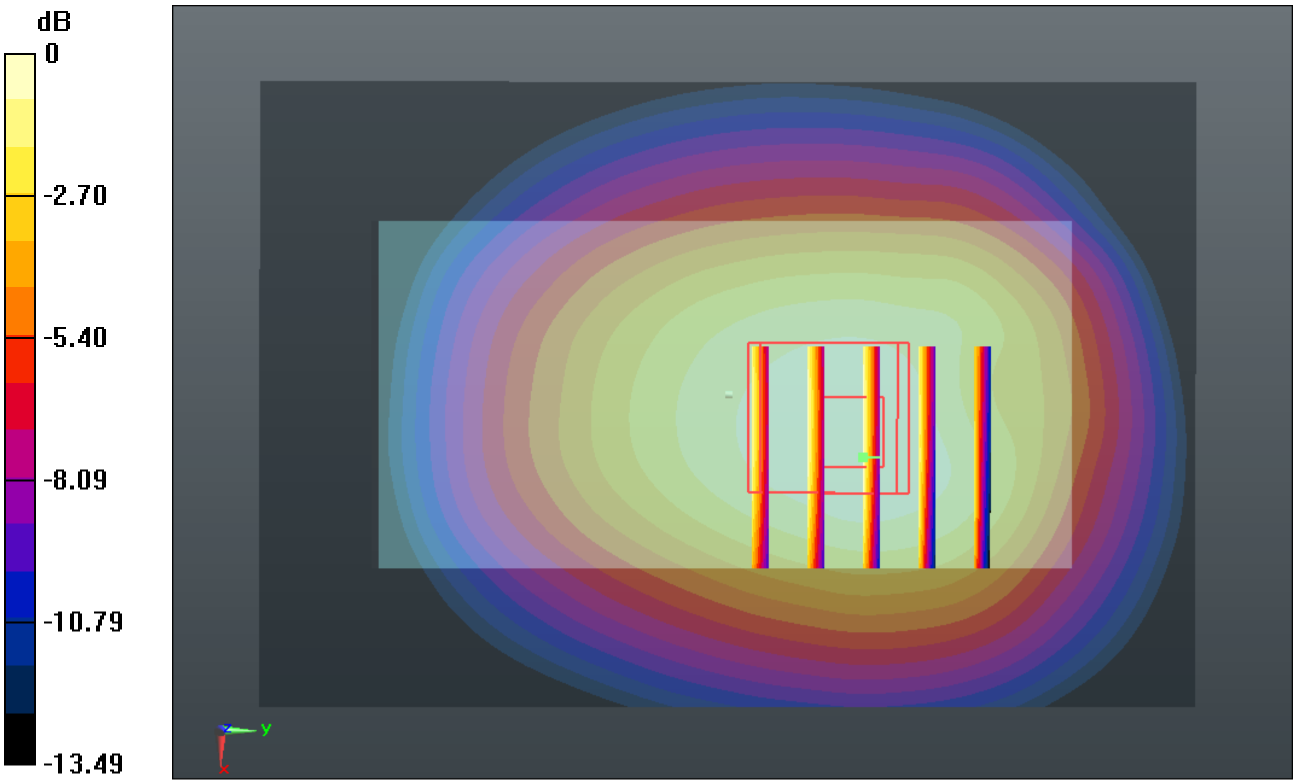
#06_GSM850_GPRS (4 Tx slots)_Back 0.5cm_Ch128

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 824.2 MHz;Duty Cycle: 1:2.08
Medium: MSL_835_130924 Medium parameters used: f = 824.2 MHz; σ = 0.972 mho/m; ε_r = 55.281; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch128/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.925 mW/g

Ch128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.680 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.054 W/kg
SAR(1 g) = 0.756 mW/g; SAR(10 g) = 0.531 mW/g
Maximum value of SAR (measured) = 0.909 mW/g



0 dB = 0.910mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.24

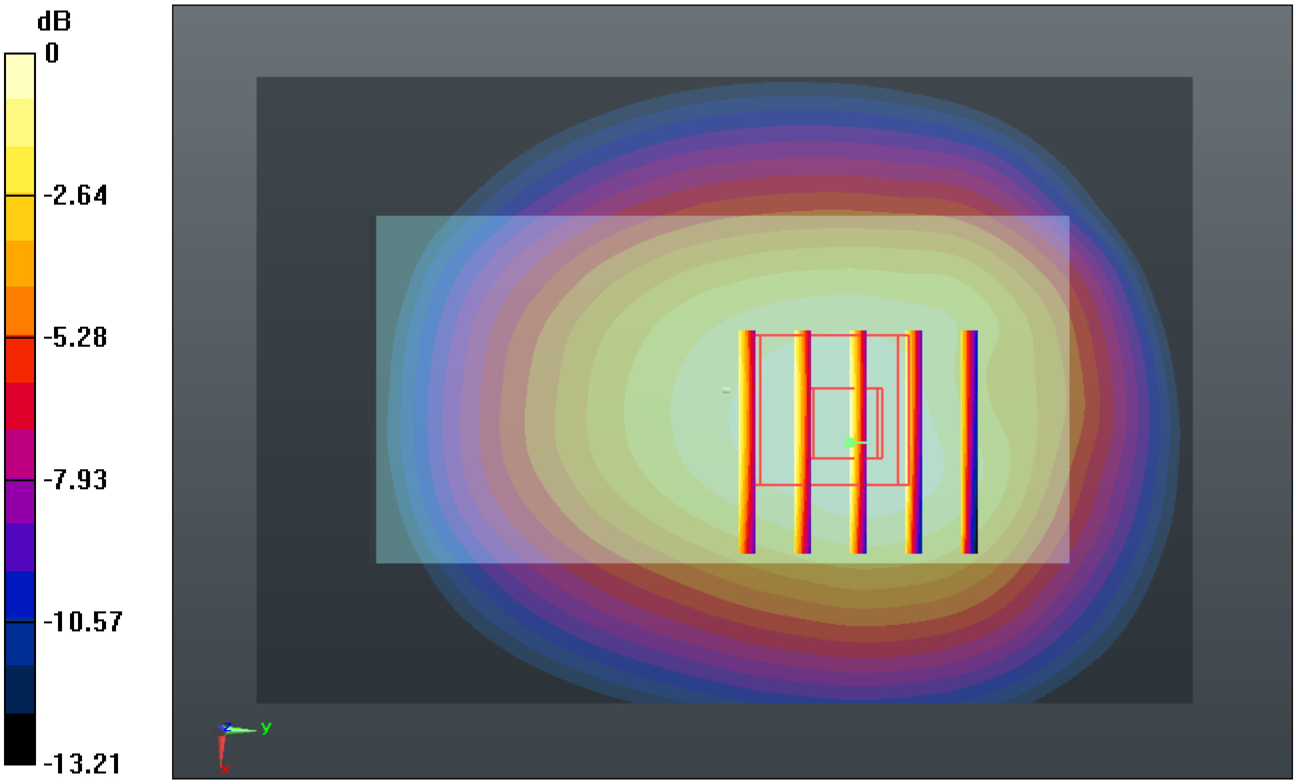
#07_GSM850_GPRS (4 Tx slots)_Back 0.5cm_Ch189

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 836.4 MHz;Duty Cycle: 1:2.08
Medium: MSL_835_130924 Medium parameters used: f = 836.4 MHz; σ = 0.985 mho/m; ε_r = 55.165; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch189/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.910 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.411 V/m; Power Drift = -0.0041 dB
Peak SAR (extrapolated) = 1.037 W/kg
SAR(1 g) = 0.744 mW/g; SAR(10 g) = 0.523 mW/g
Maximum value of SAR (measured) = 0.894 mW/g



0 dB = 0.890mW/g

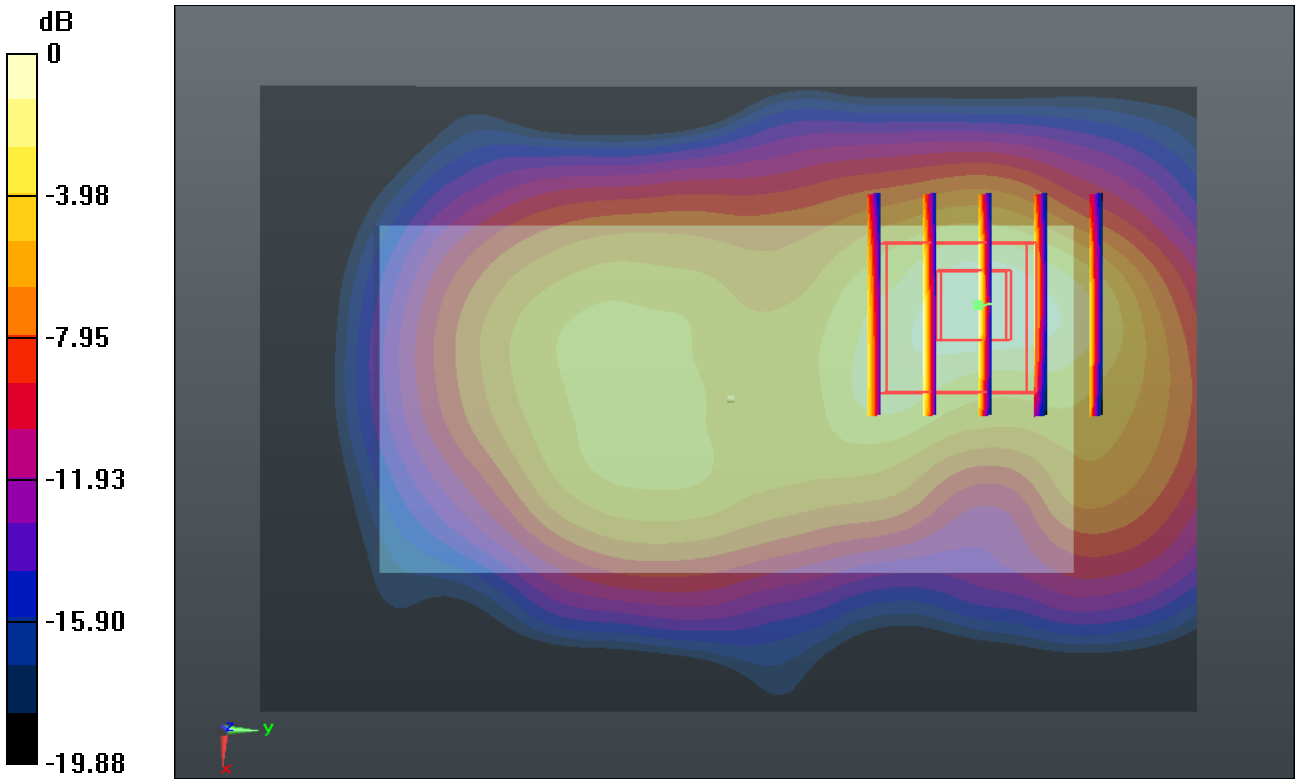
#08_GSM1900_GPRS (4 Tx slots)_Front 0.5cm_Ch810

