



Specific Absorption Rate (SAR) Test Report

for
HTC Corporation
on the
Pocket PC Phone

Report Number : FA920713C
Model Name : QUAR100
FCC ID : NM8QUAR100
Date of Testing : Feb. 28, 2009 ~ Mar. 31, 2009
Issued Date of Report : Apr. 17, 2009

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1. Statement of Compliance

The Specific Absorption Rate (SAR) maximum results found during testing for the **HTC Corporation Pocket PC Phone QUAR100** are as follows (with expanded uncertainty 21.9%):

Band	Position	SAR (W/kg)
802.16e	Head	0.527
	Body	0.234

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 IEEE 1528-2003 and 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.
Address : No. 52, Hwa-Ya 1st RD., Hwa Ya Technology Park, Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
Test Site : SAR01-HY
Telephone Number : 886-3-327-3456
Fax Number : 886-3-328-4978

2.2 Applicant

Company Name : HTC Corporation
Address : No. 23, Xinghua Rd., Taoyuan City, Taiwan

2.3 Manufacturer

Company Name : HTC Corporation
Address : 1F, No. 6-3, Baoqiang Rd., Xindian City, Taipei, Taiwan

2.4 Application Details

Date of reception of application: Feb. 07, 2009
Start of test : Feb. 28, 2009
End of test : Mar. 31, 2009



3. General Information

3.1 Description of Device Under Test (DUT)

Product Feature & Specification	
DUT Type	Pocket PC Phone
Model Name	QUAR100
FCC ID	NM8QUAR100
Tx/Rx Frequency Range	802.16e : 2496 MHz ~ 2690 MHz
Maximum Output Power to Antenna	802.16e : 21.36 dBm
Antenna Type	Fixed Internal Antenna
Type of Modulation	802.16e : QPSK / 16-QAM
DUT Stage	Production Unit

Note: 802.11b/g and 802.16e can not be co-located.

3.2 Product Photos

Refer to Appendix D.

3.3 Applied Standards

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

- y 47 CFR Part 2 (2.1093)
- y IEEE C95.1-1999
- y IEEE 1528-2003
- y OET Bulletin 65 Supplement C (Edition 01-01)
- y KDB 648474 D01 v01r05

3.4 Device Category and SAR Limits

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



3.5 Test Conditions

3.5.1 Ambient Condition

Ambient Temperature	20-24
Humidity	<60

3.5.2 Test Configuration

For WiMAX link mode, the EUT was connected with WiMAX Base Station Emulator (BSE), Agilent E6651A. BSE will ask the EUT to transmit the maximum power at the modulation type of DL:UL = 29:18 ratio. In 18 uplink signals, there are 3 control signals with the reduced power and 15 traffic signals with the maximum power, so it induces 31.7% duty cycle and 3.15 crest factor.

The maximum duty cycle was used for SAR measurement and power measurement. The system can transmit up to 48 OFDMA symbols in each 5 ms frame, including 1.6 symbols for TTG and RTG. If all the 18 uplink symbols transmit at the maximum power, the duty factor is estimated to be 18/48 or 37.5%. However, the first three uplink symbols are reserved for control signals/channels, which are transmitted at reduced power; the condition for the SAR measurement is exactly the same in the normal operation, i.e. with 3 reduced control signals, because the EUT is connected to WiMAX base station emulator, which will make the EUT to transmit the reduced power of the control signals and transmit the maximum power of traffic signals during the SAR measurement and power measurement.

Duty Factor and Crest Factor:

Since 3 control symbols powers were reduced in the SAR measurement, the specific maximum power is 21.5 dBm (141.25 mW)
the maximum power for each control symbol is $141.25 \times 5/35 = 20.18$ mW,
the duty factor = $((20.18 / 141.25) \times 3 \times 102.857) + (15 \times 102.857 \mu s) / 5000 \mu s = 0.317 = 31.7\%$,
Crest Factor = $1/(\text{duty factor}) = 3.15$ for this periodic pulse signal device.

BW	DL/UL Symbols	UL Duty Cycle	Crest Factor	UL Modulation	DL Modulation
10 MHz	29/18	31.7 %	3.15	QPSK 1/2	64-QAM 5/6
10 MHz	29/18	31.7 %	3.15	16-QAM 3/4	QPSK 1/2

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:

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

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

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

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

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

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

, 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

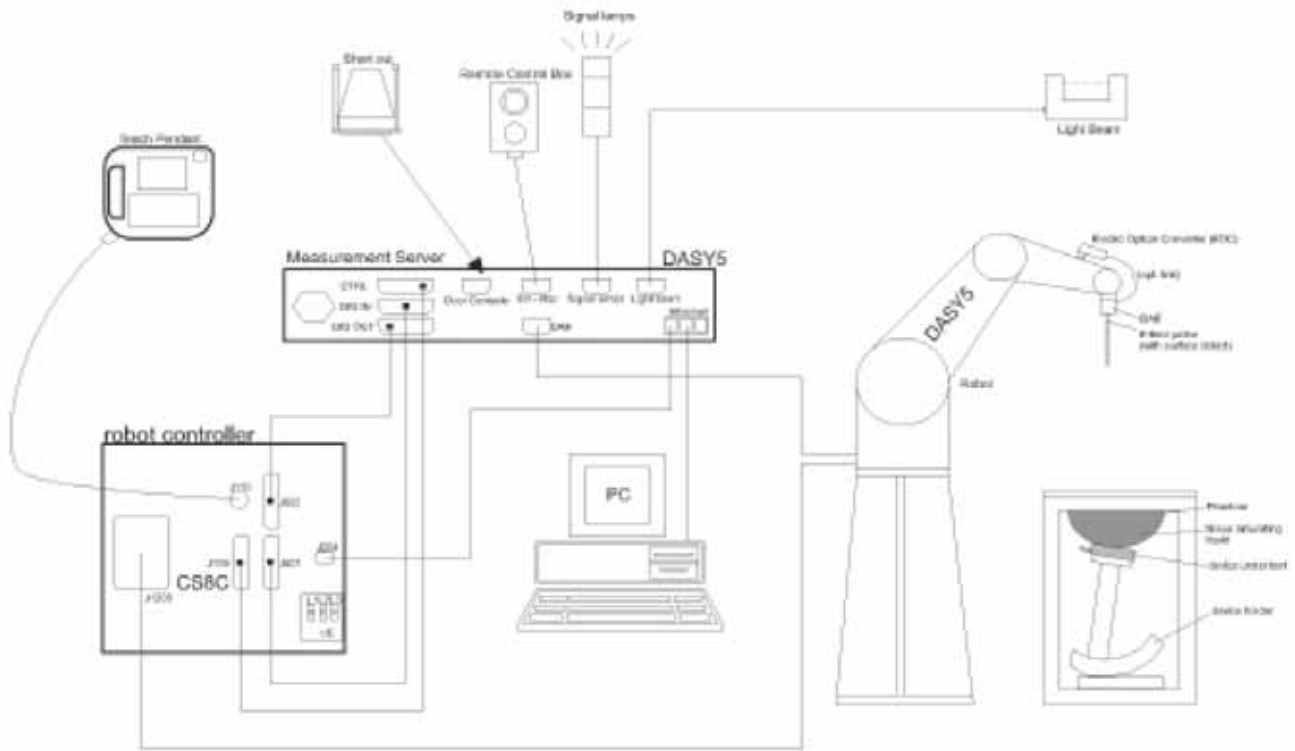


Fig. 5.1 DASY5 System

The DASY5 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
- Remote control with teach pendant and additional circuitry for robot safety such as warning 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 DASY5 E-Field Probe System

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
<EX3DV3 Probe>**

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents)	 <p>Fig. 5.3 EX3DV3 E-field Probe</p>
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 E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. The spherical isotropy shall be evaluated and within $\pm 0.25\text{dB}$. 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 are as below:

EX3DV3 sn3514 (Cal: Jan. 21, 2009)			
Item	X axis	Y axis	Z axis
Sensitivity (μV)	0.66	0.70	0.60
Diode Compression Point (mV)	91	94	95
Conversion Factor (Head / Body)	Frequency (MHz)	X,Y,Z axis	
	800~1000	9.31 / 9.41	
	1710~1910	8.16 / 8.18	
	2200~2400	7.78 / 7.60	
	2500~2700	7.34 / 7.20	
	3400~3600	6.89 / 6.40	
	5100~5300	4.78 / 4.29	
	5200~5400	4.40 / 3.94	
	5400~5600	4.22 / 3.88	
	5500~5700	4.13 / 3.89	
5700~5900	4.13 / 3.85		
Boundary Effect (Head / Body)	Frequency (MHz)	Alpha	Depth
	800~1000	0.45 / 0.42	0.76 / 0.76
	1710~1910	0.60 / 0.85	0.63 / 0.56
	2200~2400	0.53 / 0.18	0.63 / 4.17
	2500~2700	0.16 / 0.34	2.19 / 1.14
	3400~3600	0.50 / 0.53	0.86 / 0.81
	5100~5300	0.40 / 0.45	1.70 / 1.75
	5200~5400	0.40 / 0.45	1.70 / 1.75
	5400~5600	0.40 / 0.45	1.70 / 1.75
	5500~5700	0.40 / 0.45	1.70 / 1.75
5700~5900	0.40 / 0.45	1.70 / 1.75	

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

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 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 DAE is 200M Ohm; the inputs are symmetrical and floating. Common mode rejection is above 80dB.

5.3 Robot

The DASY5 system uses the high precision robots TX90 XL type out of the newer series from Stäubli SA (France). For the 6-axis controller DASY5 system, the CS8C robot controller version from Stäubli is used. The XL 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 DASY5 measurement server is based on a PC/104 CPU board with
400 MHz CPU
128 MB chipdisk and
128 MB RAM.

Communication with
the DAE 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

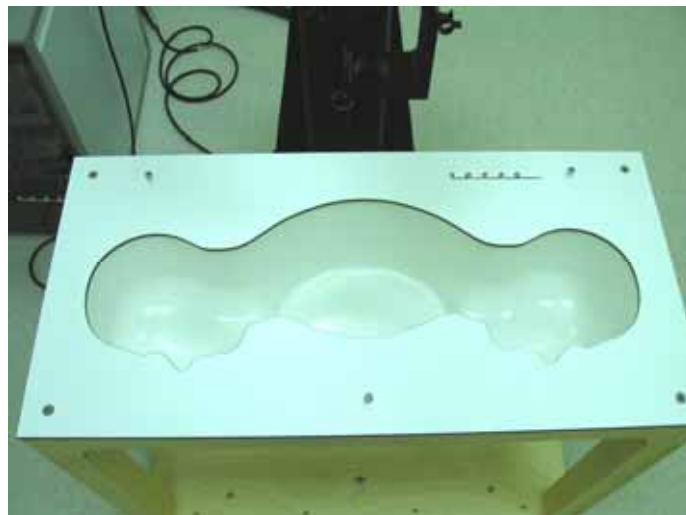


Fig. 5.4 Top View of Twin Phantom



Fig. 5.5 Bottom View of Twin Phantom

5.6 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 in 5 mm distance, a positioning uncertainty of $\pm 0.5\text{mm}$ would produce a SAR uncertainty of $\pm 20\%$. An accurate device position is therefore crucial for accurate and repeatable measurement. The position in which the devices must be measured, are defined by the standards.

The DASY5 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 DASY5 device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon_r = 3$ and loss tangent $\delta = 0.02$. 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. 5.6 Device Holder



5.7 Data Storage and Evaluation

5.7.1 Data Storage

The DASY5 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. 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 DASY5 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 _j , a _ρ , a _{i1} , a ₂
	- Conversion factor	ConvF _j
	- Diode compression point	dcp _j
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 DASY5 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{

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

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

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

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

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

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

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

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

Ê 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 **$Ppwe$** = 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



5.8 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Dosimetric E-Filed Probe	ET3DV6	1787	Aug. 26, 2008	Aug. 25, 2009
SPEAG	Dosimetric E-Filed Probe	ET3DV6	1788	Sep. 23, 2008	Sep. 22, 2009
SPEAG	Dosimetric E-Filed Probe	EX3DV3	3514	Jan. 21, 2009	Jan. 20, 2010
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 17, 2008	Mar. 16, 2010
SPEAG	900MHz System Validation Kit	D900V2	190	Jul. 16, 2007	Jul. 15, 2009
SPEAG	1800MHz System Validation Kit	D1800V2	2d076	Jul. 10, 2007	Jul. 09, 2009
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 28, 2008	Mar. 27, 2010
SPEAG	2000MHz System Validation Kit	D2000V2	1010	Sep. 17, 2008	Sep. 16, 2010
SPEAG	2300MHz System Validation Kit	D2300V2	1006	Sep. 12, 2007	Sep. 11, 2009
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 12, 2007	Jul. 11, 2009
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Sep. 12, 2007	Sep. 11, 2009
SPEAG	3500MHz System Validation Kit	D3500V2	1014	Sep. 19, 2007	Sep. 18, 2009
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Jan. 24, 2008	Jan. 23, 2010
SPEAG	Data Acquisition Electronics	DAE3	577	Nov. 12, 2008	Nov. 11, 2009
SPEAG	Data Acquisition Electronics	DAE4	778	NCR	NCR
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-1477	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 001 BB	1026	Apr. 02, 2008	Apr. 01, 2009
SPEAG	ELI4 Phantom	QD 0VA 001 BA	1029	Dec. 15, 2008	Dec. 14, 2009
Agilent	ENA Series Network Analyzer	E5071C	MY46100746	Jan. 20, 2009	Jan. 19, 2010
Agilent	Wireless Communication Test Set	E5515C	MY48360820	NCR	NCR
R&S	Universal Radio Communication Tester	CMU200	105934	NCR	NCR
Agilent	Dielectric Probe Kit	85070D	US01440205	NCR	NCR
Agilent	Dual Directional Coupler	778D	50422	Oct. 20, 2008	Oct. 19, 2009
AR	Power Amplifier	5S1G4M2	0328767	Oct. 20, 2008	Oct. 19, 2009
R&S	Power Meter	NRVD	101394	Aug. 26, 2008	Aug. 25, 2009
R&S	Power Sensor	NRV-Z1	100130	Sep. 23, 2008	Sep. 22, 2009

Table 5.1 Test Equipment List

6. Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY5, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. The liquid height from the bottom of the phantom body is 15.2 centimeters, which is shown in Fig. 6.1.



