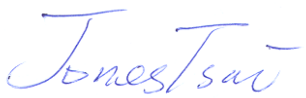
FCC SAR Test Report

APPLICANT	**:**	**Harpers LLC**
EQUIPMENT	**:**	**Tablet Device**
MODEL NAME	**:**	**X43Z60**
FCC ID	**:**	**YJM-0725**
STANDARD	**:**	**FCC 47 CFR Part 2 (2.1093)** **ANSI/IEEE C95.1-1992** **IEEE 1528-2003** **FCC OET Bulletin 65 Supplement C (Edition 01-01)**

The product was received on Apr. 29, 2012 and completely tested on May 24, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA210222	Rev. 01	Initial issue of report	May 22, 2012
FA210222	Rev. 02	Update report for revising data in Section 1, 11.2, 11.3, table 6.2, 8.1, Appendix A, and Appendix B	May 24, 2012
FA210222	Rev. 03	Update report for revising conducted power of 2.4GHz 802.11n (BW 20MHz)	May 28, 2012
FA210222	Rev. 04	Update report for revising conducted power of 5GHz 802.11n (BW 40MHz) CH38	May 31, 2012

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Harpers LLC Tablet Device X43Z60** are as follows.

Band	Position	SAR_{1g} (W/kg)
802.11 b/g/n	**Body (0 cm)**	**1.26**
802.11 a/n	**Body (0 cm)**	**1.260**

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

2. Administration Data

2.1 Testing Laboratory

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

2.2 Applicant

Company Name	Harpers LLC
Address	Suite 5, 2215-B Renaissance Drive Las Vegas, NV 89119

2.3 Application Details

Date of Receipt of Application	Apr. 29, 2012
Date of Start during the Test	Apr. 29, 2012
Date of End during the Test	May 24, 2012

3. General Information

3.1 Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT	Tablet Device
Model Name	X43Z60
FCC ID	YJM-0725
Tx Frequency	802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n: 5180 MHz ~ 5240 MHz; 5745 MHz ~ 5805 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Rx Frequency	802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n: 5180 MHz ~ 5240 MHz; 5745 MHz ~ 5805 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Maximum Average Output Power to Antenna	**<2412 MHz ~ 2462 MHz>** 802.11b: 15.73 dBm 802.11g: 14.80 dBm 802.11n (2.4GHz): 16.17 dBm (BW 20MHz) **<5180 MHz ~ 5240 MHz>** 802.11a: 13.14 dBm 802.11n (5GHz): 15.08 dBm (BW 20MHz) 802.11n (5GHz): 14.22 dBm (BW 40MHz) **<5745 MHz ~ 5805 MHz>** 802.11a: 13.07 dBm 802.11n (5GHz): 13.66 dBm (BW 20MHz) 802.11n (5GHz): 13.16 dBm (BW 40MHz) Bluetooth: 8.74 dBm
Antenna Type	WLAN / Bluetooth: Fixed Internal Antenna
Type of Modulation	802.11b: DSSS (BPSK / QPSK / CCK) 802.11a/g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth (1Mbps): GFSK Bluetooth EDR (2Mbps): π/4-DQPSK Bluetooth EDR (3Mbps): 8-DPSK
EUT Stage	Production Unit
Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

3.2 Applied Standards

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2003
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v04
- FCC KDB 616217 D03 v01
- FCC KDB 248227 D01 v01r02

3.3 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.

3.4 Test Conditions

3.4.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.4.2 Test Configuration

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

2.4G	Antenna	Duty Cycle
11b	Antenna 1	100%
11n(20M)	Antenna 1+ 2	95.28%
5G	Antenna	Duty Cycle
11a	Antenna 1	97.81%
11n(20M)	Antenna 1+ 2	95.53%

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

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

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

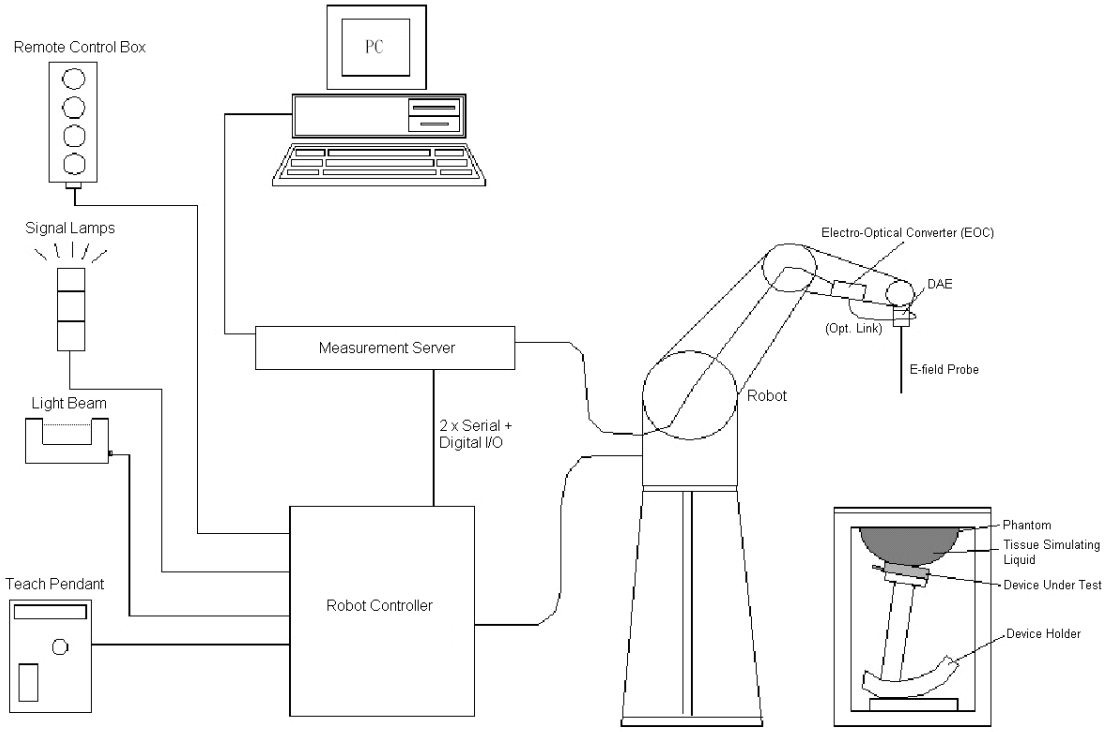


Fig 5.1 SPEAG DASY System Configurations

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 (ECO) performs the conversion between optical and electrical signals
- A measurement server performs the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the accuracy of the probe positioning
- A computer operating Windows XP
- DASY software
- Remove control with teach pendant and additional circuitry for robot safety such as warming lamps, etc.
- The SAM twin phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

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

5.1 E-Field Probe

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

5.1.1 E-Field Probe Specification

<ET3DV6 / ET3DV6R Probe >

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

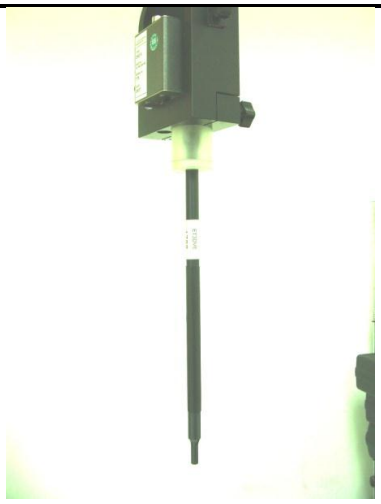


Fig 5.2 Photo of ET3DV6/ET3DV6R

<EX3DV4 / ES3DV4 Probe>

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

Fig 5.3 Photo of EX3DV4/ES3DV4

5.1.2 E-Field Probe Calibration

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

5.2 Data Acquisition Electronics (DAE)

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

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

Fig 5.4 Photo of DAE

5.3 Robot

The SPEAG DASY system uses the high precision robots (DASY4: RX90BL; DASY5: TX90XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB; DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

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

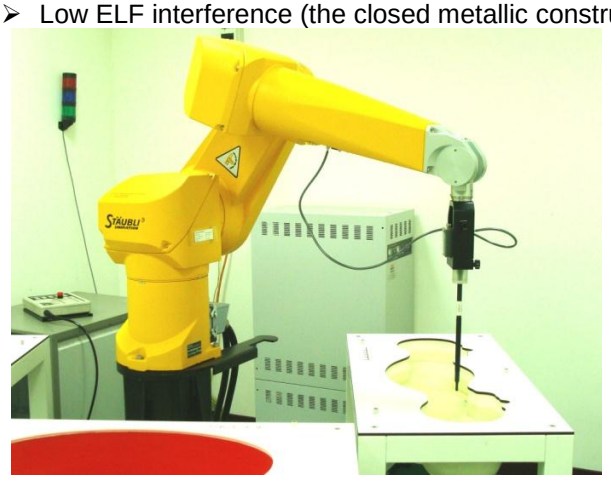


Fig 5.1 Photo of DASY4

Fig 5.2 Photo of DASY5

5.4 Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY4: 166 MHz, Intel Pentium; DASY5: 400 MHz, Intel Celeron), chipdisk (DASY4: 32 MB; DASY5: 128 MB), RAM (DASY4: 64 MB, DASY5: 128 MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O board, which is directly connected to the PC/104 bus of the CPU board.

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

Fig 5.1 Photo of Server for DASY4

Fig 5.2 Photo of Server for DASY5

5.5 Phantom

<SAM Twin Phantom>

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

Fig 5.3 Photo of SAM Phantom

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

<ELI4 Phantom>

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

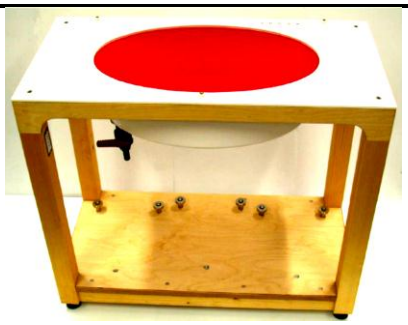


Fig 5.4 Photo of ELI4 Phantom

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

5.6 Device Holder

<Device Holder for SAM Twin Phantom>

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

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

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

Fig 5.5 Device Holder

<Laptop Extension Kit>

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

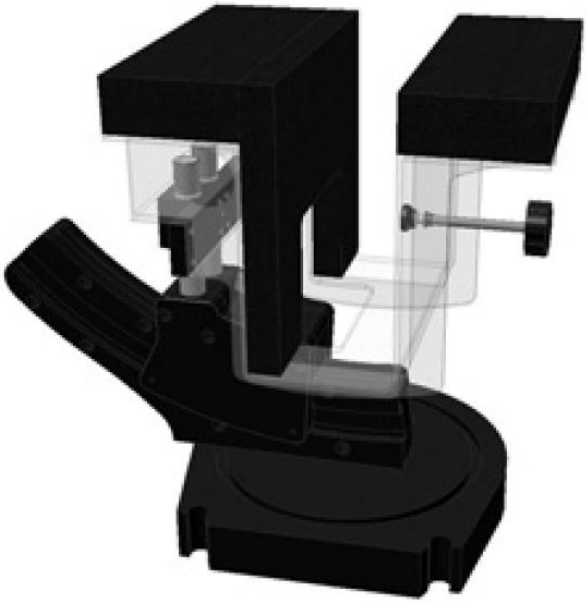


Fig 5.6 Laptop Extension Kit

5.7 Data Storage and Evaluation

5.7.1 Data Storage

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

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

5.7.2 Data Evaluation

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

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

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

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

The formula for each channel can be given as：

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

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

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

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

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

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

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

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

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

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

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

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

5.8 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Dosimetric E-Field Probe	ET3DV6	1787	May 20, 2011	May 19, 2012
SPEAG	Dosimetric E-Field Probe	EX3DV4	3801	Jul. 11, 2011	Jul. 10, 2012
SPEAG	Dosimetric E-Field Probe	EX3DV4	3554	Sep. 29, 2011	Sep. 28, 2012
SPEAG	Dosimetric E-Field Probe	EX3DV4	3792	Jun. 20, 2011	Jun. 19, 2012
SPEAG	Dosimetric E-Field Probe	EX3DV4	3819	Nov. 16, 2011	Nov. 15, 2012
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 25, 2011	Jul. 24, 2012
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Jan. 18, 2012	Jan. 17, 2013
SPEAG	Data Acquisition Electronics	DAE4	778	Nov. 22, 2011	Nov. 21, 2012
SPEAG	Data Acquisition Electronics	DAE3	495	Apr. 23, 2012	Apr. 22, 2013
SPEAG	Data Acquisition Electronics	DAE4	913	Dec. 23, 2011	Dec. 22, 2012
SPEAG	Data Acquisition Electronics	DAE4	1279	May 03, 2012	May 02, 2013
SPEAG	Data Acquisition Electronics	DAE4	910	Dec. 07, 2011	Dec. 06, 2012
SPEAG	Device Holder	N/A	N/A	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1303	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1383	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1446	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1478	NCR	NCR
SPEAG	SAM Phantom	QD 000 P41 C	TP-1150	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 CD	TP-1644	NCR	NCR
SPEAG	SAM Phantom	SM 000 T01 DA	TP-1542	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 001 BB	1026	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 001 BA	1029	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 002 AA	TP-1127	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 002 AA	TP-1131	NCR	NCR
Agilent	ENA Series Network Analyzer	E5071C	MY46100746	Jun. 10, 2011	Jun. 09, 2012
Agilent	ESG Vector Series Signal Generator	E4438C	MY49070755	Oct. 17, 2011	Oct. 16, 2012
Anritsu	Power Meter	ML2495A	0932001	Sep. 21, 2011	Sep. 20, 2012
Anritsu	Radio Communication Analyzer	MT8820C	6201074414	Dec. 21, 2011	Dec. 20, 2012

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 05, 2012	Jan. 04, 2014
Agilent	Wireless Communication Test Set	E5515C	GB46311322	Mar. 23, 2011	Mar. 22, 2013
Agilent	Wireless Communication Test Set	E5515C	MY50264370	Apr. 19, 2011	Apr. 18, 2013
Agilent	Wireless Communication Test Set	E5515C	MY50266977	Nov. 13, 2011	Nov. 12, 2013
R&S	Universal Digital Radio communication Tester	CMU200	117995	Jul. 28, 2011	Jul. 27, 2012
R&S	Spectrum Analyzer	FSP7	101131	Jul. 29, 2011	Jul. 28, 2012

Table 5.1 Test Equipment List

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

6. Tissue Simulating Liquids

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

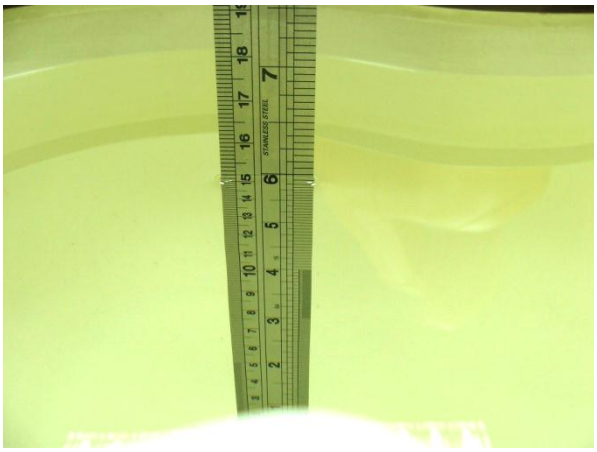


Fig 6.1 Photo of Liquid Height for Head SAR

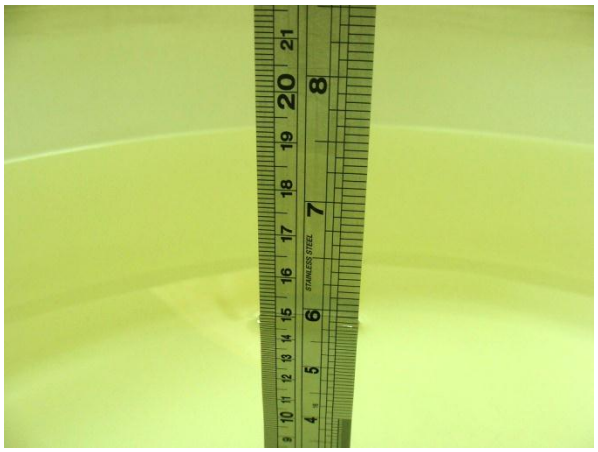


Fig 6.2 Photo of Liquid Height for Body SAR

The following table gives the recipes for tissue simulating liquid.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ε_r)
For Head								
2450	55.0	0	0	0	0	45.0	1.80	39.2
For Body								
2450	68.6	0	0	0	0	31.4	1.95	52.7

Table 6.1 Recipes of Tissue Simulating Liquid

Simulating Liquid for 5G, Manufactured by SPEAG

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

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

The following table shows the measuring results for simulating liquid.

Freq. (MHz)	Liquid Type	Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
2450	Body	21.7	1.97	54.2	1.95	52.7	1.03	2.85	±5	Apr. 30, 2012
2450	Body	21.4	1.97	53.8	1.95	52.7	1.03	2.09	±5	May 15, 2012
5200	Body	21.6	5.244	47.372	5.3	49	-1.06	-3.32	±5	Apr. 29, 2012
5200	Body	21.5	5.268	47.552	5.3	49	-0.60	-2.96	±5	Apr. 30, 2012
5200	Body	21.5	5.244	47.499	5.3	49	-1.06	-3.06	±5	May 11, 2012
5800	Body	21.5	6.127	46.464	6	48.2	2.12	-3.60	±5	May 11, 2012
5800	Body	21.6	6.144	46.492	6	48.2	2.40	-3.54	±5	May 24, 2012

Table 6.2 Measuring Results for Simulating Liquid

7. Uncertainty Assessment

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

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

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

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

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

(b) κ is the coverage factor

Table 7.1 Standard Uncertainty for Assumed Distribution

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

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

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

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

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (1g)
Measurement System					
Probe Calibration	6.55	Normal	1	1	± 6.55 %
Axial Isotropy	4.7	Rectangular	√3	0.7	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	± 3.9 %
Boundary Effects	2.0	Rectangular	√3	1	± 1.2 %
Linearity	4.7	Rectangular	√3	1	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	± 0.6 %
Readout Electronics	0.3	Normal	1	1	± 0.3 %
Response Time	0.8	Rectangular	√3	1	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	± 1.7 %
Probe Positioner	0.8	Rectangular	√3	1	± 0.5 %
Probe Positioning	9.9	Rectangular	√3	1	± 5.7 %
Max. SAR Eval.	4.0	Rectangular	√3	1	± 2.3 %
Test Sample Related					
Device Positioning	2.9	Normal	1	1	± 2.9 %
Device Holder	3.6	Normal	1	1	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	± 2.9 %
Phantom and Setup					
Phantom Uncertainty	4.0	Rectangular	√3	1	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	± 1.8 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	± 1.6 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	± 1.7 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	± 1.5 %
Combined Standard Uncertainty					± 12.8 %
Coverage Factor for 95 %					K = 2
Expanded Uncertainty					**± 25.6 %**

Table 7.3 Uncertainty Budget of DASY for frequency range 3 GHz to 6 GHz

8. SAR Measurement Evaluation

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

8.1 Purpose of System Performance check

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

8.2 System Setup

In the simplified setup for system evaluation, the 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:

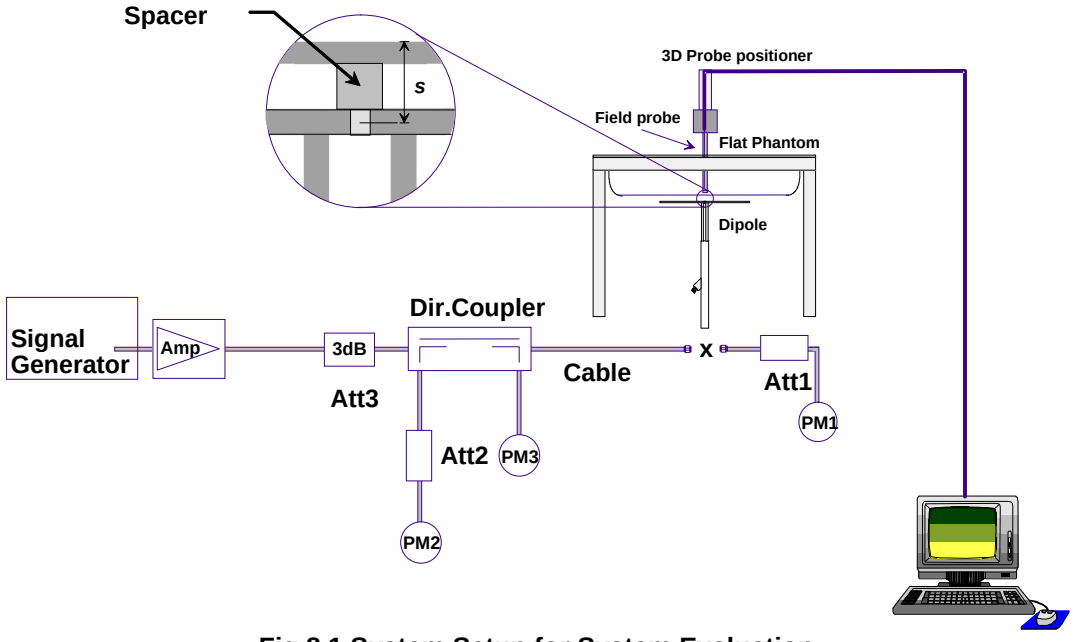


Fig 8.1 System Setup for System Evaluation

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

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

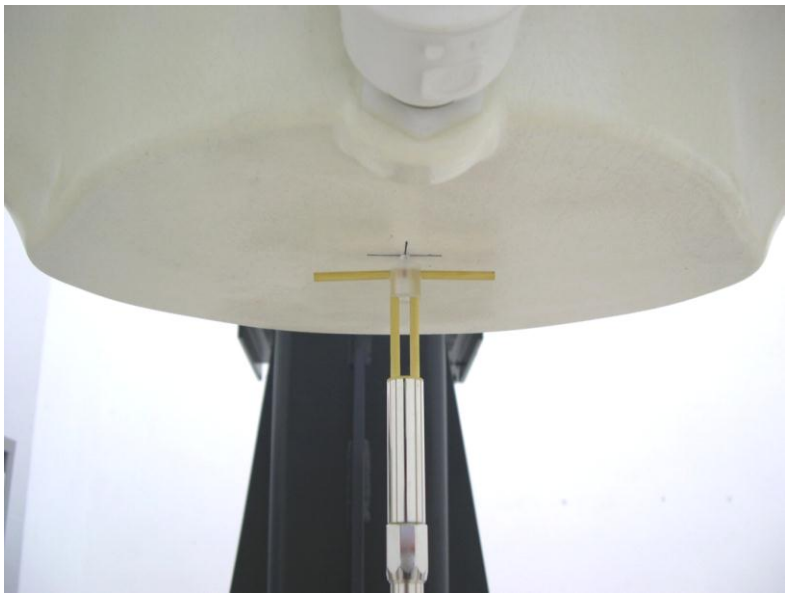


Fig 8.2 Photo of Dipole Setup

8.3 Validation Results

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

Measurement Date	Frequency (MHz)	Liquid Type	Targeted SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	Normalized SAR_{1g} (W/kg)	Deviation (%)
Apr. 30, 2012	2450	Body	52.3	14	56.00	7.07
May 15, 2012	2450	Body	52.30	12.1	48.40	-7.46
Apr. 29, 2012	5200	Body	72.60	18.9	75.60	4.13
Apr. 30, 2012	5200	Body	72.60	17.8	71.20	-1.93
May 11, 2012	5200	Body	72.60	19.2	76.80	5.79
May 11, 2012	5800	Body	73.10	19.2	76.80	5.06
May 24, 2012	5800	Body	73.1	17.1	68.40	-6.43

Table 8.1 Target and Measurement SAR after Normalized

9. EUT Testing Position

Refer to "SAR Test Photo" exhibit for detailed test setup information.

