Specific Absorption Rate (SAR) Test Report

for

NETGEAR, INC.

on the

RangeMax™ Dual Band Wireless-N USB Adapter

Report No.	:	FA810917
Trade Name	:	NETGEAR
Model Name	:	WNDA3100
FCC ID	:	PY307300073
Date of Testing	:	Jan. 09~10, 2008
Date of Report	:	Jan. 11, 2008
Date of Review	:	Jan. 11, 2008

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- Report Version: Rev. 01

SPORTON International Inc.

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1. Statement of Compliance

The Specific Absorption Rate (SAR) maximum result found during testing for the NETGEAR, INC. RangeMax™ Dual Band Wireless-N USB Adapter NETGEAR WNDA3100 on the 2.4GHz band and 5GHz band body SAR are as follows (with expanded uncertainty 21.9% for 2.4GHz Band and 25.9% for 5GHz Band):

WLAN 2400~2483.5MHz Body SAR (W/kg)	WLAN 5150~5250MHz Body SAR (W/kg)	WLAN 5725~5850MHz Body SAR (W/kg)
0.974	**1.09**	**1.56**

They are in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1999 and had been tested in accordance with the measurement methods and procedures specified in OET Bulletin 65 Supplement C (Edition 01-01).

Approved by

Roy Wu
Manager

2. Administration Data

2.1 Testing Laboratory

Company Name : Sporton International Inc.
Department : Antenna Design/SAR
Address : No.52, Hwa-Ya 1st RD., Hwa Ya Technology Park, Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
Telephone Number : 886-3-327-3456
Fax Number : 886-3-328-4978

2.2 Detail of Applicant

Company Name : NETGEAR, INC.
Address : 4500 GREAT AMERICA PARKWAY, SANTA CLARA, CA 95054 U.S.A.

2.3 Detail of Manufacturer

Company Name : Delta Networks, Inc.
Address : 252 SAN YING RD., KUEI SAN HSIANG, TAOYUAN HSIEN, 333 TAIWAN

2.4 Application Detail

Date of reception of application: Jan. 09, 2008
Start of test : Jan. 09, 2008
End of test : Jan. 10, 2008

3. General Information

3.1 Description of Device Under Test (DUT)

Product Feature & Specification	
DUT Type :	RangeMax™ Dual Band Wireless-N USB Adapter
Trade Name :	NETGEAR
Model Name :	WNDA3100
FCC ID :	PY307300073
Frequency Range :	802.11b/g/n : 2400 MHz ~ 2483.5 MHz 802.11a/n : 5150 MHz ~ 5250 MHz (Band I) 5725 MHz ~ 5850 MHz (Band III)
Channel Spacing :	5 MHz in 2.4 GHz band 20 MHz in 5 GHz band
Maximum Output Power to Antenna :	**2400 MHz ~ 2483.5 MHz** Ant-0 : 802.11b : 22.68 dBm 802.11g : 22.81 dBm Ant-1 : 802.11b : 21.50 dBm 802.11g : 22.56 dBm Ant-0 / Ant-1 : 802.11n (BW 20 MHz) : 25.45 dBm 802.11n (BW 40 MHz) : 24.04 dBm **5150 MHz ~ 5250 MHz** Ant-0 : 802.11a : 16.98 dBm Ant-1 : 802.11a : 13.36 dBm Ant-0 / Ant-1 : 802.11n (BW 20 MHz) : 16.97 dBm 802.11n (BW 40 MHz) : 16.91 dBm **5725 MHz ~ 5850 MHz** Ant-0 : 802.11a : 24.51 dBm Ant-1: 802.11a : 24.26 dBm Ant-0 / Ant-1 : 802.11n (BW 20 MHz) : 27.55 dBm 802.11n (BW 40 MHz) : 27.81 dBm
Type of Antenna Connector	N/A
Antenna Type :	Printed Antenna
Antenna Gain :	Ant-0 : 2.83 dBi (for 2.4GHz), 4.25 dBi (for 5GHz) Ant-1 : 3.73 dBi (for 2.4GHz), 4.99 dBi (for 5GHz)
Type of Modulation :	802.11a : OFDM 802.11b : DSSS 802.11g : OFDM 802.11n : OFDM
DUT Stage :	Identical Prototype
Application Type :	Certification

Remark: Ant-0 and Ant-1 can transmit simultaneously for 802.11n.

3.2 Product Photo

Please refer to Appendix D

3.3 Applied Standards

The Specific Absorption Rate (SAR) testing specification, method and procedure for this RangeMax™ Dual Band Wireless-N USB Adapter is in accordance with the following standards:

47 CFR Part 2 (2.1093),
IEEE C95.1-1999,
IEEE C95.3-2002,
IEEE P1528 -2003, and
OET Bulletin 65 Supplement C (Edition 01-01)

3.4 Device Category and SAR Limits

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user.

Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

3.5 Test Conditions

3.5.1 Ambient Condition

Item	MSL_2450	MSL_5200	MSL_5800
Ambient Temperature (^{o}C)	20 ~ 24℃		
Tissue simulating liquid temperature (^{o}C)	21.4℃	21.5℃	21.3℃
Humidity (%)	< 60%		

3.5.2 Test Configuration

Engineering testing software installed on the EUT can provide continuous transmitting RF signal. This RF signal utilized in SAR measurement has almost 100% duty cycle and its crest factor is 1. The measurements were performed on the lowest, middle, and highest channel.

However, measurements were performed only on the middle channel if the SAR is below 3 dB of limit.

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 FCC 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:

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

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

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

$$\textbf{SAR} = C\frac{\delta T}{\delta t}$$

, where C is the specific head capacity, δT is the temperature rise and δt the exposure duration,

or related to the electrical field in the tissue by

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

, 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 Setup

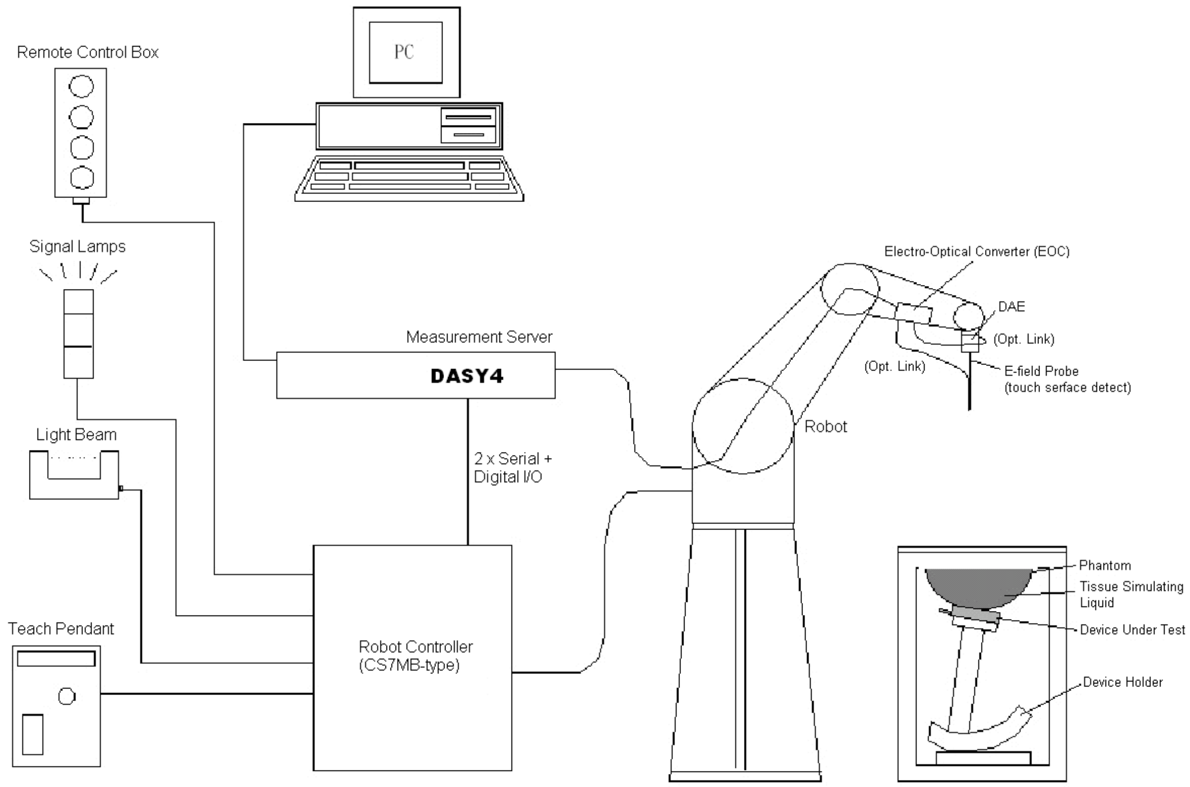

Fig. 5.1 DASY4 system

The DASY4 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
- DASY5 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 DASY4 E-Field Probe System