Fig 6.1 Liquid height from the bottom of the phantom body is 15.2 centimeters

The following ingredients for tissue simulating liquid are used:

- **Water:** deionized water (pure H₂O), resistivity \hat{o} 16M Ω - as basis for the liquid
- **Sugar:** refined sugar in crystals, as available in food shops – to reduce relative permittivity
- **Salt:** pure NaCl – to increase conductivity
- **Cellulose:** Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2% in water, 20°C), CAS#54290-to increase viscosity and to keep sugar in solution.
- **Preservative:** Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS#55965-84-9- to prevent the spread of bacteria and molds.
- **DGMBE:** Deithlenglycol-monobuthyl ether (DGMBE), Fluka Chemie GmbH, CAS#112-34-5 – to reduce relative permittivity.

Table 6.1 gives the targets for simulating liquid.

Frequency (MHz)	Liquid Type	Conductivity (σ)	$\pm 5\%$ Range	Permittivity (ϵ_r)	$\pm 5\%$ Range
2450	Head	1.80	1.71 ~ 1.89	39.2	37.2 ~ 41.2
2600	Head	1.96	1.87 ~ 2.06	39.0	37.1 ~ 41.0
2450	Body	1.95	1.85 ~ 2.05	52.7	50.1 ~ 55.3
2600	Body	2.16	2.05 ~ 2.27	52.5	49.9 ~ 55.1

Table 6.1 Targets of Tissue Simulating Liquid

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

Table 6.2 shows the measuring results for simulating liquid.

Band	Position	Temperature ()	Frequency (MHz)	Conductivity (σ)	Permittivity (ϵ_r)	Measurement date	
802.16e	Head	21.3	2501	1.88	38.6	Feb. 28, 2009	
			2593	1.97	38.2		
			2685	2.05	37.9		
		21.4	2501	1.89	38.7	Mar. 31, 2009	
			2593	1.97	38.3		
			2685	2.06	38.0		
	Body	21.5	21.5	2501	2.07	54.0	Feb. 28, 2009
				2593	2.19	53.8	
				2685	2.25	53.6	
		21.5	21.5	2501	2.07	53.0	Mar. 31, 2009
				2593	2.19	52.8	
				2685	2.25	52.6	

Table 6.2 Measuring Results for Simulating Liquid

7. Uncertainty Assessment

The component of uncertainty may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainty 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/√3	1/√6	1/√2

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

(b) κ is the coverage factor

Table 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 DASY5 uncertainty Budget is showed in Table 7.2.



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 DASYS

8. SAR Measurement Evaluation

Each DASY5 system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY5 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 2600 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:

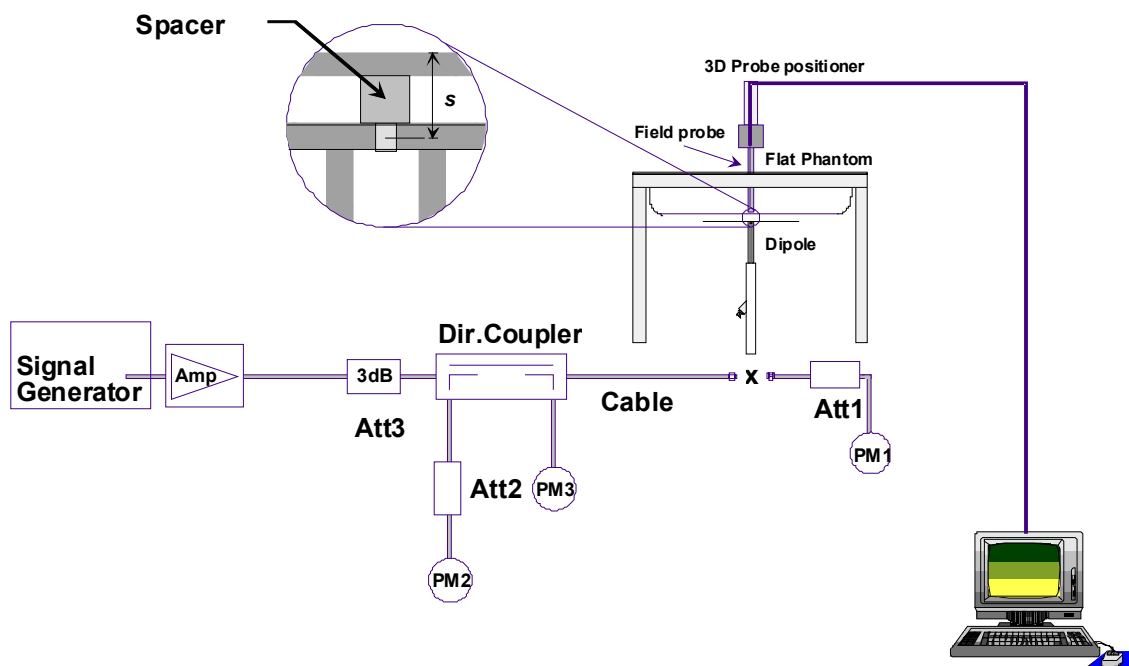


Fig. 8.1 System Setup for System Evaluation

1. Signal Generator
2. Amplifier
3. Directional Coupler
4. Power Meter
5. 2600 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 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.

Frequency (MHz)	Position	SAR	Target (W/kg)	Measurement data (W/kg)	Variation	Measurement Date
2600	Body	SAR (1g)	57.6	58.2	1.0 %	Feb. 28, 2009
		SAR (10g)	25.5	25.8	1.2 %	
		SAR (1g)	57.6	55.5	-3.6 %	Mar. 31, 2009
		SAR (10g)	25.5	24.6	-3.5 %	

Table 8.1 Target and Measurement Data Comparison



9. Description for DUT Testing Position

This DUT was tested in six different positions. They are right cheek, right tilted, left cheek, left tilted, face of the DUT with gap 1.5 cm and bottom of the DUT with gap 1.5 cm as illustrated below: (Please refer to Appendix E for the test setup photos.)

- 1) “Cheek Position”
 - i) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M, RE and LE) and align the center of the ear piece with the line RE-LE.
 - ii) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig. 9.1).

- 2) “Tilted Position”
 - i) To position the device in the “cheek” position described above
 - ii) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (sees Fig. 9.2).

- 3) “Body Worn”
 - i) To position the device parallel to the phantom surface with either keypad up or down.
 - ii) To adjust the device parallel to the flat phantom.
 - iii) To adjust the distance between the device surface and the flat phantom to 1.5 cm.

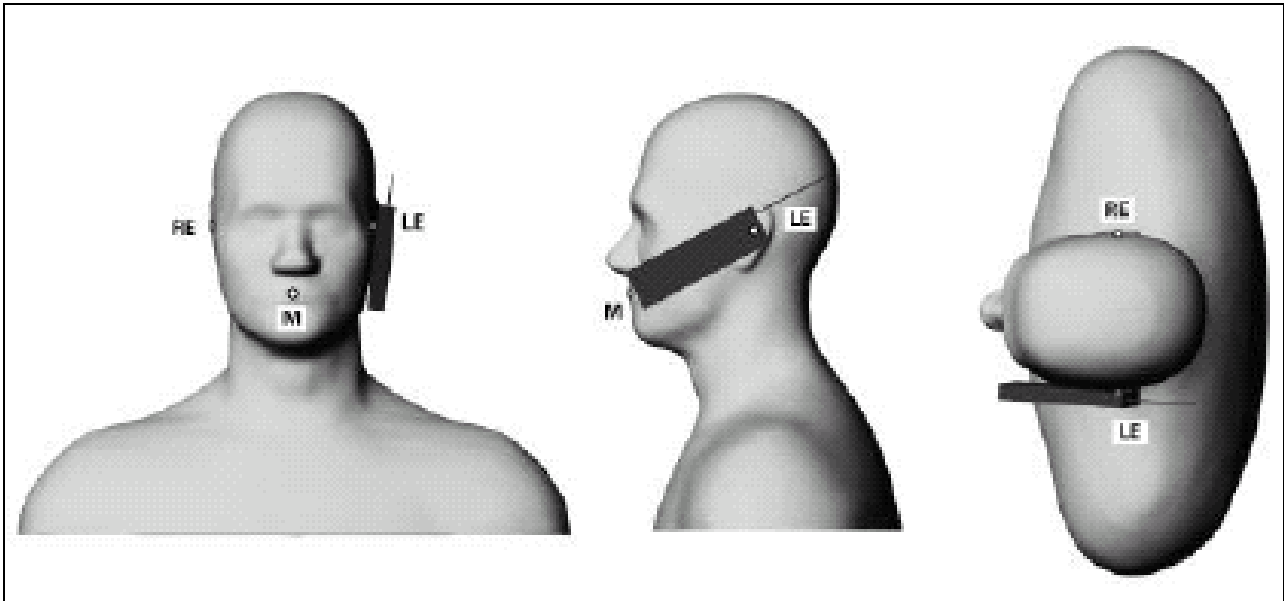


Fig. 9.1 Phone Position 1, "Cheek" or "Touch" Position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the plane for phone positioning, are indicated.

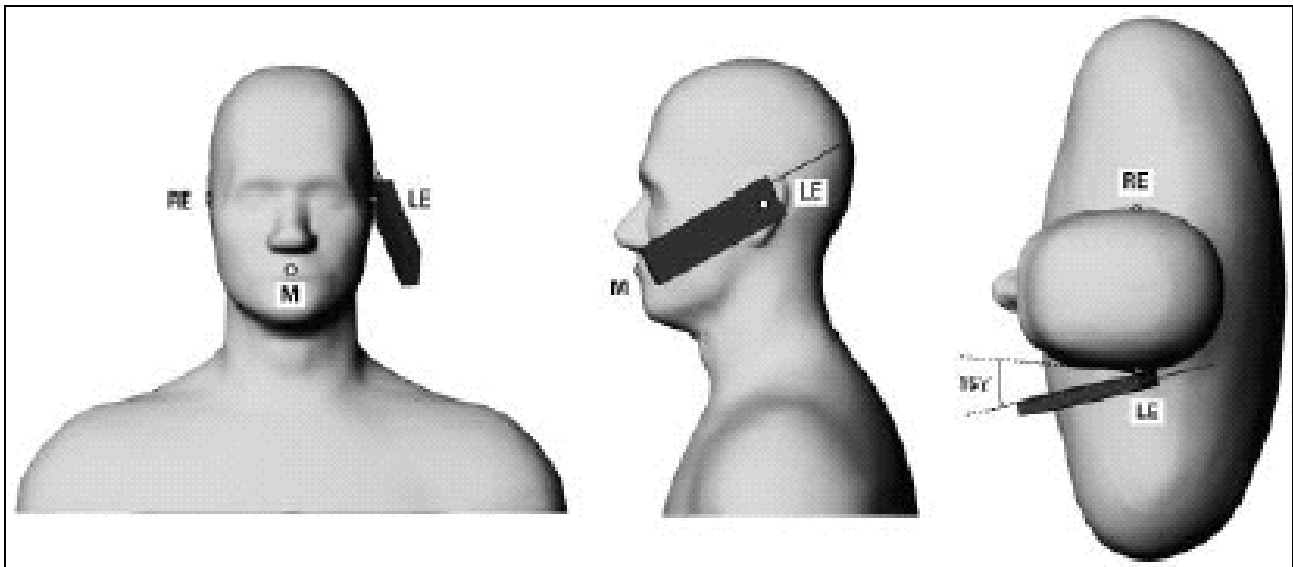


Fig. 9.2 Phone Position 2, "Tilted Position". The reference point for the right ear (RE), left ear (LE) and mouth (M), which define the plane for phone positioning, are indicated.