10. Measurement Procedures

The measurement procedures are as follows:

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

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

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

10.1 Spatial Peak SAR Evaluation

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

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

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

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

10.2 Area & Zoom Scan Procedures

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

10.3 Volume Scan Procedures

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

10.4 SAR Averaged Methods

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

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

10.5 Power Drift Monitoring

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

11. SAR Test Results

11.1 Antenna configuration

Band \ Antenna	Ant1	Ant2	Ant1+2
Bluetooth	No	Yes	No
2.4GHz 802.11b/g	Yes	No	No
2.4GHz 802.11n	Yes	No	Yes
5GHz 802.11a	Yes	No	No
5GHz 802.11n	Yes	No	Yes

Sides for SAR tests; Tablet mode						
	Bottom Face	Front Face	Secondary Landscape	Primary Landscape	Secondary Portrait	Primary Portrait
Antenna 1	✓(0 cm)	x	✓(0 cm)	x	✓(0 cm)	x
Antenna 1+2	✓(0 cm)	x	✓(0 cm)	✓(0 cm)	✓(0 cm)	✓(0 mm)

Note:

1. Per KDB 941225 D07, the EUT diagonal > 20 cm and Mini-Tablet procedure is not applied. Therefore, SAR tests follow the Tablet Mode in KDB 447498.
2. There is no screen orientation limitation in EUT; that is 4 orientations are supported.
3. As in (1), the test distance is 0 mm to the flat phantom; SAR evaluation is required for Bottom Face and each applicable Edge with the antenna within 5 cm to the user.
4. Per KDB 447498 D01, the distance from Antenna 1 to the Primary Landscape / Primary Portrait edge > 5 cm, therefore the stand-alone in these configurations SAR are not required.
5. Per KDB 447498 D01, Bluetooth output power ≤ 60/f, thus standalone SAR is not required.

11.2 Conducted Power (Unit: dBm)

<WLAN 2.4GHz – Antenna 1>

Band			802.11b			
Data Rate (bps)			1M			
Channel			1	6		11
Frequency (MHz)			2412	2437		2462
Average Power			15.66	**15.73**		15.42
Mode	Channel	Frequency (MHz)	Average power (dBm)			
			Data Rate (bps)			
			1M	2M	5.5M	11M
802.11b	CH 06	2437 MHz	**15.73**	15.52	15.5	15.46

Band			802.11g							
Data Rate (bps)			6M							
Channel			1		6			11		
Frequency (MHz)			2412		2437			2462		
Average Power			13.70		**14.80**			14.74		
Mode	Channel	Frequency (MHz)	Average power (dBm)							
			Data Rate (bps)							
			6M	9M	12M	18M	24M	36M	48M	54M
802.11g	CH 06	2437 MHz	**14.80**	14.63	14.63	14.61	14.64	14.66	14.55	14.52

Band			802.11n (BW 20MHz)							
Data Rate (bps)			MCS0							
Channel			1		6			11		
Frequency (MHz)			2412		2437			2462		
Average Power			9.47		**12.36**			12.01		
Mode	Channel	Frequency (MHz)	Average power (dBm)							
			Data Rate (bps)							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n 20M	CH 06	2437 MHz	**12.36**	12.2	12.3	12.35	12.33	12.25	12.3	12.31

Note:

1. Per KDB 248227, 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 requirement when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.
3. Per KDB 248227, 11g and 11n(20M) output power is less than 1/4 dB higher than 11b, thus the SAR can be excluded.

<WLAN 5GHz– Antenna 1>

Band			802.11a							
Data Rate (bps)			6M							
Channel			36	40	44	48	149	153	157	161
Frequency (MHz)			5180	5200	5220	5240	5745	5765	5785	5805
Average Power			12.45	12.82	**13.14**	12.67	12.18	13.03	**13.07**	12.98
Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate (bps)							
			6M	9M	12M	18M	24M	36M	48M	54M
802.11a	CH 044	5220 MHz	**13.14**	12.81	13.03	13.05	13.03	13.06	13.10	12.69
	CH 157	5785 MHz	**13.07**	13.06	13.05	13.02	13.01	13.05	13.06	12.94

Band			802.11n (BW 20MHz)							
Data Rate (bps)			MCS0							
Channel			36	40	44	48	149	153	157	161
Frequency (MHz)			5180	5200	5220	5240	5745	5765	5785	5805
Average Power			12.10	12.85	12.31	**12.94**	12.49	12.90	**12.91**	12.86
Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate (bps)							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n 20M	CH 048	5240 MHz	**12.94**	12.7	12.85	12.14	12.56	12.19	12.17	12.7
	CH 157	5785 MHz	**12.91**	12.80	12.80	12.87	12.85	12.87	12.76	12.88

Band			802.11n (BW 40MHz)							
Data Rate (bps)			MCS0							
Channel			38		46		151		159	
Frequency (MHz)			5190		5230		5755		5795	
Average Power			11.00		**12.88**		12.65		**12.85**	
Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate (bps)							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n 40M	CH 046	5230 MHZ	**12.88**	12.86	12.84	12.78	12.86	12.76	12.82	12.80
	CH 159	5795 MHz	**12.85**	12.80	12.81	12.83	12.84	12.79	12.70	12.71

Note:

1. Per KDB 248227, 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 requirement when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.
3. Per KDB 248227, 11n(20M),11n(40M) 5180 MHz ~ 5240MHz output power is less than 1/4 dB higher than 11a 5180 MHz ~ 5240 MHz, thus the SAR can be excluded.
4. Per KDB 248227, 11n(20M),11n(40M) 5745 MHz ~ 5805MHz output power is less than 1/4 dB higher than 11a 5745 MHz ~ 5805 MHz, thus the SAR can be excluded.

<WLAN 2.4GHz– Antenna 1+2>

Band			802.11n (BW 20MHz)							
Data Rate (bps)			MCS8							
Channel			1		6		11			
Frequency (MHz)			2412		2437		2462			
Average Power			13.26		**16.17**		15.54			
Mode	Channel	Frequency (MHz)	Average power (dBm)							
			Data Rate (bps)							
			MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
802.11n 20M	CH 06	2437 MHz	**16.17**	15.40	15.36	15.23	15.28	15.23	15.30	15.35

<WLAN 5GHz – Antenna 1+2>

Band			802.11n (BW 20MHz)							
Data Rate (bps)			MCS8							
Channel			36	40	44	48	149	153	157	161
Frequency (MHz)			5180	5200	5220	5240	5745	5765	5785	5805
Average Power			14.84	14.48	**15.08**	15.00	13.31	13.49	13.07	**13.66**
Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate (bps)							
			MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
802.11n 20M	CH 044	5220 MHz	**15.08**	14.75	14.66	14.66	14.7	14.74	14.76	14.76
	CH 161	5805 MHz	**13.66**	13.55	13.47	13.57	13.57	13.65	13.58	13.65

Band			802.11n (BW 40MHz)							
Data Rate (bps)			MCS8							
Channel			38		46		151		159	
Frequency (MHz)			5190		5230		5755		5795	
Average Power			**14.22**		13.79		**13.16**		13.10	
Mode	Channel	Frequency (MHz)	Average Power (dBm)							
			Data Rate (bps)							
			MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
802.11n 40M	CH 038	5190 MHZ	**14.22**	14.08	13.95	13.81	13.67	13.52	13.38	13.42
	CH 151	5755 MHz	**13.16**	13.09	13.09	13.12	13.13	13.14	13.14	13.09

Note:

1. Per KDB 248227, 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 requirement when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.
3. Per KDB 248227, 11n(40M) 5180 MHz ~ 5240MHz output power is less than 1/4 dB higher than 11n(20M) 5180 MHz ~ 5240 MHz, thus the SAR can be excluded.
4. Per KDB 248227, 11n(40M) 5745 MHz ~ 5805MHz output power is less than 1/4 dB higher than 11n(20M) 5745 MHz ~ 5805 MHz, thus the SAR can be excluded.

<Bluetooth – Antenna 2>

Mode	Channel	Frequency (MHz)	Average power (dBm)								
			Data Rate (bps)								
			DH1	DH3	DH5	2DH1	2DH3	2DH5	3DH1	3DH3	3DH5
Bluetooth	CH 00	2402 MHz	8.52	8.62	8.65	7.41	6.79	6.73	7.45	6.79	6.65
	CH 39	2441 MHz	8.64	8.70	**8.74**	7.52	6.88	6.84	7.55	6.90	6.85
	CH 78	2480 MHz	8.34	8.46	8.49	7.29	6.76	6.66	7.34	6.81	6.70

11.3 Test Records for Body SAR Test

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Ant. Status	Average Power (dbm)	SAR_{1g} (W/kg)	Duty Cycle	Scaling Factor	Scaled 1g SAR
102	802.11b	-	Bottom Face	0	6	1	15.73	1.26	100%	1	1.26
103	802.11b	-	Secondary Portrait	0	6	1	15.73	0.598	100%	1	0.598
104	802.11b	-	Secondary Landscape	0	6	1	15.73	0.286	100%	1	0.286
105	**802.11b**	**-**	**Bottom Face**	**0**	**1**	**1**	**15.66**	**1.26**	**100%**	**1**	**1.26**
106	802.11b	-	Bottom Face	0	11	1	15.42	1.1	100%	1	1.1
150	802.11n	20M	Bottom Face	0	6	1+2	16.17	0.744	95.28%	1.05	0.781
151	802.11n	20M	Secondary Portrait	0	6	1+2	16.17	0.35	95.28%	1.05	0.368
152	802.11n	20M	Primary Portrait	0	6	1+2	16.17	0.029	95.28%	1.05	0.030
153	802.11n	20M	Secondary Landscape	0	6	1+2	16.17	0.125	95.28%	1.05	0.131
154	802.11n	20M	Primary Landscape	0	6	1+2	16.17	0.405	95.28%	1.05	0.425
66	802.11a	-	Secondary Landscape	0	44	1	13.14	0.099	97.81%	1.02	0.101
67	802.11a	-	Bottom Face	0	44	1	13.14	0.469	97.81%	1.02	0.478
68	802.11a	-	Secondary Portrait	0	44	1	13.14	1.05	97.81%	1.02	1.071
72	802.11a	-	Secondary Portrait	0	36	1	12.45	1	97.81%	1.02	1.020
122	802.11n	20M	Bottom Face	0	44	1+2	15.08	0.385	95.53%	1.05	0.404
123	802.11n	20M	Secondary Portrait	0	44	1+2	15.08	0.817	95.53%	1.05	0.858
124	802.11n	20M	Primary Portrait	0	44	1+2	15.08	0.048	95.53%	1.05	0.050
125	802.11n	20M	Secondary Landscape	0	44	1+2	15.08	0.029	95.53%	1.05	0.030
126	802.11n	20M	Primary Landscape	0	44	1+2	15.08	0.402	95.53%	1.05	0.422
136	802.11n	20M	Secondary Portrait	0	36	1+2	14.84	1.05	95.53%	1.05	1.103
146	802.11a	-	Bottom Face	0	157	1	13.07	0.387	97.81%	1.02	0.395
147	802.11a	-	Secondary Portrait	0	157	1	13.07	0.75	97.81%	1.02	0.765
145	802.11a	-	Secondary Landscape	0	157	1	13.07	0.154	97.81%	1.02	0.157
129	802.11n	20M	Bottom Face	0	161	1+2	13.66	0.999	95.53%	1.05	1.049
130	802.11n	20M	Secondary Portrait	0	161	1+2	13.66	0.336	95.53%	1.05	0.353
131	802.11n	20M	Primary Portrait	0	161	1+2	13.66	0.073	95.53%	1.05	0.077
132	802.11n	20M	Secondary Landscape	0	161	1+2	13.66	0.108	95.53%	1.05	0.113
133	802.11n	20M	Primary Landscape	0	161	1+2	13.66	1.11	95.53%	1.05	1.166
134	802.11n	20M	Bottom Face	0	149	1+2	13.31	1.13	95.53%	1.05	1.187
135	**802.11n**	**20M**	**Primary Landscape**	**0**	**149**	**1+2**	**13.31**	**1.2**	**95.53%**	**1.05**	**1.260**

Note:

1. Ant.1+2 represents antennas simultaneous transmission at MIMO mode.
2. Per KDB447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

Test Engineer： Ken Li, Jack Wu, Niels Ouyang, Nick Yu, Bevis Chang, and Aaron Chen

12. References

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

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

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

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

[5] SPEAG DASY System Handbook

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

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

[8] FCC KDB 616217 D03 v01, “SAR Evaluation Considerations for Laptop/Notebook/Netbook and Tablet Computers”, November 2009

Appendix A. Plots of System Performance Check

The plots are shown as follows.

System Check_Body_2450MHz_120430

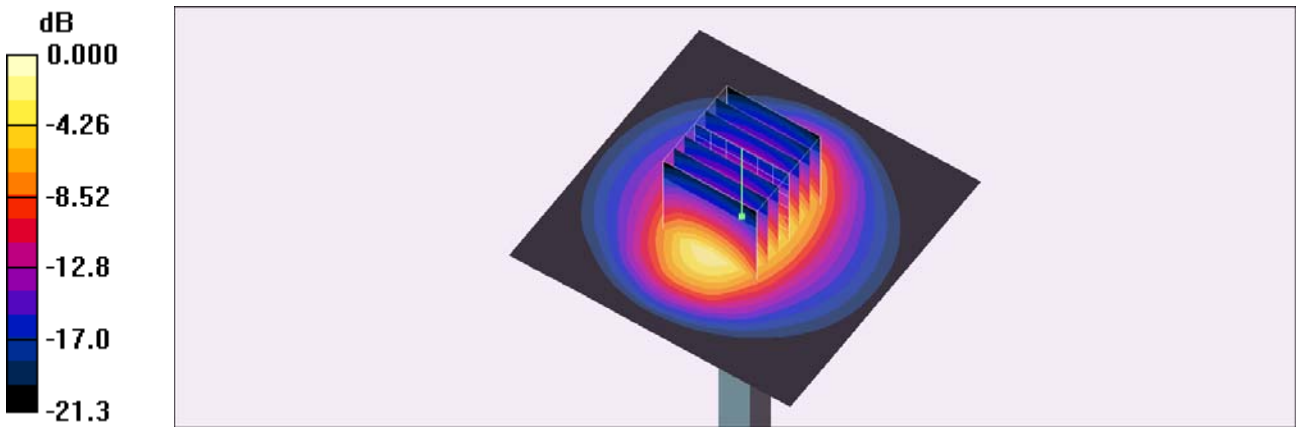
DUT: D2450V2-SN:736

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120430 Medium parameters used: f = 2450 MHz; σ = 1.97 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Ambient Temperature：22.7 ℃; Liquid Temperature：21.7 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(3.96, 3.96, 3.96); Calibrated: 2011/5/20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 15.6 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.1 V/m; Power Drift = -0.041 dB
Peak SAR (extrapolated) = 34.3 W/kg
SAR(1 g) = 14 mW/g; SAR(10 g) = 6.61 mW/g
Maximum value of SAR (measured) = 15.1 mW/g



0 dB = 15.1mW/g

System Check_Body_2450MHz_120515

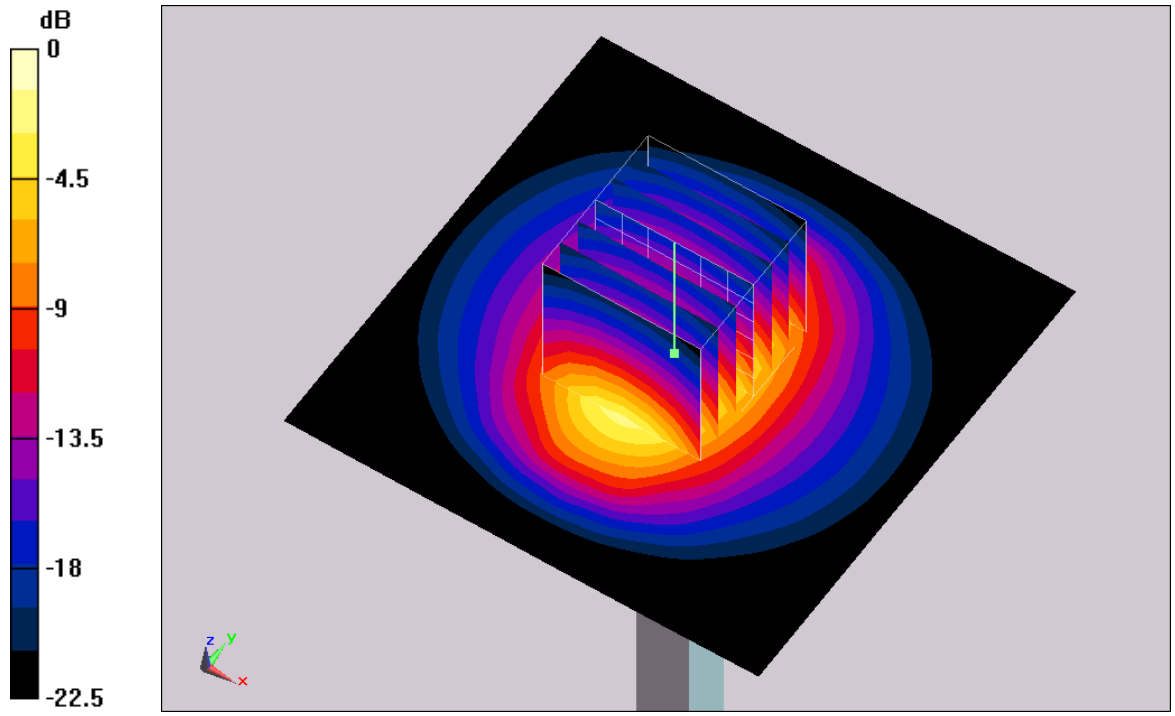
DUT: D2450V2-SN:736

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120515 Medium parameters used: f = 2450 MHz; σ = 1.97 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.79, 6.79, 6.79); Calibrated: 2011/7/11
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 14.3 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.6 V/m; Power Drift = 0.028 dB
Peak SAR (extrapolated) = 26 W/kg
SAR(1 g) = 12.1 mW/g; SAR(10 g) = 5.5 mW/g
Maximum value of SAR (measured) = 13.9 mW/g



0 dB = 13.9mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/4/29

System Check_Body_5200MHz_120429

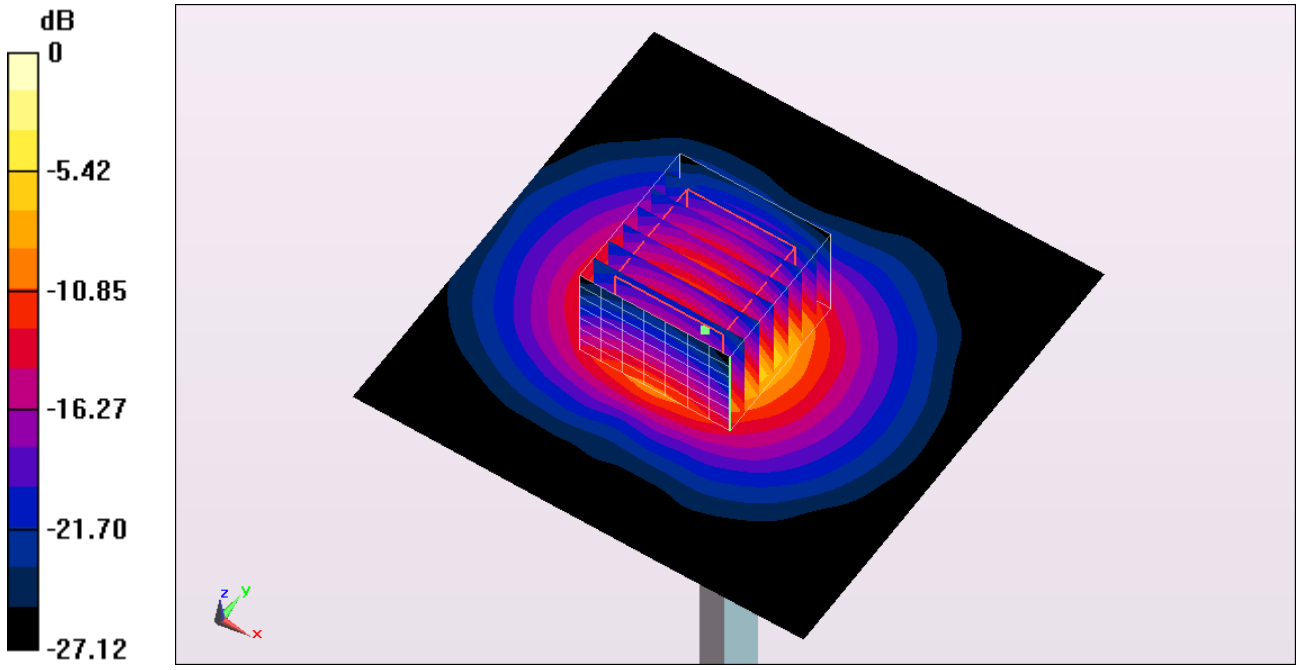
DUT: D5GHzV2-SN:1006

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120429 Medium parameters used: f = 5200 MHz; σ = 5.244 mho/m; ε_r = 47.372; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3554; ConvF(3.68, 3.68, 3.68); Calibrated: 2011/9/29;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2011/11/22
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 31.8 mW/g

Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 76.593 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 45.738 mW/g
SAR(1 g) = 18.9 mW/g; SAR(10 g) = 6.33 mW/g
Maximum value of SAR (measured) = 29.1 mW/g



0 dB = 29.1 mW/g = 29.28 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/4/30

System Check_Body_5200MHz_120430

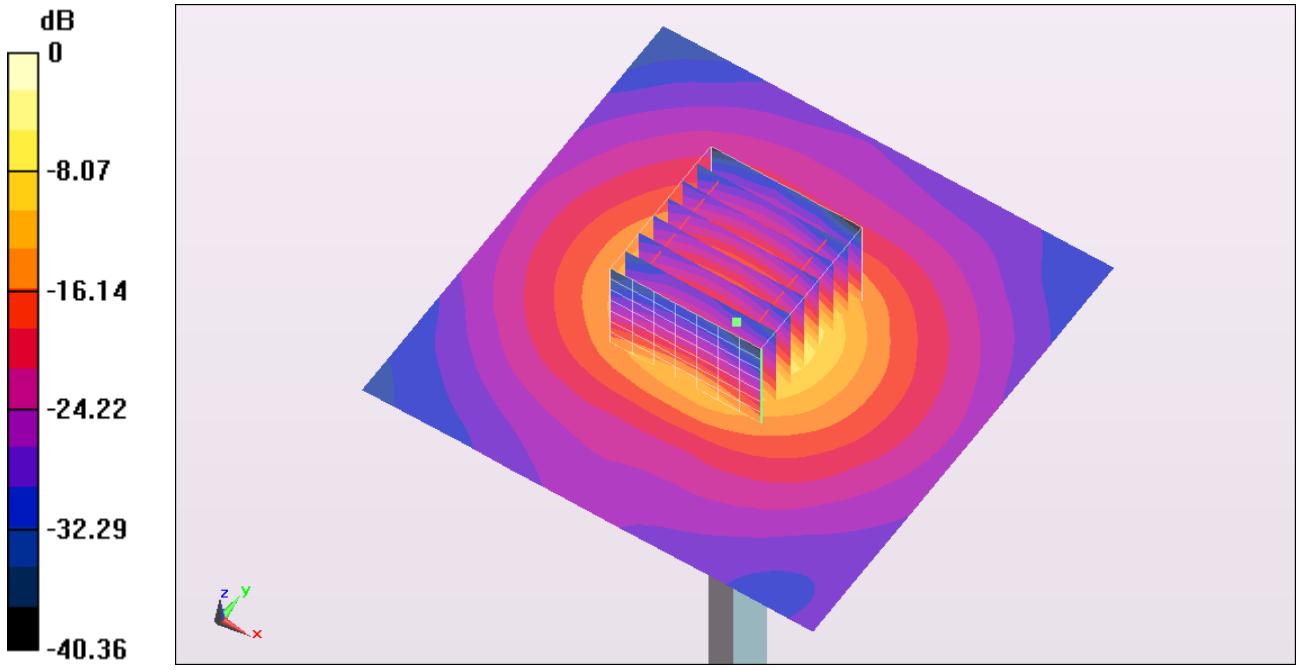
DUT: D5GHzV2-SN:1006

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120430 Medium parameters used: f = 5200 MHz; σ = 5.268 mho/m; ε_r = 47.552; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2011/12/23
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 32.3 mW/g

Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 89.303 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 59.357 mW/g
SAR(1 g) = 17.8 mW/g; SAR(10 g) = 5.06 mW/g
Maximum value of SAR (measured) = 29.3 mW/g



0 dB = 29.3 mW/g = 29.34 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/5/11

System Check_Body_5200MHz_120511

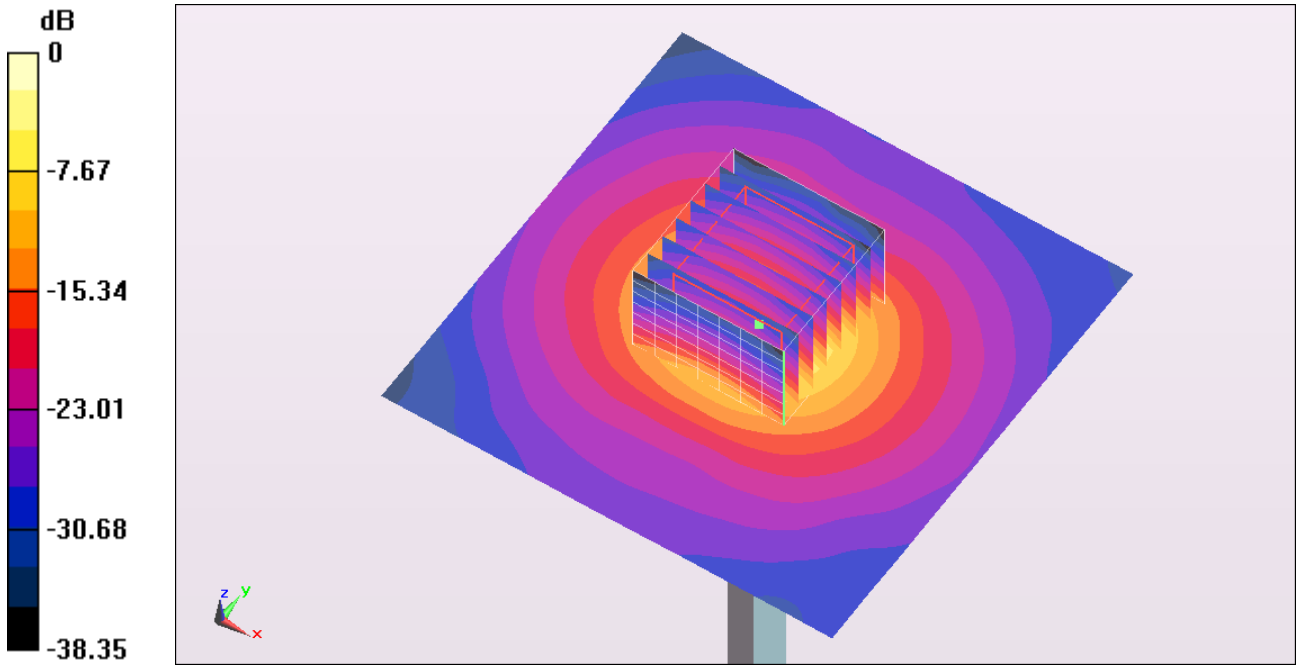
DUT: D5GHzV2-SN:1006

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5200 MHz; σ = 5.244 mho/m; ε_r = 47.499; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 34.4 mW/g

Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 85.137 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 65.843 mW/g
SAR(1 g) = 19.2 mW/g; SAR(10 g) = 5.32 mW/g
Maximum value of SAR (measured) = 32.8 mW/g



0 dB = 32.8 mW/g = 30.32 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/5/11

System Check_Body_5800MHz_120511

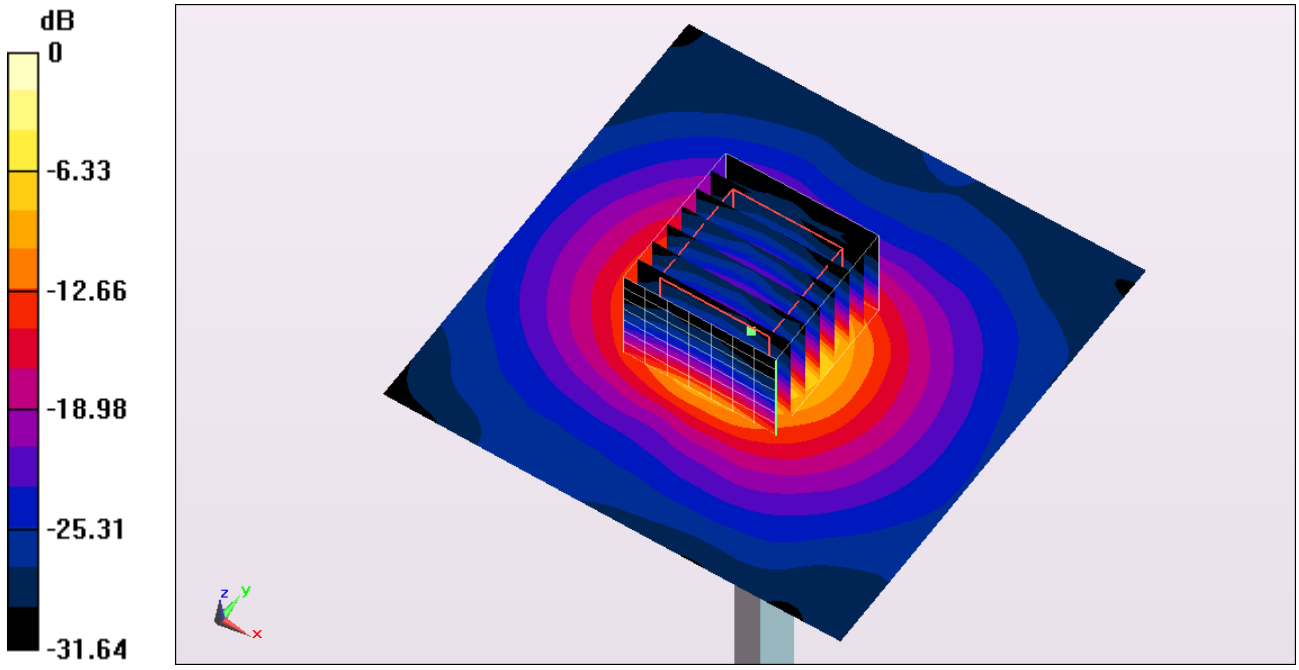
DUT: D5GHzV2-SN:1006

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5800 MHz; σ = 6.127 mho/m; ε_r = 46.464; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(3.78, 3.78, 3.78); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 34.4 mW/g

Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 81.326 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 75.476 mW/g
SAR(1 g) = 19.2 mW/g; SAR(10 g) = 5.38 mW/g
Maximum value of SAR (measured) = 33.2 mW/g



0 dB = 33.2 mW/g = 30.42 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/5/24

System Check_Body_5800MHz_120524

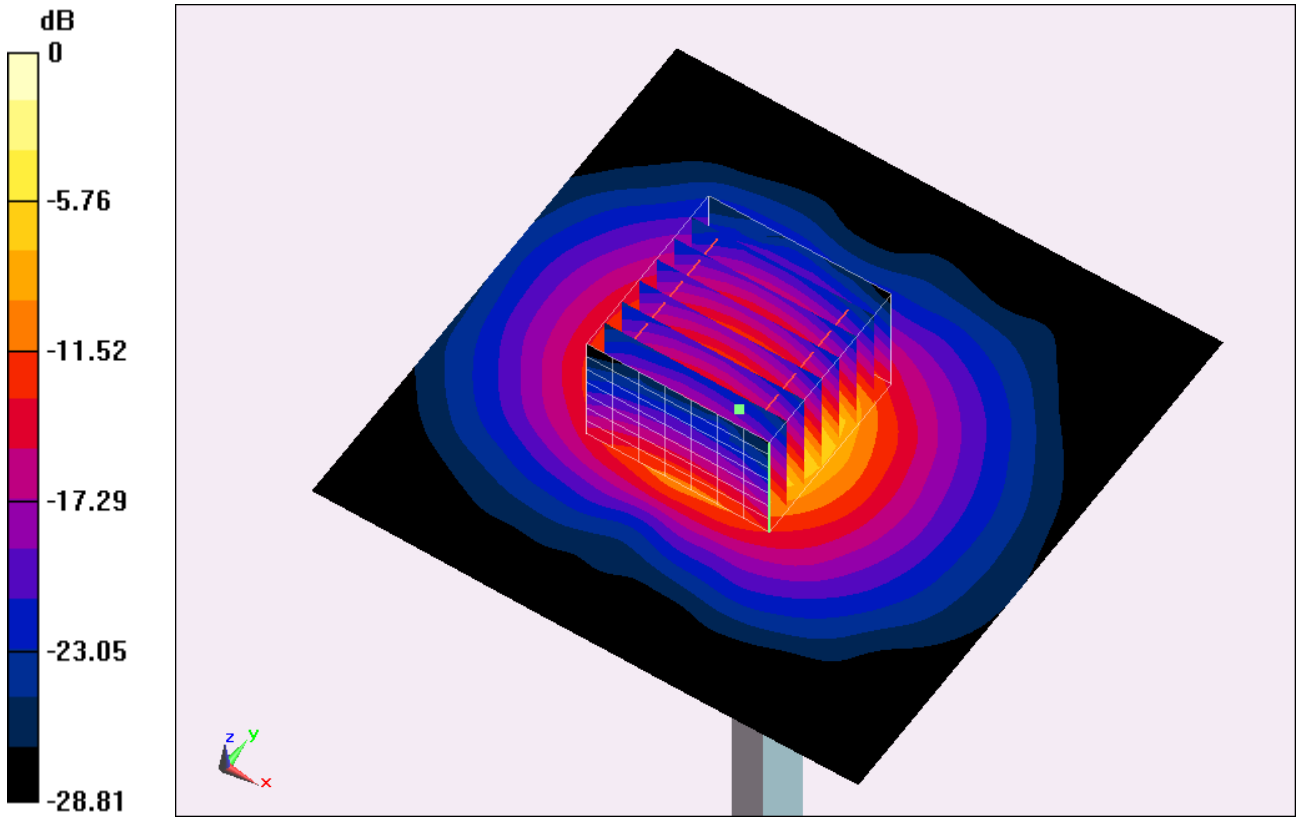
DUT: D5GHzV2-SN:1006

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120524 Medium parameters used: f = 5800 MHz; σ = 6.144 mho/m; ε_r = 46.492; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃； Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(4.02, 4.02, 4.02); Calibrated: 2011/11/16;
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 28.4 mW/g

Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 67.344 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 43.588 mW/g
SAR(1 g) = 17.1 mW/g; SAR(10 g) = 5.55 mW/g
Maximum value of SAR (measured) = 26.9 mW/g



0 dB = 26.9 mW/g = 28.60 dB mW/g

Appendix B. Plots of SAR Measurement

The plots are shown as follows.

#102 802.11b_Bottom Face_0cm_Ch6_Ant 1

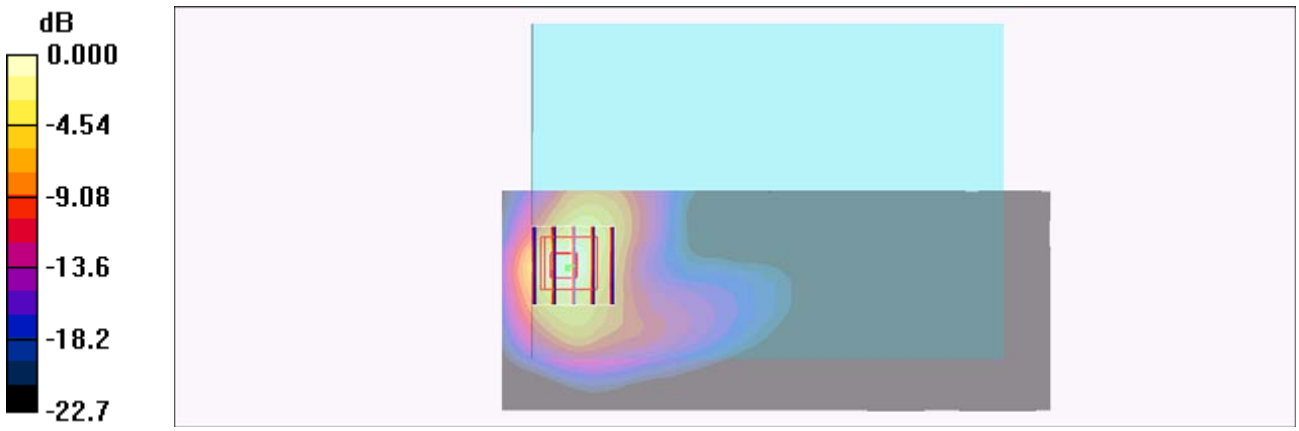
DUT: 210222

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120430 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Ambient Temperature：22.7 ℃; Liquid Temperature：21.7 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(3.96, 3.96, 3.96); Calibrated: 2011/5/20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch6/Area Scan (61x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.27 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.10 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 3.55 W/kg
SAR(1 g) = 1.26 mW/g; SAR(10 g) = 0.536 mW/g
Maximum value of SAR (measured) = 1.37 mW/g



0 dB = 1.37mW/g

#103 802.11b_Secondary Portrait_0cm_Ch6_Ant 1

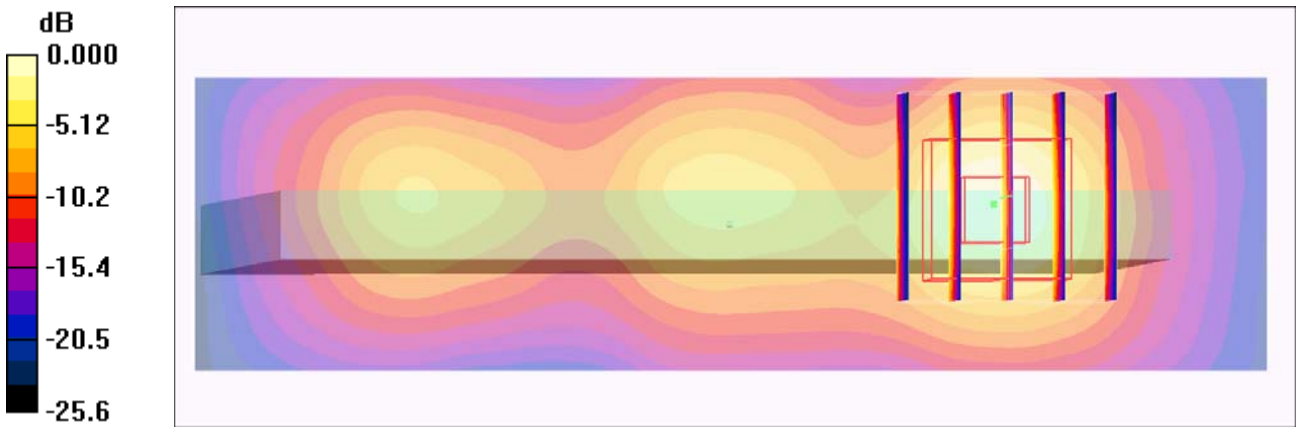
DUT: 210222

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120430 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Ambient Temperature：22.7 ℃; Liquid Temperature：21.7 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(3.96, 3.96, 3.96); Calibrated: 2011/5/20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch6/Area Scan (31x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.661 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 0.598 mW/g; SAR(10 g) = 0.247 mW/g
Maximum value of SAR (measured) = 0.647 mW/g



0 dB = 0.647mW/g

#104 802.11b_Secondary Landscape_0cm_Ch6_Ant 1

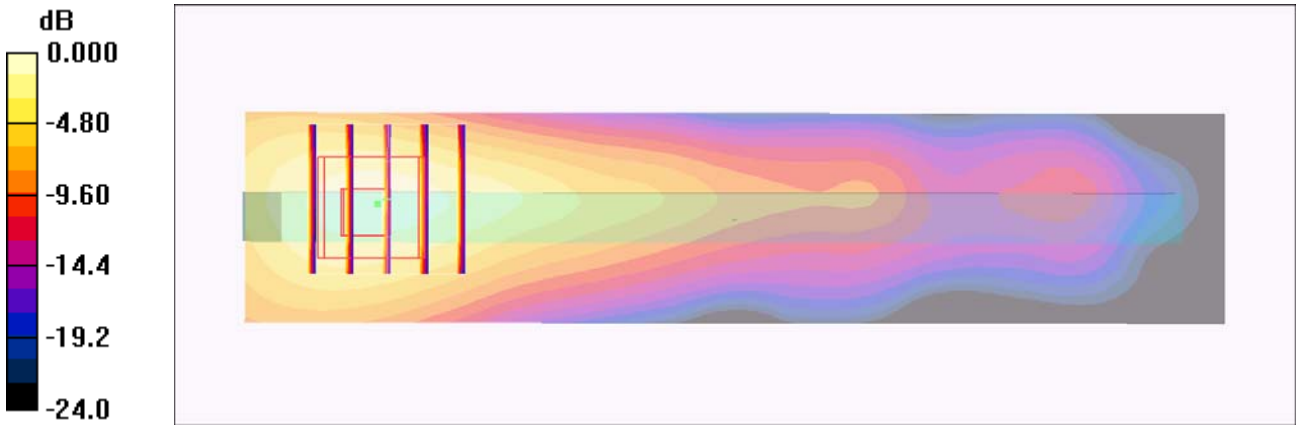
DUT: 210222

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120430 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Ambient Temperature：22.7 ℃; Liquid Temperature：21.7 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(3.96, 3.96, 3.96); Calibrated: 2011/5/20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch6/Area Scan (31x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.258 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.24 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 0.713 W/kg
SAR(1 g) = 0.286 mW/g; SAR(10 g) = 0.133 mW/g
Maximum value of SAR (measured) = 0.289 mW/g



0 dB = 0.289mW/g

#105 802.11b_Bottom Face_0cm_Ch1_Ant 1

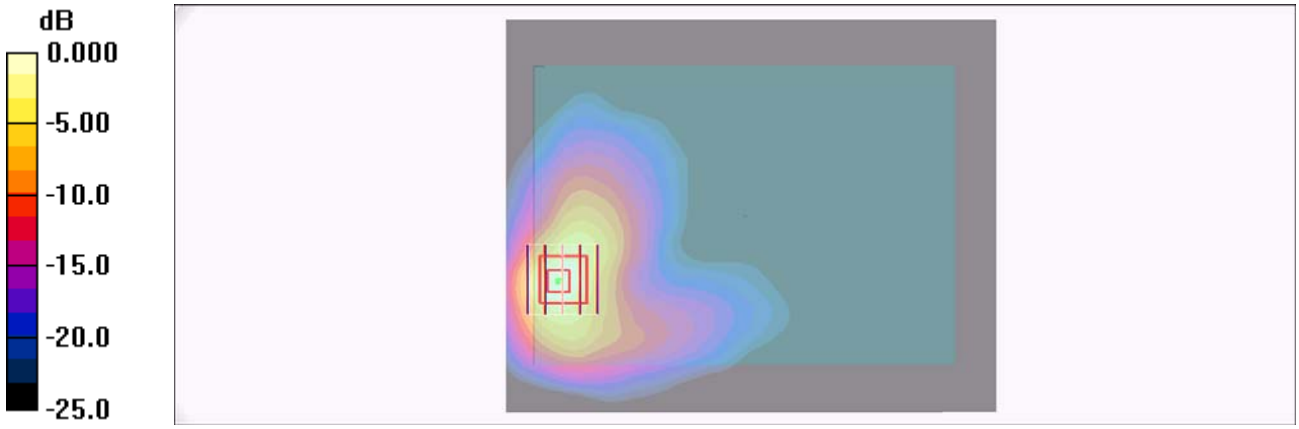
DUT: 210222

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120430 Medium parameters used: f = 2412 MHz; σ = 1.92 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Ambient Temperature：22.7 ℃; Liquid Temperature：21.7 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(3.96, 3.96, 3.96); Calibrated: 2011/5/20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (121x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.30 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.522 V/m; Power Drift = 0.078 dB
Peak SAR (extrapolated) = 3.70 W/kg
SAR(1 g) = 1.26 mW/g; SAR(10 g) = 0.545 mW/g
Maximum value of SAR (measured) = 1.35 mW/g