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900_130925 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 53.334; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.367 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.555 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.466 W/kg
SAR(1 g) = 0.250 mW/g; SAR(10 g) = 0.130 mW/g
Maximum value of SAR (measured) = 0.348 mW/g



0 dB = 0.350mW/g

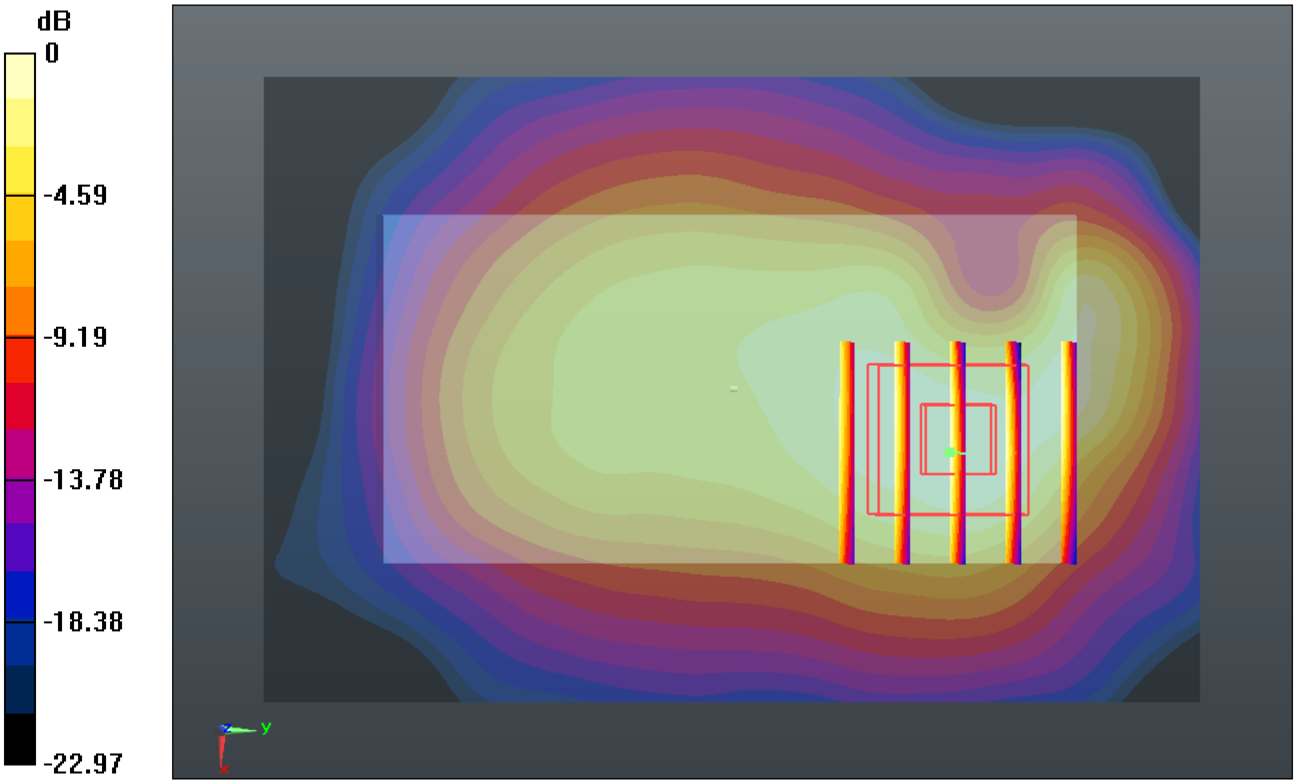
#09_GSM1900_GPRS (4 Tx slots)_Back 0.5cm_Ch810

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900_130925 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 53.334; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.430 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.521 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.537 W/kg
SAR(1 g) = 0.319 mW/g; SAR(10 g) = 0.178 mW/g
Maximum value of SAR (measured) = 0.421 mW/g



0 dB = 0.420mW/g

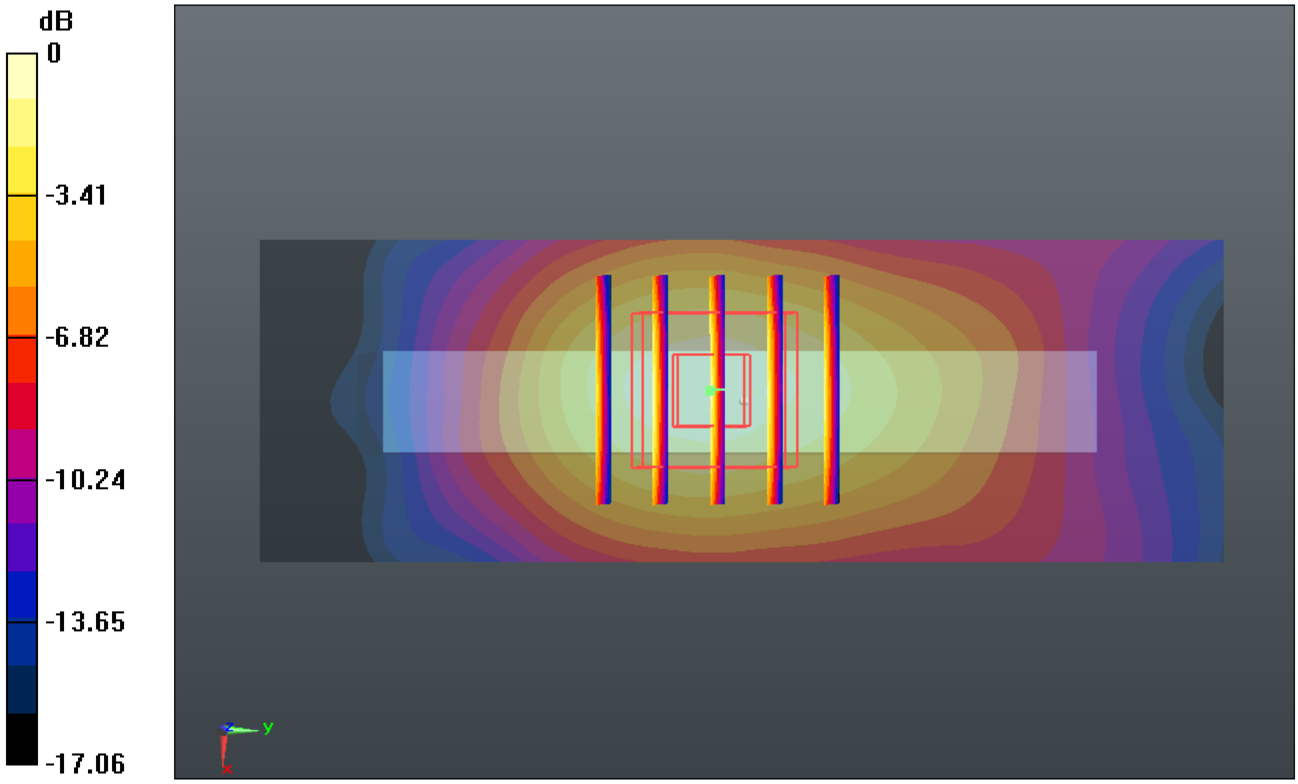
#10_GSM1900_GPRS (4 Tx slots)_Right Side 0.5cm_Ch810

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900_130925 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 53.334; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (31x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.153 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.093 V/m; Power Drift = 0.0015 dB
Peak SAR (extrapolated) = 0.190 W/kg
SAR(1 g) = 0.117 mW/g; SAR(10 g) = 0.067 mW/g
Maximum value of SAR (measured) = 0.158 mW/g