10. Measurement Procedures

The measurement procedures are as follows:

- Using engineering software to transmit RF power continuously (continuous Tx) in the middle 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 middle channel on each testing position
- Finding out the largest SAR result on these testing positions of each band
- Measuring output power and SAR results for the lowest and highest channels in this worst case testing position

According to the OET Bulletin 65 Supplement C 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 OET Bulletin 65 Supplement C standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY5 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:

- 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 from 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 DASY5, 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 Conducted Power

QPSK 1/2

Channel Band Width	Frequency (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (dB)
		Peak	Average	
10	2501	29.36	20.69	8.67
	2593	29.98	21.25	8.73
	2685	29.61	20.89	8.72

QPSK 3/4

Channel Band Width	Frequency (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (dB)
		Peak	Average	
10	2501	29.62	20.90	8.72
	2593	29.45	20.75	8.70
	2685	29.22	20.57	8.65

16-QAM 1/2

Channel Band Width	Frequency (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (dB)
		Peak	Average	
10	2501	29.42	20.73	8.69
	2593	28.96	20.39	8.57
	2685	29.64	20.92	8.72

16-QAM 3/4

Channel Band Width	Frequency (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (dB)
		Peak	Average	
10	2501	29.26	20.73	8.53
	2593	30.09	21.36	8.73
	2685	29.72	21.00	8.72



11.2 Test Records for Head SAR Test

Position	Battery	Band	Chan.	Freq. (MHz)	Modulation Type	Measured 1g SAR (W/kg)	Limit (W/kg)	Result
Right Cheek	1	802.16e (BW 10MHz)	1	2593	QPSK 1/2	0.361	1.6	Pass
Right Cheek	2	802.16e (BW 10MHz)	1	2593	QPSK 1/2	0.346	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	1	2593	QPSK 1/2	0.425	1.6	Pass
Left Cheek	1	802.16e (BW 10MHz)	1	2593	QPSK 1/2	0.316	1.6	Pass
Left Tilted	1	802.16e (BW 10MHz)	1	2593	QPSK 1/2	0.387	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	0	2501	QPSK 1/2	0.340	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	2	2685	QPSK 1/2	0.527	1.6	Pass
Right Cheek	1	802.16e (BW 10MHz)	1	2593	QPSK 3/4	0.316	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	1	2593	QPSK 3/4	0.443	1.6	Pass
Left Cheek	1	802.16e (BW 10MHz)	1	2593	QPSK 3/4	0.32	1.6	Pass
Left Tilted	1	802.16e (BW 10MHz)	1	2593	QPSK 3/4	0.364	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	0	2501	QPSK 3/4	0.306	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	2	2685	QPSK 3/4	0.411	1.6	Pass
Right Cheek	1	802.16e (BW 10MHz)	1	2593	16QAM 1/2	0.367	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	1	2593	16QAM 1/2	0.455	1.6	Pass
Left Cheek	1	802.16e (BW 10MHz)	1	2593	16QAM 1/2	0.323	1.6	Pass
Left Tilted	1	802.16e (BW 10MHz)	1	2593	16QAM 1/2	0.382	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	0	2501	16QAM 1/2	0.329	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	2	2685	16QAM 1/2	0.522	1.6	Pass
Right Cheek	1	802.16e (BW 10MHz)	1	2593	16QAM 3/4	0.347	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	1	2593	16QAM 3/4	0.416	1.6	Pass
Left Cheek	1	802.16e (BW 10MHz)	1	2593	16QAM 3/4	0.304	1.6	Pass
Left Tilted	1	802.16e (BW 10MHz)	1	2593	16QAM 3/4	0.384	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	0	2501	16QAM 3/4	0.291	1.6	Pass
Right Tilted	1	802.16e (BW 10MHz)	2	2685	16QAM 3/4	0.392	1.6	Pass



11.3 Test Records for Body SAR Test

Position	Battery	Earphone	Band	Chan.	Freq. (MHz)	Modulation Type	Measured 1g SAR (W/kg)	Limit (W/kg)	Result
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	1	2593	QPSK 1/2	0.19	1.6	Pass
Bottom with 1.5cm Gap	2	2	802.16e (BW 10MHz)	1	2593	QPSK 1/2	0.189	1.6	Pass
Face with 1.5cm Gap	1	1	802.16e (BW 10MHz)	1	2593	QPSK 1/2	0.071	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	0	2501	QPSK 1/2	0.156	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	2	2685	QPSK 1/2	0.234	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	1	2593	QPSK 3/4	0.18	1.6	Pass
Face with 1.5cm Gap	1	1	802.16e (BW 10MHz)	1	2593	QPSK 3/4	0.067	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	0	2501	QPSK 3/4	0.138	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	2	2685	QPSK 3/4	0.149	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	1	2593	16QAM 1/2	0.186	1.6	Pass
Face with 1.5cm Gap	1	1	802.16e (BW 10MHz)	1	2593	16QAM 1/2	0.07	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	0	2501	16QAM 1/2	0.155	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	2	2685	16QAM 1/2	0.229	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	1	2593	16QAM 3/4	0.17	1.6	Pass
Face with 1.5cm Gap	1	1	802.16e (BW 10MHz)	1	2593	16QAM 3/4	0.064	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	0	2501	16QAM 3/4	0.133	1.6	Pass
Bottom with 1.5cm Gap	1	1	802.16e (BW 10MHz)	2	2685	16QAM 3/4	0.143	1.6	Pass

Test Engineer{ Jason Wang, Robert Liu, and A-Rod Chen



12. References

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [2] 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"
- [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
- [4] 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
- [5] 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
- [6] DASY5 System Handbook
- [7] KDB 648474 D01 v01r05, "SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas", Sept 2008



Appendix A - System Performance Check Data

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

Date: 2009/2/28

System Check_Body_2600MHz_090228

DUT: Dipole 2600 MHz

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: MSL_2600 Medium parameters used: $f = 2600$ MHz; $\sigma = 2.2$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 °C; Liquid Temperature : 21.5 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 7.01 mW/g

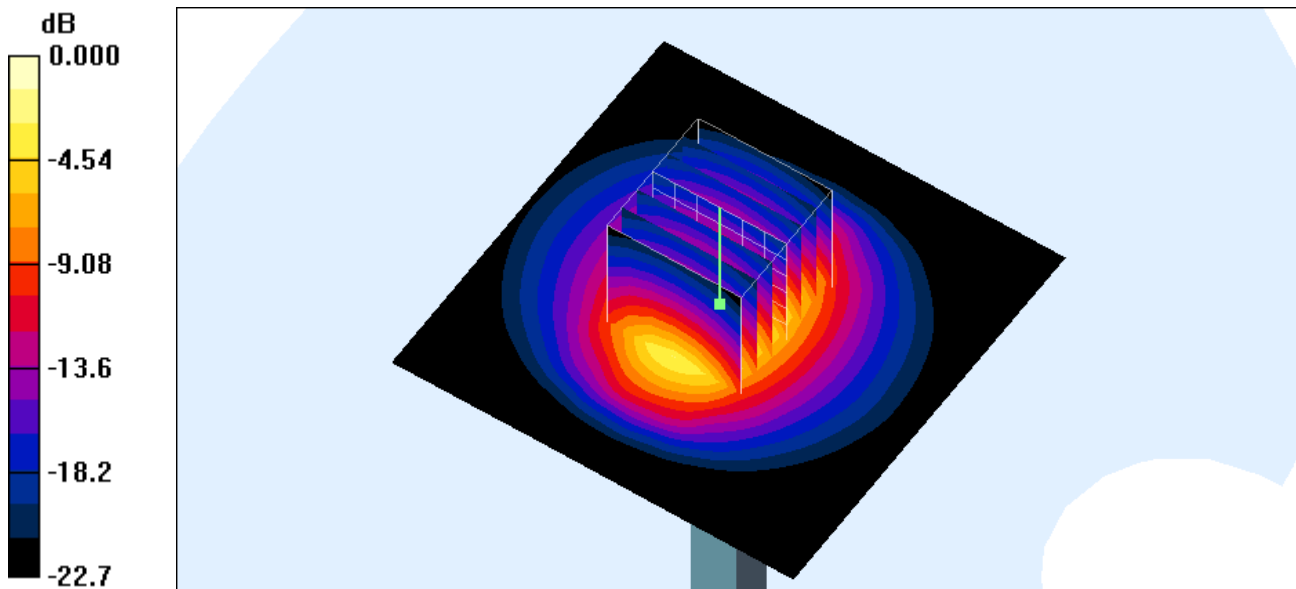
Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.4 V/m; Power Drift = -0.062 dB

Peak SAR (extrapolated) = 12.4 W/kg

SAR(1 g) = 5.82 mW/g; SAR(10 g) = 2.58 mW/g

Maximum value of SAR (measured) = 6.76 mW/g



0 dB = 6.76mW/g



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

Date: 2009/3/31

System Check_Body_2600MHz_090331

DUT: Dipole 2600 MHz

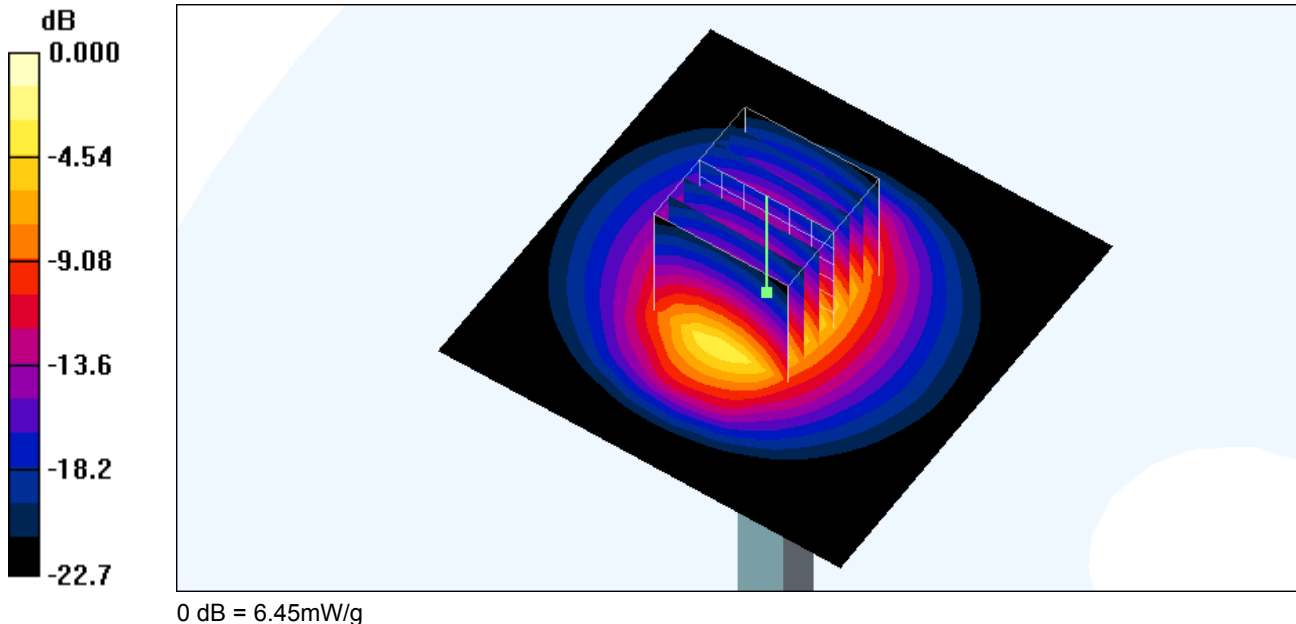
Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: MSL_2600 Medium parameters used: $f = 2600$ MHz; $\sigma = 2.2$ mho/m; $\epsilon_r = 52.8$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.7 °C; Liquid Temperature : 21.5 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 6.69 mW/g

Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.9 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 11.9 W/kg
SAR(1 g) = 5.55 mW/g; SAR(10 g) = 2.46 mW/g
Maximum value of SAR (measured) = 6.45 mW/g





Appendix B - SAR Measurement Data

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

Date: 2009/2/28

Right Cheek_802.16e Ch1_QPSK 1/2_Battery1

DUT: 920713

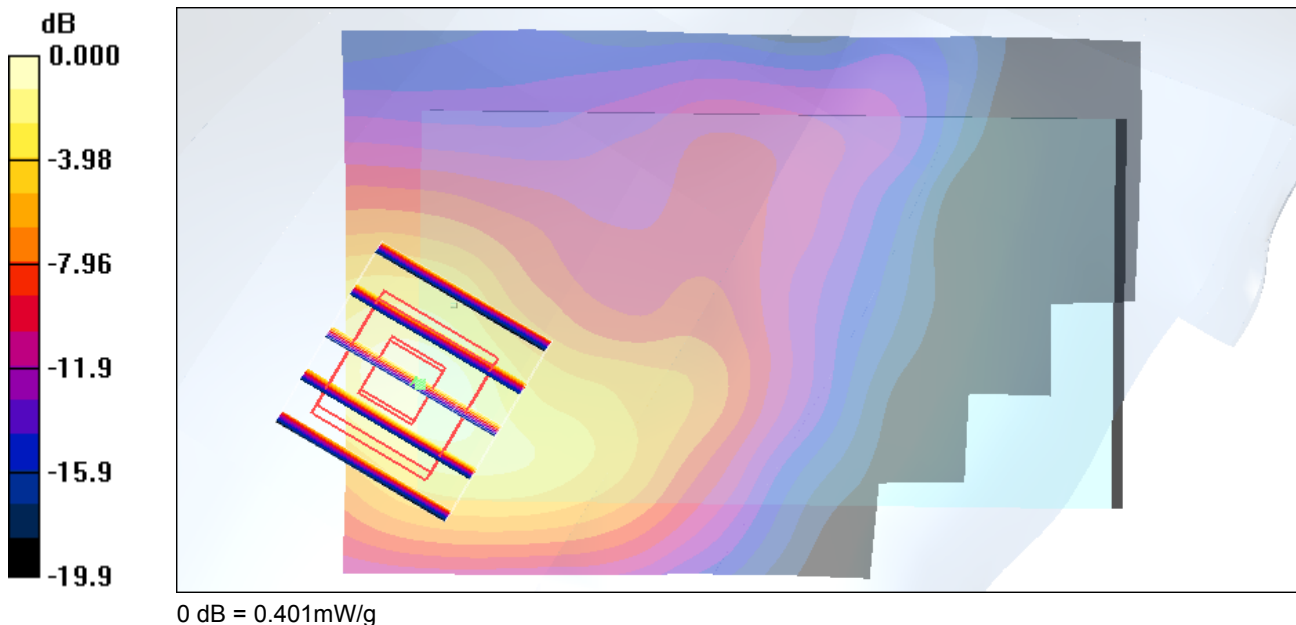
Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.5 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.366 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.87 V/m; Power Drift = -0.105 dB
Peak SAR (extrapolated) = 0.763 W/kg
SAR(1 g) = 0.361 mW/g; SAR(10 g) = 0.169 mW/g
Maximum value of SAR (measured) = 0.401 mW/g