The SAR measurement is conducted with the dosimetric probe ET3DV6 and EX3DV3 (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 ET3DV6 & EX3DV3 E-Field Probe Specification


Fig. 5.2 Probe setup on robot

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)
Frequency	10 MHz to > 3 GHz
Directivity	± 0.2 dB in brain tissue (rotation around probe axis) ± 0.4 dB in brain tissue (rotation perpendicular to probe axis)
Dynamic Range	5 μ W/g to > 100mW/g; Linearity: ±0.2dB
Surface Detection	± 0.2 mm repeatability in air and clear liquids on reflecting surface
Dimensions	Overall length: 330mm Tip length: 16mm Body diameter: 12mm Tip diameter: 6.8mm Distance from probe tip to dipole centers: 2.7mm
Application	General dosimetry up to 3GHz Compliance tests for mobile phones and Wireless LAN Fast automatic scanning in arbitrary phantoms

<EX3DV3 Probe>

Fig. 5.3 EX3DV3 E-field Probe

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents)
Frequency	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
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
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

5.1.2 ET3DV6 & EX3DV3 E-Field Probe Calibration

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

➢ **ET3DV6 sn1787**

Sensitivity	X axis : 1.63 µV		Y axis : 1.66 µV	Z axis : 2.08 µV
Diode compression point	X axis : 92 mV		Y axis : 96 mV	Z axis : 91 mV
Conversion factor (Body)	**Frequency (MHz)**	**X axis**	**Y axis**	**Z axis**
	2350~2550	4.02	4.02	4.02
Boundary effect (Body)	**Frequency (MHz)**	**Alpha**	**Depth**	
	2350~2550	0.65	2.15	

➢ **EX3DV3 sn3514**

Sensitivity	X axis : 0.660 µV		Y axis : 0.690 µV	Z axis : 0.570 µV
Diode compression point	X axis : 95 mV		Y axis : 93 mV	Z axis : 96 mV
Conversion factor (Body)	**Frequency (MHz)**	**X axis**	**Y axis**	**Z axis**
	5100~5300	4.31	4.31	4.31
	5700~5900	4.16	4.16	4.16
Boundary effect (Body)	**Frequency (MHz)**	**Alpha**	**Depth**	
	5100~5300	0.35	1.70	
	5700~5900	0.35	1.70	

NOTE: The probe parameters have been calibrated by the SPEAG.

5.2 DATA Acquisition Electronics (DAE)

The data acquisition electronics (DAE4) 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 mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE4 is 200M Ohm; the inputs are symmetrical and floating. Common mode rejection is above 80dB.

5.3 Robot

The DASY4 system uses the high precision robots RX90BL type out of the newer series from Stäubli SA (France). For the 6-axis controller DASY4 system, the CS7MB robot controller version from Stäubli is used. The RX robot series have many features that are important for our application:

- High precision (repeatability 0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)
- 6-axis controller

5.4 Measurement Server

The DASY4 measurement server is based on a PC/104 CPU board with
166 MHz CPU
32 MB chipset and
64 MB RAM.

Communication with
the DAE4 electronic box
the 16-bit AD-converter system for optical detection and digital I/O interface.

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

5.5 SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas:

- Left head
- Right head
- Flat phantom

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.

A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters.

On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

The phantom can be used with the following tissue simulating liquids:
*Water-sugar based liquid
*Glycol based liquids

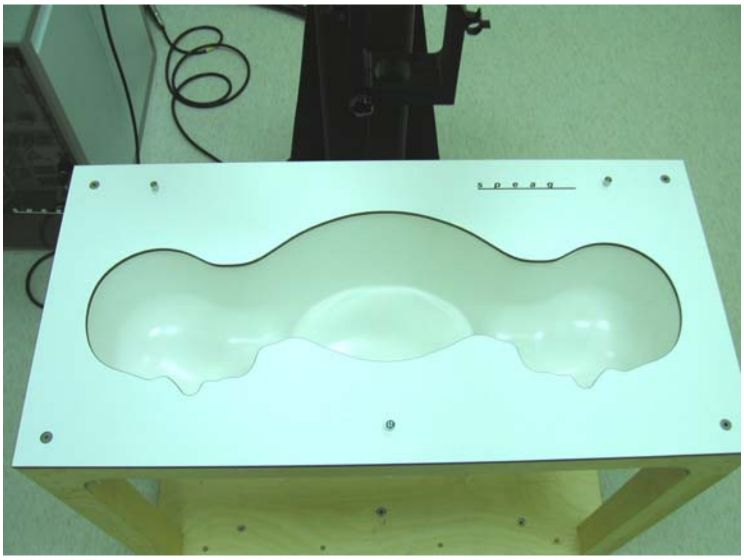

Fig. 5.3 Top View of Twin Phantom

Fig. 5.4 Bottom View of Twin Phantom

5.6 Data Storage and Evaluation

5.6.1 Data Storage

The DASY4 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 with the extension .DA4. 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-louse media, will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

5.6.2 Data Evaluation

The DASY4 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：

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

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

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

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

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

$$E_{tot} = \sqrt{E_X^2 + E_Y^2 + E_Z^2}$$

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

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

with ***SAR*** = local specific absorption rate in mW/g
Etot = 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.

The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = \frac{E_{tot}^2}{3770} \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm^2
E_{tot} = total electric field strength in V/m
H_{tot} = total magnetic field strength in A/m

5.7 Test Equipment List

Manufacture	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Dosimetric E-Filed Probe	ET3DV6	1787	Aug. 28, 2007	Aug. 28, 2008
SPEAG	Dosimetric E-Filed Probe	EX3DV3	3514	Feb. 21, 2007	Feb. 21, 2008
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 12, 2007	Jul. 12, 2009
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Feb. 10, 2006	Feb. 10, 2008
SPEAG	Data Acquisition Electronics	DAE4	778	Sep. 17, 2007	Sep. 17, 2008
SPEAG	Device Holder	N/A	N/A	NCR	NCR
SPEAG	Phantom	QD 000 P40 C	TP-1303	NCR	NCR
SPEAG	Phantom	QD 000 P40 C	TP-1383	NCR	NCR
SPEAG	Phantom	QDOVA001BA	1029	NCR	NCR
SPEAG	Robot	Staubli RX90BL	F03/5W15A1/A/01	NCR	NCR
SPEAG	Software	DASY4 V4.7 Build 55	N/A	NCR	NCR
SPEAG	Software	SEMCAD V1.8 Build 176	N/A	NCR	NCR
SPEAG	Measurement Server	SE UMS 001 BA	1021	NCR	NCR
Agilent	ENA Series Network Analyzer	E5071C	MY46100746	Feb. 21, 2007	Feb. 21, 2008
Agilent	Wireless Communication Test Set	E5515C	GB46311322	Dec. 22, 2006	Dec. 22, 2008
Agilent	Dielectric Probe Kit	85070D	US01440205	NCR	NCR
Agilent	Dual Directional Coupler	778D	50422	NCR	NCR
Agilent	Power Amplifier	8449B	3008A01917	NCR	NCR
Agilent	Power Meter	E4416A	GB41292344	Feb. 08, 2007	Feb. 08, 2008
Agilent	Power Sensor	E9327A	US40441548	Feb. 08, 2007	Feb. 08, 2008
Agilent	Signal Generator	E8247C	MY43320596	Mar. 01, 2006	Mar. 01, 2008

Table 5.1 Test Equipment List

6. Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY4, the phantom must be filled with around 25 liters of homogeneous tissue simulating liquid. The liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is (head SAR)or from the flat phantom to the liquid top surface (body SAR) is 15.2cm.

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.

Table 6.1 shows the measuring results for muscle simulating liquid.