0 dB = 1.35mW/g

#105 802.11b_Bottom Face_0cm_Ch1_Ant 1_2D

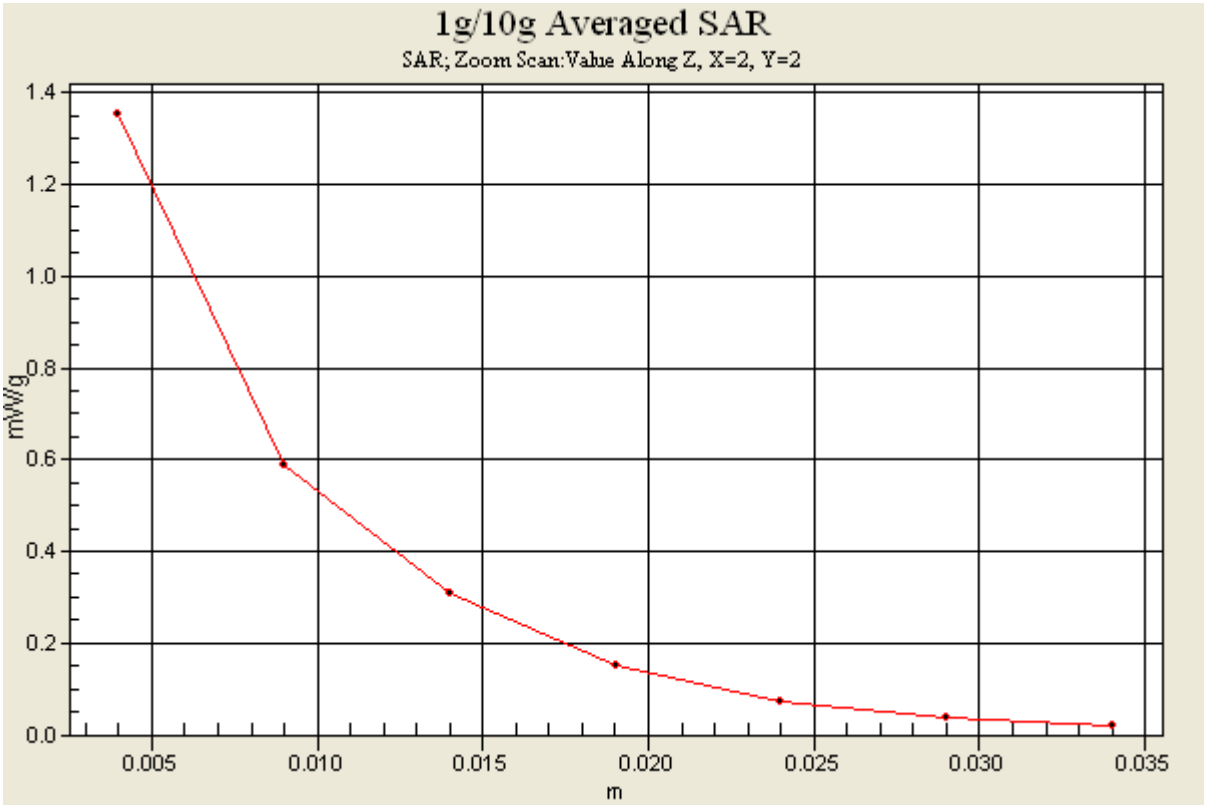
DUT: 210222

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120430 Medium parameters used: f = 2412 MHz; σ = 1.92 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Ambient Temperature：22.7 ℃; Liquid Temperature：21.7 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(3.96, 3.96, 3.96); Calibrated: 2011/5/20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (121x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.30 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.522 V/m; Power Drift = 0.078 dB
Peak SAR (extrapolated) = 3.70 W/kg
SAR(1 g) = 1.26 mW/g; SAR(10 g) = 0.545 mW/g
Maximum value of SAR (measured) = 1.35 mW/g



#106 802.11b_Bottom Face_0cm_Ch11_Ant 1

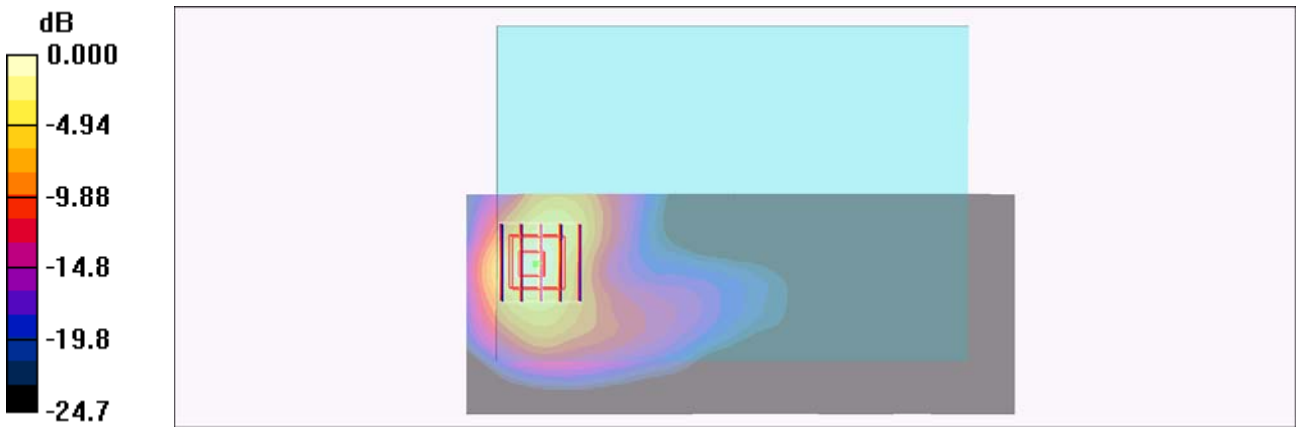
DUT: 210222

Communication System: 802.11b ; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120430 Medium parameters used: f = 2462 MHz; σ = 1.99 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3
Ambient Temperature：22.7 ℃; Liquid Temperature：21.7 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(3.96, 3.96, 3.96); Calibrated: 2011/5/20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI 4.0_Front; Type: QDOVA001BB; Serial: 1026
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch11/Area Scan (61x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.10 mW/g

Ch11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.555 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 3.42 W/kg
SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.466 mW/g
Maximum value of SAR (measured) = 1.14 mW/g



0 dB = 1.14mW/g

#150 802.11n_20M_Bottom Face_0cm_Ch6_Ant 1+2

DUT: 210222

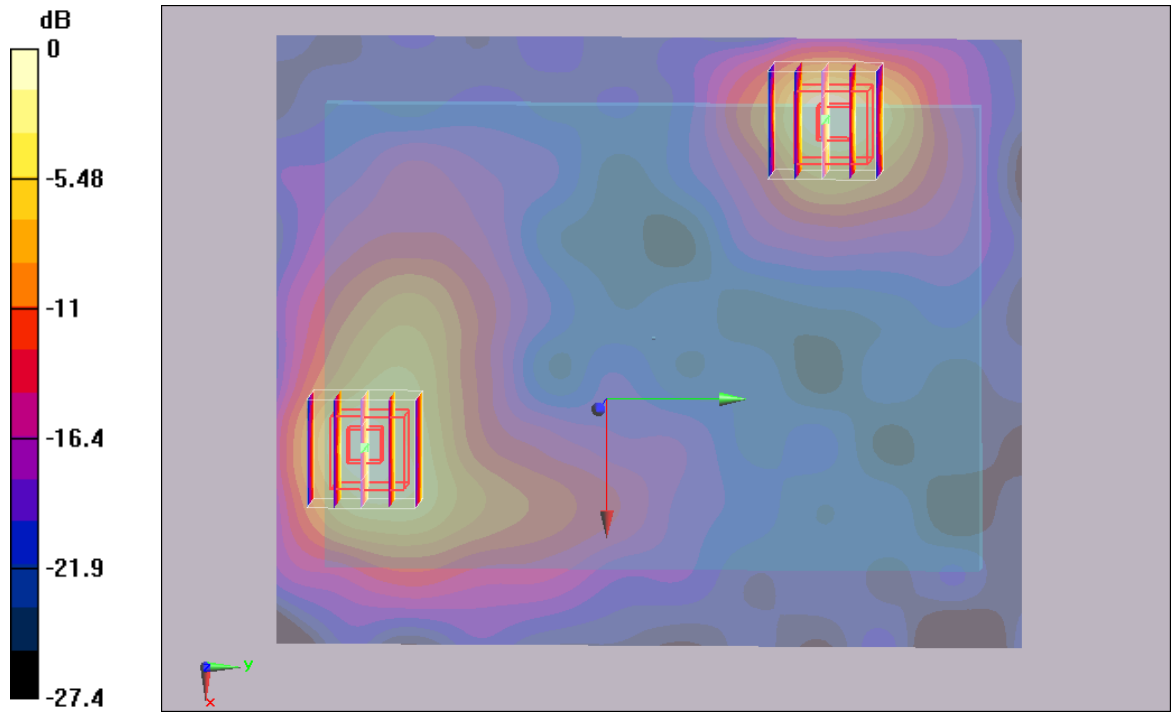
Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120515 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.79, 6.79, 6.79); Calibrated: 2011/7/11
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Ch6/Area Scan (91x111x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.680 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.325 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.87 W/kg
SAR(1 g) = 0.744 mW/g; SAR(10 g) = 0.278 mW/g
Maximum value of SAR (measured) = 0.854 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.325 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.561 mW/g; SAR(10 g) = 0.251 mW/g
Maximum value of SAR (measured) = 0.650 mW/g



0 dB = 0.650mW/g

#150 802.11n_20M_Bottom Face_0cm_Ch6_Ant 1+2 _2D

DUT: 210222

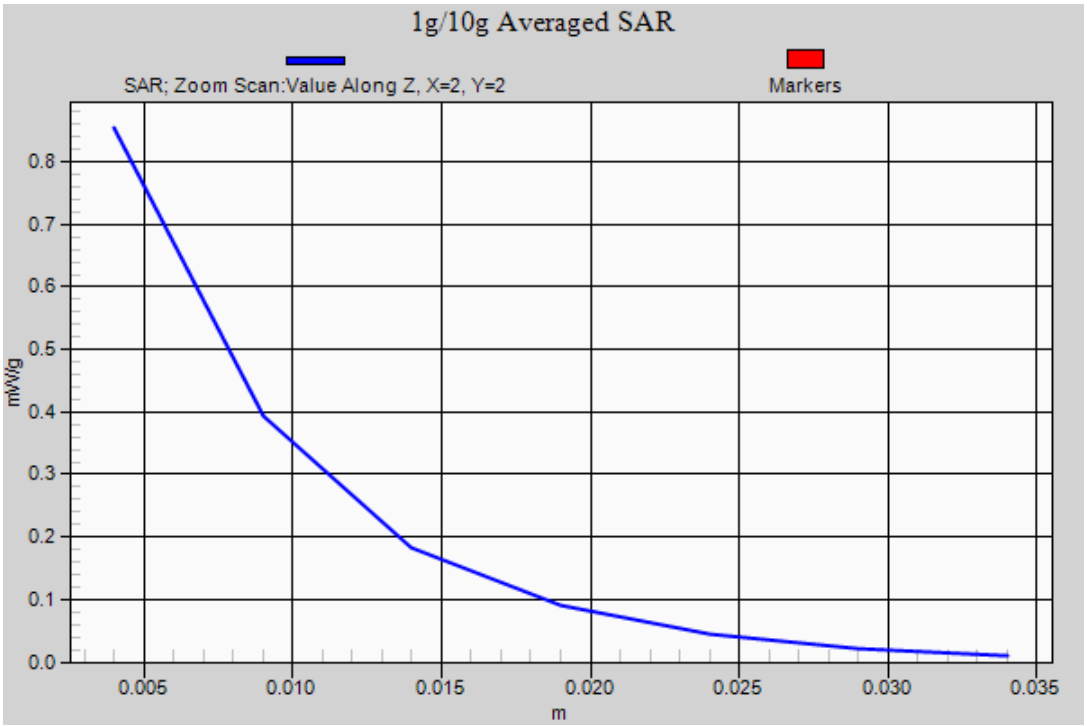
Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120515 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.79, 6.79, 6.79); Calibrated: 2011/7/11
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Ch6/Area Scan (91x111x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.680 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.325 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.87 W/kg
SAR(1 g) = 0.744 mW/g; SAR(10 g) = 0.278 mW/g
Maximum value of SAR (measured) = 0.854 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.325 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.561 mW/g; SAR(10 g) = 0.251 mW/g
Maximum value of SAR (measured) = 0.650 mW/g



#151 802.11n_20M_Secondary Portrait_0cm_Ch6_Ant 1+2

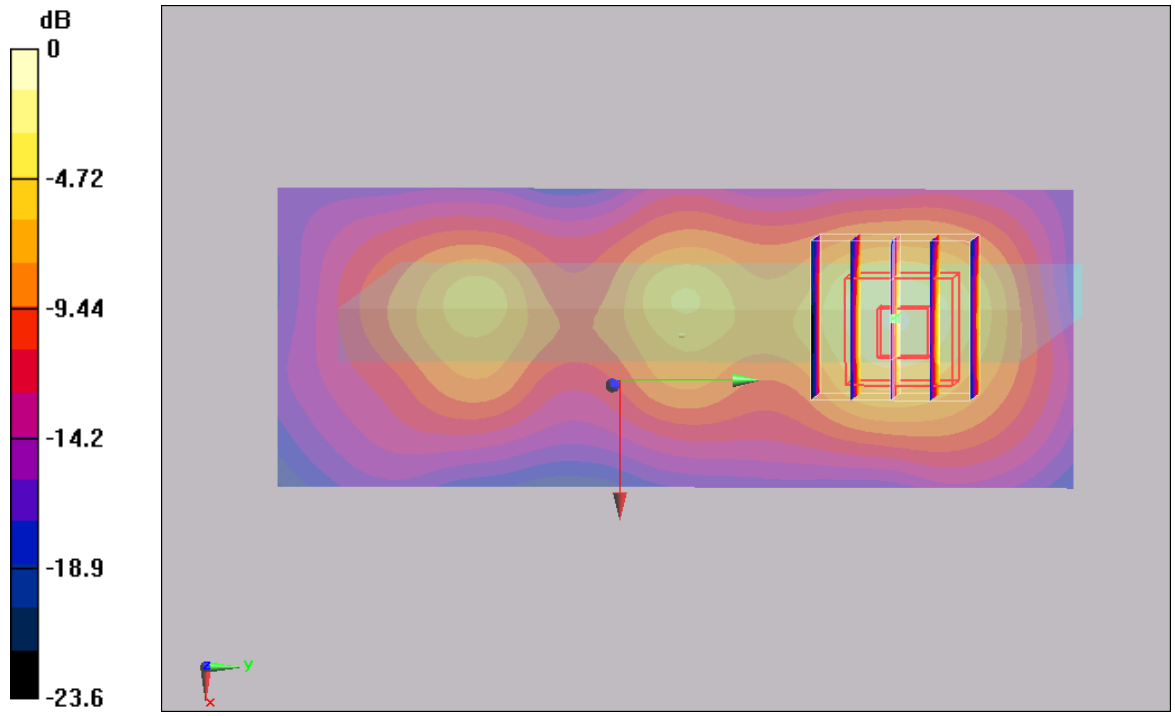
DUT: 210222

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120515 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.79, 6.79, 6.79); Calibrated: 2011/7/11
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Ch6/Area Scan (31x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.263 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.61 V/m; Power Drift = 0.111 dB
Peak SAR (extrapolated) = 0.813 W/kg
SAR(1 g) = 0.350 mW/g; SAR(10 g) = 0.149 mW/g
Maximum value of SAR (measured) = 0.364 mW/g



0 dB = 0.364mW/g

#152 802.11n_20M_Primary Portrait_0cm_Ch6_Ant 1+2

DUT: 210222

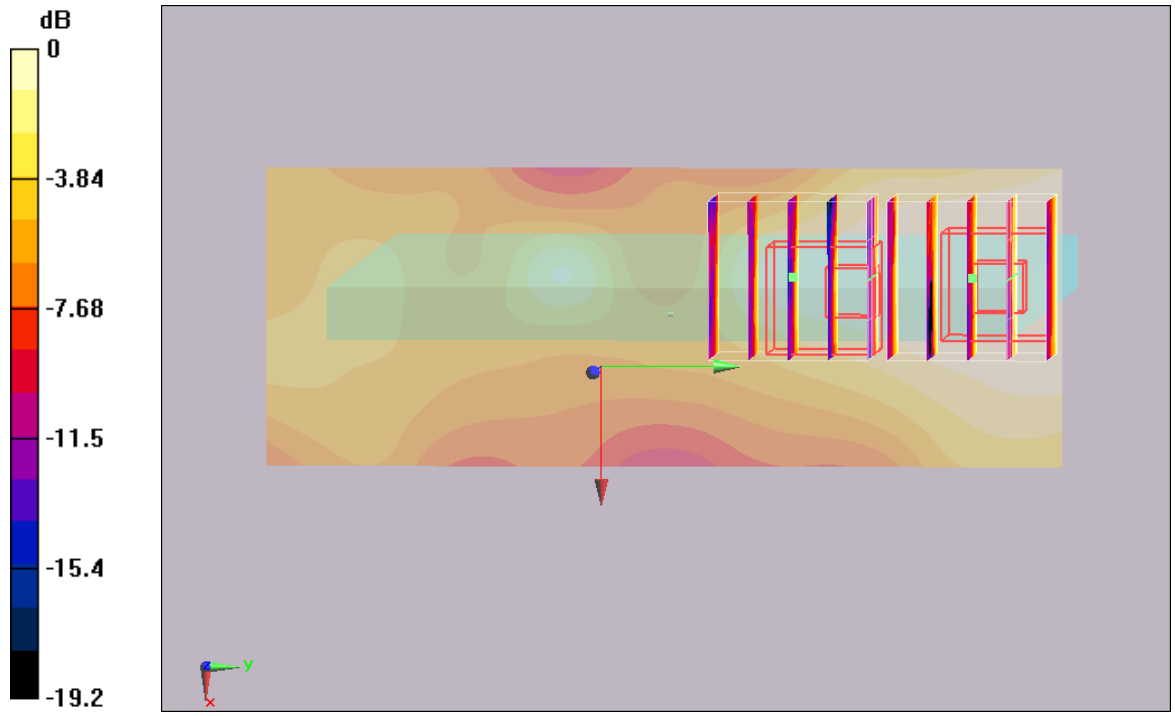
Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120515 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.79, 6.79, 6.79); Calibrated: 2011/7/11
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Ch6/Area Scan (31x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.030 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.98 V/m; Power Drift = -0.169 dB
Peak SAR (extrapolated) = 0.057 W/kg
SAR(1 g) = 0.029 mW/g; SAR(10 g) = 0.015 mW/g
Maximum value of SAR (measured) = 0.031 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.98 V/m; Power Drift = -0.169 dB
Peak SAR (extrapolated) = 0.040 W/kg
SAR(1 g) = 0.020 mW/g; SAR(10 g) = 0.00994 mW/g
Maximum value of SAR (measured) = 0.022 mW/g



0 dB = 0.022mW/g

#153 802.11n_20M_Secondary Landscape_0cm_Ch6_Ant 1+2

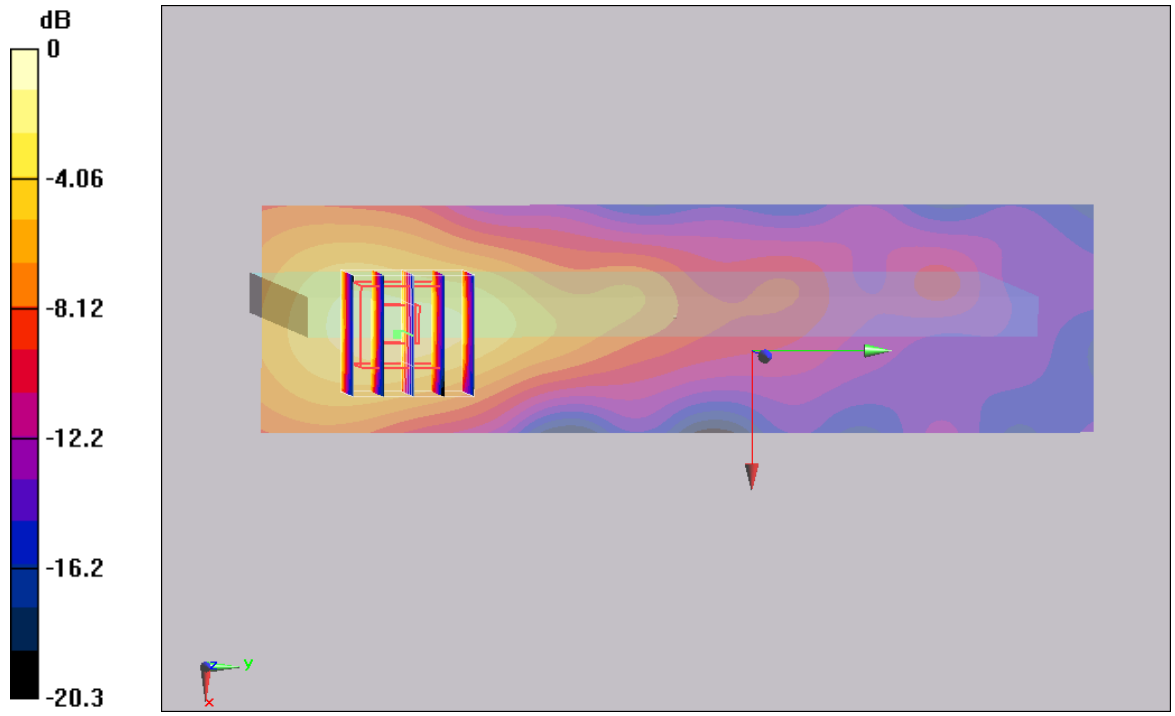
DUT: 210222

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120515 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.79, 6.79, 6.79); Calibrated: 2011/7/11
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Ch6/Area Scan (31x111x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.090 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.38 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 0.351 W/kg
SAR(1 g) = 0.125 mW/g; SAR(10 g) = 0.060 mW/g
Maximum value of SAR (measured) = 0.137 mW/g