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

Date: 2009/2/28

Right Cheek_802.16e Ch1_QPSK 1/2_Battery2

DUT: 920713

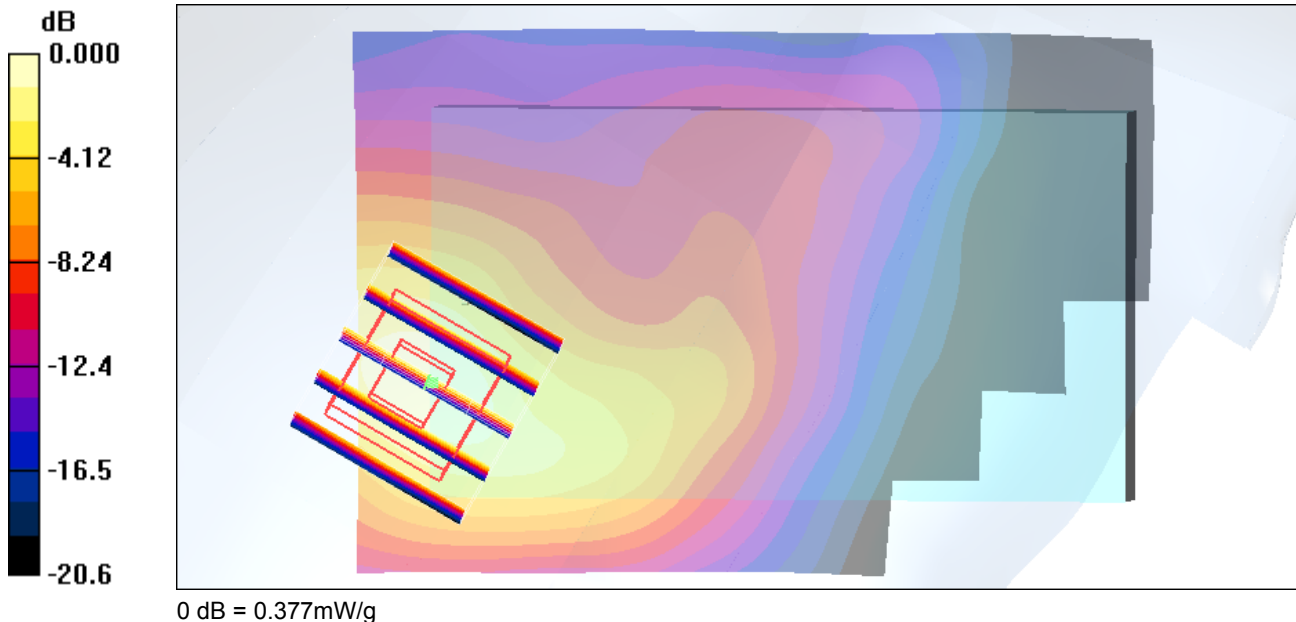
Communication System: Wimax; Frequency: 2593 MHz;Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.5 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.348 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.45 V/m; Power Drift = -0.035 dB
Peak SAR (extrapolated) = 0.732 W/kg
SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.164 mW/g
Maximum value of SAR (measured) = 0.377 mW/g





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

Date: 2009/2/28

Right Tilted_802.16e Ch1_QPSK 1/2_Battery1

DUT: 920713

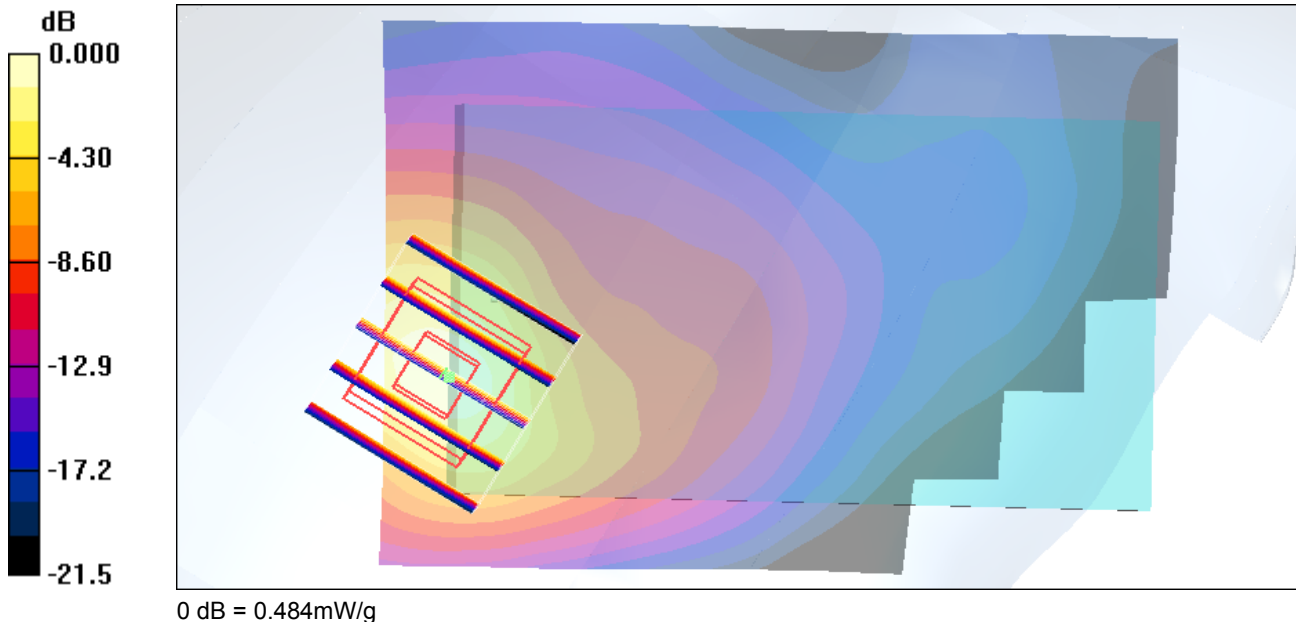
Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.438 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.78 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 0.919 W/kg
SAR(1 g) = 0.425 mW/g; SAR(10 g) = 0.192 mW/g
Maximum value of SAR (measured) = 0.484 mW/g





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

Date: 2009/2/28

Left Cheek_802.16e Ch1_QPSK 1/2_Battery1

DUT: 920713

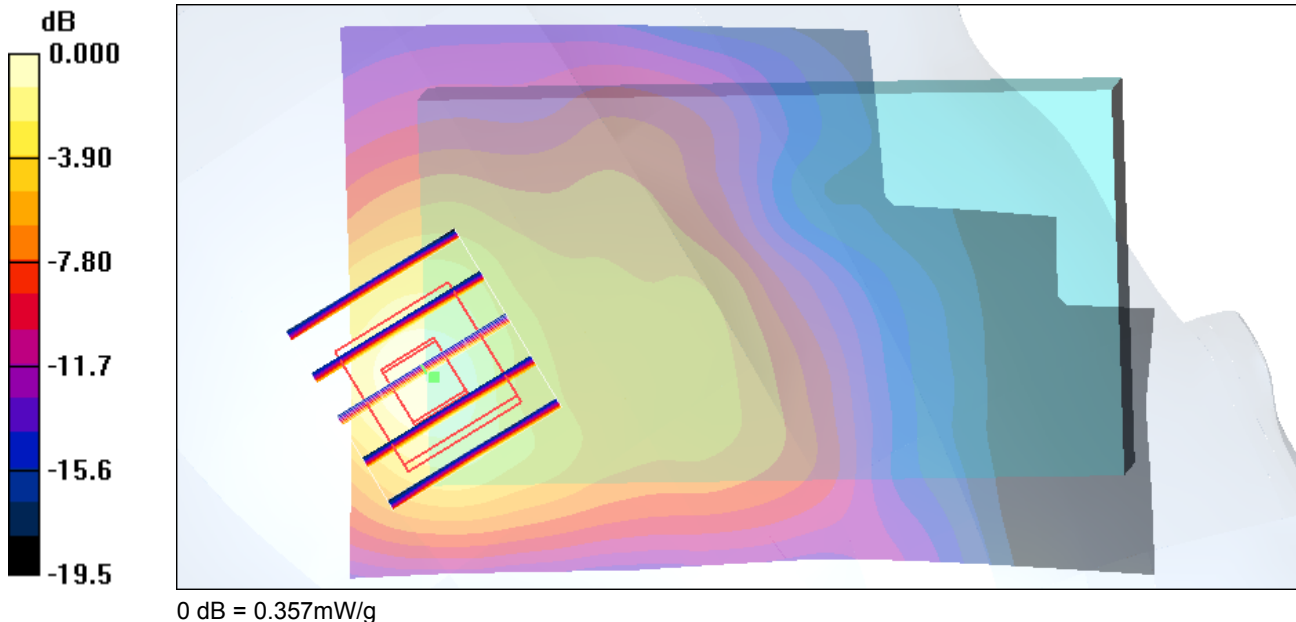
Communication System: Wimax; Frequency: 2593 MHz;Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.344 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.00 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 0.634 W/kg
SAR(1 g) = 0.316 mW/g; SAR(10 g) = 0.154 mW/g
Maximum value of SAR (measured) = 0.357 mW/g





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

Date: 2009/2/28

Left Tilted_802.16e Ch1_QPSK 1/2_Battery1

DUT: 920713

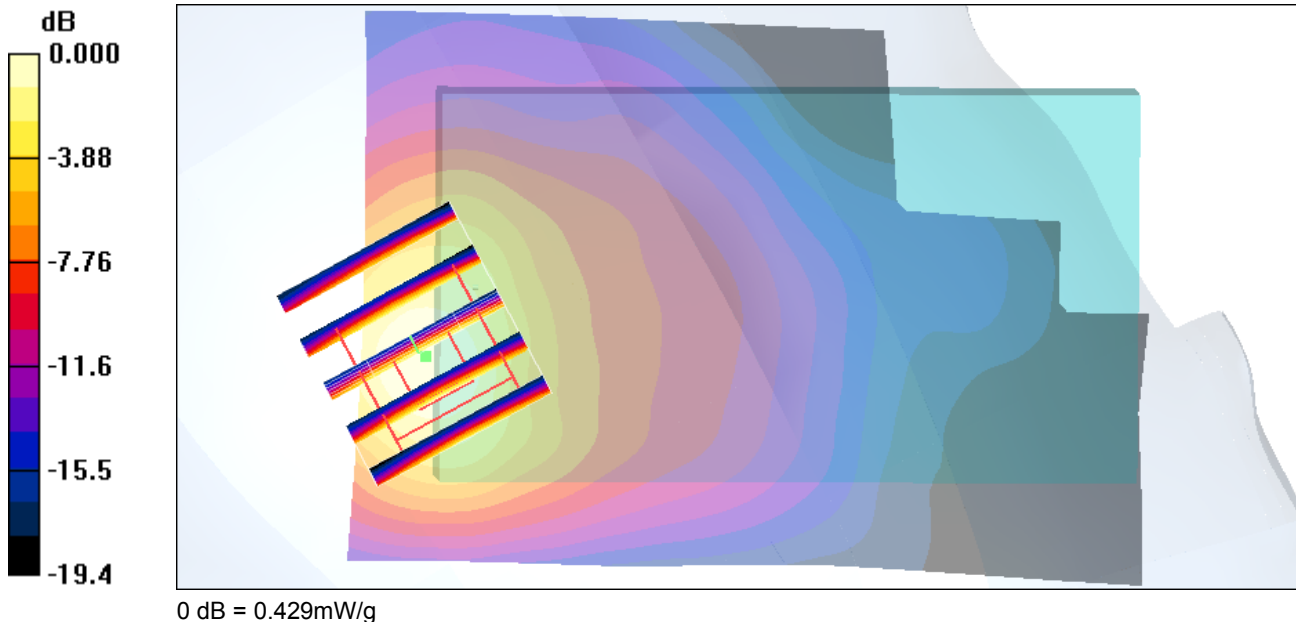
Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.428 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 0.780 W/kg
SAR(1 g) = 0.387 mW/g; SAR(10 g) = 0.186 mW/g
Maximum value of SAR (measured) = 0.429 mW/g





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

Date: 2009/2/28

Right Tilted_802.16e Ch0_QPSK 1/2_Battery1

DUT: 920713

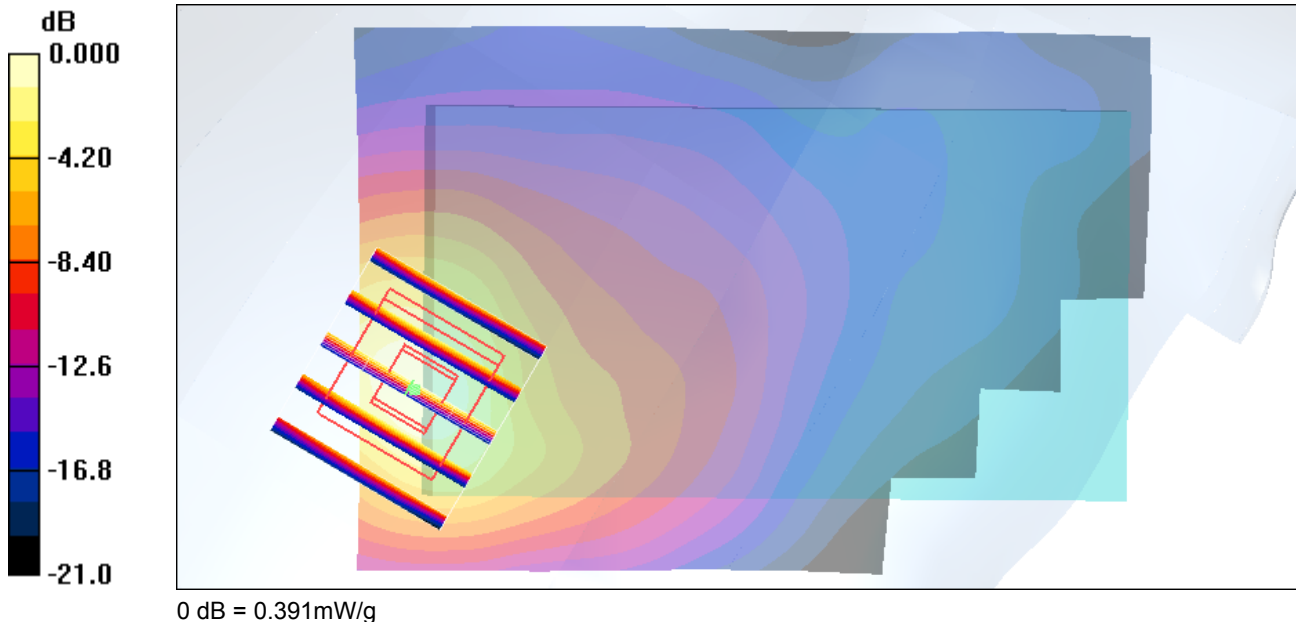
Communication System: Wimax; Frequency: 2501 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2501$ MHz; $\sigma = 1.88$ mho/m; $\epsilon_r = 38.6$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2501/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.354 mW/g