Bands	Frequency (MHz)	Permittivity (ε_r)	Conductivity (σ)	Measurement date
WLAN (2400 ~ 2483.5 MHz)	2412	53.6	1.92	Jan. 09, 2008
	2437	53.5	1.95	
	2462	53.4	1.98	
WLAN (5150~5250 MHz)	5180	47.6	5.28	Jan. 10, 2008
	5190	47.6	5.29	
	5200	47.5	5.30	
	5240	47.4	5.34	
WLAN (5725~5850 MHz)	5745	46.9	6.08	Jan. 10, 2008
	5785	46.8	6.14	
	5795	46.7	6.16	
	5825	46.7	6.18	

Table 6.1 Measuring Results for Muscle Simulating Liquid

The measuring data are consistent with ε r = 52.7 ± 5%, σ = 1.95 ± 5% for 2400~2483.5MHz, ε_r = 49.0 ± 5% and σ = 5.30 ± 5% for 5150~5250MHz and ε r = 48.2 ±5%, 6 = 6.00 ± 5% for body 5725~5850MHz.

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 A 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
Multiplying 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) k 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 DASY4 uncertainty Budget is showed in Table 7.2 and 7.3.

Error Description	Uncertainty Value ± %	Probability Distribution	Divisor	Ci (1g)	Standard Unc. (1g)	vi or Veff
Measurement Equipment						
Probe Calibration	±5.9 %	Normal	1	1	±5.9 %	∞
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 %	145
Device Holder	±3.6 %	Normal	1	1	±3.6 %	5
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					**±10.9 %**	**387**
Coverage Factor for 95 %	**K=2**					
Expanded uncertainty (Coverage factor = 2)					**±21.9 %**	

Table 7.2 Uncertainty Budget of DASY4 for 2.4GHz

Error Description	Uncertainty Value	Probability Distribution	Divisor	Ci (1g)	Standard Unc. (1g)	vi or Veff
Measurement System						
Probe Calibration	±6.8 %	Normal	1	1	±6.8 %	∞
Axial Isotropy	±4.7 %	Rectangular	√3	0.7	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	Rectangular	√3	0.7	±3.9 %	∞
Boundary Effect	±2.0 %	Rectangular	√3	1	±1.2 %	∞
Linearity	±4.7 %	Rectangular	√3	1	±2.7 %	∞
System Detection Limit	±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 %	145
Device Holder	±3.6 %	Normal	1	1	±3.6 %	5
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 Std. Uncertainty					**±12.9 %**	**330**
Coverage Factor for 95%	**Kp=2**					
Expanded STD Uncertainty					**±25.9 %**	

Table 7.3 Uncertainty Budget of DASY4 for 5GHz Band

8. SAR Measurement Evaluation

Each DASY4 system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY4 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 DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator at frequency 2450 MHz, 5200 MHz, and 5800 MHz. 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:

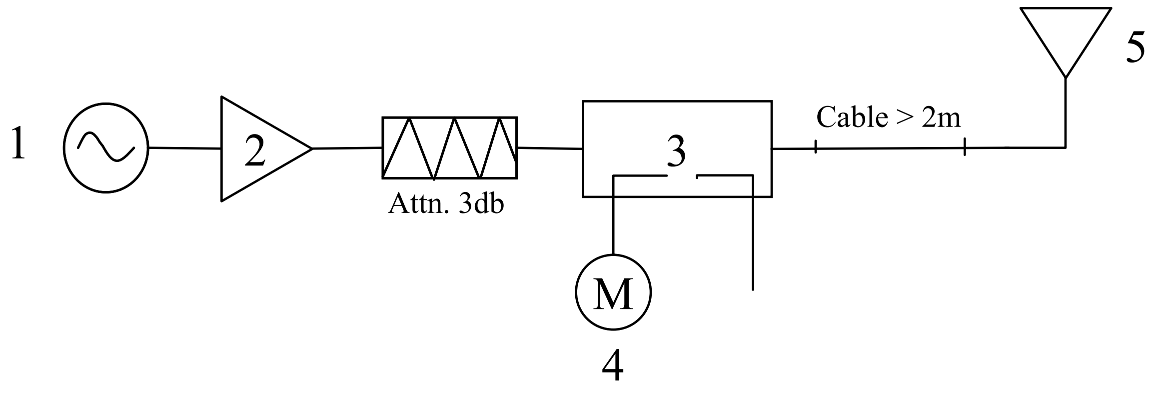

Fig. 8.1 System Setup for System Evaluation

1. Signal Generator
2. Amplifier
3. Directional Coupler
4. Power Meter
5. 2450 MHz or 5200 MHz or 5800 MHz Dipole

The output power on dipole port must be calibrated to 20dBm (100mW) before dipole is connected.

Fig 8.2 Dipole Setup

8.3 Validation Results

Comparing to the original SAR value provided by SPEAG, the validation data should within its specification of 10 %. Table 8.1 shows the target SAR and measured SAR after normalized to 1W input power.

Band	SAR	Target (W/kg)	Measurement data (W/kg)	Variation	Measurement date
WLAN (2400~2450 MHz)	SAR (1g)	52.5	53.2	1.3 %	Jan. 09, 2008
	SAR (10g)	24.4	25.3	3.7 %	
WLAN (5150~5250 MHz)	SAR (1g)	73.7	77.8	5.6 %	Jan. 10, 2008
	SAR (10g)	20.6	22.0	6.8 %	
WLAN (5725~5850 MHz)	SAR (1g)	69.80	69.2	-0.9 %	Jan. 10, 2008
	SAR (10g)	19.70	19.0	-3.6 %	

Table 8.1 Target and Measured SAR after Normalized

The table above indicates the system performance check can meet the variation criterion.

9. Description for DUT Testing Position

This DUT was tested in 5 different positions. They are “DELL D500 Notebook Bottom with 0cm Gap with Horizontal USB Port”, “DELL D500 Notebook Bottom with 0cm Gap with Vertical USB Port”, “Acer Aspire 3620 Notebook Bottom with 0cm Gap with Horizontal USB Port”, “Acer Aspire 3620 Notebook Bottom with 0cm Gap with Vertical USB Port”, and “TOSHIBA A512 Notebook Bottom with 0cm Gap with Vertical USB Port”

Remark: Please refer to Appendix E for the test setup photo.

10. Measurement Procedures

The measurement procedures are as follows:

- Using engineering software to transmit RF power continuously (continuous Tx) in the low channel
- Placing the DUT in the positions described in the last section
- Setting scan area, grid size and other setting on the DASY4 software
- Taking data for the low channel
- Repeat the previous steps for the middle and high channels.

According to the IEEE P1528 draft standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- Power reference measurement
- Area scan
- Zoom scan
- Power reference measurement

10.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the IEEE1528-2003 standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY4 software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

Base on the Draft: SCC-34, SC-2, WG-2-Computational Dosimetry, P1528/D1.2 (Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques), a new algorithm has been implemented. The spatial-peak SAR can be computed over any required mass.

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:

- extraction of the measured data (grid and values) from the Zoom Scan
- calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- generation of a high-resolution mesh within the measured volume
- interpolation of all measured values form the measurement grid to the high-resolution grid
- extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
- calculation of the averaged SAR within masses of 1g and 10g

10.2 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. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 1 g.

10.3 SAR Averaged Methods

In DASY4, 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.