0 dB = 0.137mW/g

#154 802.11n_20M_Primary Landscape_0cm_Ch6_Ant 1+2

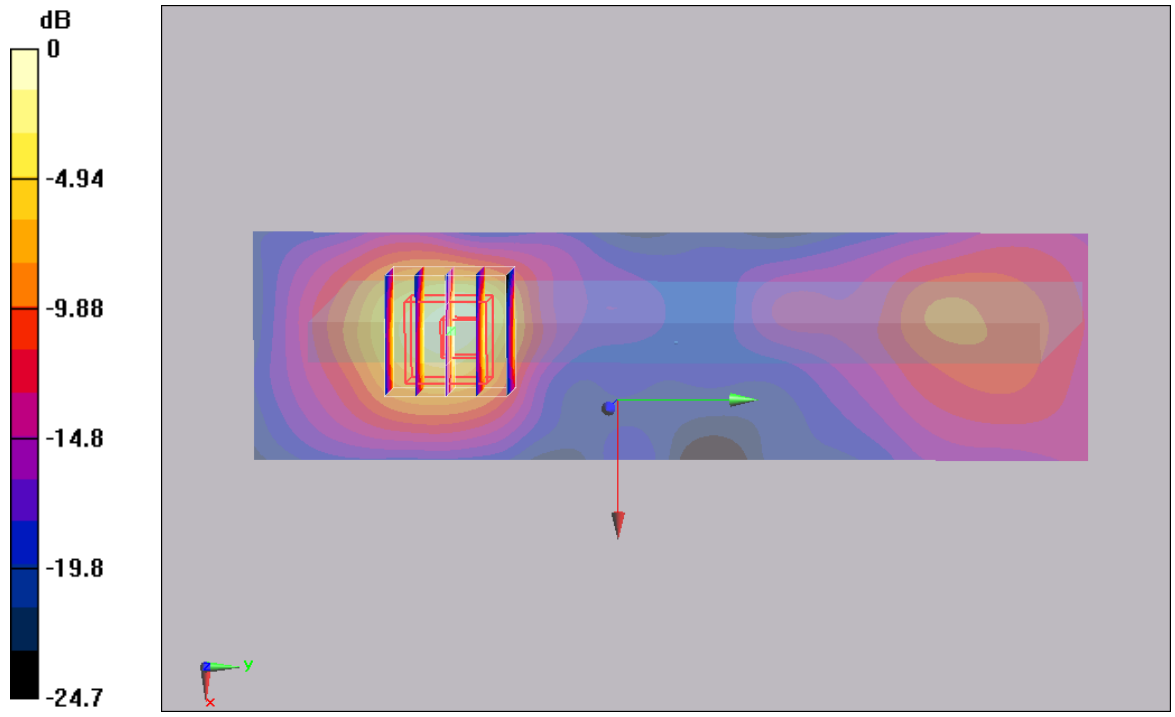
DUT: 210222

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_120515 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.79, 6.79, 6.79); Calibrated: 2011/7/11
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn495; Calibrated: 2012/4/23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Software: DASY5 Version; SEMCAD X Version 13.4 Build 45

Ch6/Area Scan (31x111x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.446 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.88 V/m; Power Drift = -0.191 dB
Peak SAR (extrapolated) = 0.714 W/kg
SAR(1 g) = 0.405 mW/g; SAR(10 g) = 0.175 mW/g
Maximum value of SAR (measured) = 0.444 mW/g



0 dB = 0.444mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/4/29

#66 802.11a_Secondary Landscape_0cm_Ch44_Ant 1

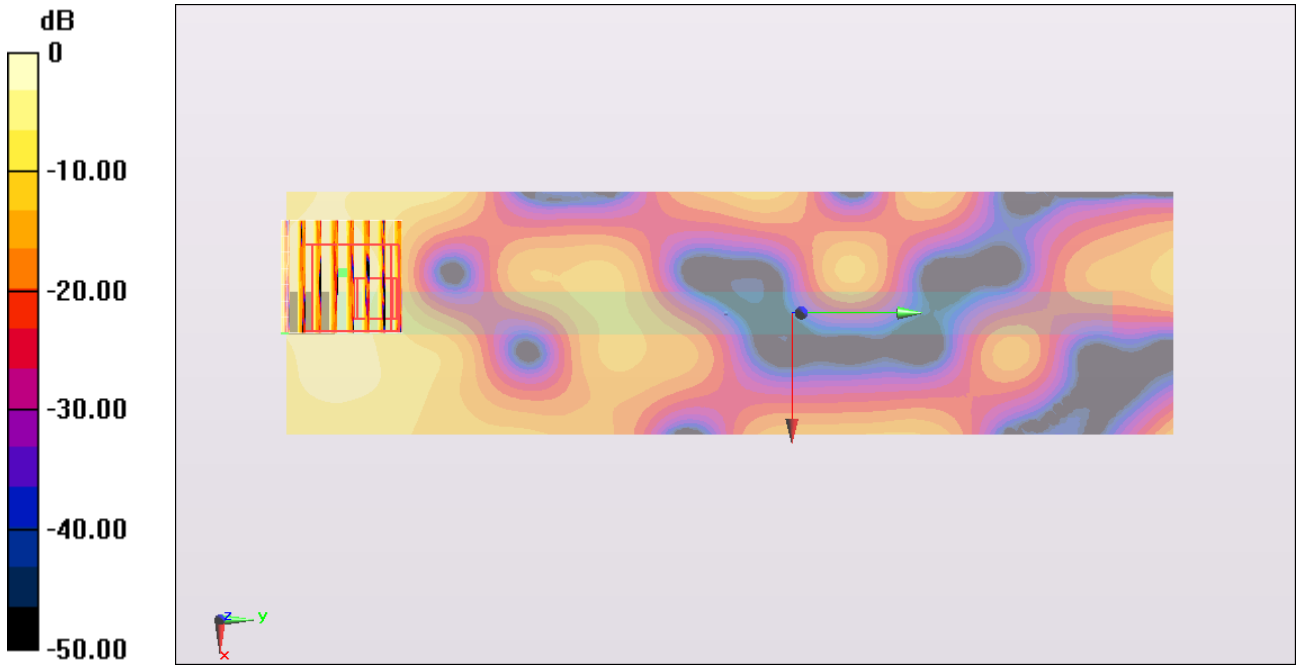
DUT: 210222

Communication System: 802.11a; Frequency: 5220 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120429 Medium parameters used: f = 5220 MHz; σ = 5.257 mho/m; ε_r = 47.44; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3554; ConvF(3.68, 3.68, 3.68); Calibrated: 2011/9/29;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2011/11/22
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch44/Area Scan (61x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.0949 mW/g

Ch44/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.829 V/m; Power Drift = 0.124 dB
Peak SAR (extrapolated) = 0.392 mW/g
SAR(1 g) = 0.099 mW/g; SAR(10 g) = 0.033 mW/g
Maximum value of SAR (measured) = 0.208 mW/g



0 dB = 0.208 mW/g = -13.64 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/4/29

#67 802.11a_Bottom Face_0cm_Ch44_Ant 1

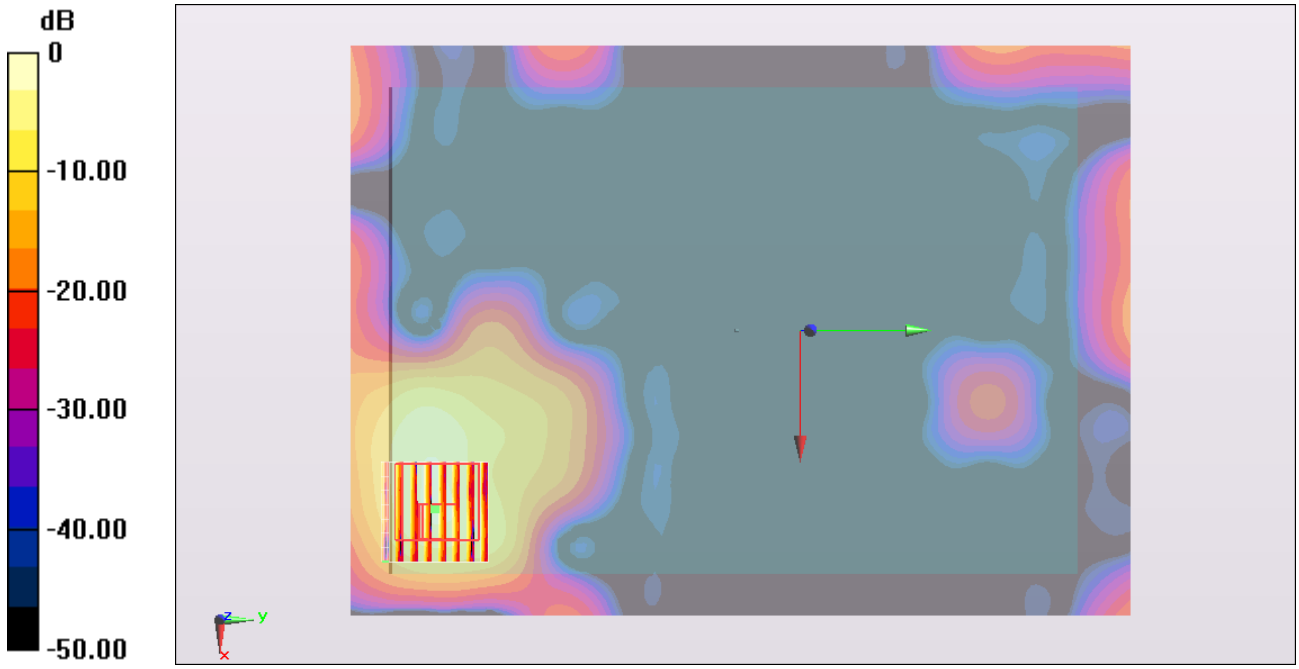
DUT: 210222

Communication System: 802.11a; Frequency: 5220 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120429 Medium parameters used: f = 5220 MHz; σ = 5.257 mho/m; ε_r = 47.44; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3554; ConvF(3.68, 3.68, 3.68); Calibrated: 2011/9/29;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2011/11/22
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch44/Area Scan (161x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.570 mW/g

Ch44/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.253 V/m; Power Drift = 0.163 dB
Peak SAR (extrapolated) = 1.875 mW/g
SAR(1 g) = 0.469 mW/g; SAR(10 g) = 0.162 mW/g
Maximum value of SAR (measured) = 1.03 mW/g



0 dB = 1.03 mW/g = 0.26 dB mW/g

#68 802.11a_Secondary Portrait_0cm_Ch44_Ant 1

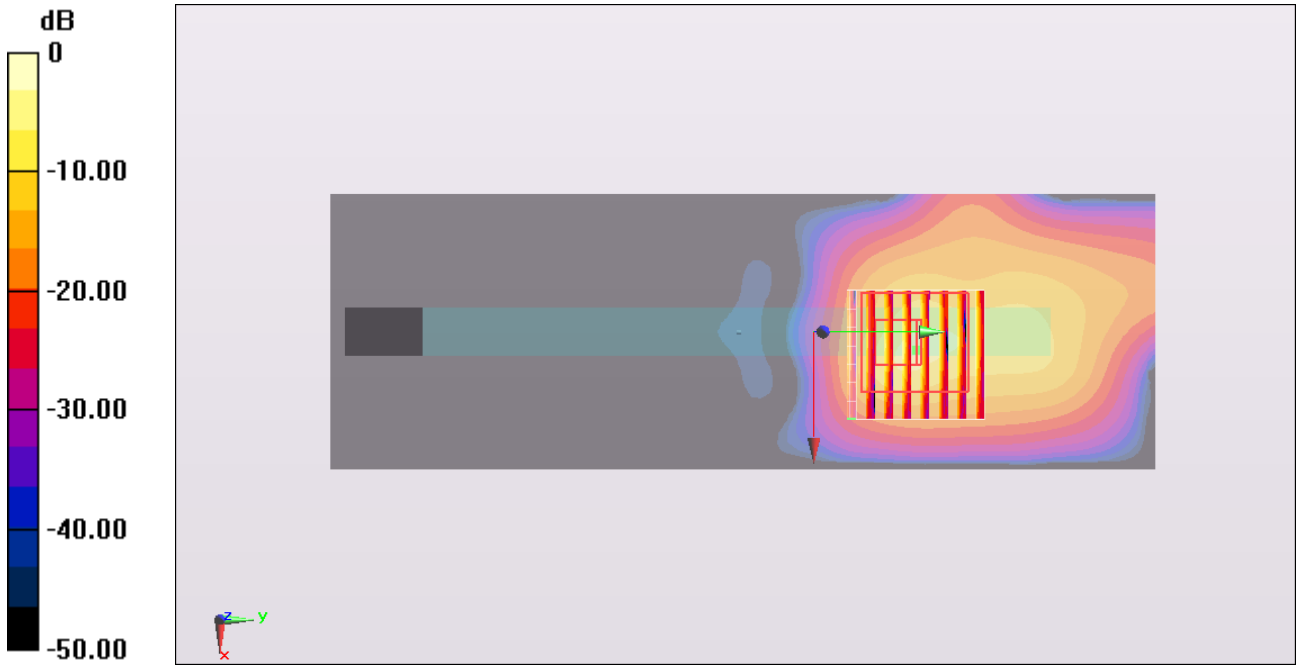
DUT: 210222

Communication System: 802.11a; Frequency: 5220 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120430 Medium parameters used: f = 5220 MHz; σ = 5.281 mho/m; ε_r = 47.487; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2011/12/23
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch44/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.670 mW/g

Ch44/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 3.236 V/m; Power Drift = -0.133 dB
Peak SAR (extrapolated) = 5.162 mW/g
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.257 mW/g
Maximum value of SAR (measured) = 2.35 mW/g



0 dB = 2.35 mW/g = 7.42 dB mW/g

#68 802.11a_Secondary Portrait_0cm_Ch44_Ant 1_2D

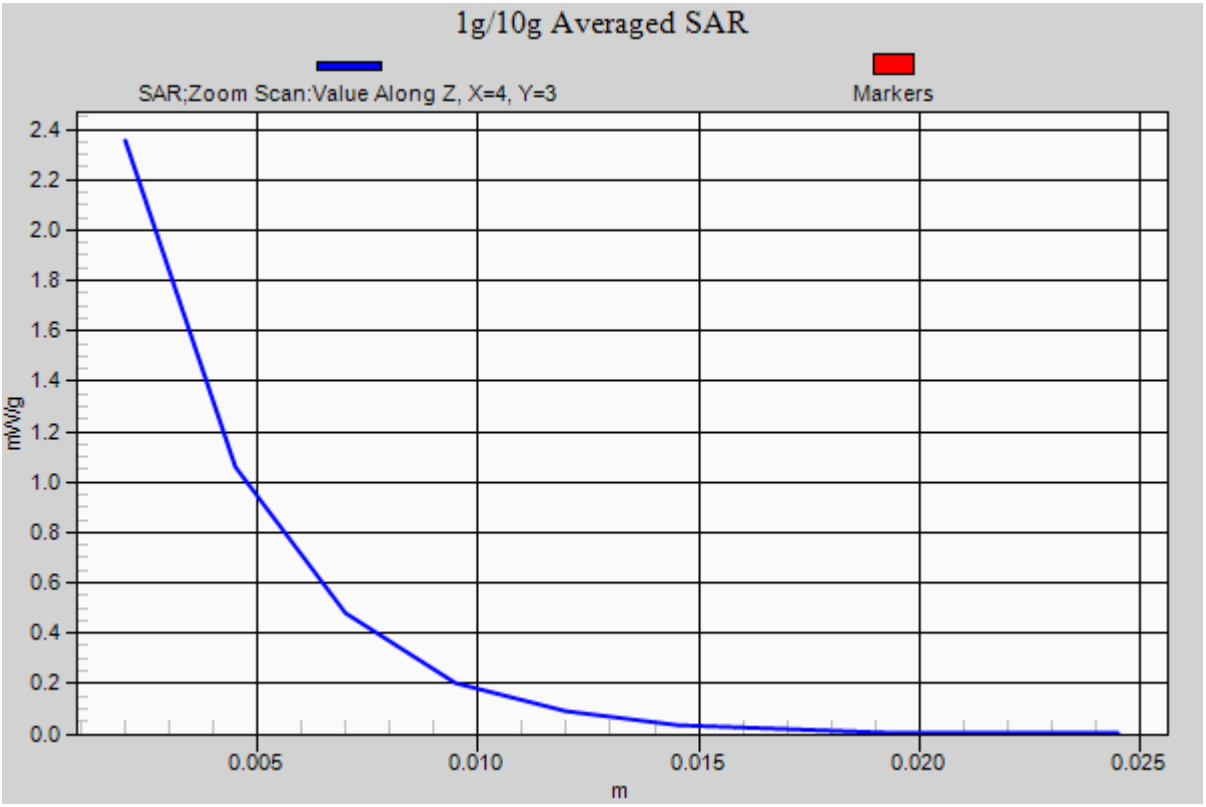
DUT: 210222

Communication System: 802.11a; Frequency: 5220 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120430 Medium parameters used : f = 5220 MHz; σ = 5.281 mho/m; ε_r = 47.487; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2011/12/23
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch44/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.670 mW/g

Ch44/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 3.236 V/m; Power Drift = -0.133 dB
Peak SAR (extrapolated) = 5.162 mW/g
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.257 mW/g
Maximum value of SAR (measured) = 2.35 mW/g



#72 802.11a_Secondary Portrait_0cm_Ch36_Ant 1

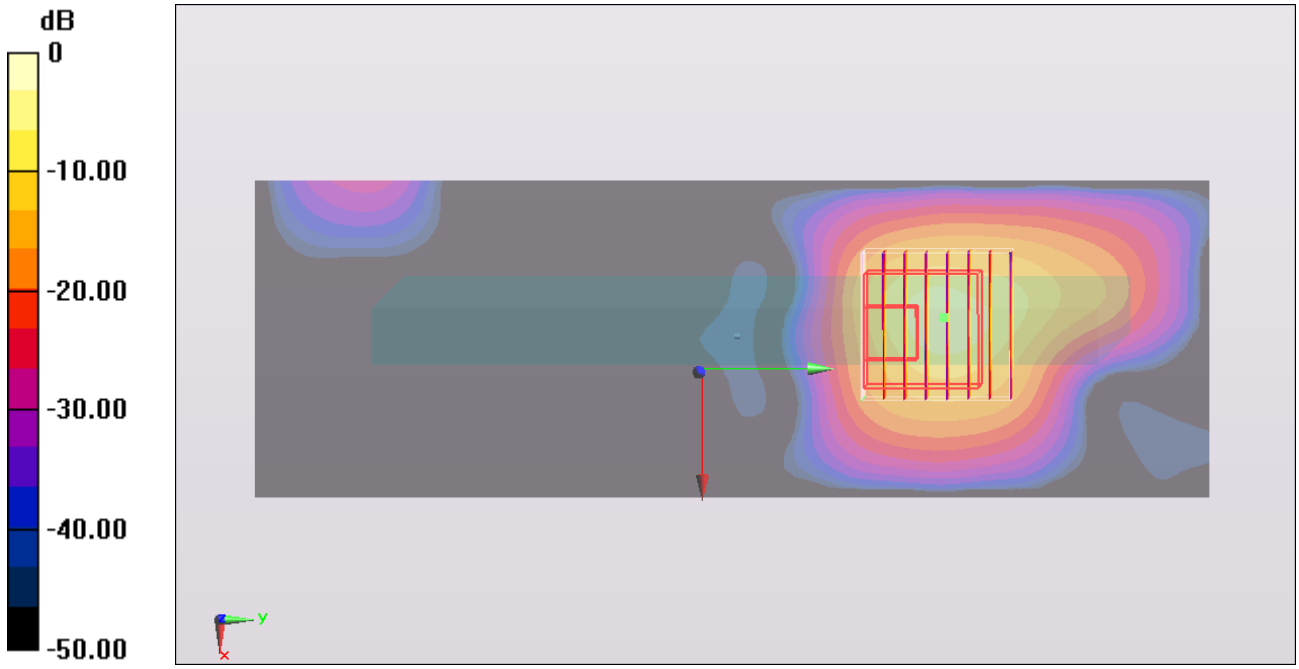
DUT: 210222

Communication System: 802.11a; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120430 Medium parameters used : f = 5180 MHz; σ = 5.232 mho/m; ε_r = 47.554; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2011/12/23
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch36/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.27 mW/g

Ch36/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.387 V/m; Power Drift = 0.171 dB
Peak SAR (extrapolated) = 6.239 mW/g
SAR(1 g) = 1 mW/g; SAR(10 g) = 0.226 mW/g
Maximum value of SAR (measured) = 3.08 mW/g



0 dB = 3.08 mW/g = 9.77 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/5/11