0 dB = 0.160mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.25

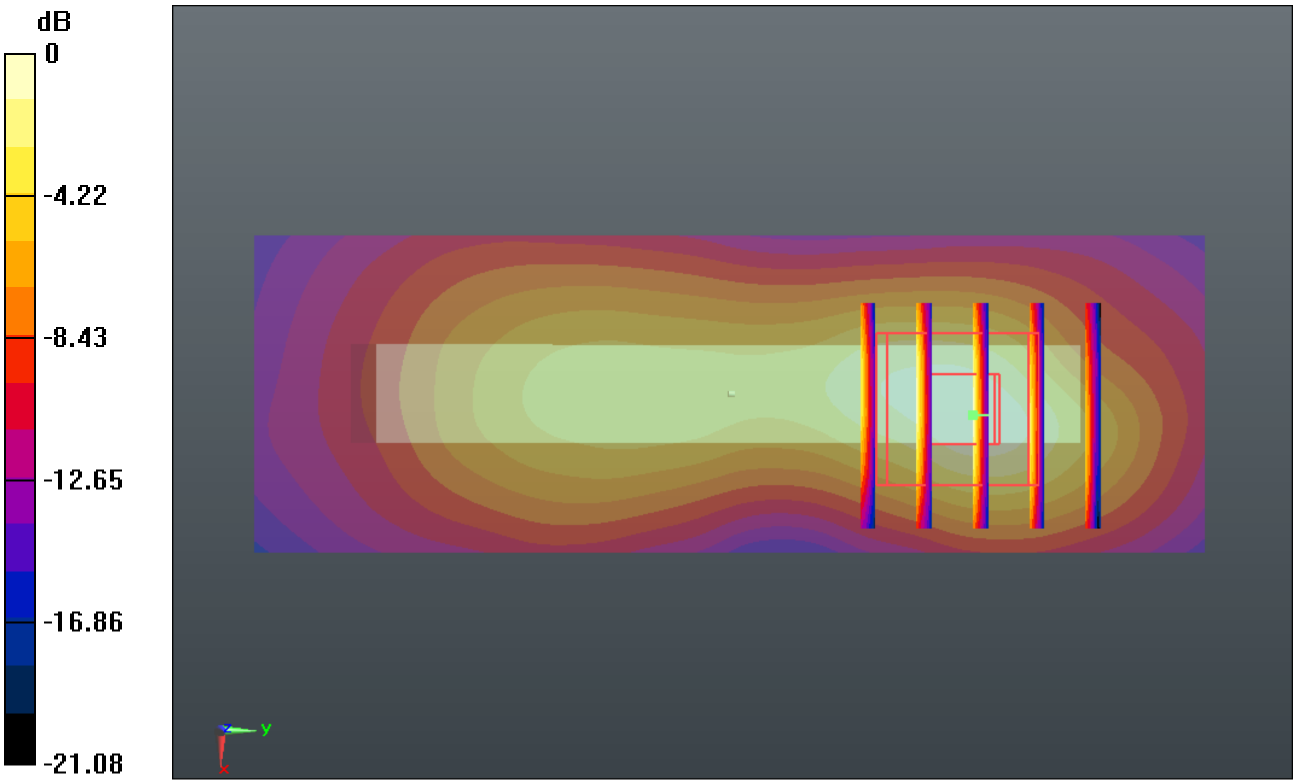
#11_GSM1900_GPRS (4 Tx slots)_Left Side 0.5cm_Ch810

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900_130925 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 53.334; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (31x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.259 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.902 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.325 W/kg
SAR(1 g) = 0.178 mW/g; SAR(10 g) = 0.089 mW/g
Maximum value of SAR (measured) = 0.258 mW/g



0 dB = 0.260mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.25

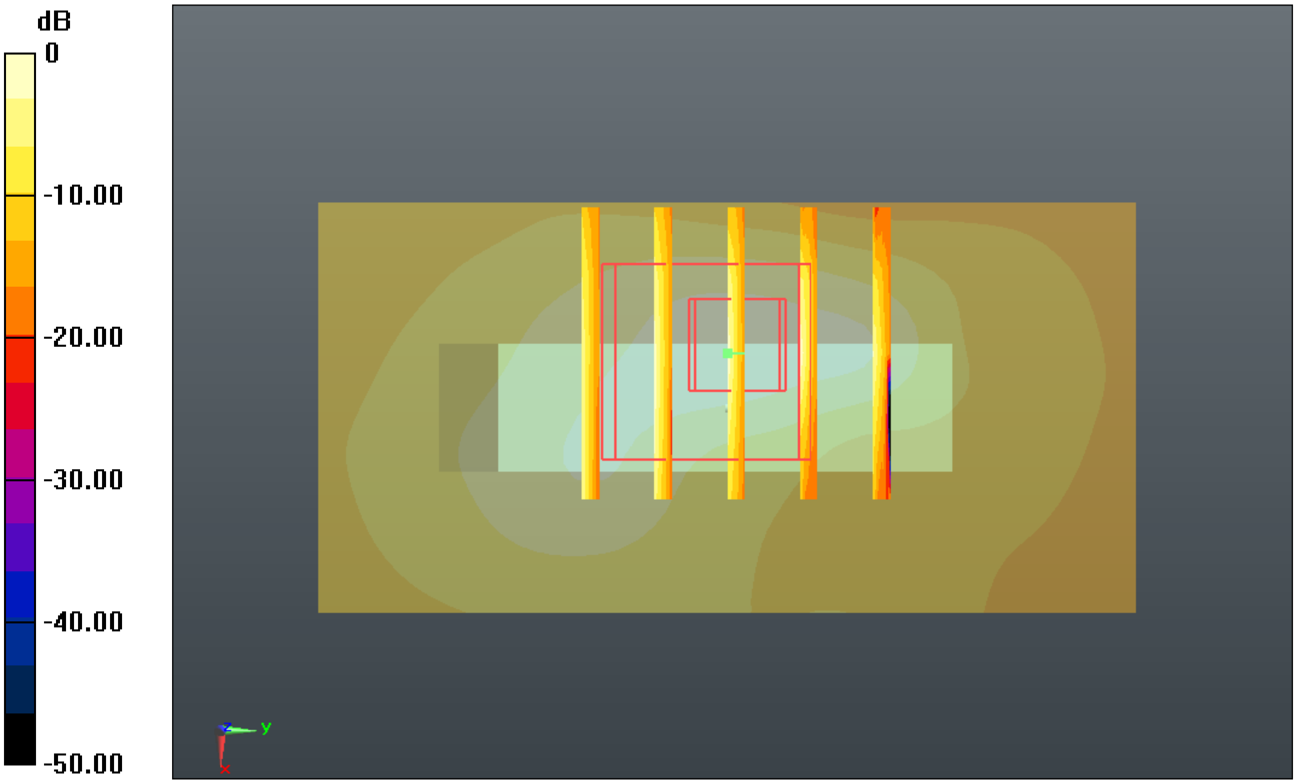
#12_GSM1900_GPRS (4 Tx slots)_Top Side 0.5cm_Ch810

Communication System: GPRS/EDGE (4 Tx slots); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900_130925 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 53.334; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.223 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.798 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.262 W/kg
SAR(1 g) = 0.132 mW/g; SAR(10 g) = 0.060 mW/g
Maximum value of SAR (measured) = 0.226 mW/g



0 dB = 0.230mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.24

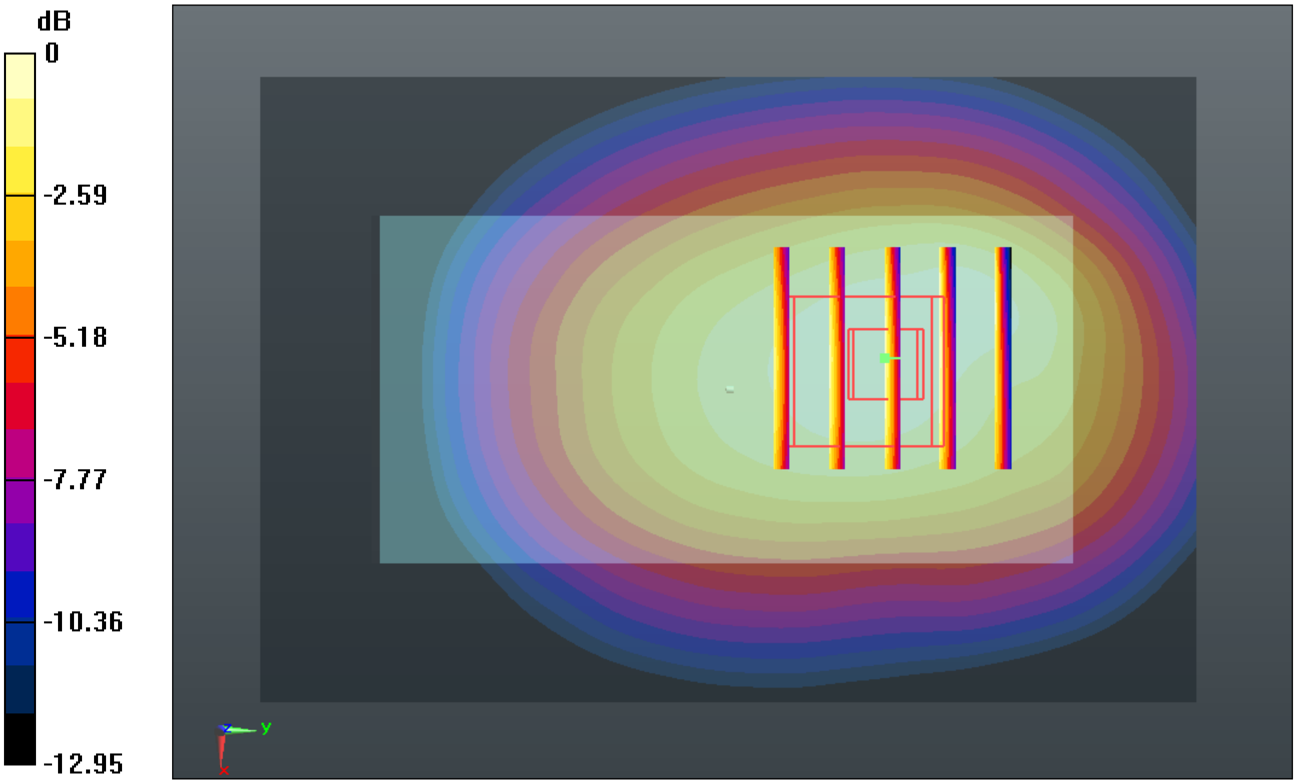
#13_WCDMA Band V_RMC12.2K_Front 0.5cm_Ch4182

Communication System: UMTS; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: MSL_835_130924 Medium parameters used: f = 836.4 MHz; σ = 0.985 mho/m; ε_r = 55.165; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch4182/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.588 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.927 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.696 W/kg
SAR(1 g) = 0.486 mW/g; SAR(10 g) = 0.340 mW/g
Maximum value of SAR (measured) = 0.585 mW/g