Ch2501/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.07 V/m; Power Drift = -0.149 dB
Peak SAR (extrapolated) = 0.698 W/kg
SAR(1 g) = 0.340 mW/g; SAR(10 g) = 0.159 mW/g
Maximum value of SAR (measured) = 0.391 mW/g





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

Date: 2009/2/28

Right Tilted_802.16e Ch2_QPSK 1/2_Battery1

DUT: 920713

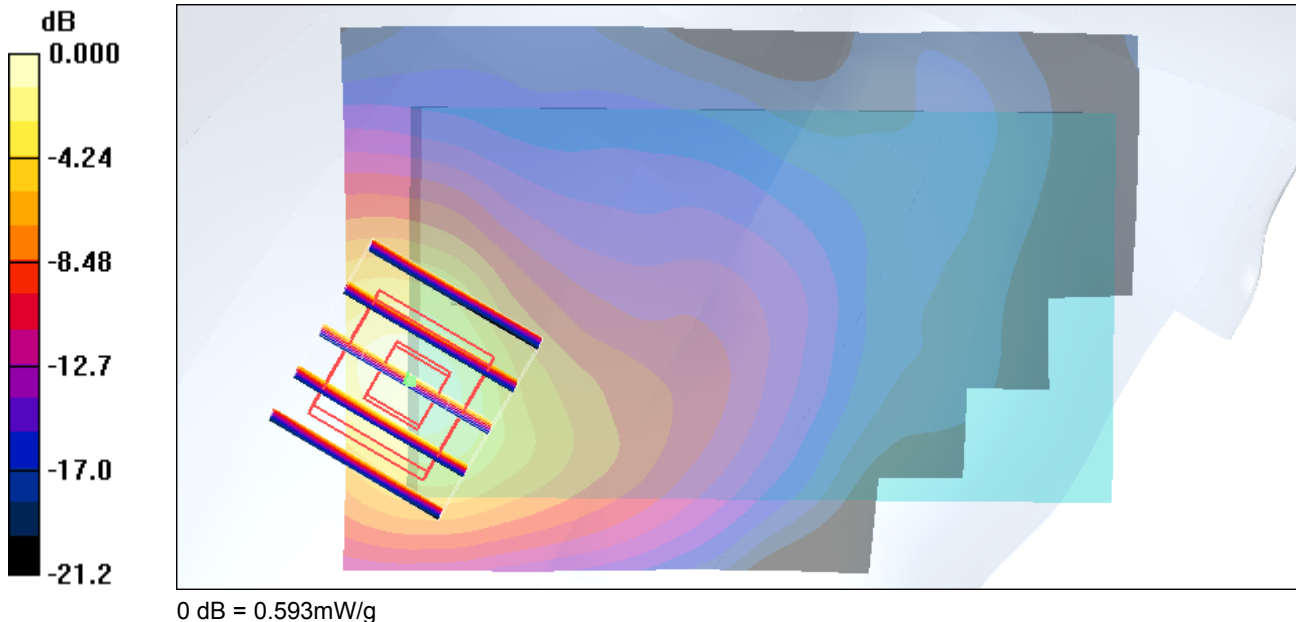
Communication System: Wimax; Frequency: 2685 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2685$ MHz; $\sigma = 2.05$ mho/m; $\epsilon_r = 37.9$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2685/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.561 mW/g

Ch2685/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = 0.014 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.527 mW/g; SAR(10 g) = 0.240 mW/g
Maximum value of SAR (measured) = 0.593 mW/g





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

Date: 2009/2/28

Right Cheek_802.16e Ch1_QPSK 3/4_Battery1

DUT: 920713

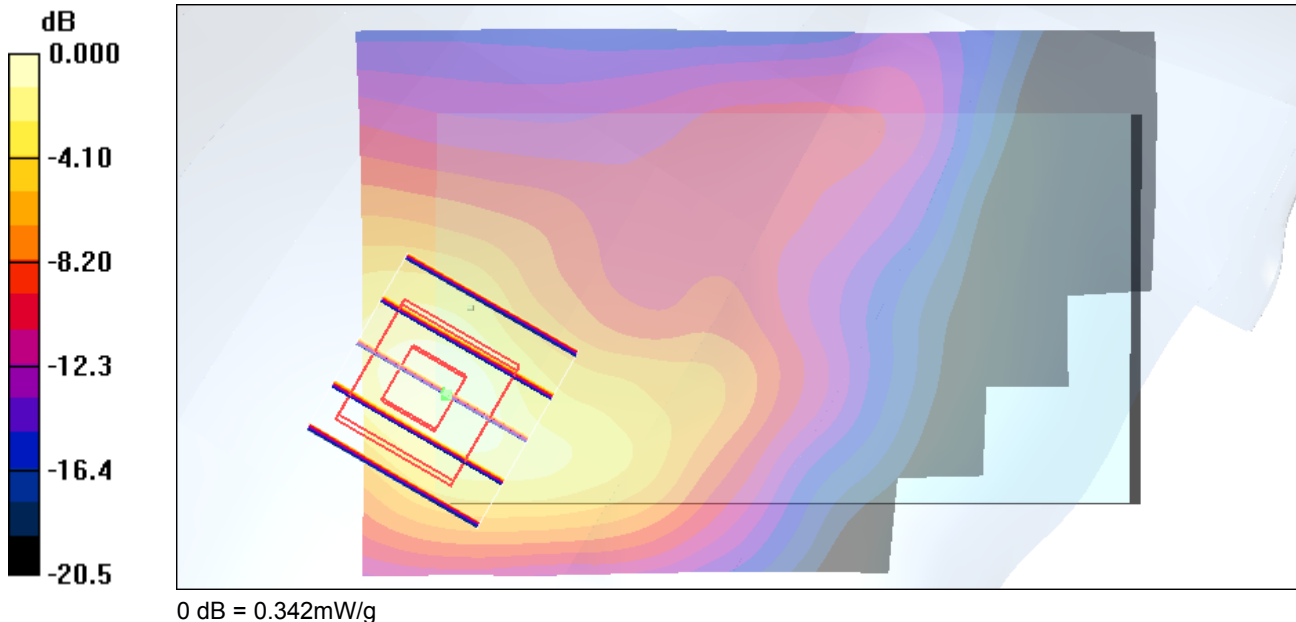
Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.5 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.324 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.06 V/m; Power Drift = -0.070 dB
Peak SAR (extrapolated) = 0.675 W/kg
SAR(1 g) = 0.316 mW/g; SAR(10 g) = 0.147 mW/g
Maximum value of SAR (measured) = 0.342 mW/g





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

Date: 2009/3/31

Right Tilted_802.16e Ch1_QPSK 3-4_Battery1

DUT: 920713

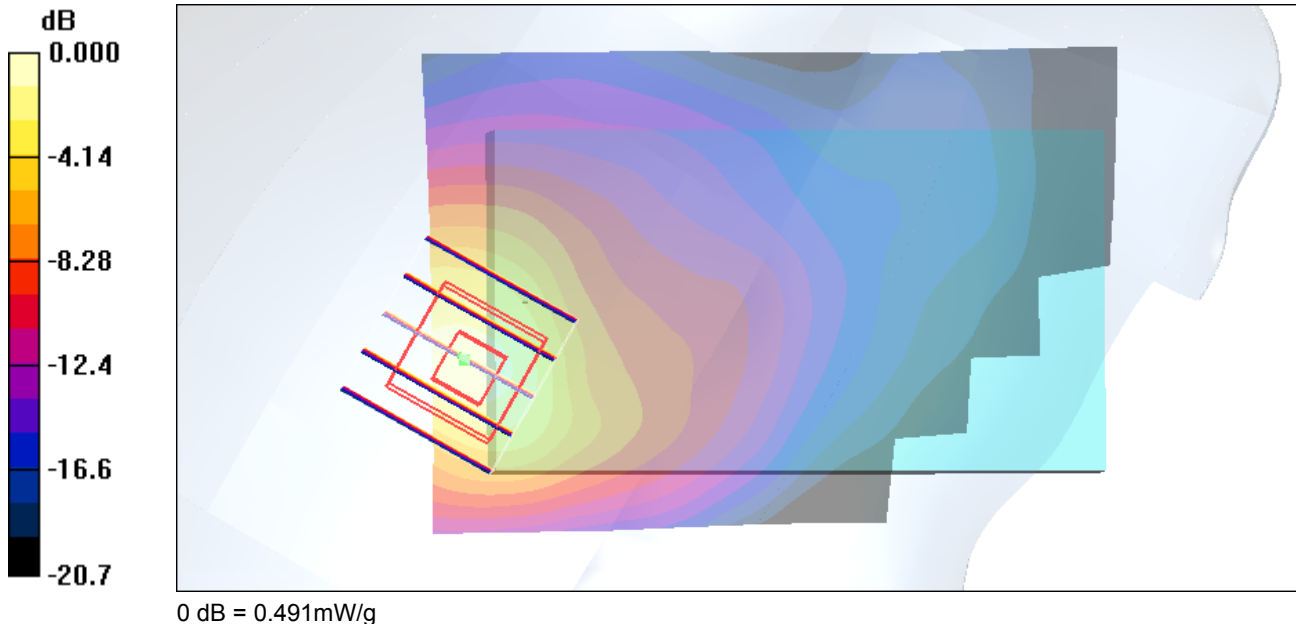
Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.3$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.7 °C; Liquid Temperature : 21.4 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.443 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.89 V/m; Power Drift = 0.196 dB
Peak SAR (extrapolated) = 0.981 W/kg
SAR(1 g) = 0.443 mW/g; SAR(10 g) = 0.200 mW/g
Maximum value of SAR (measured) = 0.491 mW/g





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

Date: 2009/3/31

Left Cheek_802.16e Ch1_QPSK 3/4_Battery1

DUT: 920713

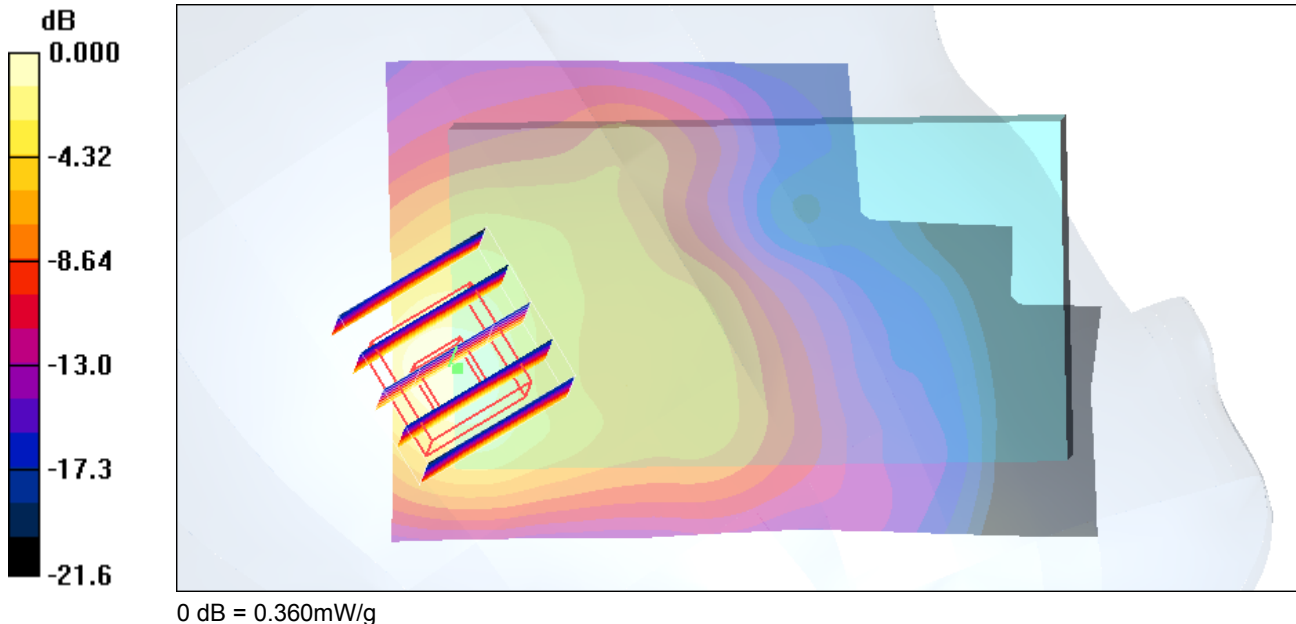
Communication System: Wimax; Frequency: 2593 MHz;Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.3$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.5 °C; Liquid Temperature : 21.4 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.338 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.74 V/m; Power Drift = -0.004 dB
Peak SAR (extrapolated) = 0.670 W/kg
SAR(1 g) = 0.320 mW/g; SAR(10 g) = 0.151 mW/g
Maximum value of SAR (measured) = 0.360 mW/g