11.SAR Test Results

11.1 Notebook Bottom with 0cm Gap with Horizontal USB Port

NB	Band	Tx Ant.	Chan.	Freq. (MHz)	Modulation type	Conducted Power (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Limits (W/Kg)	Results
DELL D500	802.11b	Ant-0	1	2412(Low)	CCK	22.68	-	-	-	-
			6	2437(Mid)	CCK	21.97	-0.155	0.123	1.6	Pass
			11	2462(High)	CCK	21.88	-	-	-	-
		Ant-1	1	2412(Low)	CCK	21.50	-	-	-	-
			6	2437(Mid)	CCK	21.27	-0.127	0.227	1.6	Pass
			11	2462(High)	CCK	20.89	-	-	-	-
	802.11g	Ant-0	1	2412(Low)	OFDM	22.64	-	-	-	-
			6	2437(Mid)	OFDM	22.32	0.146	0.107	1.6	Pass
			11	2462(High)	OFDM	22.81	-	-	-	-
		Ant-1	1	2412(Low)	OFDM	22.56	-	-	-	-
			6	2437(Mid)	OFDM	21.53	-0.07	0.159	1.6	Pass
			11	2462(High)	OFDM	21.57	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	1	2412(Low)	OFDM	25.02	-	-	-	-
			6	2437(Mid)	OFDM	23.96	-0.066	0.245	1.6	Pass
			11	2462(High)	OFDM	25.45	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	3	2422(Low)	OFDM	24.04	-	-	-	-
			6	2437(Mid)	OFDM	24.00	0.088	0.205	1.6	Pass
			9	2452(High)	OFDM	23.65	-	-	-	-
	802.11a Band I	Ant-0	36	5180(Low)	OFDM	16.98	-	-	-	-
			40	5200(Mid)	OFDM	16.89	0.023	0.528	1.6	Pass
			48	5240(High)	OFDM	16.92	-	-	-	-
		Ant-1	36	5180(Low)	OFDM	13.36	-	-	-	-
			40	5200(Mid)	OFDM	12.18	0.116	0.742	1.6	Pass
			48	5240(High)	OFDM	12.02	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	36	5180(Low)	OFDM	16.97	0.04	0.817	1.6	Pass
			40	5200(Mid)	OFDM	16.89	0.007	0.864	1.6	Pass
			48	5240(High)	OFDM	16.87	0.073	0.883	1.6	Pass
	802.11n (BW 40)	Ant-0 Ant-1	38	5190(Low)	OFDM	16.85	0.139	0.782	1.6	Pass
			46	5230(High)	OFDM	16.82	-	-	-	-
	802.11a Band III	Ant-0	149	5745(Low)	OFDM	24.46	-	-	-	-
			157	5785(Mid)	OFDM	24.16	0.137	0.781	1.6	Pass
			165	5825(High)	OFDM	24.51	-	-	-	-
		Ant-1	149	5745(Low)	OFDM	24.26	0.109	0.996	1.6	Pass
			157	5785(Mid)	OFDM	23.58	0.133	1.02	1.6	Pass
			165	5825(High)	OFDM	23.13	0.041	1.09	1.6	Pass
	802.11n (BW 20)	Ant-0 Ant-1	149	5745(Low)	OFDM	27.55	0.137	1.41	1.6	Pass
			157	5785(Mid)	OFDM	27.37	0.12	1.3	1.6	Pass
			165	5825(High)	OFDM	27.44	0.03	1.36	1.6	Pass
	802.11n (BW 40)	Ant-0 Ant-1	151	5755(Low)	OFDM	27.81	-0.089	1.56	1.6	Pass
			159	5795(High)	OFDM	27.21	0.043	1.56	1.6	Pass

NB	Band	Ant.	Chan.	Freq. (MHz)	Modulation type	Conducted Power (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Limits (W/Kg)	Results
acer Aspire 3620	802.11n (BW 20)	Ant-0 Ant-1	1	2412(Low)	OFDM	25.02	-	-	-	-
			6	2437(Mid)	OFDM	23.96	-0.125	0.095	1.6	Pass
			11	2462(High)	OFDM	25.45	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	3	2422(Low)	OFDM	24.04	-	-	-	-
			6	2437(Mid)	OFDM	24.00	-	-	-	-
			9	2452(High)	OFDM	23.65	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	36	5180(Low)	OFDM	16.97	-	-	-	-
			40	5200(Mid)	OFDM	16.89	0.125	0.174	1.6	Pass
			48	5240(High)	OFDM	16.87	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	38	5190(Low)	OFDM	16.85	-	-	-	-
			46	5230(High)	OFDM	16.82	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	149	5745(Low)	OFDM	27.55	-	-	-	-
			157	5785(Mid)	OFDM	27.37	-	-	-	-
			165	5825(High)	OFDM	27.44	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	151	5755(Low)	OFDM	27.81	0.139	0.219	1.6	Pass
			159	5795(High)	OFDM	27.21	-	-	-	-

11.2 Notebook Bottom with 0cm Gap with Vertical USB Port

NB	Band	Ant.	Chan.	Freq. (MHz)	Modulation type	Conducted Power (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Limits (W/Kg)	Results
DELL D500	802.11b	Ant-0	1	2412(Low)	CCK	22.68	-	-	-	-
			6	2437(Mid)	CCK	21.97	-	-	-	-
			11	2462(High)	CCK	21.88	-	-	-	-
		Ant-1	1	2412(Low)	CCK	21.50	-	-	-	-
			6	2437(Mid)	CCK	21.27	-	-	-	-
			11	2462(High)	CCK	20.89	-	-	-	-
	802.11g	Ant-0	1	2412(Low)	OFDM	22.64	-	-	-	-
			6	2437(Mid)	OFDM	22.32	-	-	-	-
			11	2462(High)	OFDM	22.81	-	-	-	-
		Ant-1	1	2412(Low)	OFDM	22.56	-	-	-	-
			6	2437(Mid)	OFDM	21.53	-	-	-	-
			11	2462(High)	OFDM	21.57	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	1	2412(Low)	OFDM	25.02	-	-	-	-
			6	2437(Mid)	OFDM	23.96	0.019	0.247	1.6	Pass
			11	2462(High)	OFDM	25.45	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	3	2422(Low)	OFDM	24.04	-	-	-	-
			6	2437(Mid)	OFDM	24.00	-	-	-	-
			9	2452(High)	OFDM	23.65	-	-	-	-
	802.11a Band I	Ant-0	36	5180(Low)	OFDM	16.98	-	-	-	-
			40	5200(Mid)	OFDM	16.89	-	-	-	-
			48	5240(High)	OFDM	16.92	-	-	-	-
		Ant-1	36	5180(Low)	OFDM	13.36	-	-	-	-
			40	5200(Mid)	OFDM	12.18	-	-	-	-
			48	5240(High)	OFDM	12.02	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	36	5180(Low)	OFDM	16.97	-	-	-	-
			40	5200(Mid)	OFDM	16.89	0.098	0.548	1.6	Pass
			48	5240(High)	OFDM	16.87	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	38	5190(Low)	OFDM	16.85	-	-	-	-
			46	5230(High)	OFDM	16.82	-	-	-	-
	802.11a Band III	Ant-0	149	5745(Low)	OFDM	24.46	-	-	-	-
			157	5785(Mid)	OFDM	24.16	-	-	-	-
			165	5825(High)	OFDM	24.51	-	-	-	-
		Ant-1	149	5745(Low)	OFDM	24.26	-	-	-	-
			157	5785(Mid)	OFDM	23.58	-	-	-	-
			165	5825(High)	OFDM	23.13	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	149	5745(Low)	OFDM	27.55	-	-	-	-
			157	5785(Mid)	OFDM	27.37	-	-	-	-
			165	5825(High)	OFDM	27.44	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	151	5755(Low)	OFDM	27.81	0.132	0.712	1.6	Pass
			159	5795(High)	OFDM	27.21	-	-	-	-

NB	Band	Ant.	Chan.	Freq. (MHz)	Modulation type	Conducted Power (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Limits (W/Kg)	Results
acer Aspire 3620	802.11n (BW 20)	Ant-0 Ant-1	1	2412(Low)	OFDM	25.02	-	-	-	-
			6	2437(Mid)	OFDM	23.96	-0.14	0.276	1.6	Pass
			11	2462(High)	OFDM	25.45	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	3	2422(Low)	OFDM	24.04	-	-	-	-
			6	2437(Mid)	OFDM	24.00	-	-	-	-
			9	2452(High)	OFDM	23.65	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	36	5180(Low)	OFDM	16.97	-	-	-	-
			40	5200(Mid)	OFDM	16.89	-0.002	0.196	1.6	Pass
			48	5240(High)	OFDM	16.87	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	38	5190(Low)	OFDM	16.85	-	-	-	-
			46	5230(High)	OFDM	16.82	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	149	5745(Low)	OFDM	27.55	-	-	-	-
			157	5785(Mid)	OFDM	27.37	-	-	-	-
			165	5825(High)	OFDM	27.44	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	151	5755(Low)	OFDM	27.81	0.109	0.399	1.6	Pass
			159	5795(High)	OFDM	27.21	-	-	-	-
TOSHIBA A512	802.11n (BW 20)	Ant-0 Ant-1	1	2412(Low)	OFDM	25.02	0	0.974	1.6	Pass
			6	2437(Mid)	OFDM	23.96	-0.028	0.726	1.6	Pass
			11	2462(High)	OFDM	25.45	-0.167	0.85	1.6	Pass
	802.11n (BW 40)	Ant-0 Ant-1	3	2422(Low)	OFDM	24.04	-	-	-	-
			6	2437(Mid)	OFDM	24.00	-	-	-	-
			9	2452(High)	OFDM	23.65	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	36	5180(Low)	OFDM	16.97	-0.042	0.891	1.6	Pass
			40	5200(Mid)	OFDM	16.89	0.189	1.09	1.6	Pass
			48	5240(High)	OFDM	16.87	0.069	0.889	1.6	Pass
	802.11n (BW 40)	Ant-0 Ant-1	38	5190(Low)	OFDM	16.85	-	-	-	-
			46	5230(High)	OFDM	16.82	-	-	-	-
	802.11n (BW 20)	Ant-0 Ant-1	149	5745(Low)	OFDM	27.55	-	-	-	-
			157	5785(Mid)	OFDM	27.37	-	-	-	-
			165	5825(High)	OFDM	27.44	-	-	-	-
	802.11n (BW 40)	Ant-0 Ant-1	151	5755(Low)	OFDM	27.81	-0.109	0.716	1.6	Pass
			159	5795(High)	OFDM	27.21	-	-	-	-