#122 802.11n_20M_Bottom Face_0cm_Ch44_Ant 1+2

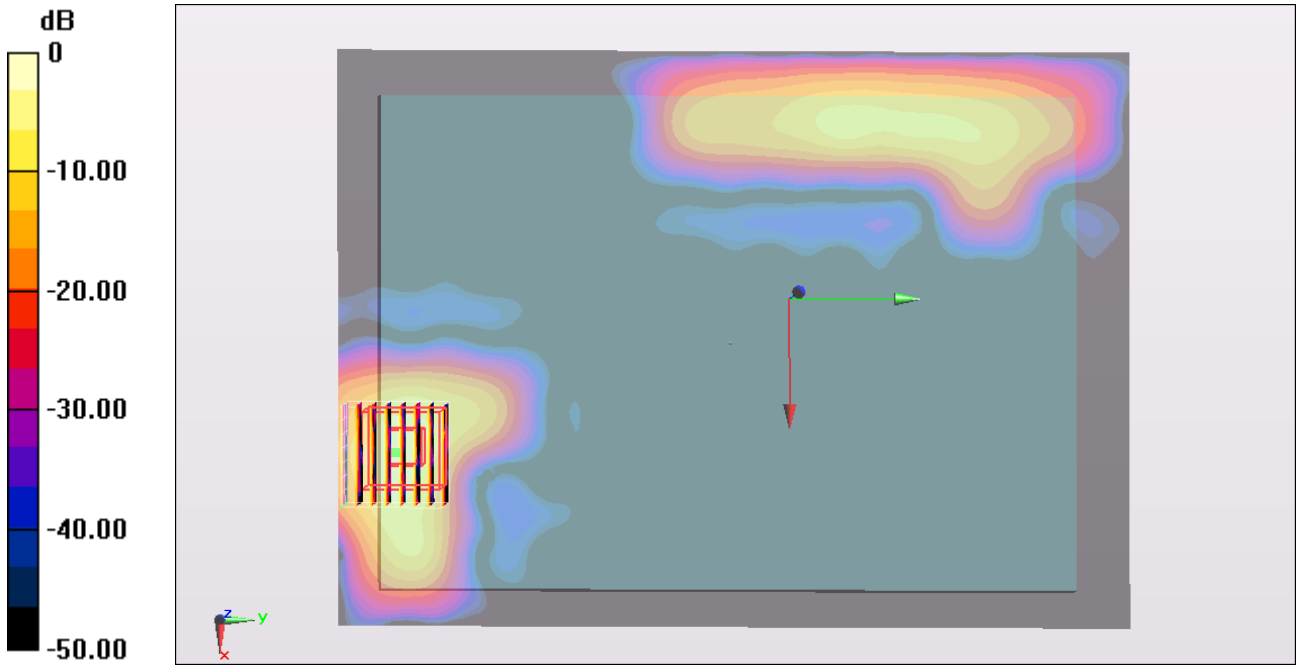
DUT: 210222

Communication System: 802.11n; Frequency: 5220 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5220 MHz; σ = 5.257 mho/m; ε_r = 47.44; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch44/Area Scan (161x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.346 mW/g

Ch44/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 1.522 mW/g
SAR(1 g) = 0.385 mW/g; SAR(10 g) = 0.116 mW/g
Maximum value of SAR (measured) = 0.784 mW/g



0 dB = 0.784 mW/g = -2.11 dB mW/g

#123 802.11n_20M_Secondary Portrait_0cm_Ch44_Ant 1+2

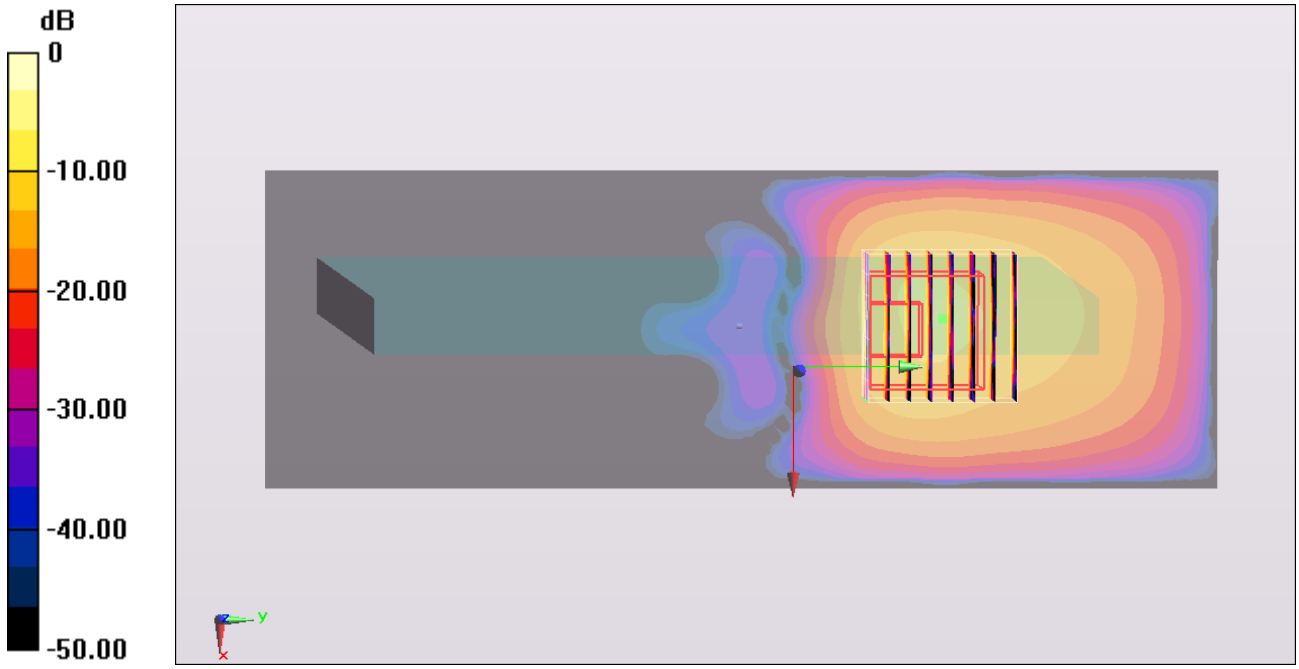
DUT: 210222

Communication System: 802.11n; Frequency: 5220 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5220 MHz; σ = 5.257 mho/m; ε_r = 47.44; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch44/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.220 mW/g

Ch44/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.867 V/m; Power Drift = 0.052 dB
Peak SAR (extrapolated) = 3.967 mW/g
SAR(1 g) = 0.817 mW/g; SAR(10 g) = 0.177 mW/g
Maximum value of SAR (measured) = 1.84 mW/g



0 dB = 1.84 mW/g = 5.30 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/5/11

#124 802.11n_20M_Primary Portrait_0cm_Ch44_Ant 1+2

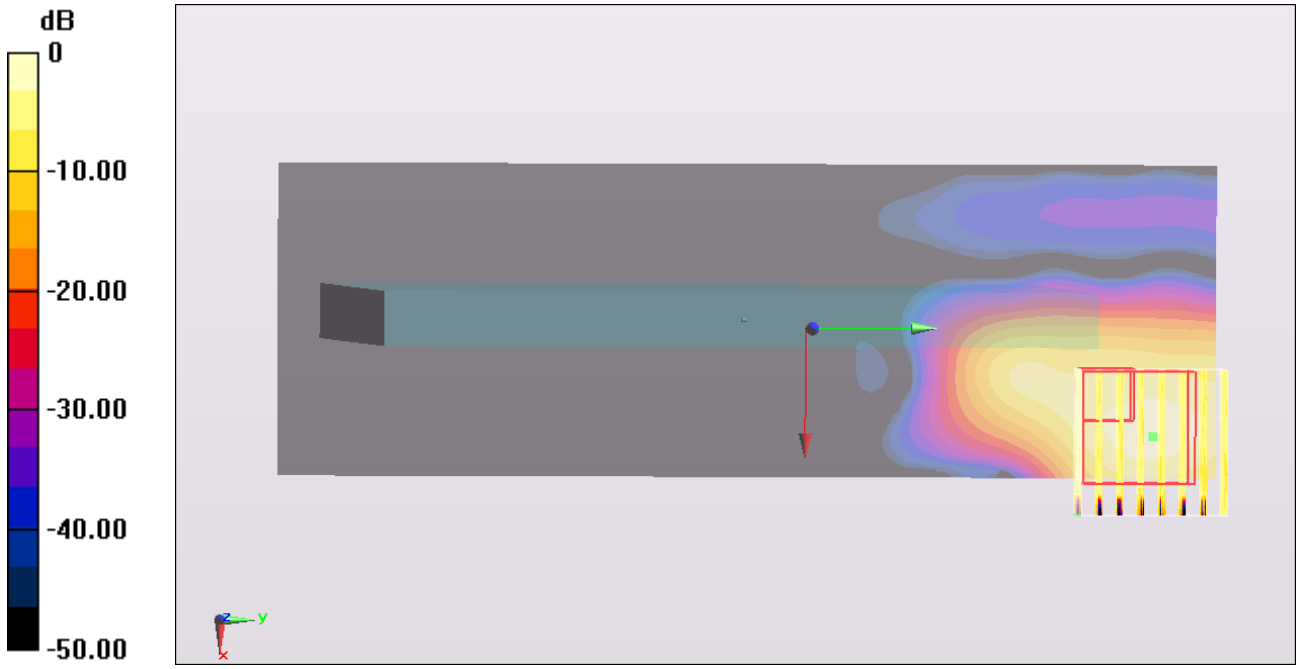
DUT: 210222

Communication System: 802.11n; Frequency: 5220 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5220 MHz; σ = 5.257 mho/m; ε_r = 47.44; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch44/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.0673 mW/g

Ch44/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0 V/m; Power Drift = 0.086 dB
Peak SAR (extrapolated) = 0.134 mW/g
SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.032 mW/g
Maximum value of SAR (measured) = 0.0888 mW/g



0 dB = 0.0888 mW/g = -21.03 dB mW/g

#125 802.11n_20M_Secondary Landscape_0cm_Ch44_Ant 1+2

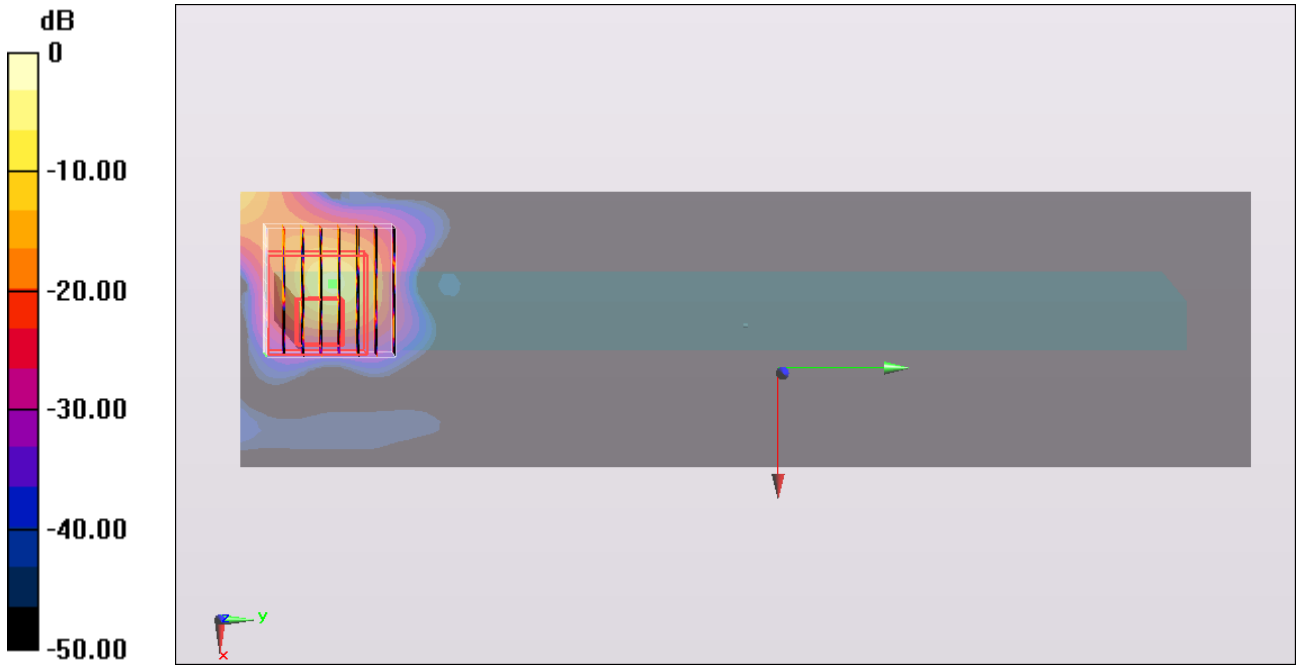
DUT: 210222

Communication System: 802.11n; Frequency: 5220 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5220 MHz; σ = 5.257 mho/m; ε_r = 47.44; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch44/Area Scan (61x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.0145 mW/g

Ch44/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.294 mW/g
SAR(1 g) = 0.029 mW/g; SAR(10 g) = 0.010 mW/g
Maximum value of SAR (measured) = 0.0514 mW/g



0 dB = 0.0514 mW/g = -25.78 dB mW/g

#126 802.11n_20M_Primary Landscape_0cm_Ch44_Ant 1+2

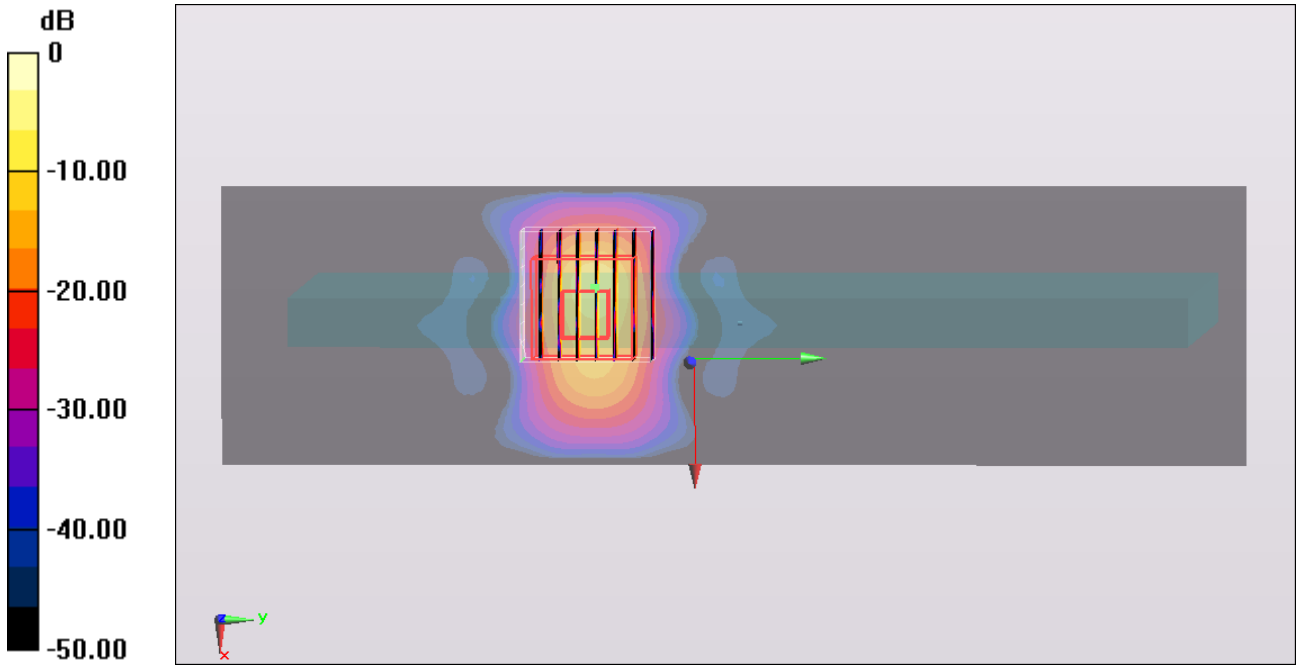
DUT: 210222

Communication System: 802.11n; Frequency: 5220 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5220 MHz; σ = 5.257 mho/m; ε_r = 47.44; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch44/Area Scan (61x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.183 mW/g

Ch44/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.047 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.577 mW/g
SAR(1 g) = 0.402 mW/g; SAR(10 g) = 0.096 mW/g
Maximum value of SAR (measured) = 0.850 mW/g



0 dB = 0.850 mW/g = -1.41 dB mW/g

#136 802.11n_20M_Secondary Portrait_0cm_Ch36_Ant 1+2

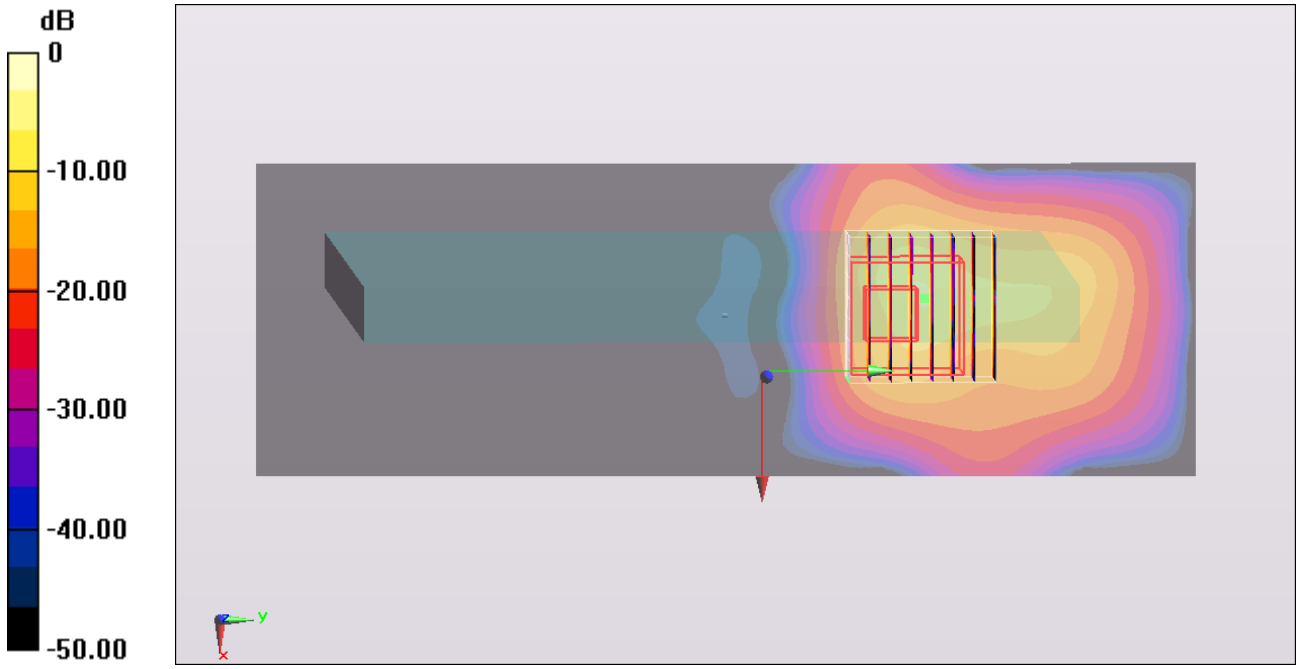
DUT: 210222

Communication System: 802.11n; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5180 MHz; σ = 5.208 mho/m; ε_r = 47.501; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch36/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.586 mW/g

Ch36/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.710 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 5.097 mW/g
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.236 mW/g
Maximum value of SAR (measured) = 2.55 mW/g



0 dB = 2.55 mW/g = 8.13 dB mW/g

#136 802.11n_20M_Secondary Portrait_0cm_Ch36_Ant 1+2 _2D

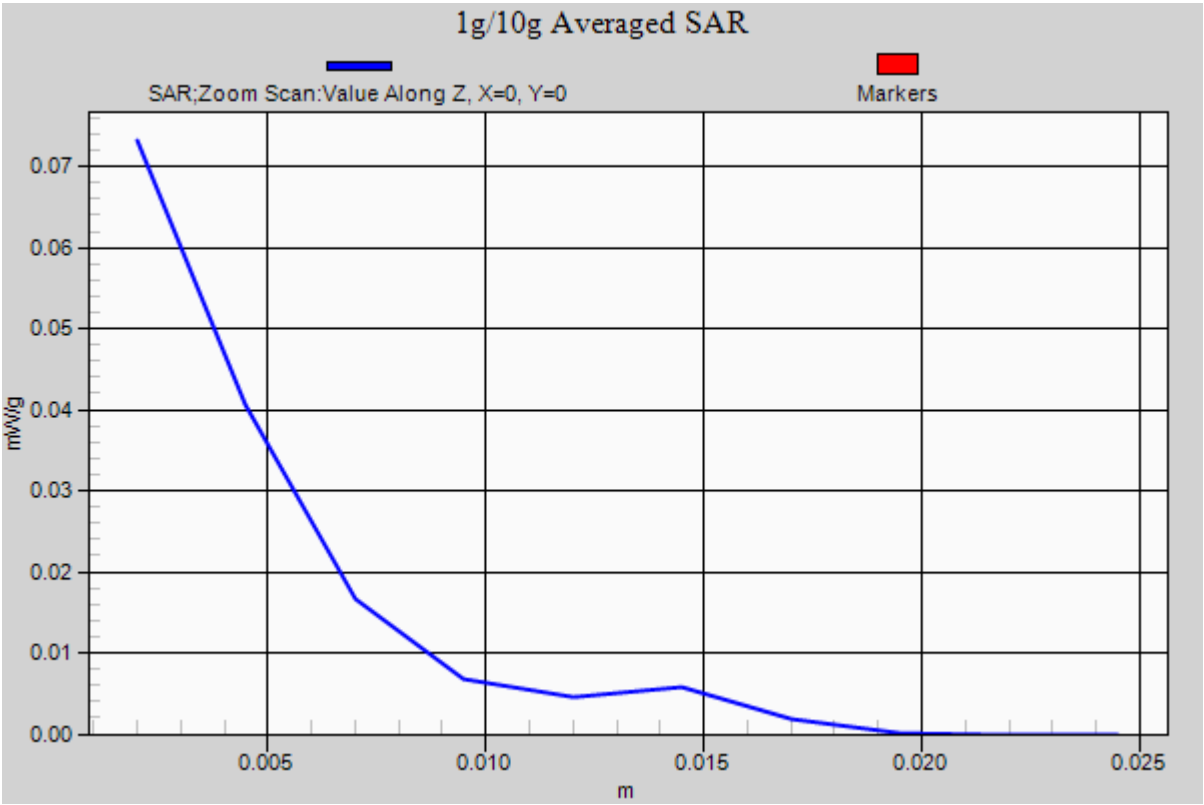
DUT: 210222

Communication System: 802.11n; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5180 MHz; σ = 5.208 mho/m; ε_r = 47.501; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(4.22, 4.22, 4.22); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch36/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.586 mW/g

Ch36/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.710 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 5.097 mW/g
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.236 mW/g
Maximum value of SAR (measured) = 2.55 mW/g