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

Date: 2009/3/31

Left Tilted_802.16e Ch1_QPSK 3/4_Battery1

DUT: 920713

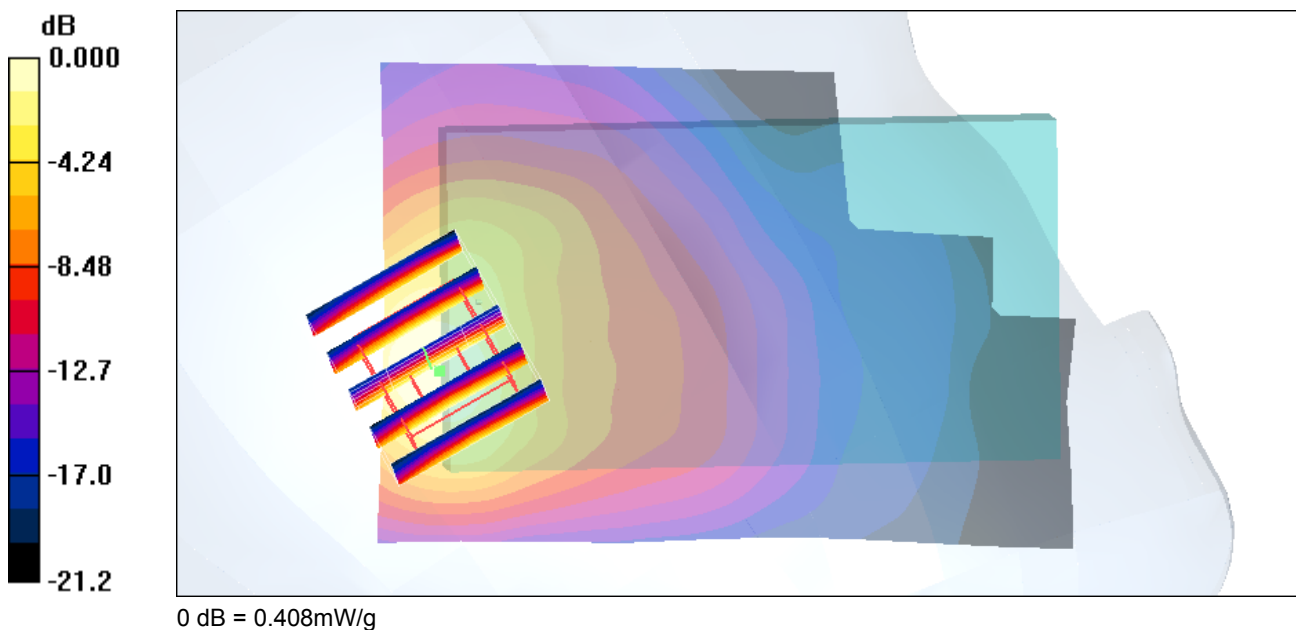
Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.3$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.7 °C; Liquid Temperature : 21.4 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.414 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 0.760 W/kg
SAR(1 g) = 0.364 mW/g; SAR(10 g) = 0.170 mW/g
Maximum value of SAR (measured) = 0.408 mW/g





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

Date: 2009/3/31

Right Tilted_802.16e Ch1_QPSK 3/4_Battery1

DUT: 920713

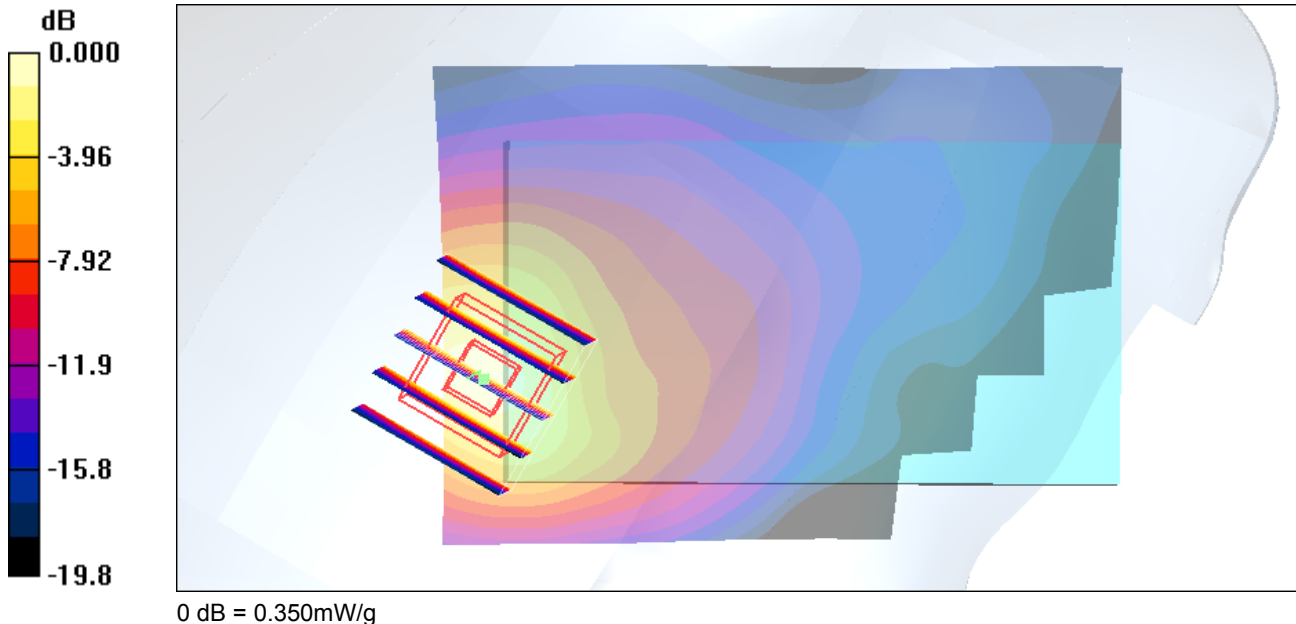
Communication System: Wimax; Frequency: 2501 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2501$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 38.7$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.6 °C; Liquid Temperature : 21.4 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2501/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.304 mW/g

Ch2501/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.53 V/m; Power Drift = -0.035 dB
Peak SAR (extrapolated) = 0.644 W/kg
SAR(1 g) = 0.306 mW/g; SAR(10 g) = 0.143 mW/g
Maximum value of SAR (measured) = 0.350 mW/g





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

Date: 2009/3/31

Right Tilted_802.16e Ch2_QPSK 3/4_Battery1

DUT: 920713

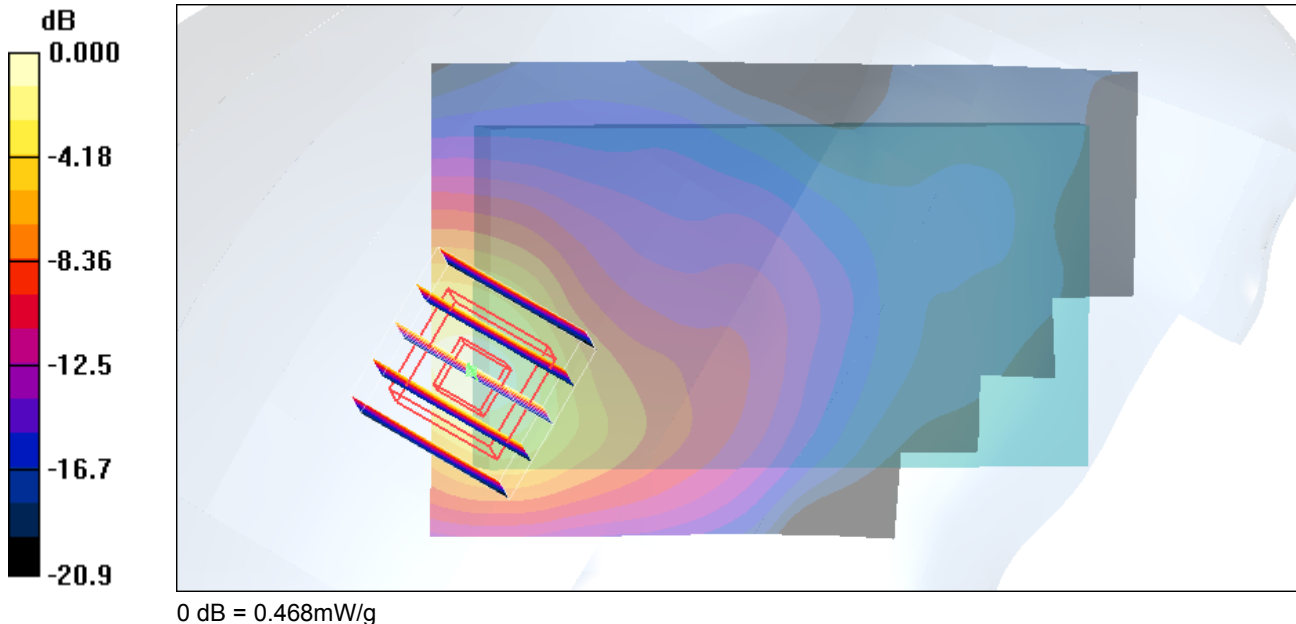
Communication System: Wimax; Frequency: 2685 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2685$ MHz; $\sigma = 2.06$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.6 °C; Liquid Temperature : 21.4 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2685/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.414 mW/g

Ch2685/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.40 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 0.906 W/kg
SAR(1 g) = 0.411 mW/g; SAR(10 g) = 0.184 mW/g
Maximum value of SAR (measured) = 0.468 mW/g





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

Date: 2009/2/28

Right Cheek_802.16e Ch1_16QAM 1/2_Battery1

DUT: 920713

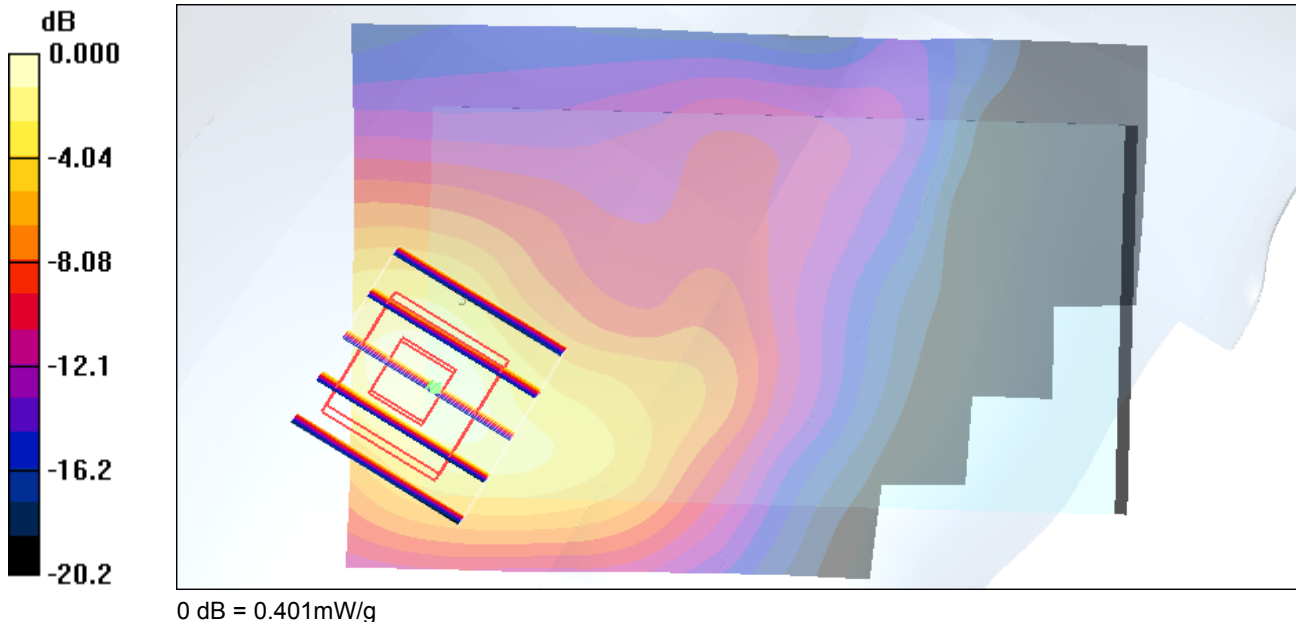
Communication System: Wimax; Frequency: 2593 MHz;Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.384 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.86 V/m; Power Drift = -0.190 dB
Peak SAR (extrapolated) = 0.776 W/kg
SAR(1 g) = 0.367 mW/g; SAR(10 g) = 0.172 mW/g
Maximum value of SAR (measured) = 0.401 mW/g