Test Engineer：Gordon Lin, Eric Huang,and Jason Wang

12. Reference

[1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
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[3] Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01), "Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to RF Emissions", June 2001
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[5] IEEE Std. C95.1-1999, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", 1999
[6] Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148
[7] DAYS4 System Handbook

Appendix A - System Performance Check Data

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

System Check_Body_2450MHz

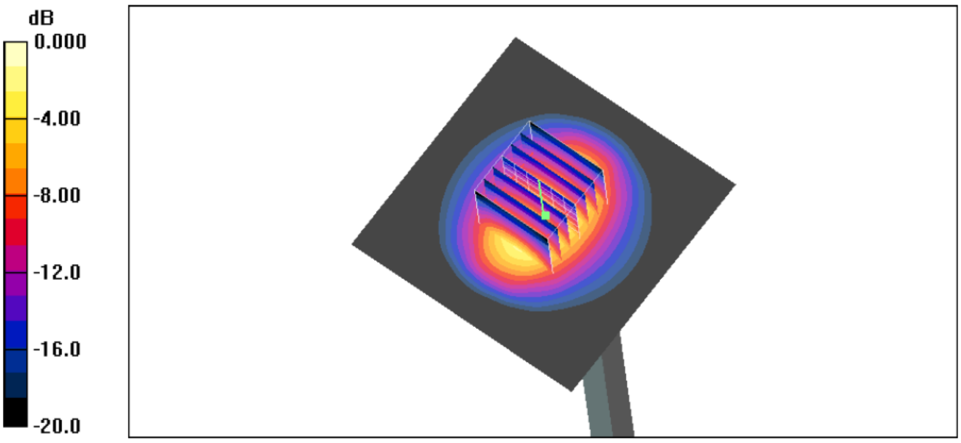
DUT: Dipole 2450 MHz

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2450 MHz; σ = 1.97 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Ambient Temperature：22.8 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 6.23 mW/g

Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.4 V/m; Power Drift = 0.007 dB
Peak SAR (extrapolated) = 11.3 W/kg
SAR(1 g) = 5.32 mW/g; SAR(10 g) = 2.53 mW/g
Maximum value of SAR (measured) = 5.99 mW/g



0 dB = 5.99mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2008/1/10

System Check_Body_5200MHz

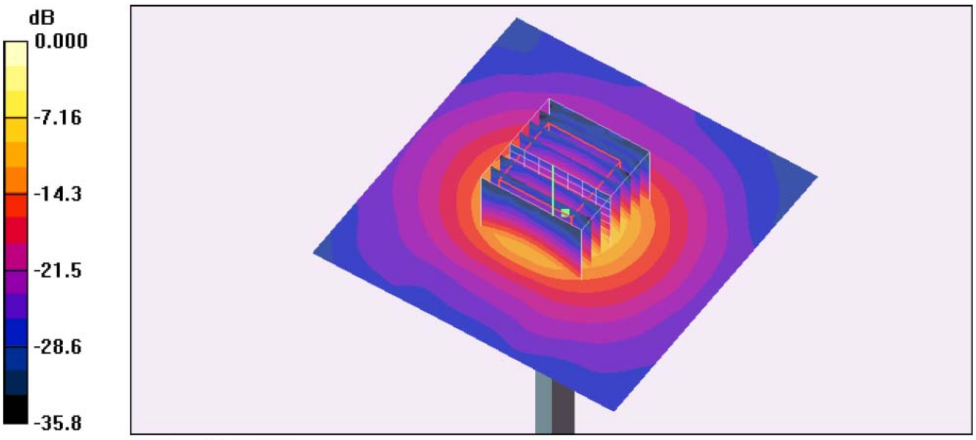
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: MSL_5200 Medium parameters used: f = 5200 MHz; σ = 5.3 mho/m; ε_r = 47.5; ρ = 1000 kg/m^3
Ambient Temperature：22.9 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: EX3DV3 - SN3514; ConvF(4.31, 4.31, 4.31); Calibrated: 2007/2/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 12.7 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 49.7 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 30.0 W/kg
SAR(1 g) = 7.78 mW/g; SAR(10 g) = 2.2 mW/g
Maximum value of SAR (measured) = 11.4 mW/g



0 dB = 11.4mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2008/1/10

System Check_Body_5800MHz

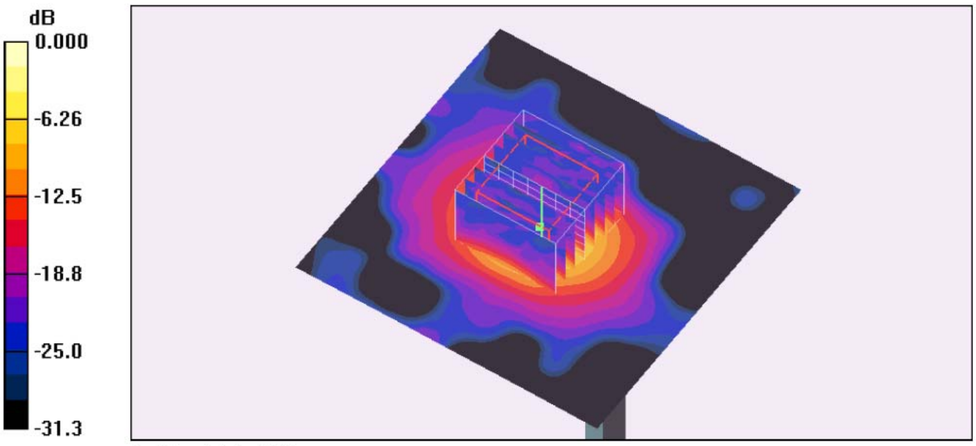
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: MSL_5800 Medium parameters used: f = 5800 MHz; σ = 6.16 mho/m; ε_r = 46.7; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.3 ℃

DASY4 Configuration:
- Probe: EX3DV3 - SN3514; ConvF(4.16, 4.16, 4.16); Calibrated: 2007/2/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 14.8 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 50.9 V/m; Power Drift = -0.098 dB
Peak SAR (extrapolated) = 32.3 W/kg
SAR(1 g) = 6.92 mW/g; SAR(10 g) = 1.9 mW/g
Maximum value of SAR (measured) = 14.1 mW/g



0 dB = 14.1mW/g

Appendix B - SAR Measurement Data

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

Body_802.11b Ch6_NB Bottom with 0cm Gap_DELL D500_Ant-0_Horizontal USB

DUT: 810917

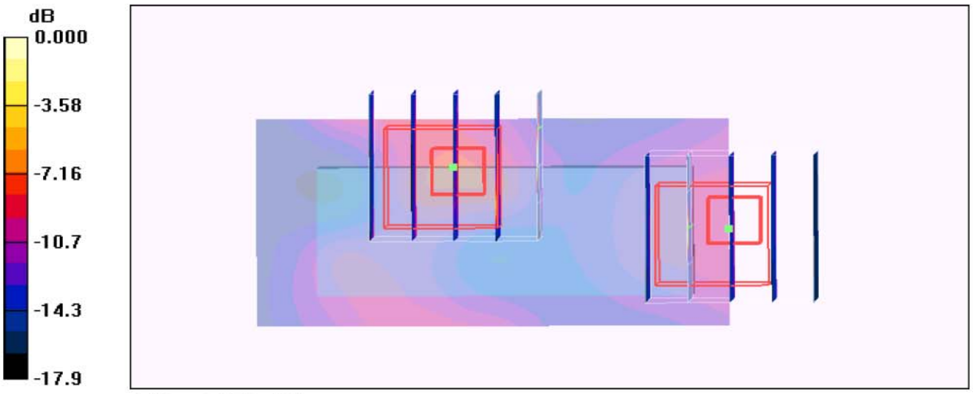
Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Ambient Temperature：22.8 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch6/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.125 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.50 V/m; Power Drift = -0.155 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.123 mW/g; SAR(10 g) = 0.056 mW/g
Maximum value of SAR (measured) = 1.41 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.50 V/m; Power Drift = -0.155 dB
Peak SAR (extrapolated) = 0.770 W/kg
SAR(1 g) = 0.074 mW/g; SAR(10 g) = 0.043 mW/g
Maximum value of SAR (measured) = 0.770 mW/g