0 dB = 0.580mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.24

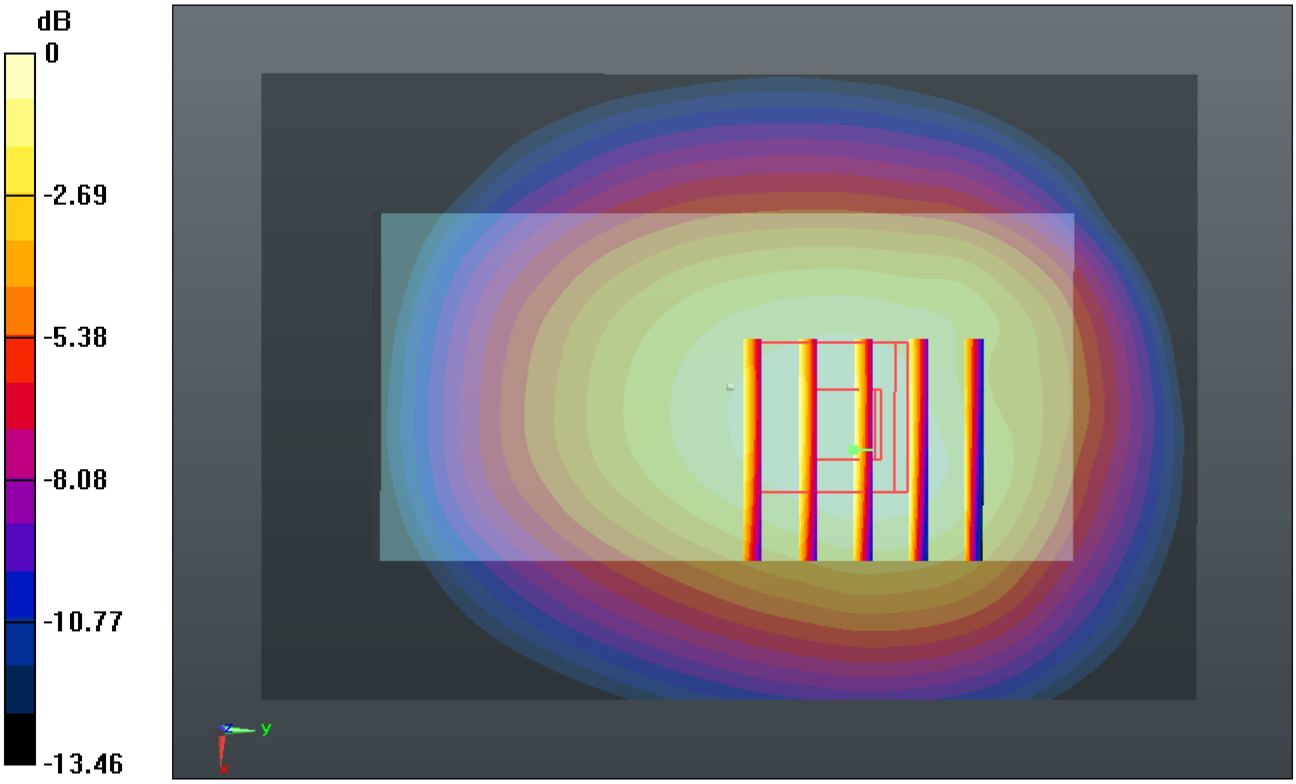
#14_WCDMA Band V_RMC12.2K_Back 0.5cm_Ch4182

Communication System: UMTS; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: MSL_835_130924 Medium parameters used: f = 836.4 MHz; σ = 0.985 mho/m; ε_r = 55.165; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch4182/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.681 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.980 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.768 W/kg
SAR(1 g) = 0.550 mW/g; SAR(10 g) = 0.386 mW/g
Maximum value of SAR (measured) = 0.662 mW/g



0 dB = 0.660mW/g

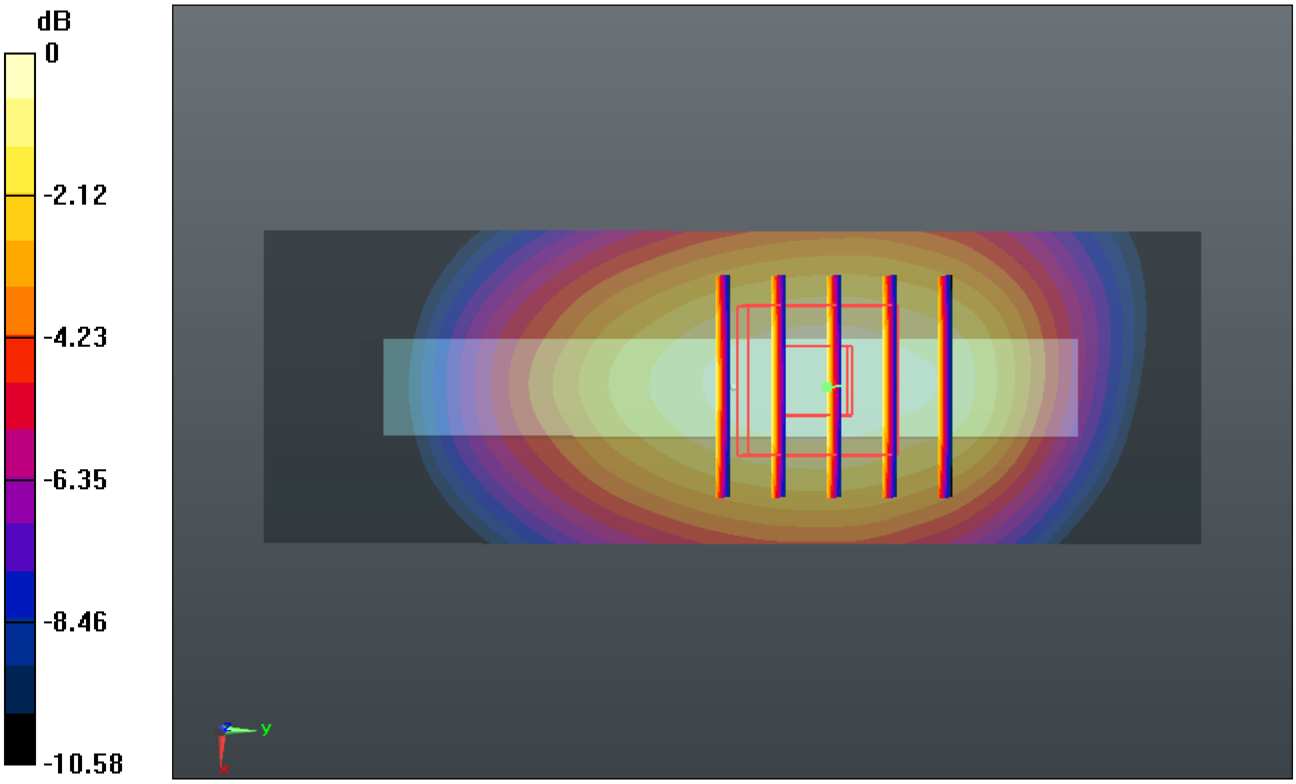
#15_WCDMA Band V_RMC12.2K_Right Side 0.5cm_Ch4182

Communication System: UMTS; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: MSL_835_130924 Medium parameters used: f = 836.4 MHz; σ = 0.985 mho/m; ε_r = 55.165; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch4182/Area Scan (31x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.379 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.747 V/m; Power Drift = 0.0061 dB
Peak SAR (extrapolated) = 0.455 W/kg
SAR(1 g) = 0.311 mW/g; SAR(10 g) = 0.211 mW/g
Maximum value of SAR (measured) = 0.387 mW/g



0 dB = 0.390mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.24

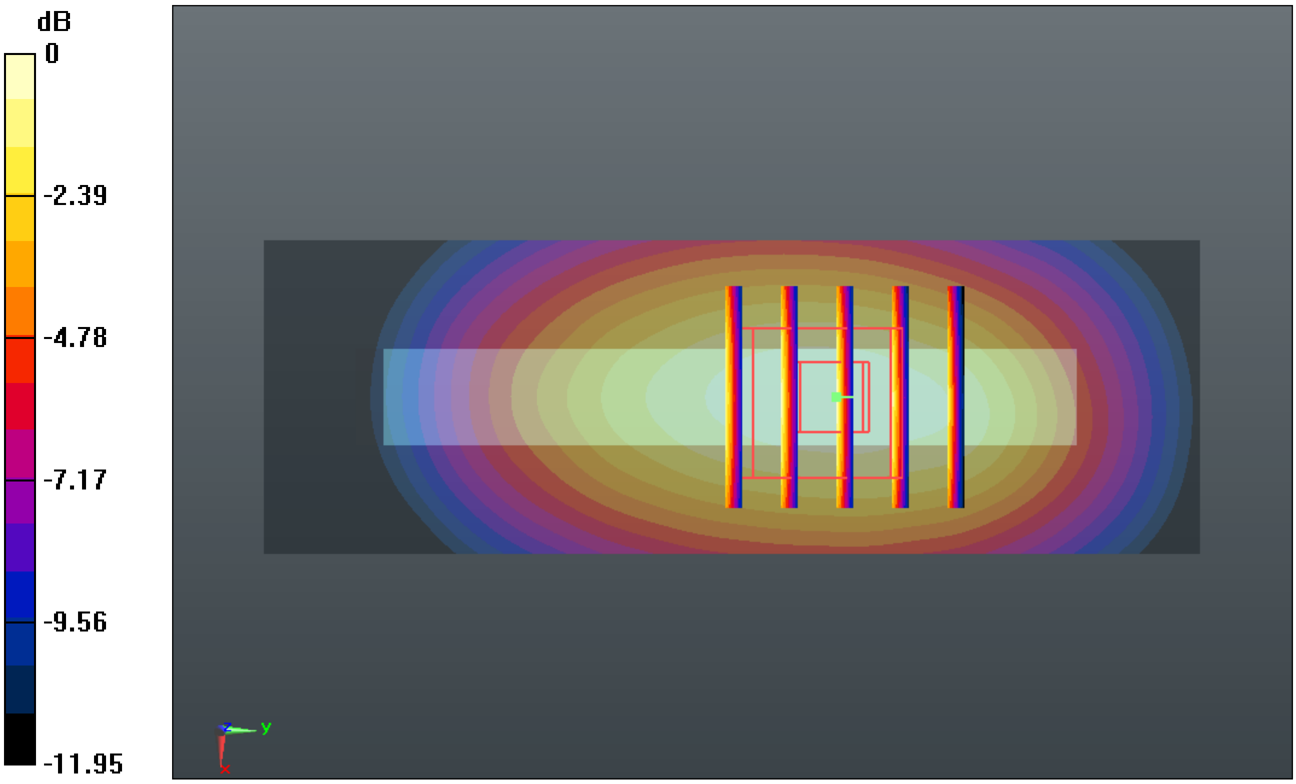
#16_WCDMA Band V_RMC12.2K_Left Side 0.5cm_Ch4182