#146 802.11a_Bottom Face_0cm_Ch157_Ant 1

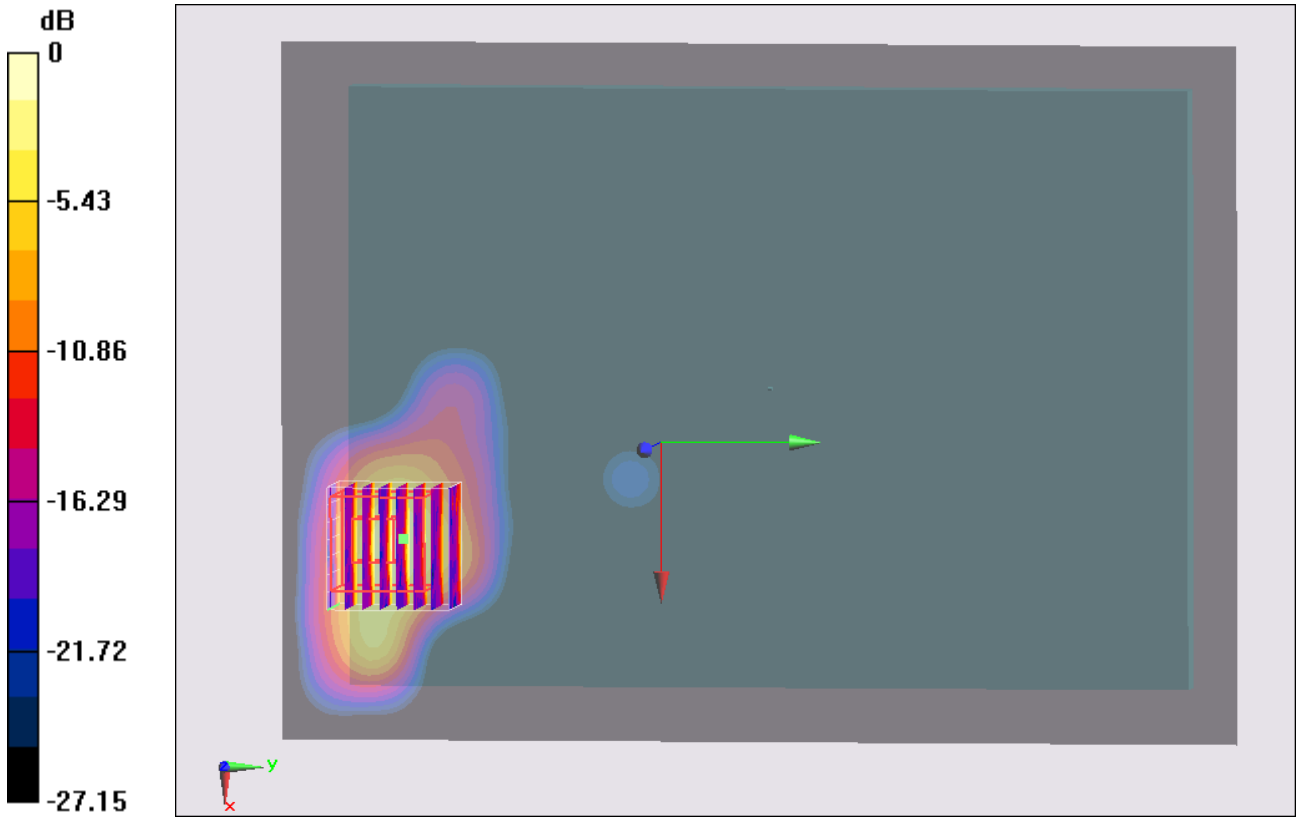
DUT: 210222

Communication System: 802.11a; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120524 Medium parameters used: f = 5785 MHz; σ = 6.131 mho/m; ε_r = 46.556; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(4.02, 4.02, 4.02); Calibrated: 2011/11/16;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch157/Area Scan (161x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.572 mW/g

Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.652 V/m; Power Drift = 0.146 dB
Peak SAR (extrapolated) = 1.416 mW/g
SAR(1 g) = 0.387 mW/g; SAR(10 g) = 0.137 mW/g
Maximum value of SAR (measured) = 0.807 mW/g



0 dB = 0.807 mW/g = -1.86 dB mW/g

#147 802.11a_Secondary Portrait_0cm_Ch157_Ant 1

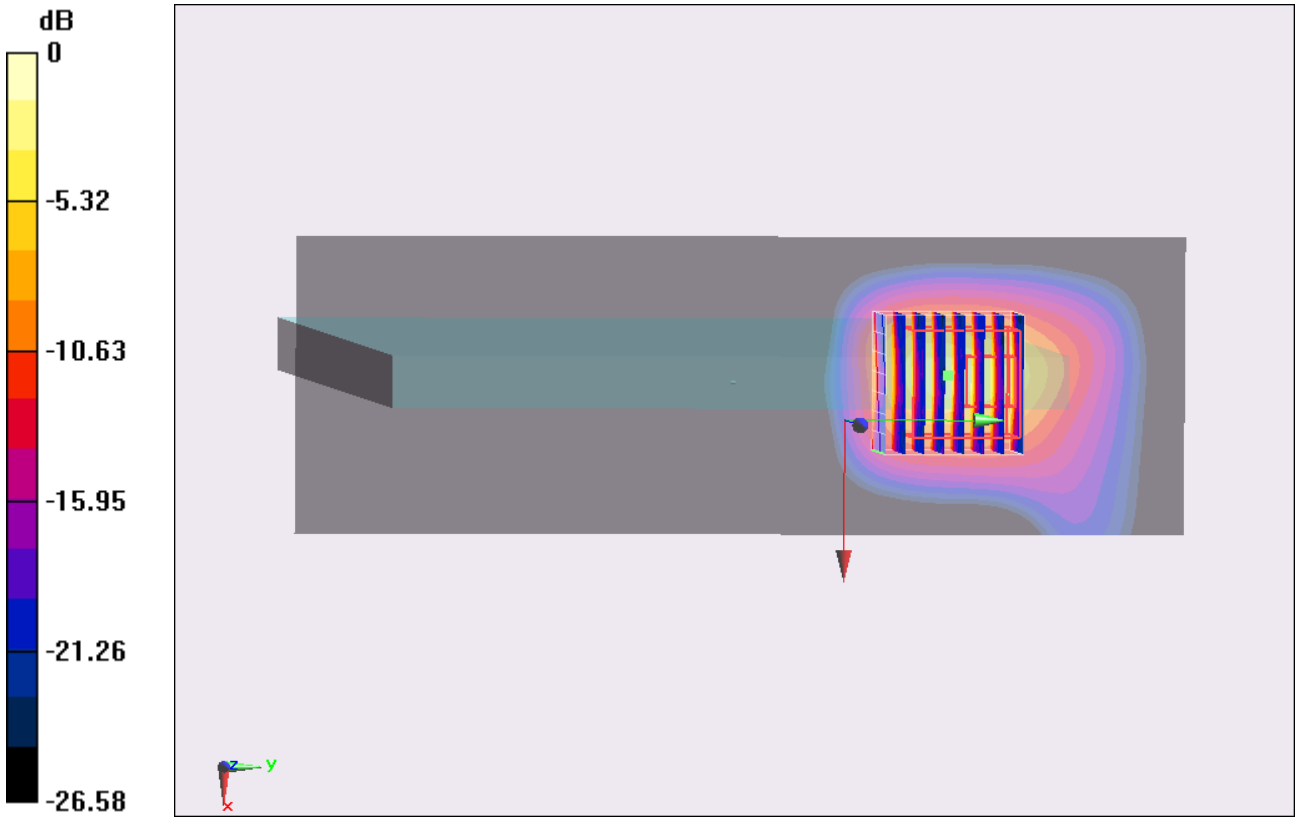
DUT: 210222

Communication System: 802.11a; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120524 Medium parameters used: f = 5785 MHz; σ = 6.131 mho/m; ε_r = 46.556; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(4.02, 4.02, 4.02); Calibrated: 2011/11/16;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch157/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.944 mW/g

Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 3.776 V/m; Power Drift = 0.150 dB
Peak SAR (extrapolated) = 3.185 mW/g
SAR(1 g) = 0.750 mW/g; SAR(10 g) = 0.197 mW/g
Maximum value of SAR (measured) = 1.58 mW/g



0 dB = 1.58 mW/g = 3.97 dB mW/g

#147 802.11a_Secondary Portrait_0cm_Ch157_Ant 1_2D

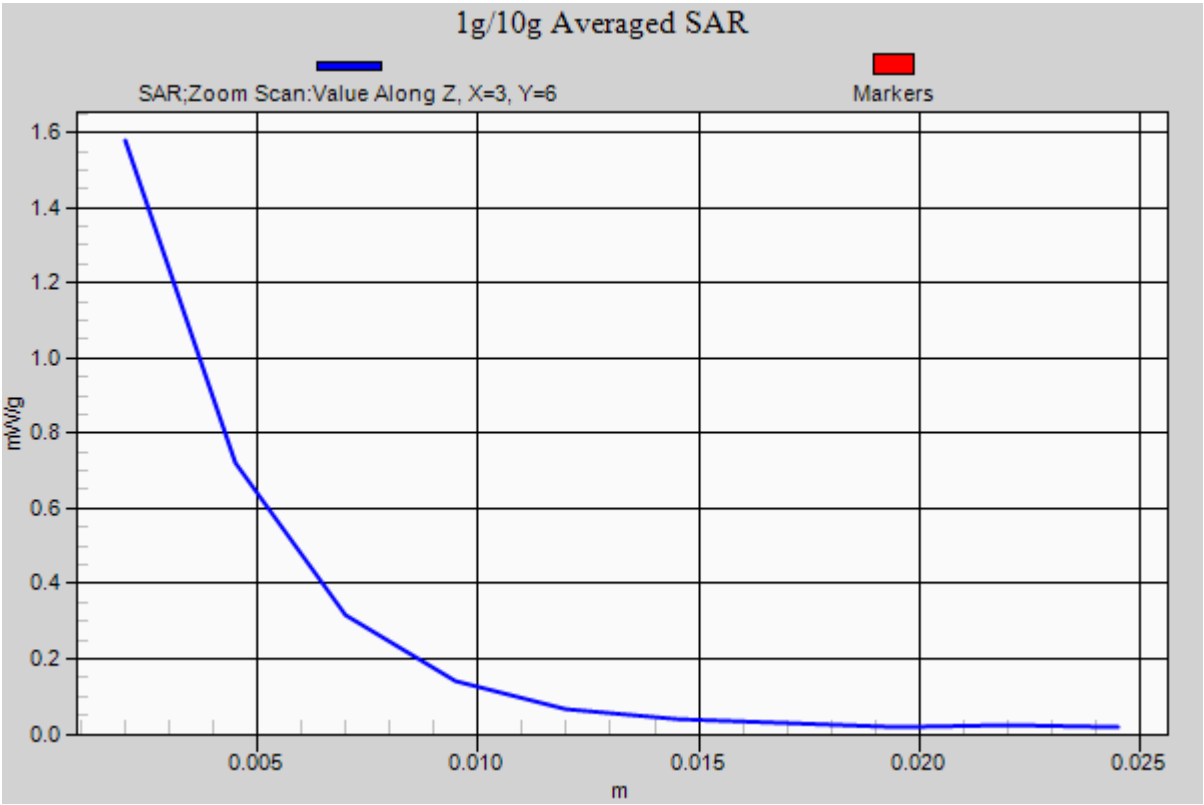
DUT: 210222

Communication System: 802.11a; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120524 Medium parameters used : f = 5785 MHz; σ = 6.131 mho/m; ε_r = 46.556; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(4.02, 4.02, 4.02); Calibrated: 2011/11/16;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch157/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.944 mW/g

Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 3.776 V/m; Power Drift = 0.150 dB
Peak SAR (extrapolated) = 3.185 mW/g
SAR(1 g) = 0.750 mW/g; SAR(10 g) = 0.197 mW/g
Maximum value of SAR (measured) = 1.58 mW/g



#145 802.11a_Secondary Landscape_0cm_Ch157_Ant 1

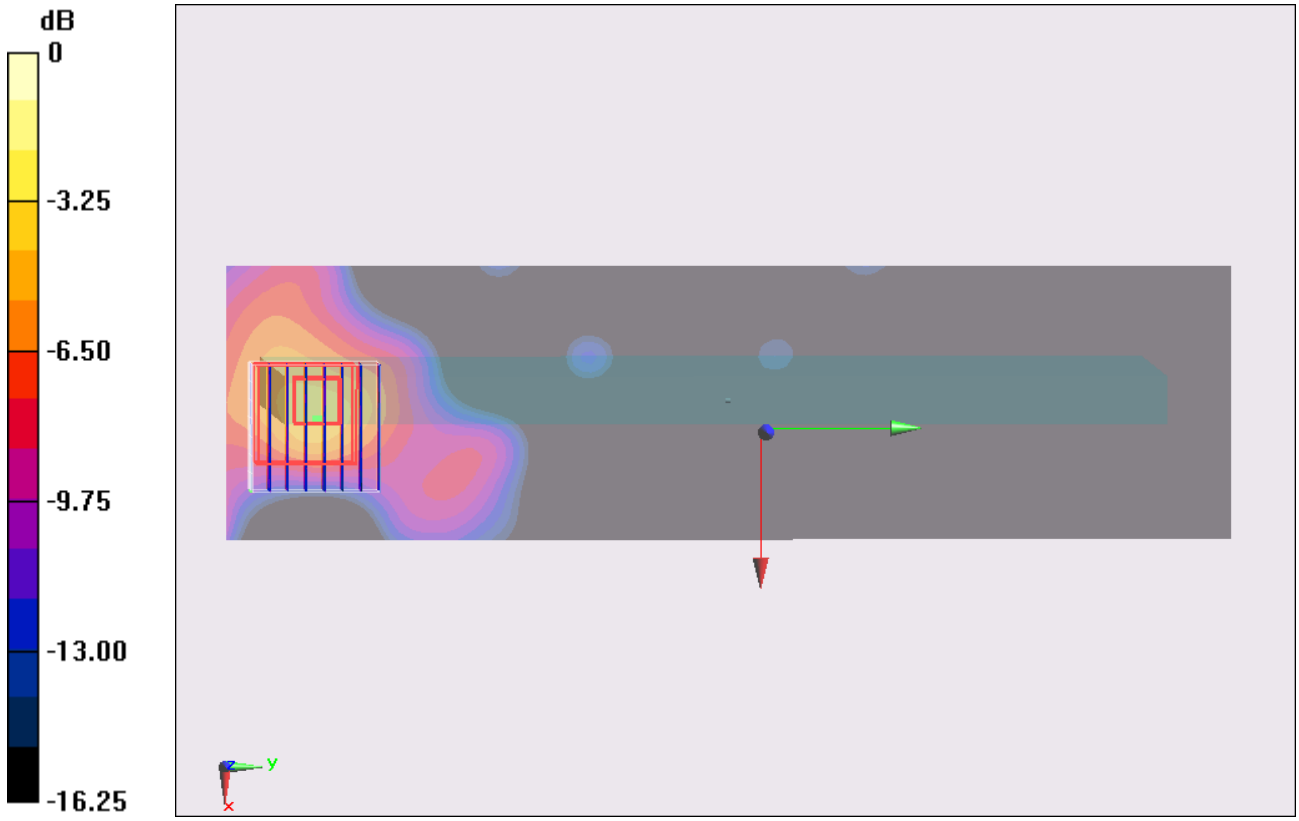
DUT: 210222

Communication System: 802.11a; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120524 Medium parameters used : f = 5785 MHz; σ = 6.131 mho/m; ε_r = 46.556; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃； Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3819; ConvF(4.02, 4.02, 4.02); Calibrated: 2011/11/16;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn910; Calibrated: 2011/12/7
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch157/Area Scan (61x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.128 mW/g

Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 3.369 V/m; Power Drift = -0.144 dB
Peak SAR (extrapolated) = 0.603 mW/g
SAR(1 g) = 0.154 mW/g; SAR(10 g) = 0.064 mW/g
Maximum value of SAR (measured) = 0.286 mW/g



0 dB = 0.286 mW/g = -10.87 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/5/11

#129 802.11n_20M_Bottom Face_0cm_Ch161_Ant 1+2

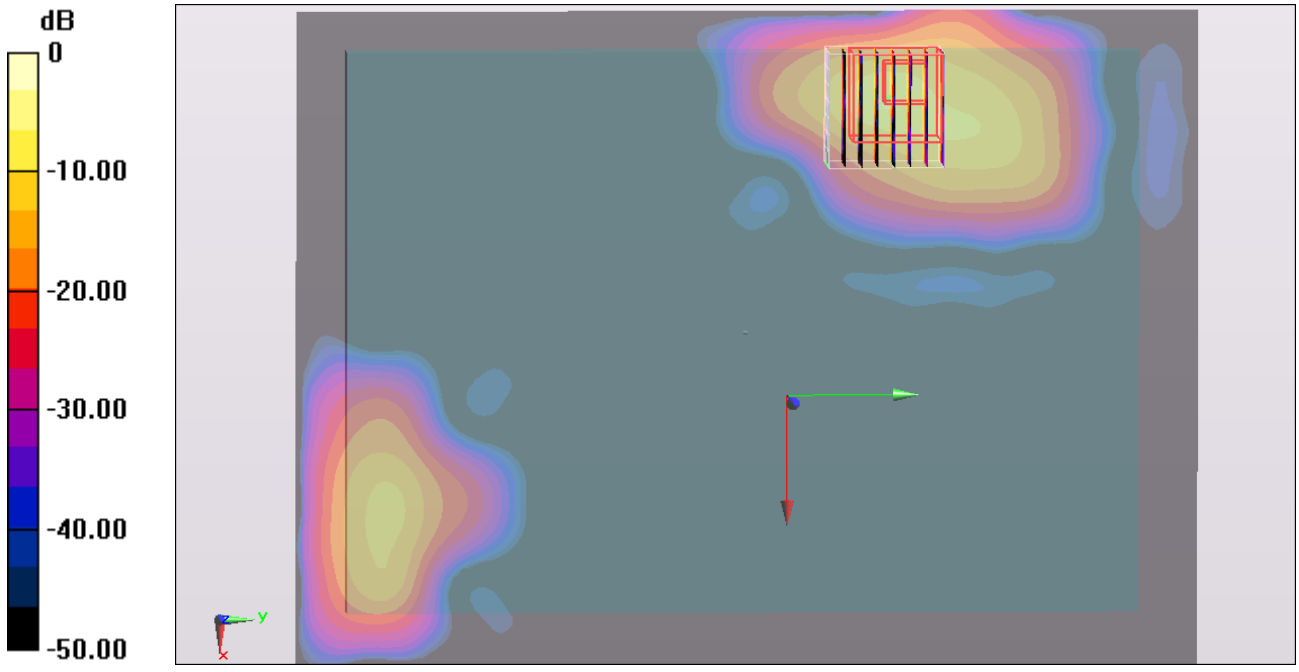
DUT: 210222

Communication System: 802.11n; Frequency: 5805 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5805 MHz; σ = 6.14 mho/m; ε_r = 46.452; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(3.78, 3.78, 3.78); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch161/Area Scan (161x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.580 mW/g

Ch161/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0 V/m; Power Drift = 0.132 dB
Peak SAR (extrapolated) = 6.140 mW/g
SAR(1 g) = 0.999 mW/g; SAR(10 g) = 0.213 mW/g
Maximum value of SAR (measured) = 2.55 mW/g



0 dB = 2.55 mW/g = 8.13 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/5/11

#130 802.11n_20M_Secondary Portrait_0cm_Ch161_Ant 1+2

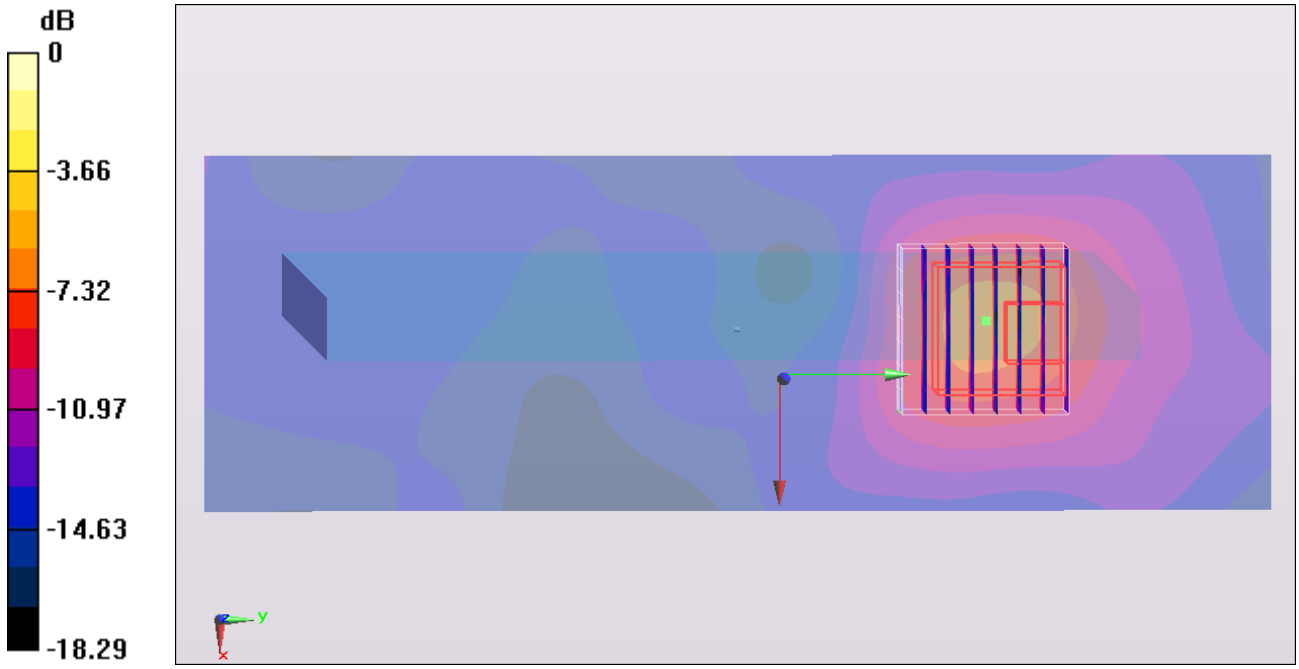
DUT: 210222

Communication System: 802.11n; Frequency: 5805 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5805 MHz; σ = 6.14 mho/m; ε_r = 46.452; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(3.78, 3.78, 3.78); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch161/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.194 mW/g

Ch161/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 3.463 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 1.591 mW/g
SAR(1 g) = 0.336 mW/g; SAR(10 g) = 0.112 mW/g
Maximum value of SAR (measured) = 0.808 mW/g



0 dB = 0.808 mW/g = -1.85 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/5/11