0 dB = 0.770mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

Body_802.11b Ch6_NB Bottom with 0cm Gap_DELL D500_Ant-1_Horizontal USB

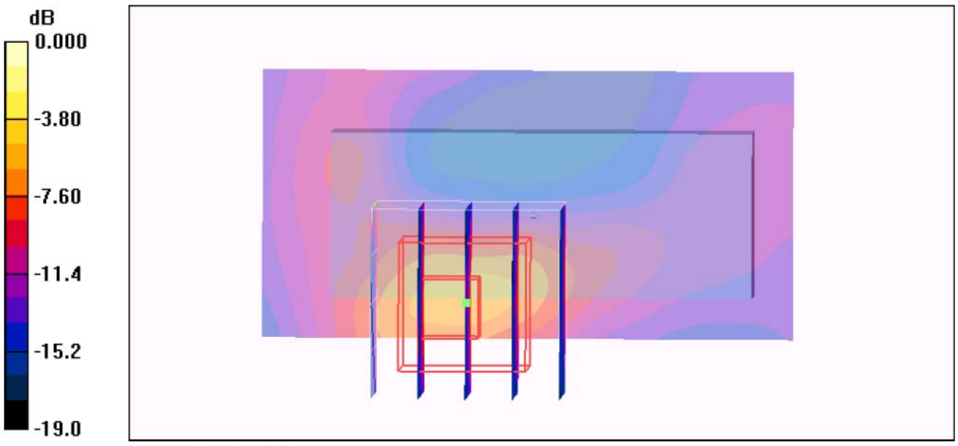
DUT: 810917

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Ambient Temperature：22.9 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch6/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.307 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.79 V/m; Power Drift = -0.127 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.227 mW/g; SAR(10 g) = 0.120 mW/g
Maximum value of SAR (measured) = 1.05 mW/g



0 dB = 1.05mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

Body_802.11g Ch6_NB Bottom with 0cm Gap_DELL D500_Ant-0_BW20M_Horizontal USB

DUT:810917

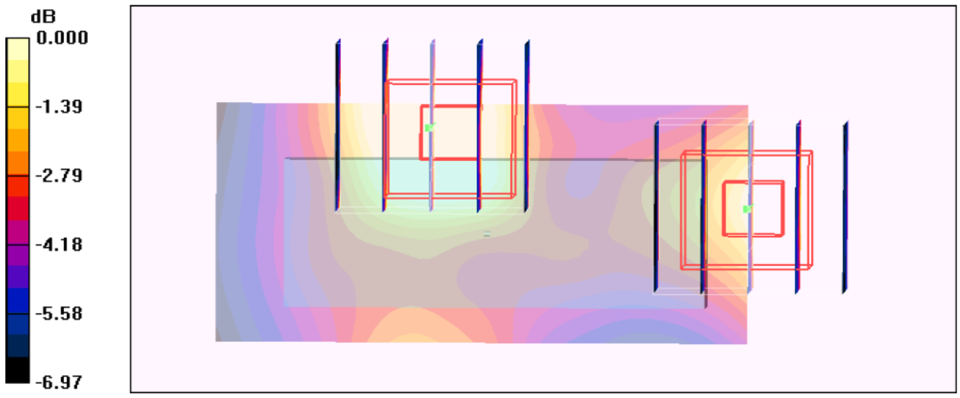
Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Ambient Temperature：22.9 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch6/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.123 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.67 V/m; Power Drift = 0.146 dB
Peak SAR (extrapolated) = 0.252 W/kg
SAR(1 g) = 0.107 mW/g; SAR(10 g) = 0.060 mW/g
Maximum value of SAR (measured) = 0.114 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.67 V/m; Power Drift = 0.146 dB
Peak SAR (extrapolated) = 0.140 W/kg
SAR(1 g) = 0.079 mW/g; SAR(10 g) = 0.050 mW/g
Maximum value of SAR (measured) = 0.086 mW/g



0 dB = 0.086mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

Body_802.11g Ch6_NB Bottom with 0cm Gap_DELL D500_Ant-1_BW20M_Horizontal USB

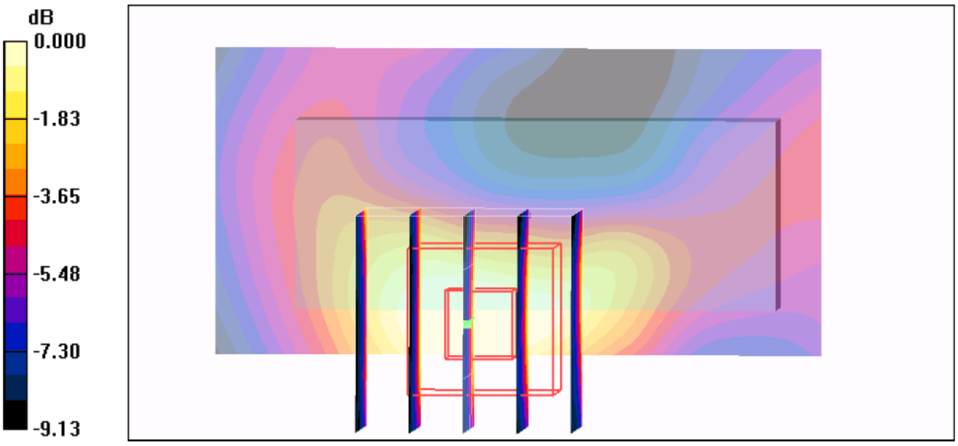
DUT:810917

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Ambient Temperature：22.8 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch6/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.203 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.39 V/m; Power Drift = -0.070 dB
Peak SAR (extrapolated) = 0.316 W/kg
SAR(1 g) = 0.159 mW/g; SAR(10 g) = 0.090 mW/g
Maximum value of SAR (measured) = 0.171 mW/g



0 dB = 0.171mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

Body_802.11n Ch6_NB Bottom with 0cm Gap_DELL D500_2Tx_BW20M_Horizontal USB

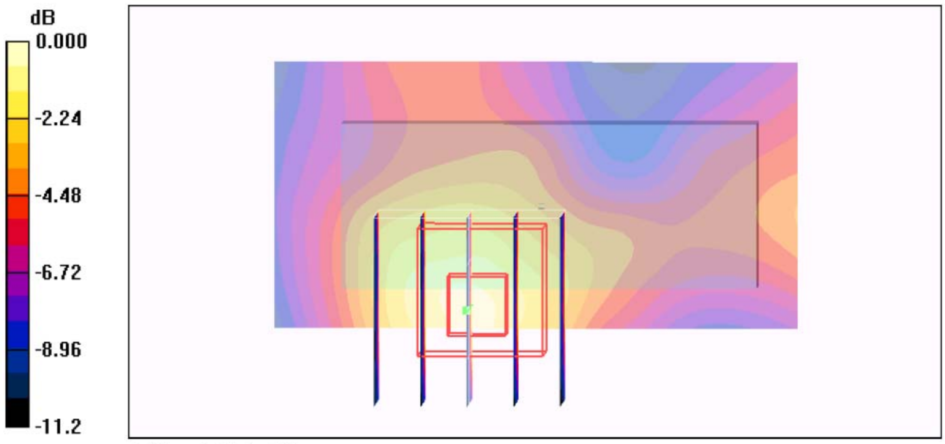
DUT: 810917

Communication System: 802.11n; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Ambient Temperature：22.9 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch6/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.255 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.23 V/m; Power Drift = -0.066 dB
Peak SAR (extrapolated) = 0.506 W/kg
SAR(1 g) = 0.245 mW/g; SAR(10 g) = 0.129 mW/g
Maximum value of SAR (measured) = 0.284 mW/g