Communication System: UMTS; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: MSL_835_130924 Medium parameters used: f = 836.4 MHz; σ = 0.985 mho/m; ε_r = 55.165; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch4182/Area Scan (31x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.363 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.006 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.442 W/kg
SAR(1 g) = 0.291 mW/g; SAR(10 g) = 0.189 mW/g
Maximum value of SAR (measured) = 0.372 mW/g



0 dB = 0.370mW/g

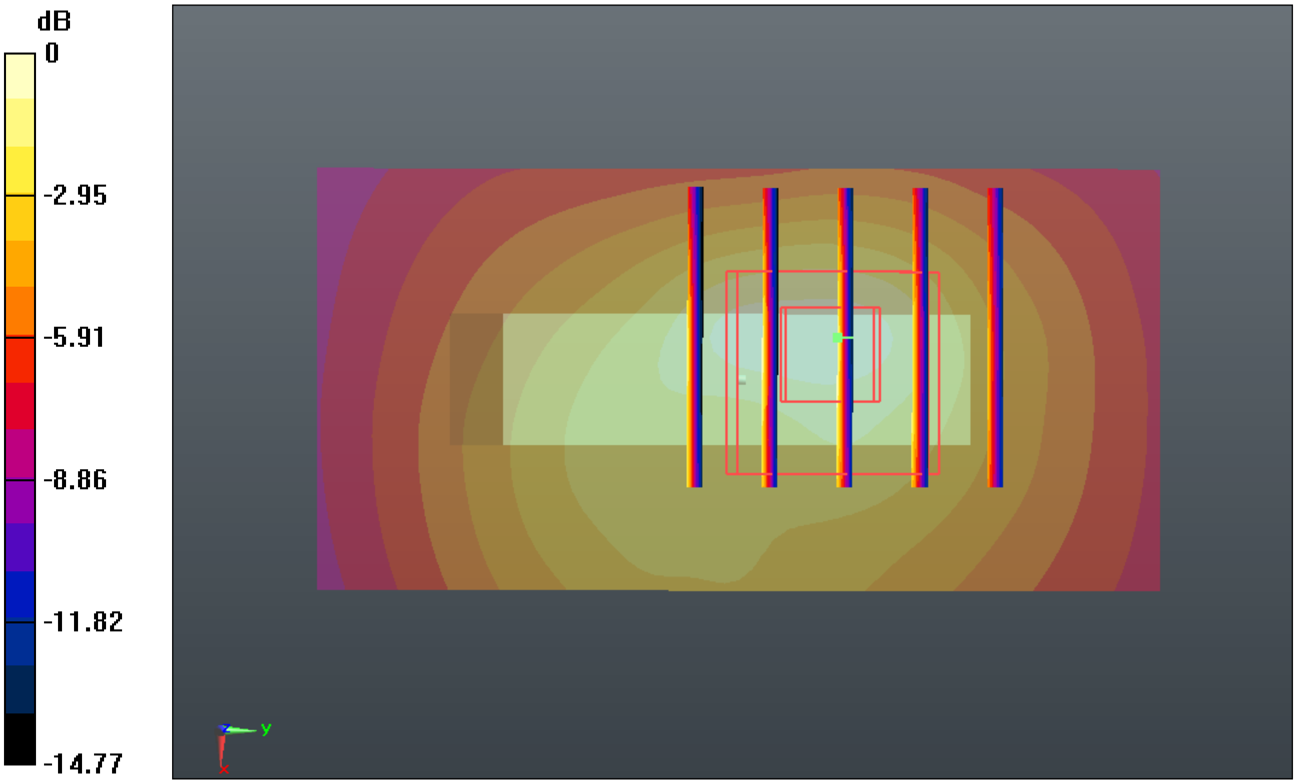
#17_WCDMA Band V_RMC12.2K_Top Side 0.5cm_Ch4182

Communication System: UMTS; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: MSL_835_130924 Medium parameters used: f = 836.4 MHz; σ = 0.985 mho/m; ε_r = 55.165; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch4182/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.138 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.713 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.211 W/kg
SAR(1 g) = 0.102 mW/g; SAR(10 g) = 0.055 mW/g
Maximum value of SAR (measured) = 0.151 mW/g



0 dB = 0.150mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.25

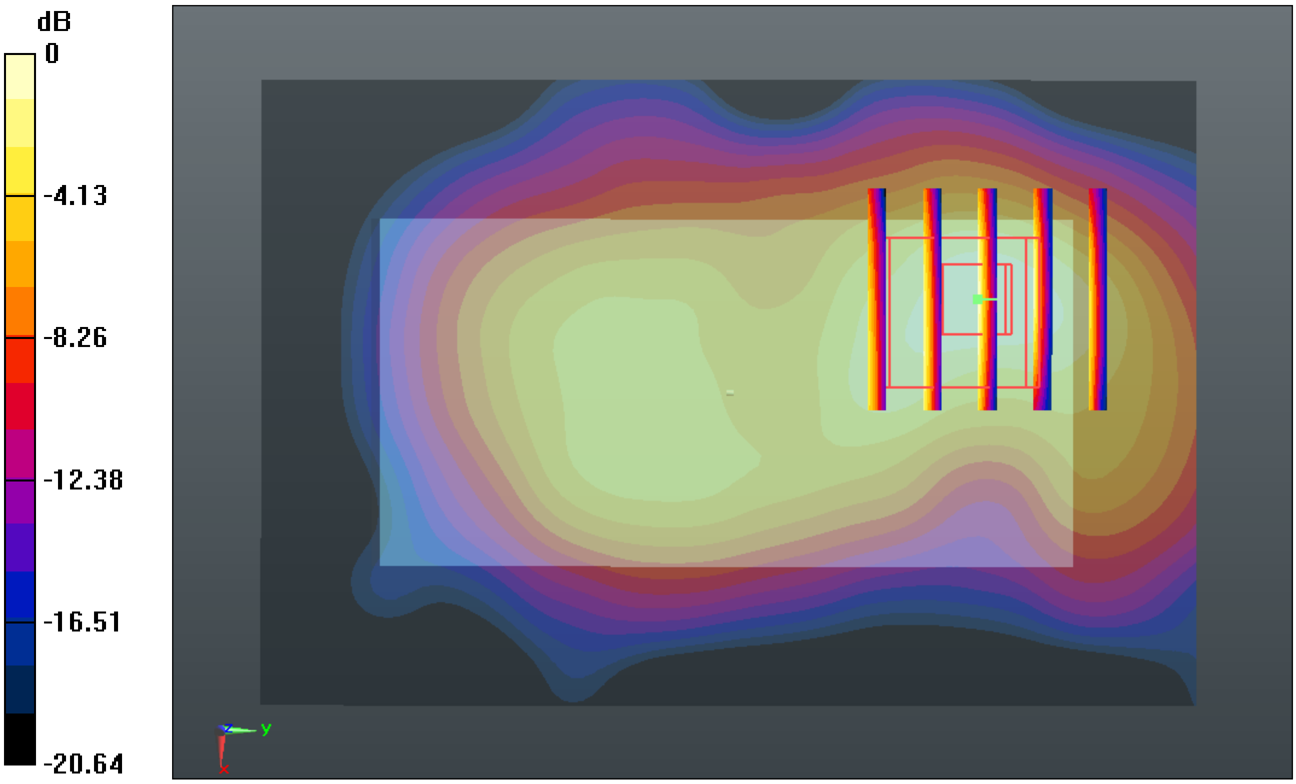
#18_WCDMA Band II_RMC12.2K_Front 0.5cm_Ch9538

Communication System: UMTS; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_130925 Medium parameters used: f = 1908 MHz; σ = 1.558 mho/m; ε_r = 53.34; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch9538/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.258 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.153 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.314 W/kg
SAR(1 g) = 0.171 mW/g; SAR(10 g) = 0.089 mW/g
Maximum value of SAR (measured) = 0.241 mW/g