#131 802.11n_20M_Primary Portrait_0cm_Ch161_Ant 1+2

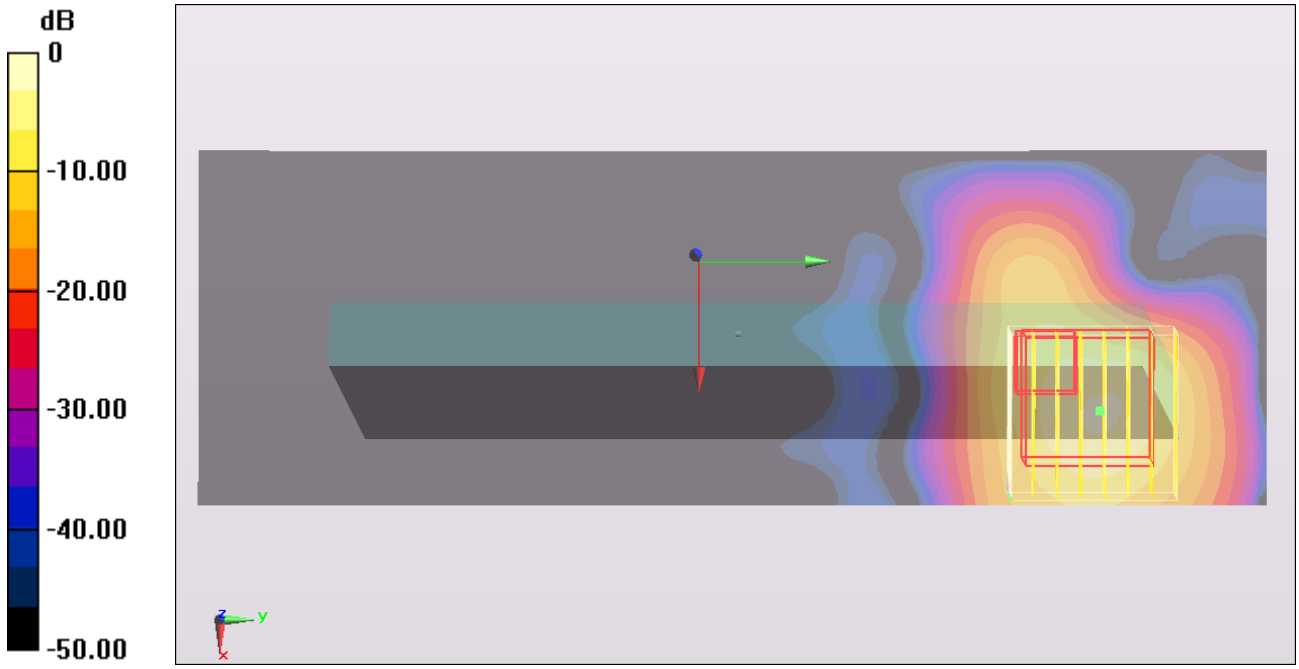
DUT: 210222

Communication System: 802.11n; Frequency: 5805 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5805 MHz; σ = 6.14 mho/m; ε_r = 46.452; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(3.78, 3.78, 3.78); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch161/Area Scan (61x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.0922 mW/g

Ch161/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.417 mW/g
SAR(1 g) = 0.073 mW/g; SAR(10 g) = 0.044 mW/g
Maximum value of SAR (measured) = 0.176 mW/g



0 dB = 0.176 mW/g = -15.09 dB mW/g

#132 802.11n_20M_Secondary Landscape_0cm_Ch161_Ant 1+2

DUT: 210222

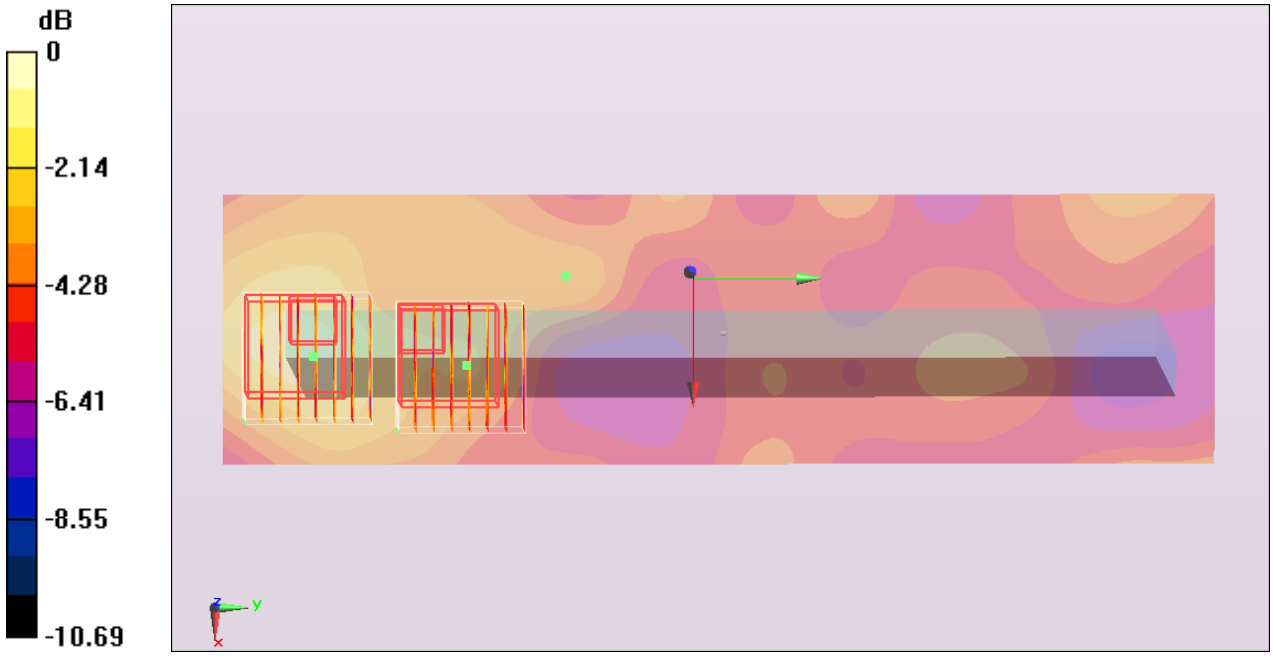
Communication System: 802.11n; Frequency: 5805 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5805 MHz; σ = 6.14 mho/m; ε_r = 46.452; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(3.78, 3.78, 3.78); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch161/Area Scan (61x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.108 mW/g

Ch161/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 3.058 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.326 mW/g
SAR(1 g) = 0.108 mW/g; SAR(10 g) = 0.069 mW/g
Maximum value of SAR (measured) = 0.170 mW/g

Ch161/Zoom Scan (8x8x10)/Cube 1: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 3.058 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.240 mW/g
SAR(1 g) = 0.079 mW/g; SAR(10 g) = 0.054 mW/g
Maximum value of SAR (measured) = 0.132 mW/g



0 dB = 0.132 mW/g = -17.59 dB mW/g

#133 802.11n_20M_Primary Landscape_0cm_Ch161_Ant 1+2

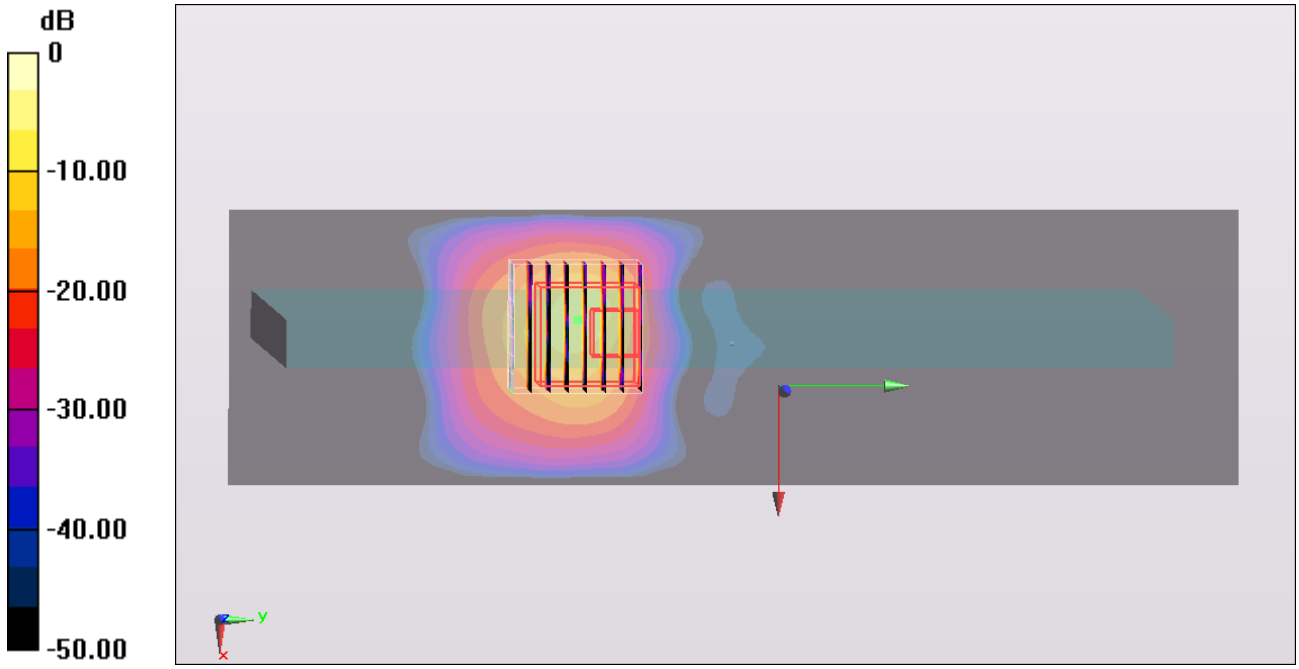
DUT: 210222

Communication System: 802.11n; Frequency: 5805 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used : f = 5805 MHz; σ = 6.14 mho/m; ε_r = 46.452; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(3.78, 3.78, 3.78); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch161/Area Scan (61x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.555 mW/g

Ch161/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.962 V/m; Power Drift = 0.177 dB
Peak SAR (extrapolated) = 5.065 mW/g
SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.233 mW/g
Maximum value of SAR (measured) = 2.69 mW/g



0 dB = 2.69 mW/g = 8.60 dB mW/g

#134 802.11n_20M_Bottom Face_0cm_Ch149_Ant 1+2

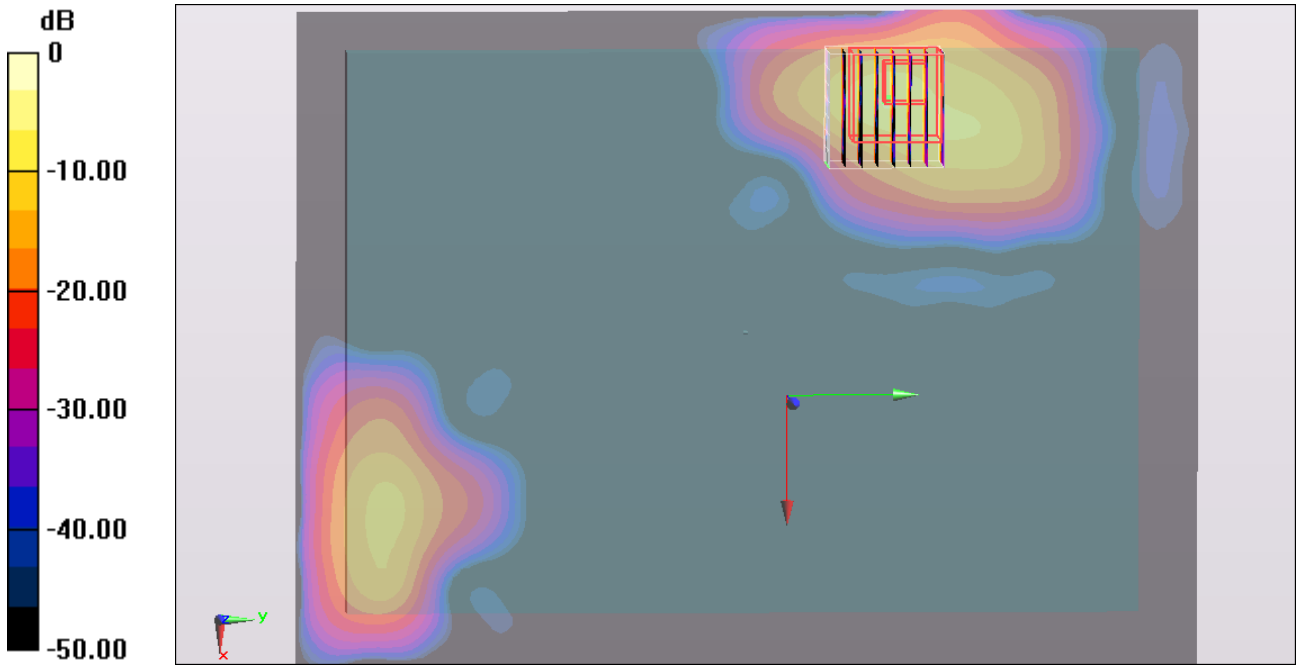
DUT: 210222

Communication System: 802.11n; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5745 MHz; σ = 6.069 mho/m; ε_r = 46.672; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(3.78, 3.78, 3.78); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch149/Area Scan (81x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.435 mW/g

Ch149/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 7.267 mW/g
SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.236 mW/g
Maximum value of SAR (measured) = 3.19 mW/g



0 dB = 3.19 mW/g = 10.08 dB mW/g

#135 802.11n_20M_Primary Landscape_0cm_Ch149_Ant 1+2

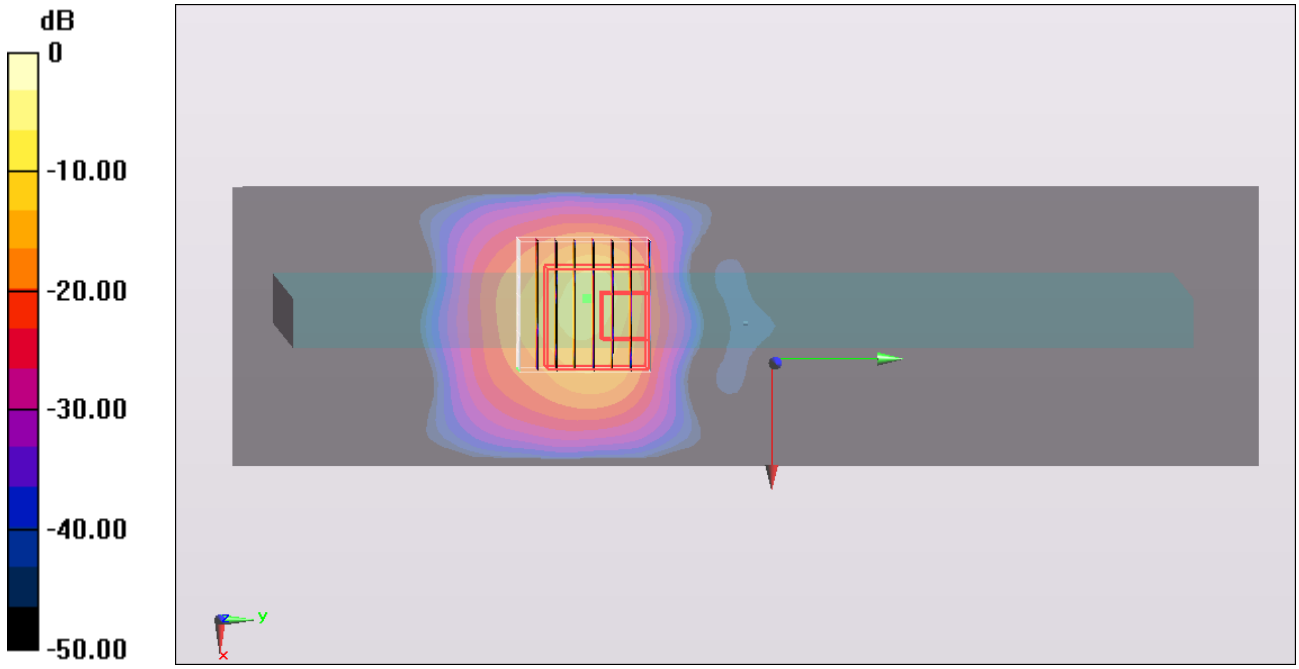
DUT: 210222

Communication System: 802.11n; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5745 MHz; σ = 6.069 mho/m; ε_r = 46.672; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(3.78, 3.78, 3.78); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch149/Area Scan (61x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.512 mW/g

Ch149/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.250 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 5.474 mW/g
SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.268 mW/g
Maximum value of SAR (measured) = 2.78 mW/g



0 dB = 2.78 mW/g = 8.88 dB mW/g

#135 802.11n_20M_Primary Landscape_0cm_Ch149_Ant 1+2_2D

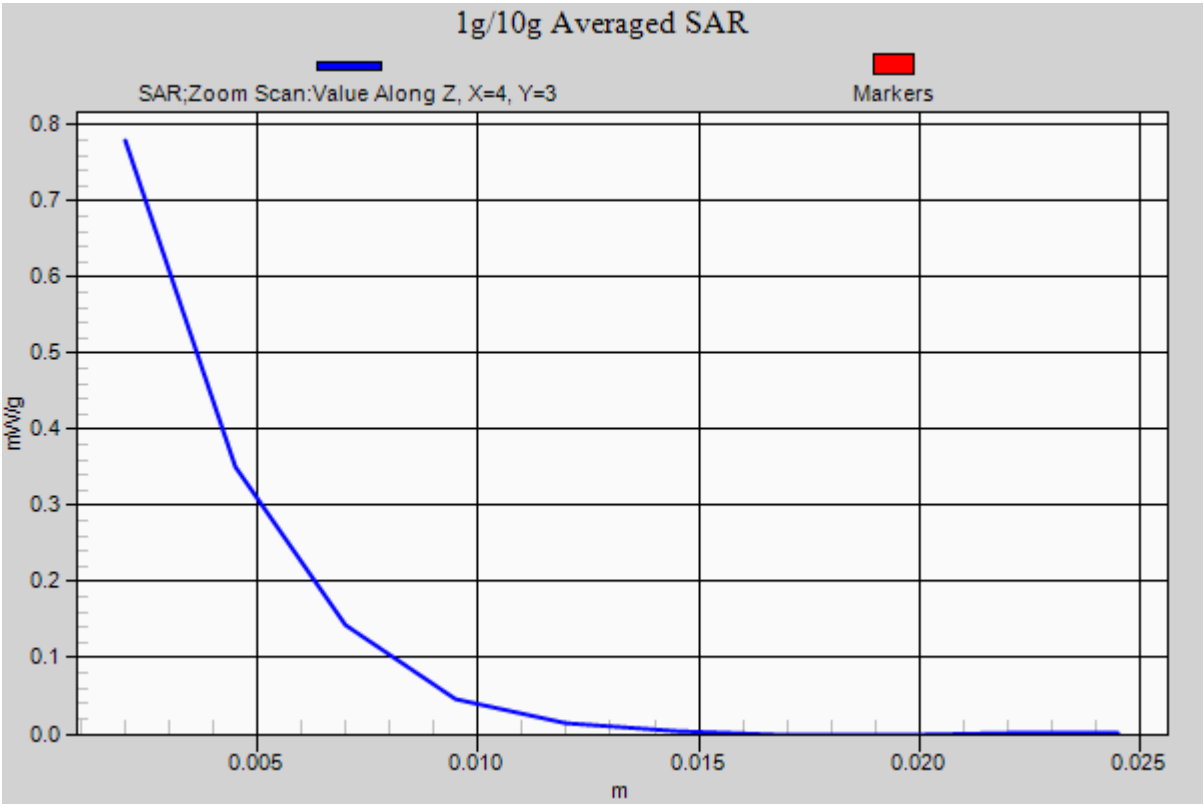
DUT: 210222

Communication System: 802.11n; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium: MSL_5G_120511 Medium parameters used: f = 5745 MHz; σ = 6.069 mho/m; ε_r = 46.672; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3792; ConvF(3.78, 3.78, 3.78); Calibrated: 2011/6/20;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2012/5/3
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP1127
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Ch149/Area Scan (61x221x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.512 mW/g

Ch149/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.250 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 5.474 mW/g
SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.268 mW/g
Maximum value of SAR (measured) = 2.78 mW/g



Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client Sporton (Auden)

Certificate No: D2450V2-736_Jul11

CALIBRATION CERTIFICATE

Object: D2450V2 - SN: 736

Calibration procedure(s): QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: July 25, 2011

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 25, 2011

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
Accreditation No.: SCS 108
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.9 ± 6 %	1.85 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.9 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**54.8 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.44 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**25.6 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.7 ± 6 %	2.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**52.3 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.18 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**24.5 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.4 Ω + 1.5 jΩ
Return Loss	- 27.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.8 Ω + 2.8 jΩ
Return Loss	- 30.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.159 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	August 26, 2003

Date: 25.07.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 736

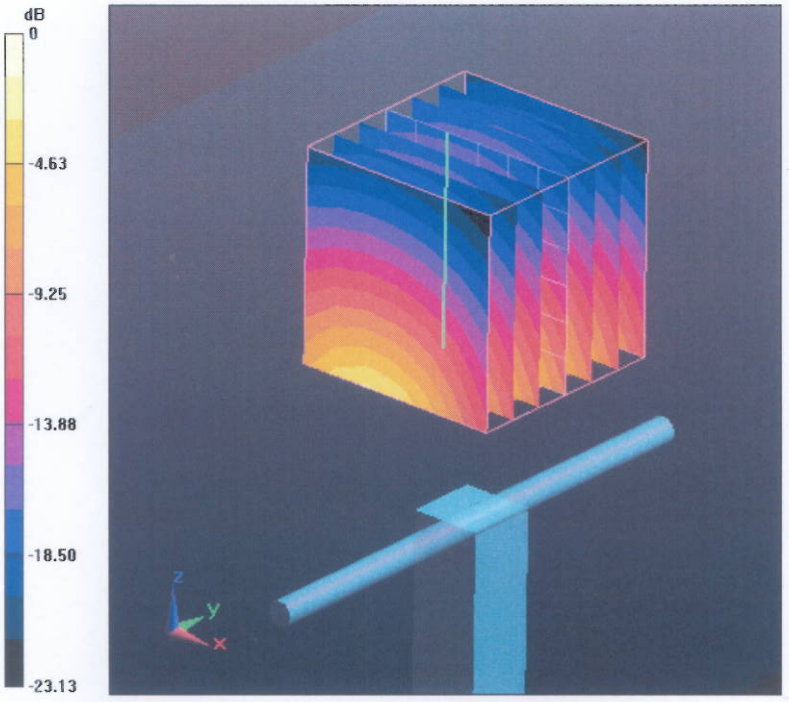
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.85 mho/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.095 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 28.615 W/kg
SAR(1 g) = 13.9 mW/g; SAR(10 g) = 6.44 mW/g
Maximum value of SAR (measured) = 18.121 mW/g



0 dB = 18.120mW/g

Impedance Measurement Plot for Head TSL