0 dB = 0.284mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

Body_802.11n Ch6_NB Bottom with 0cm Gap_DELL D500_2Tx_BW20M_Verticl USB

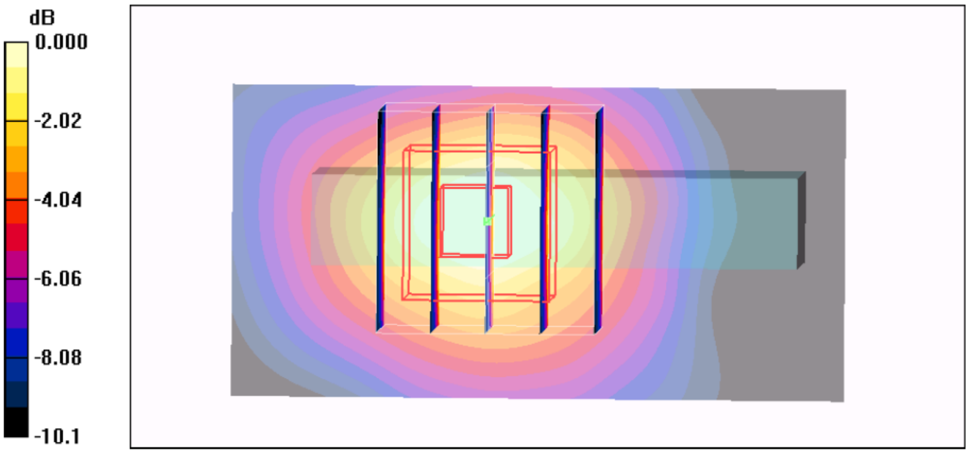
DUT: 810917

Communication System: 802.11n; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2437 MHz; $\sigma = 1.95$ mho/m; $\varepsilon_r = 53.5$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch6/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.300 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 0.495 W/kg
SAR(1 g) = 0.247 mW/g; SAR(10 g) = 0.139 mW/g
Maximum value of SAR (measured) = 0.260 mW/g



0 dB = 0.260mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

Body_802.11n Ch6_NB Bottom with 0cm Gap_DELL D500_2Tx_BW40M_Horizontal USB

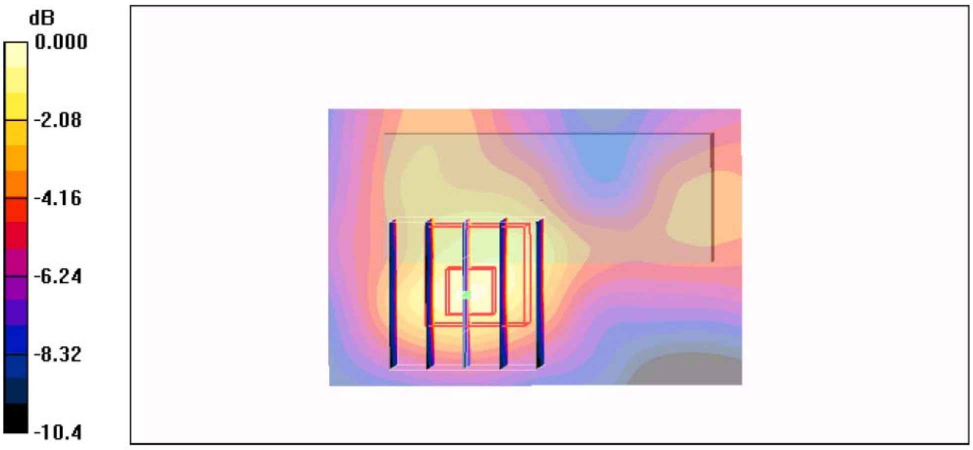
DUT: 810917

Communication System: 802.11n; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Ambient Temperature：22.8 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch6/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.207 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.42 V/m; Power Drift = 0.088 dB
Peak SAR (extrapolated) = 0.419 W/kg
SAR(1 g) = 0.205 mW/g; SAR(10 g) = 0.112 mW/g
Maximum value of SAR (measured) = 0.235 mW/g



0 dB = 0.235mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

Body_802.11n Ch6_NB Bottom with 0cm Gap_acer 3620_2Tx_BW20M_Horizontal USB

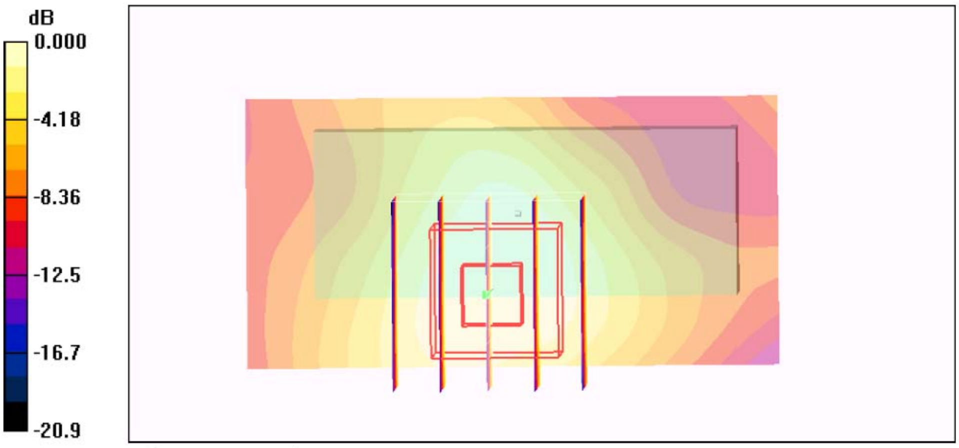
DUT: 810917

Communication System: 802.11n; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Ambient Temperature：22.8 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch6/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.107 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.26 V/m; Power Drift = -0.125 dB
Peak SAR (extrapolated) = 0.170 W/kg
SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.055 mW/g
Maximum value of SAR (measured) = 0.102 mW/g



0 dB = 0.102mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

Body_802.11n Ch6_NB Bottom with 0cm Gap_acer 3620_2Tx_BW20M_Verticl USB

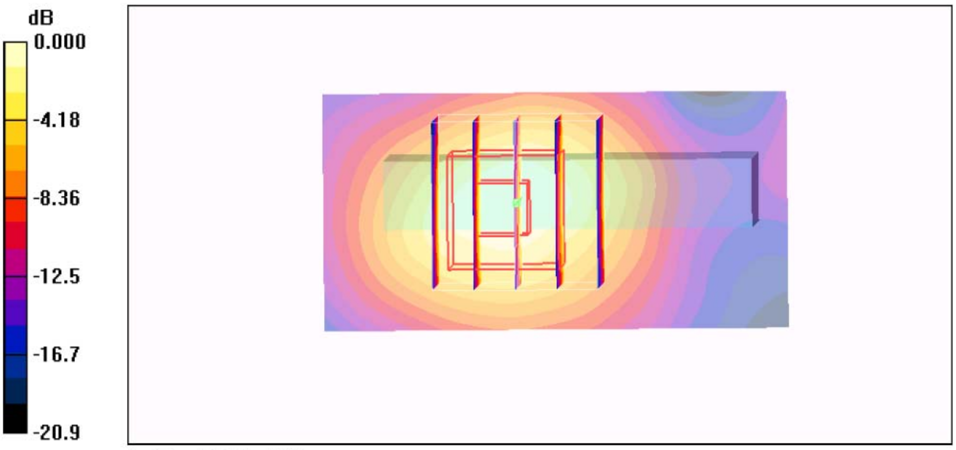
DUT:810917

Communication System: 802.11n; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.95 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Ambient Temperature：22.8 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch6/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.335 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.1 V/m; Power Drift = -0.140 dB
Peak SAR (extrapolated) = 0.555 W/kg
SAR(1 g) = 0.276 mW/g; SAR(10 g) = 0.140 mW/g
Maximum value of SAR (measured) = 0.298 mW/g