0 dB = 0.240mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.25

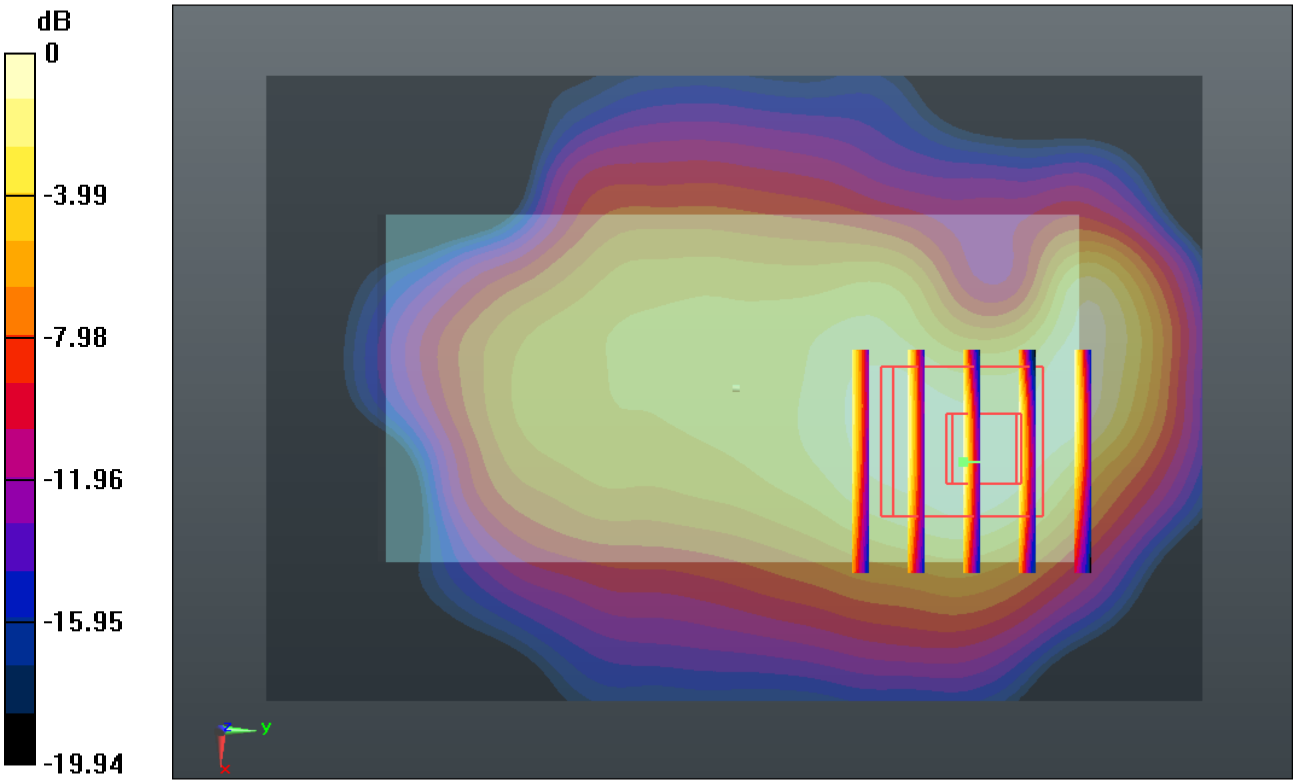
#19_WCDMA Band II_RMC12.2K_Back 0.5cm_Ch9538

Communication System: UMTS; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_130925 Medium parameters used: f = 1908 MHz; σ = 1.558 mho/m; ε_r = 53.34; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch9538/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.281 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.383 V/m; Power Drift = -0.0024 dB
Peak SAR (extrapolated) = 0.347 W/kg
SAR(1 g) = 0.203 mW/g; SAR(10 g) = 0.114 mW/g
Maximum value of SAR (measured) = 0.266 mW/g



0 dB = 0.270mW/g

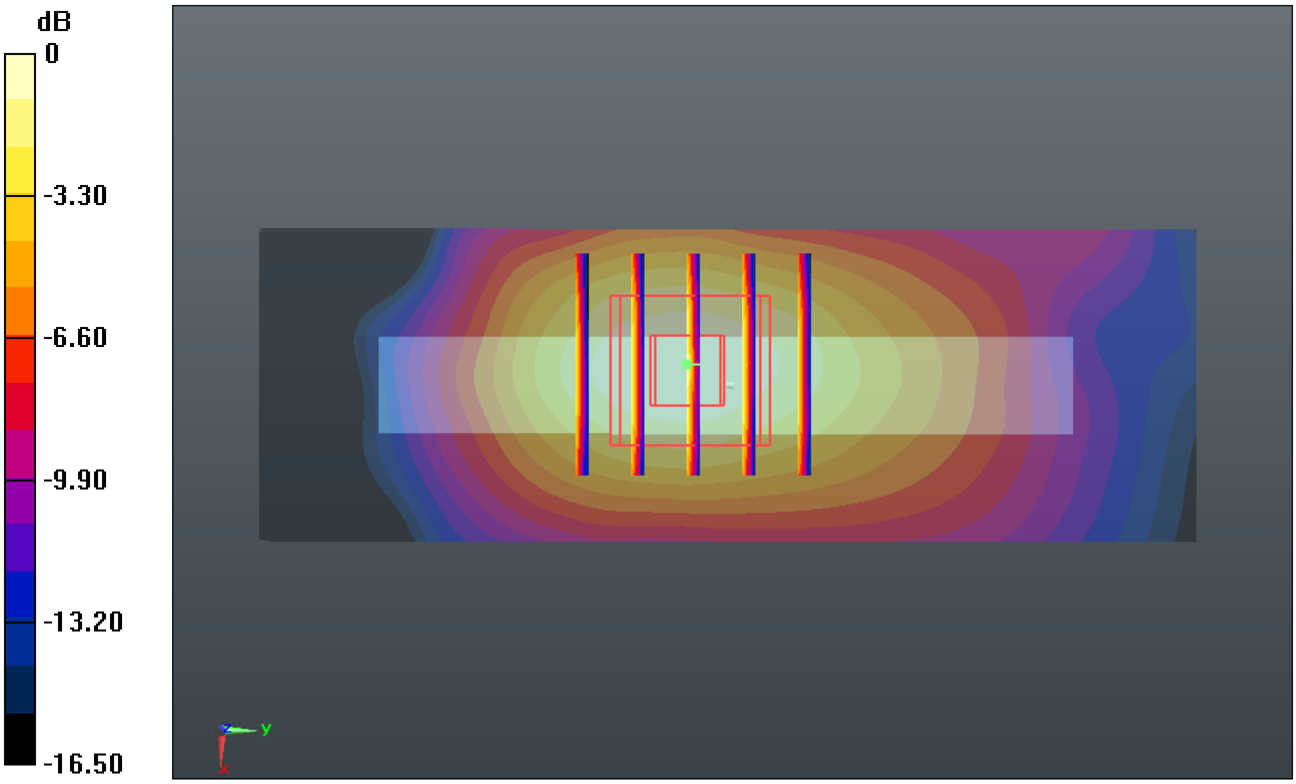
#20_WCDMA Band II_RMC12.2K_Right Side 0.5cm_Ch9538

Communication System: UMTS; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_130925 Medium parameters used: f = 1908 MHz; σ = 1.558 mho/m; ε_r = 53.34; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch9538/Area Scan (31x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.101 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.164 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.122 W/kg
SAR(1 g) = 0.076 mW/g; SAR(10 g) = 0.044 mW/g
Maximum value of SAR (measured) = 0.101 mW/g



0 dB = 0.100mW/g

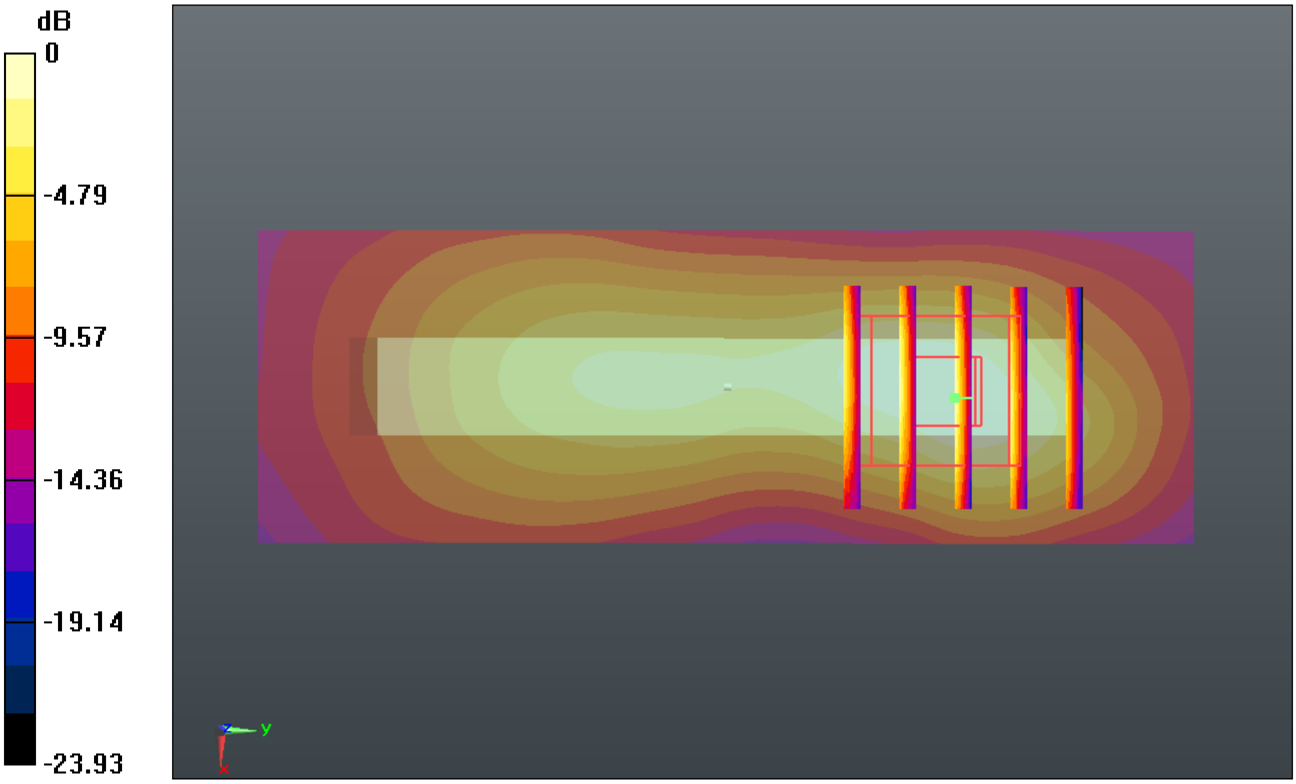
#21_WCDMA Band II_RMC12.2K_Left Side 0.5cm_Ch9538

Communication System: UMTS; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_130925 Medium parameters used: f = 1908 MHz; σ = 1.558 mho/m; ε_r = 53.34; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch9538/Area Scan (31x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.179 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.510 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.201 W/kg
SAR(1 g) = 0.112 mW/g; SAR(10 g) = 0.056 mW/g
Maximum value of SAR (measured) = 0.161 mW/g