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

Date: 2009/2/28

Right Tilted_802.16e Ch1_16QAM 1/2_Battery1

DUT: 920713

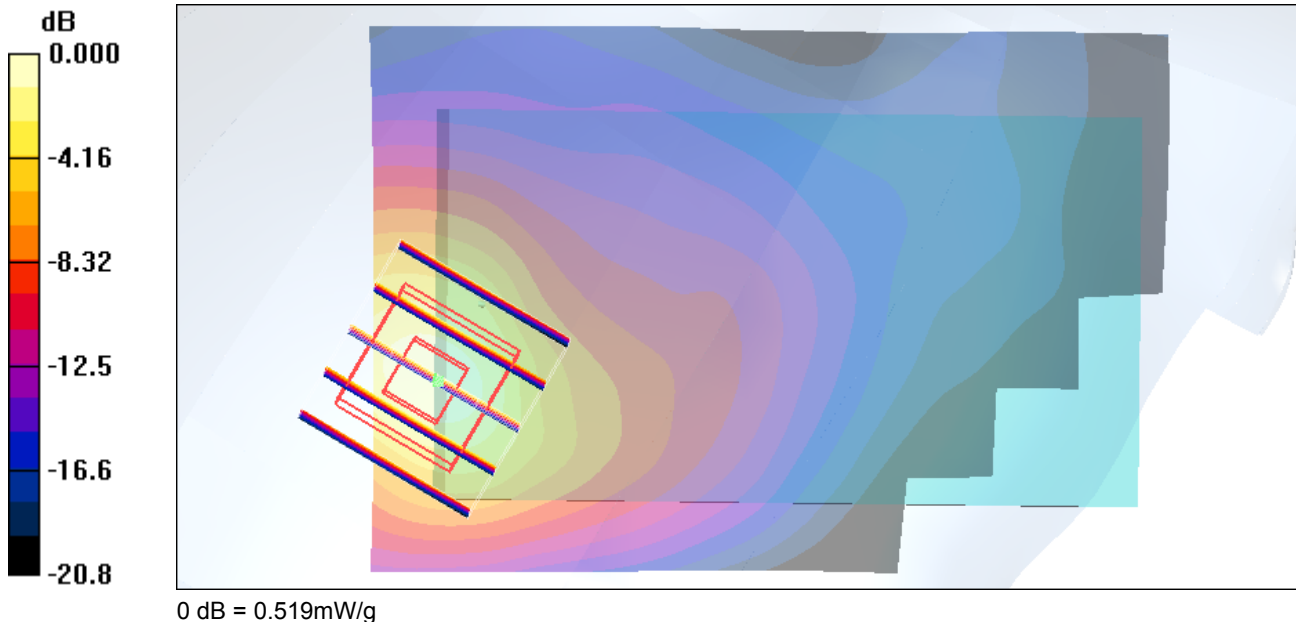
Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.476 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = -0.104 dB
Peak SAR (extrapolated) = 0.967 W/kg
SAR(1 g) = 0.455 mW/g; SAR(10 g) = 0.208 mW/g
Maximum value of SAR (measured) = 0.519 mW/g





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

Date: 2009/2/28

Left Cheek_802.16e Ch1_16QAM 1/2_Battery1

DUT: 920713

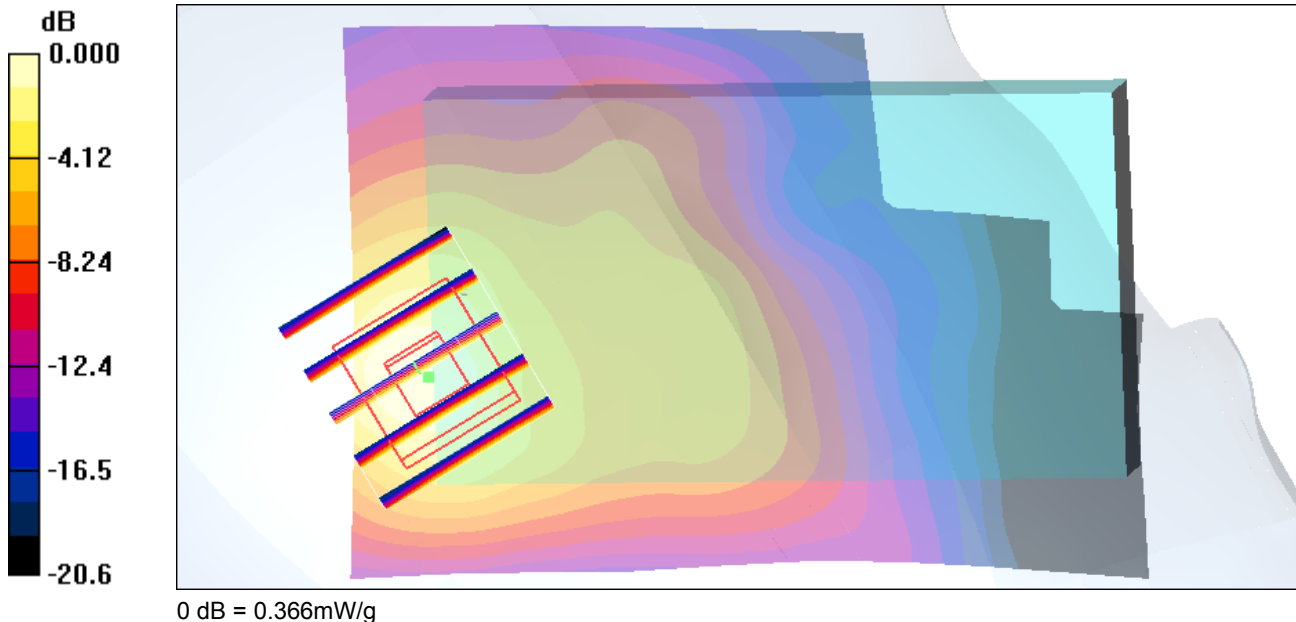
Communication System: Wimax; Frequency: 2593 MHz;Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.346 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.95 V/m; Power Drift = 0.072 dB
Peak SAR (extrapolated) = 0.649 W/kg
SAR(1 g) = 0.323 mW/g; SAR(10 g) = 0.156 mW/g
Maximum value of SAR (measured) = 0.366 mW/g





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

Date: 2009/2/28

Left Tilted_802.16e Ch1_16QAM 1/2_Battery1

DUT: 920713

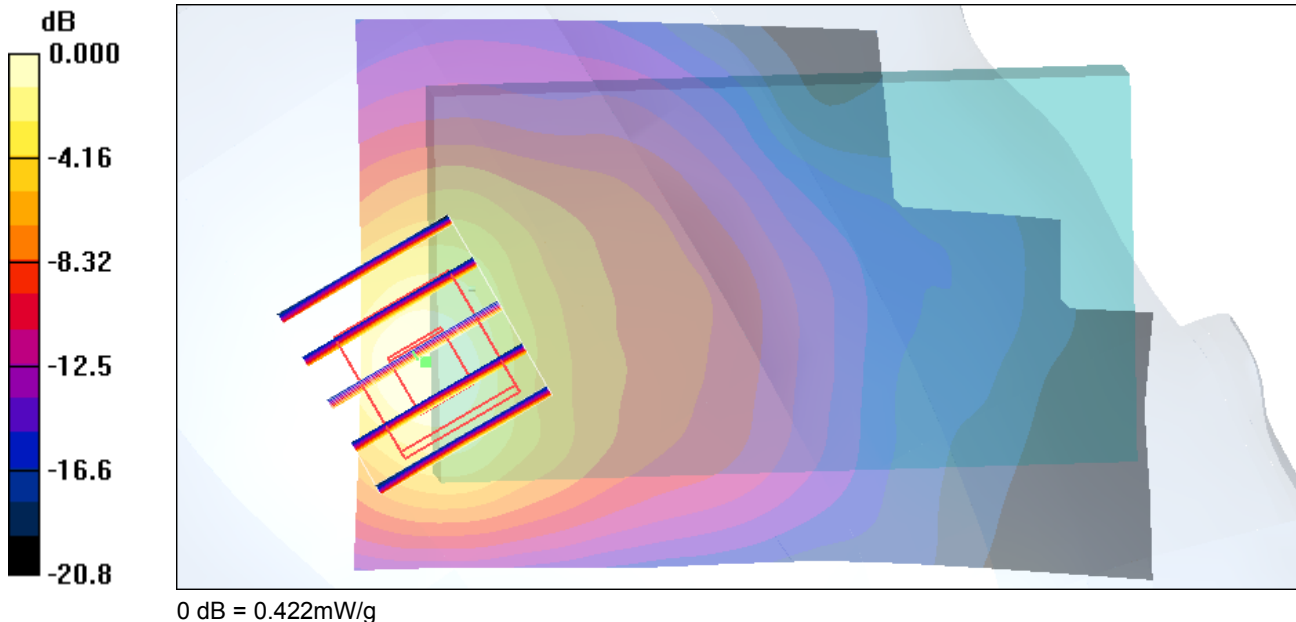
Communication System: Wimax; Frequency: 2593 MHz;Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.422 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.9 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 0.771 W/kg
SAR(1 g) = 0.382 mW/g; SAR(10 g) = 0.183 mW/g
Maximum value of SAR (measured) = 0.422 mW/g





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

Date: 2009/2/28

Right Tilted_802.16e Ch0_16QAM 1/2_Battery1

DUT: 920713

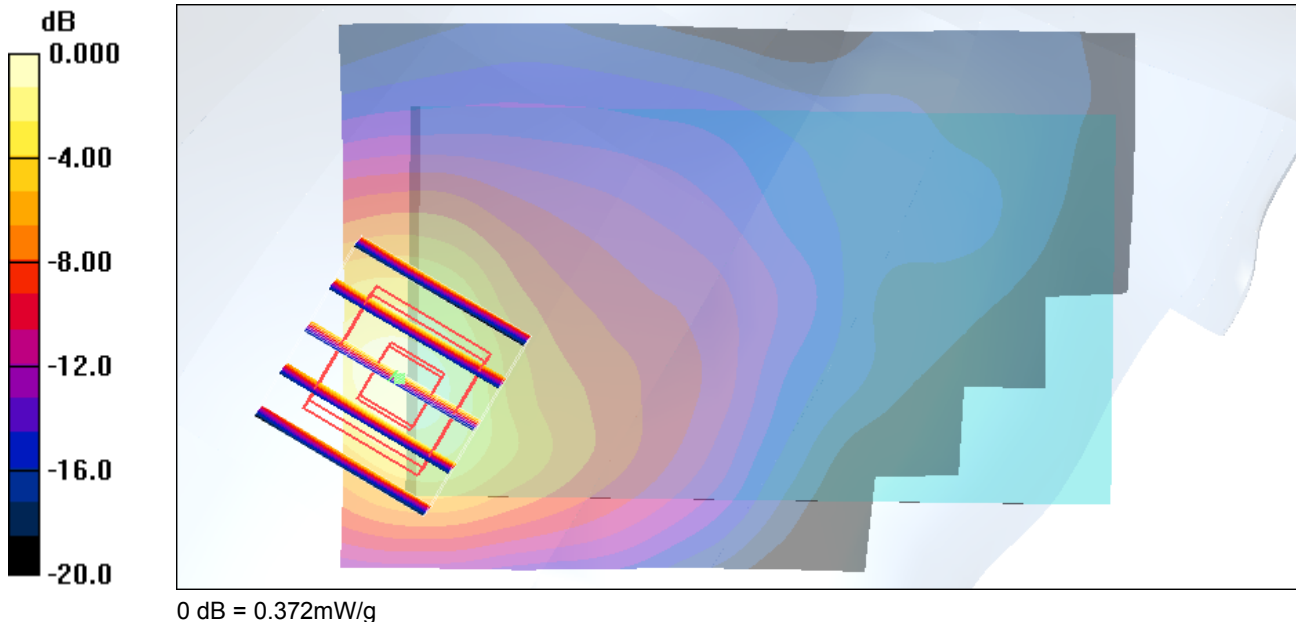
Communication System: Wimax; Frequency: 2501 MHz;Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2501$ MHz; $\sigma = 1.88$ mho/m; $\epsilon_r = 38.6$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2501/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.338 mW/g

Ch2501/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.89 V/m; Power Drift = 0.060 dB
Peak SAR (extrapolated) = 0.682 W/kg
SAR(1 g) = 0.329 mW/g; SAR(10 g) = 0.154 mW/g
Maximum value of SAR (measured) = 0.372 mW/g





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

Date: 2009/2/28

Right Tilted_802.16e Ch2_16QAM 1/2_Battery1

DUT: 920713

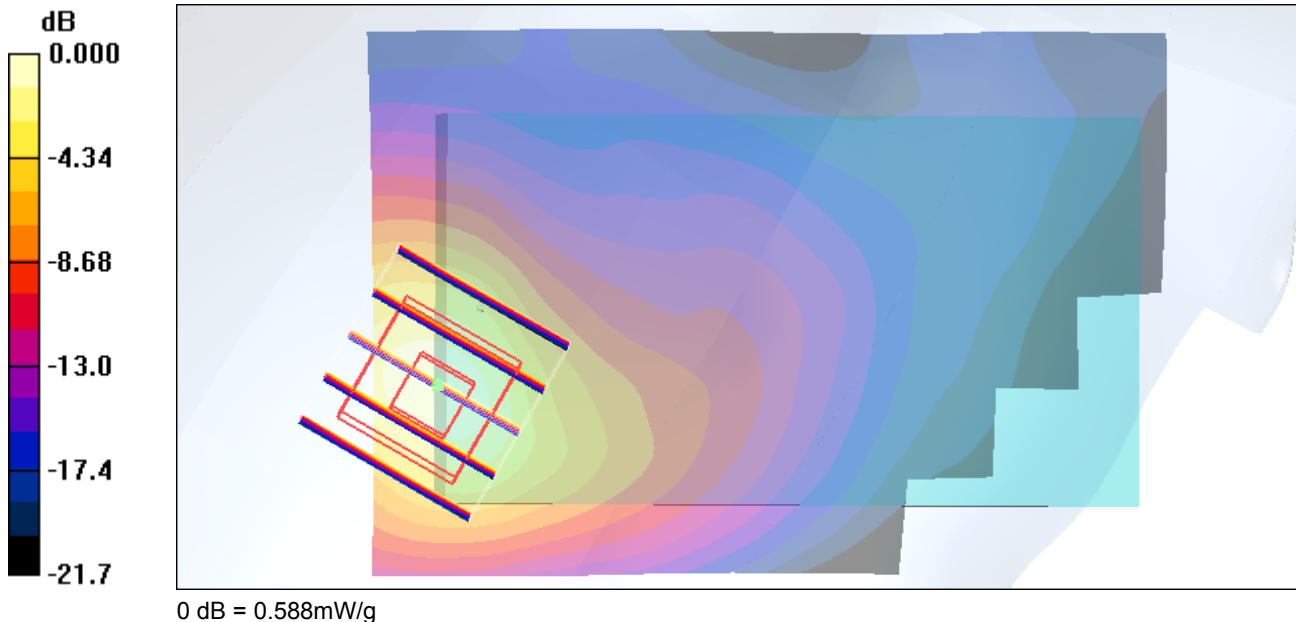
Communication System: Wimax; Frequency: 2685 MHz;Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2685$ MHz; $\sigma = 2.05$ mho/m; $\epsilon_r = 37.9$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2685/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.551 mW/g