0 dB = 0.298mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/9

Body_802.11n Ch1_NB Bottom with 0cm Gap_TOSHIBA A512_2Tx_BW20M_Verticl USB

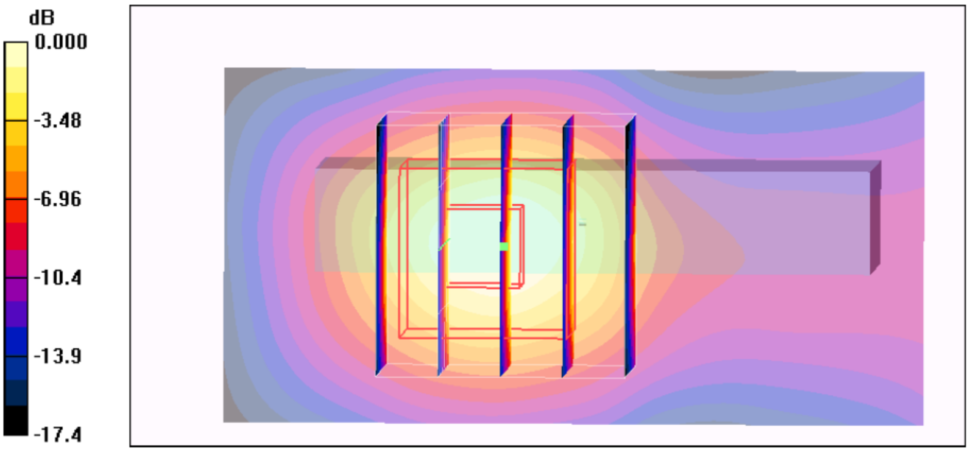
DUT: 810917

Communication System: 802.11n; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2412 MHz; σ = 1.92 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Ambient Temperature：22.8 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.02, 4.02, 4.02); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch1/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.23 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.7 V/m; Power Drift = 0.000 dB
Peak SAR (extrapolated) = 2.00 W/kg
SAR(1 g) = 0.974 mW/g; SAR(10 g) = 0.459 mW/g
Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2008/1/10

Body_802.11n Ch38_NB Bottom with 0cm Gap_DELL D500_2Tx_BW40M_Horizontal USB

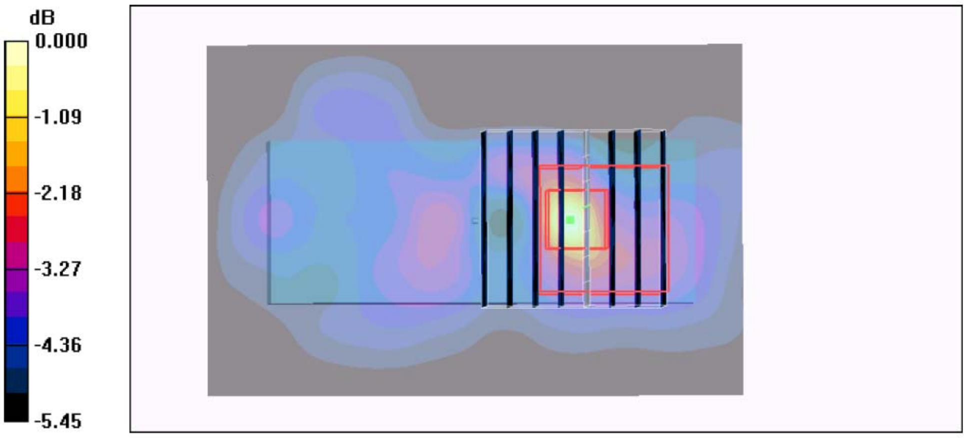
DUT: 810917

Communication System: 802.11n; Frequency: 5190 MHz;Duty Cycle: 1:1
Medium: MSL_5200 Medium parameters used: f = 5190 MHz; σ = 5.29 mho/m; ε_r = 47.6; ρ = 1000 kg/m^3
Ambient Temperature：22.9 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: EX3DV3 - SN3514; ConvF(4.31, 4.31, 4.31); Calibrated: 2007/2/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch38/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.21 mW/g

Ch38/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 9.39 V/m; Power Drift = 0.139 dB
Peak SAR (extrapolated) = 2.59 W/kg
SAR(1 g) = 0.782 mW/g; SAR(10 g) = 0.482 mW/g
Maximum value of SAR (measured) = 1.25 mW/g



0 dB = 1.25mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/10

Body_802.11n Ch48_NB Bottom with 0cm Gap_DELL D500_BW20M_2Tx_Horizontal USB

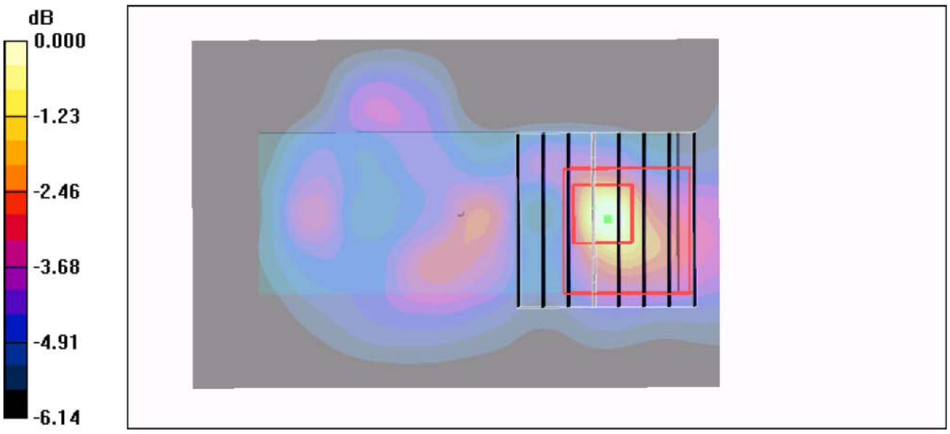
DUT: 810917

Communication System: 802.11n; Frequency: 5240 MHz;Duty Cycle: 1:1
Medium: MSL_5200 Medium parameters used: f = 5240 MHz; $\sigma = 5.34$ mho/m; $\varepsilon_r = 47.4$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.9 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: EX3DV3 - SN3514; ConvF(4.31, 4.31, 4.31); Calibrated: 2007/2/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch48/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.69 mW/g

Ch48/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 11.0 V/m; Power Drift = 0.073 dB
Peak SAR (extrapolated) = 3.22 W/kg
SAR(1 g) = 0.883 mW/g; SAR(10 g) = 0.528 mW/g
Maximum value of SAR (measured) = 1.55 mW/g



0 dB = 1.55mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2008/1/10

Body_802.11n Ch40_NB Bottom with 0cm Gap_DELL D500_BW20M_2Tx_Vertical USB

DUT: 810917

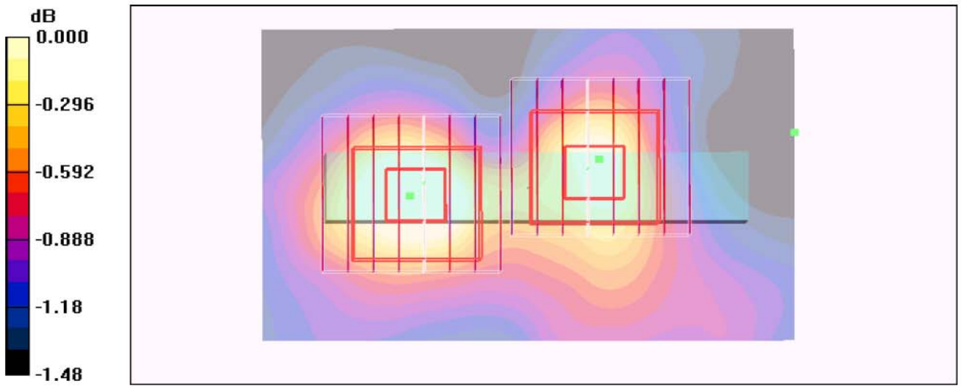
Communication System: 802.11n; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: MSL_5200 Medium parameters used: f = 5200 MHz; σ = 5.3 mho/m; ε_r = 47.5; ρ = 1000 kg/m^3
Ambient Temperature：22.9 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: EX3DV3 - SN3514; ConvF(4.31, 4.31, 4.31); Calibrated: 2007/2/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Ch40/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.631 mW/g

Ch40/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 9.88 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 0.748 W/kg
SAR(1 g) = 0.548 mW/g; SAR(10 g) = 0.503 mW/g
Maximum value of SAR (measured) = 0.615 mW/g

Ch40/Zoom Scan (8x8x8)/Cube 1: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 9.88 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 0.637 W/kg
SAR(1 g) = 0.527 mW/g; SAR(10 g) = 0.499 mW/g
Maximum value of SAR (measured) = 0.581 mW/g



0 dB = 0.581mW/g