0 dB = 0.160mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.25

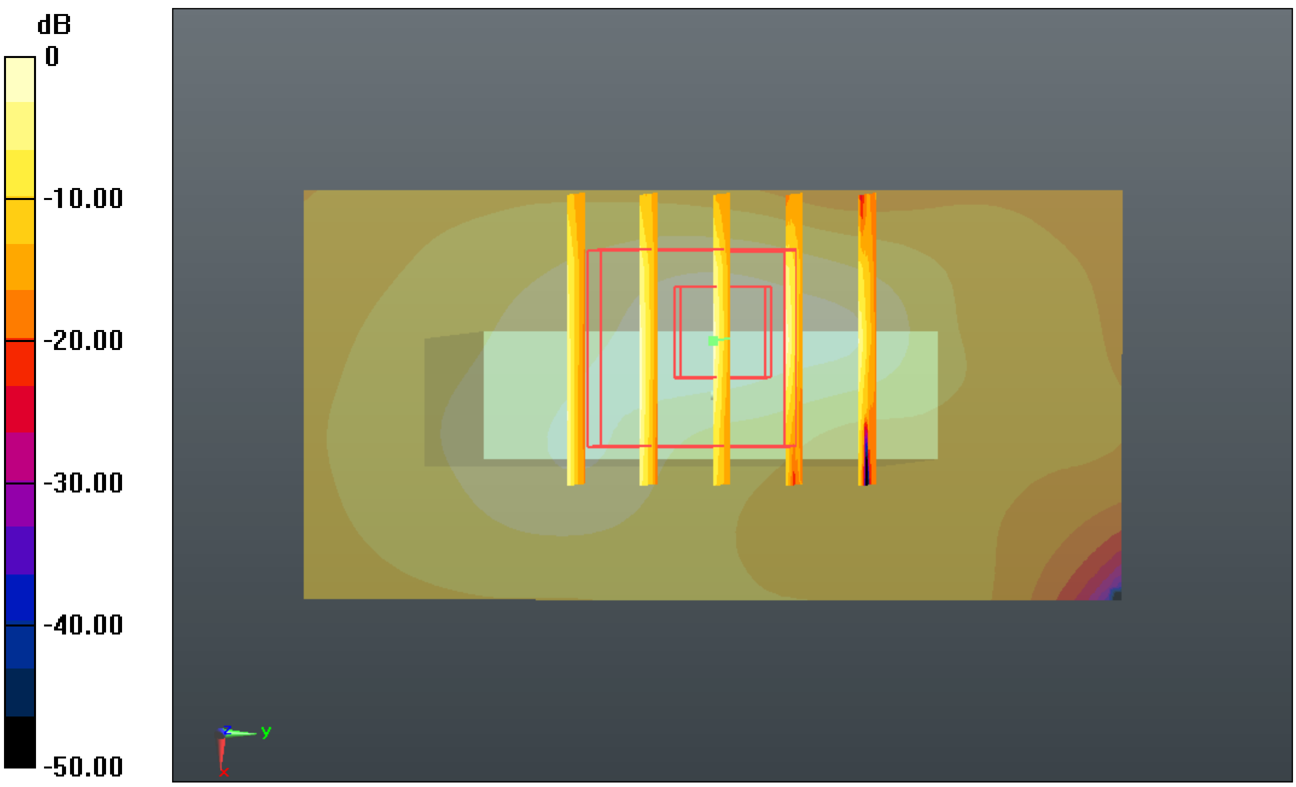
#22_WCDMA Band II_RMC12.2K_Top Side 0.5cm_Ch9538

Communication System: UMTS; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_130925 Medium parameters used: f = 1908 MHz; $\sigma = 1.558$ mho/m; $\varepsilon_r = 53.34$; $\rho = 1000$ kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.52, 7.52, 7.52); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch9538/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.156 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.409 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.182 W/kg
SAR(1 g) = 0.093 mW/g; SAR(10 g) = 0.042 mW/g
Maximum value of SAR (measured) = 0.156 mW/g



0 dB = 0.160mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.27

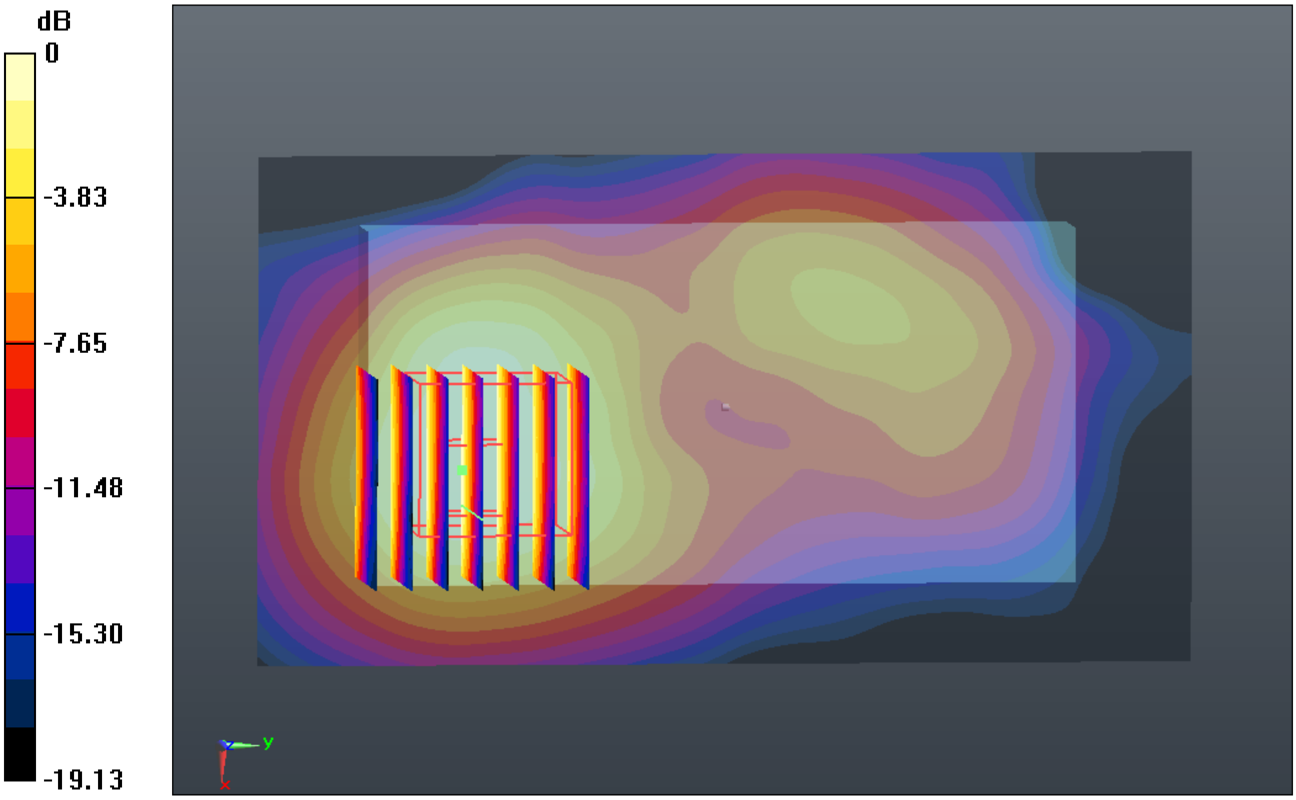
#23_WLAN 2.4GHz_802.11b_1M_Front 0.5cm_Ch1

Communication System: WIFI; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_130927 Medium parameters used: f = 2412 MHz; σ = 1.879 mho/m; ε_r = 51.45; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7, 7, 7); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch1/Area Scan (61x111x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.354 mW/g

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.015 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 0.448 W/kg
SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.128 mW/g
Maximum value of SAR (measured) = 0.324 mW/g



0 dB = 0.320mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013.09.27

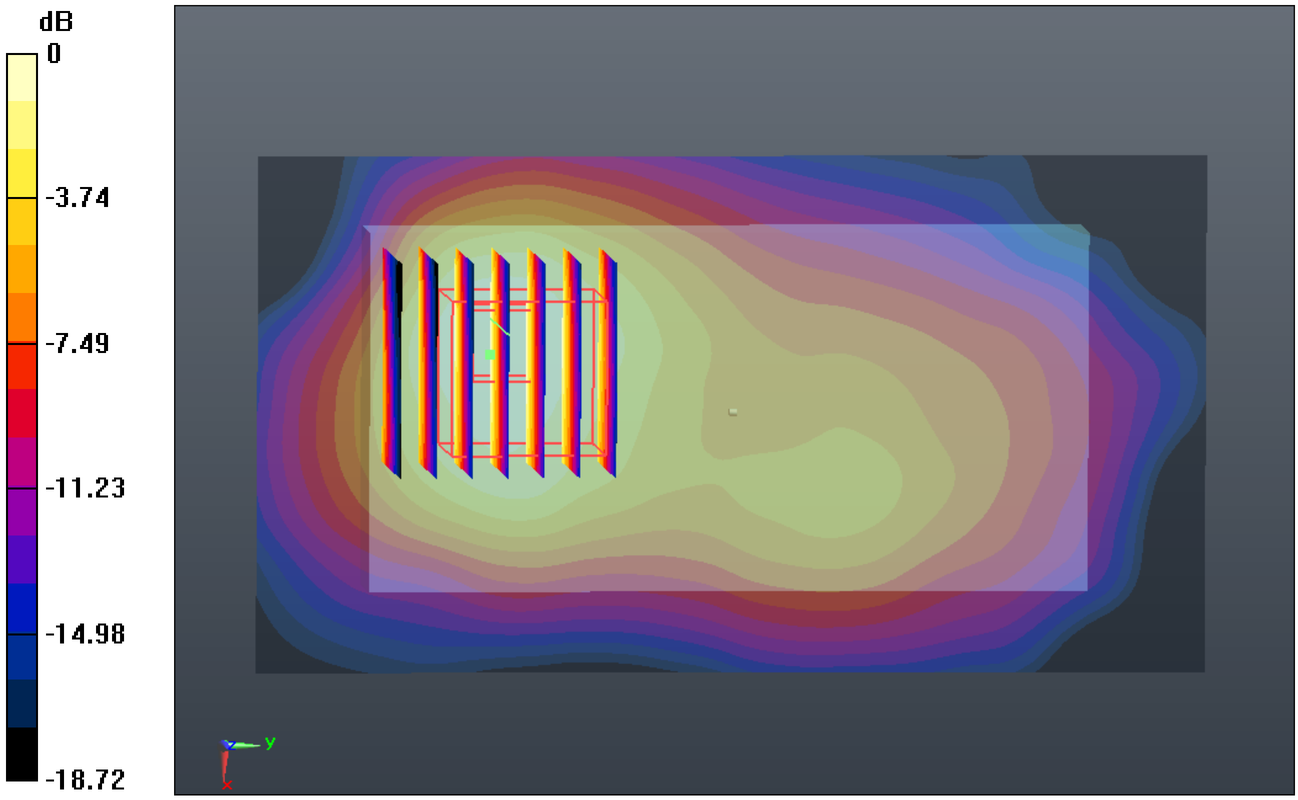
#24_WLAN 2.4GHz_802.11b_1M_Back 0.5cm_Ch1

Communication System: WIFI; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_130927 Medium parameters used: f = 2412 MHz; σ = 1.879 mho/m; ε_r = 51.45; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7, 7, 7); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch1/Area Scan (61x111x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.465 mW/g

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.467 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.613 W/kg
SAR(1 g) = 0.310 mW/g; SAR(10 g) = 0.169 mW/g
Maximum value of SAR (measured) = 0.447 mW/g



0 dB = 0.450mW/g

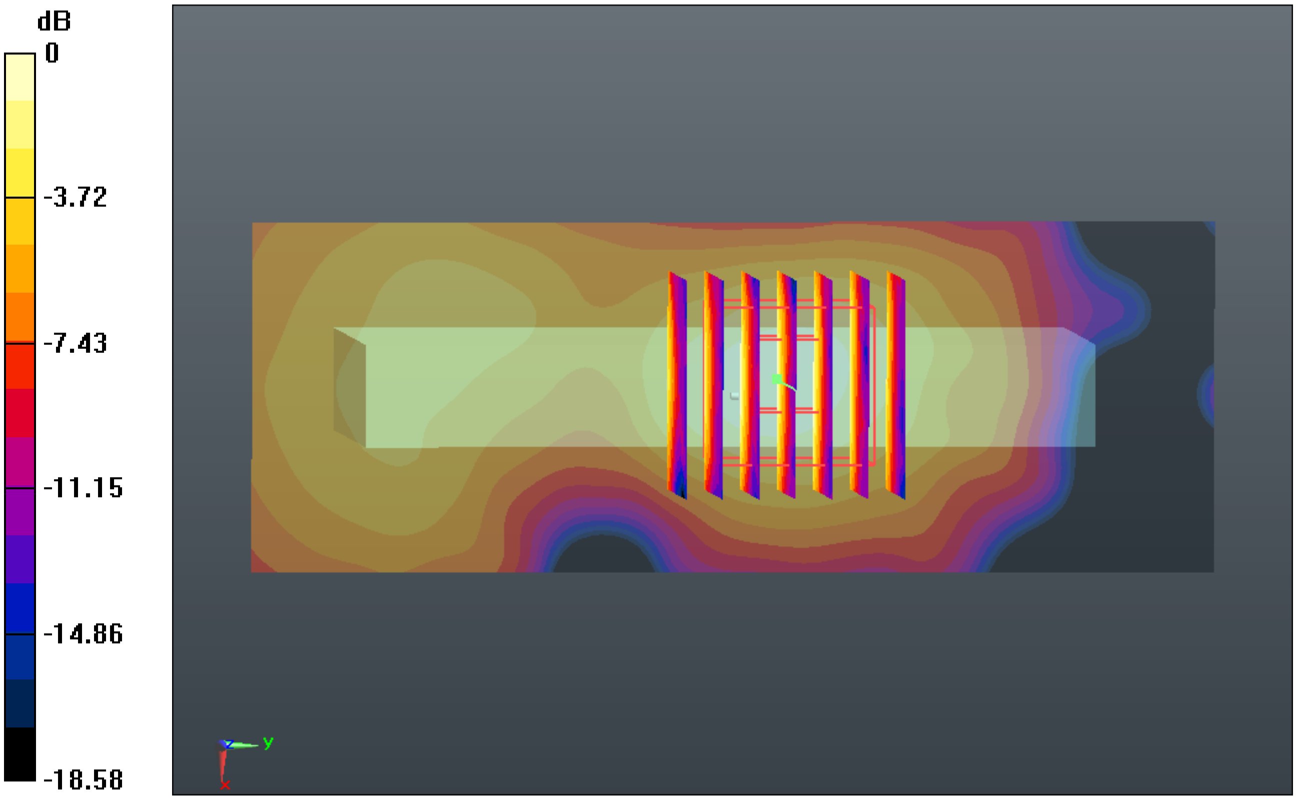
#25_WLAN 2.4GHz_802.11b_1M_Right Side 0.5cm_Ch1

Communication System: WIFI; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_130927 Medium parameters used: f = 2412 MHz; σ = 1.879 mho/m; ε_r = 51.45; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7, 7, 7); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch1/Area Scan (41x111x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.090 mW/g

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.650 V/m; Power Drift = 0.0033 dB
Peak SAR (extrapolated) = 0.121 W/kg
SAR(1 g) = 0.062 mW/g; SAR(10 g) = 0.032 mW/g
Maximum value of SAR (measured) = 0.090 mW/g



0 dB = 0.090mW/g

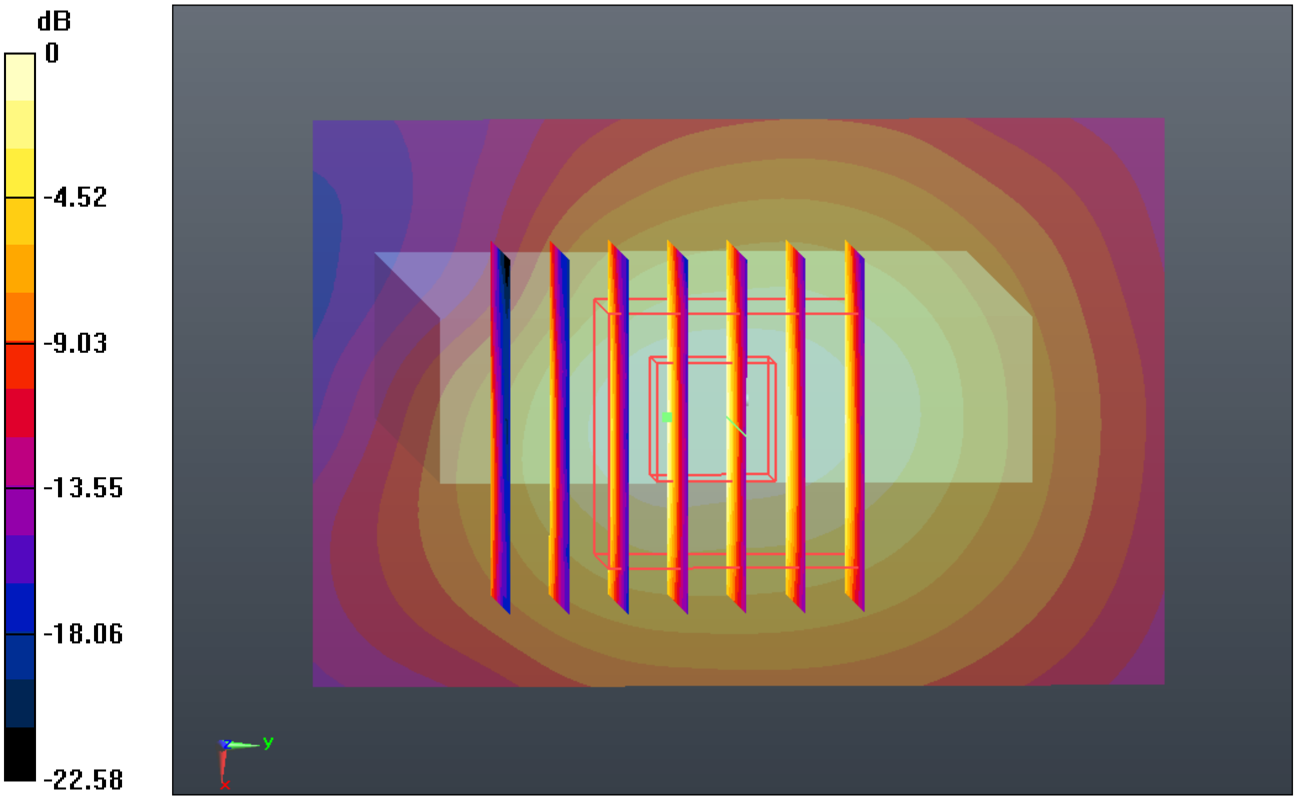
#26_WLAN 2.4GHz_802.11b_1M_Bottom Side 0.5cm_Ch1

Communication System: WIFI; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_130927 Medium parameters used: f = 2412 MHz; σ = 1.879 mho/m; ε_r = 51.45; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7, 7, 7); Calibrated: 2013.06.20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2013.06.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.4.5 (3634)

Ch1/Area Scan (41x61x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.319 mW/g

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.030 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.418 W/kg
SAR(1 g) = 0.210 mW/g; SAR(10 g) = 0.105 mW/g
Maximum value of SAR (measured) = 0.306 mW/g



0 dB = 0.310mW/g