Ch2685/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.522 mW/g; SAR(10 g) = 0.239 mW/g
Maximum value of SAR (measured) = 0.588 mW/g





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

Date: 2009/2/28

Right Cheek_802.16e Ch1_16QAM 3/4_Battery1

DUT: 920713

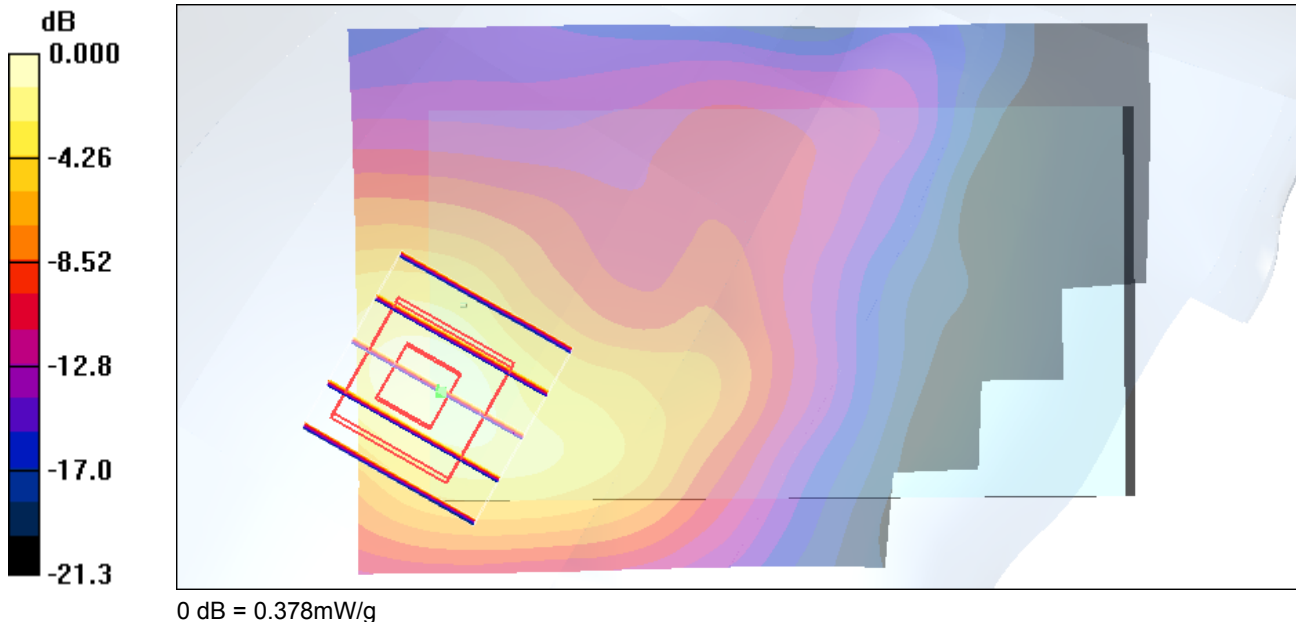
Communication System: Wimax; Frequency: 2593 MHz;Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.5 °C; Liquid Temperature : 21.3 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.351 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.51 V/m; Power Drift = -0.076 dB
Peak SAR (extrapolated) = 0.734 W/kg
SAR(1 g) = 0.347 mW/g; SAR(10 g) = 0.163 mW/g
Maximum value of SAR (measured) = 0.378 mW/g





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

Date: 2009/3/31

Right Tilted_802.16e Ch1_16QAM 3/4_Battery1

DUT: 920713

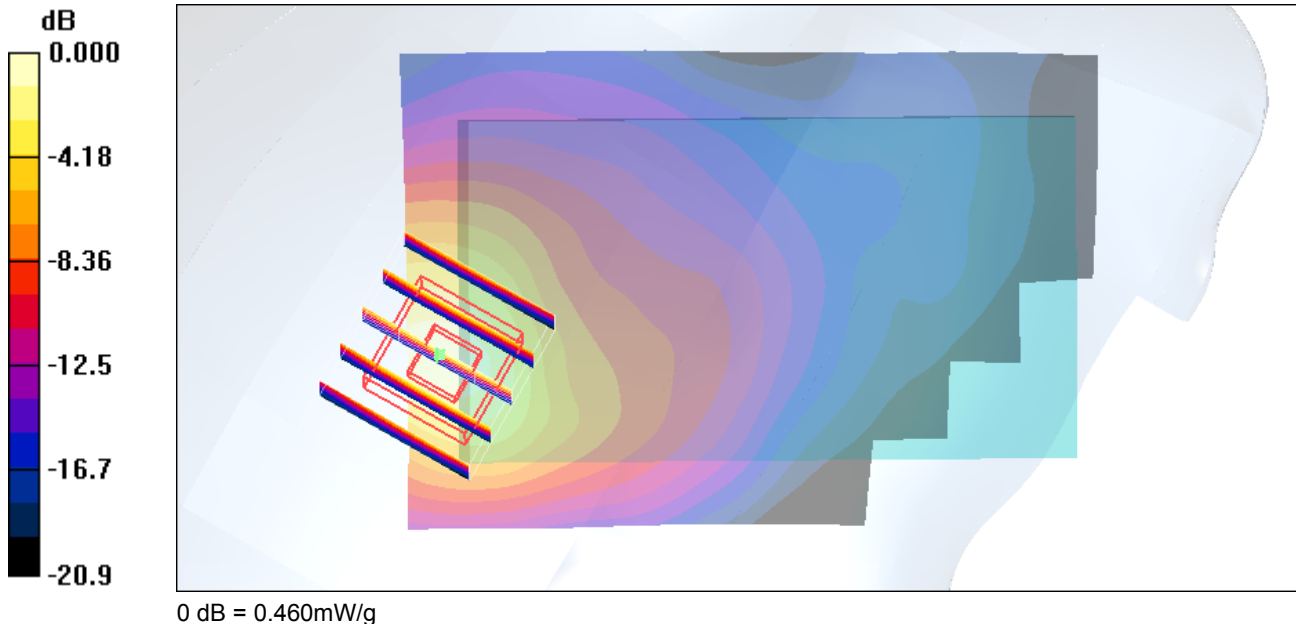
Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.3$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.6 °C; Liquid Temperature : 21.4 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.412 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.04 V/m; Power Drift = -0.068 dB
Peak SAR (extrapolated) = 0.921 W/kg
SAR(1 g) = 0.416 mW/g; SAR(10 g) = 0.188 mW/g
Maximum value of SAR (measured) = 0.460 mW/g





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

Date: 2009/3/31

Left Cheek_802.16e Ch1_16QAM 3/4_Battery1

DUT: 920713

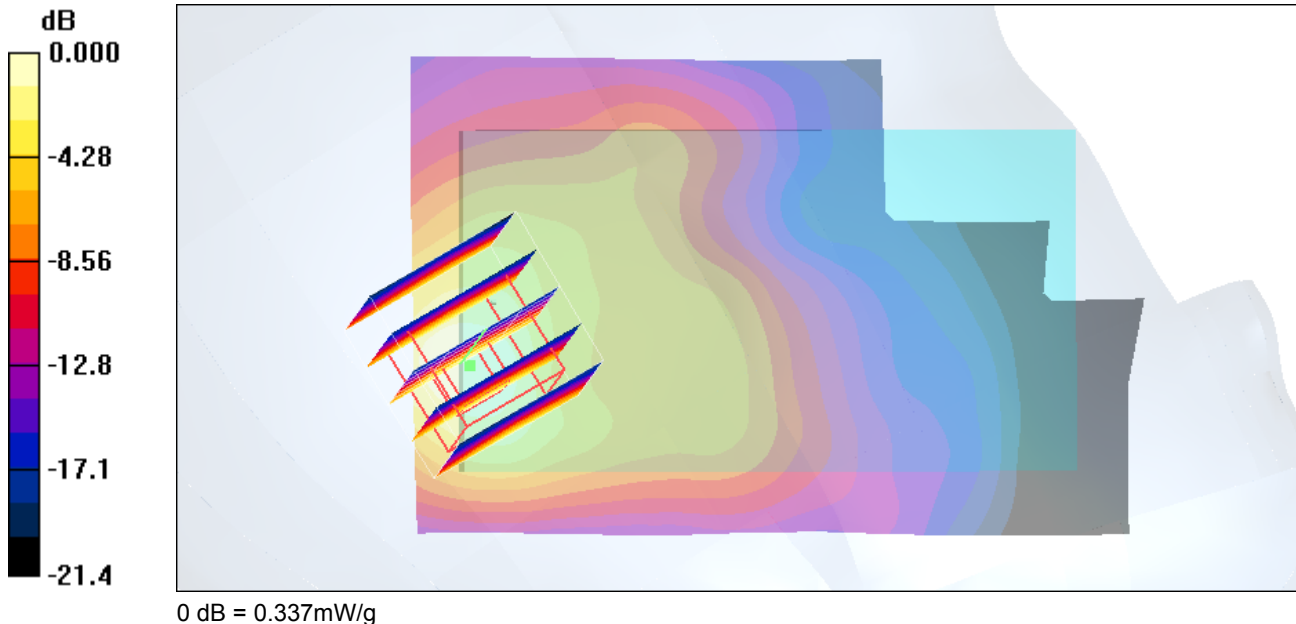
Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.3$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.7 °C; Liquid Temperature : 21.4 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.314 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.20 V/m; Power Drift = 0.191 dB
Peak SAR (extrapolated) = 0.632 W/kg
SAR(1 g) = 0.304 mW/g; SAR(10 g) = 0.144 mW/g
Maximum value of SAR (measured) = 0.337 mW/g





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

Date: 2009/3/31

Left Tilted_802.16e Ch1_16QAM 3/4_Battery1

DUT: 920713

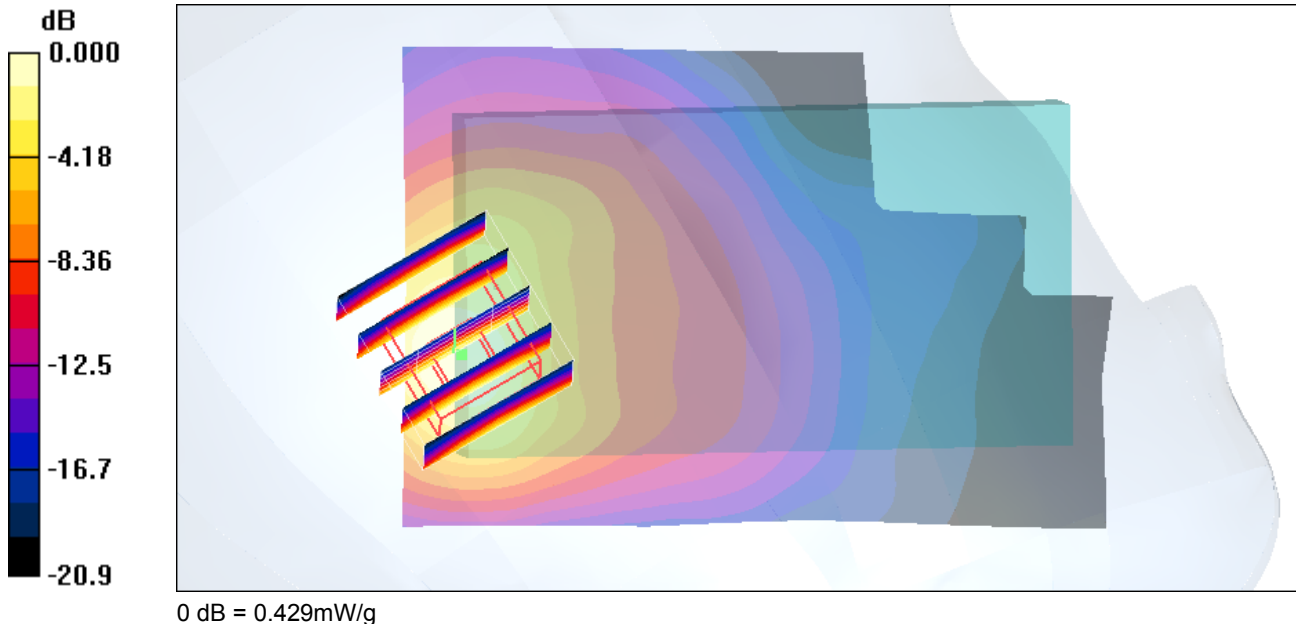
Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 38.3$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.6 °C; Liquid Temperature : 21.4°C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.427 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.120 dB
Peak SAR (extrapolated) = 0.798 W/kg
SAR(1 g) = 0.384 mW/g; SAR(10 g) = 0.180 mW/g
Maximum value of SAR (measured) = 0.429 mW/g





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

Date: 2009/3/31

Right Tilted_802.16e Ch0_16QAM 3/4_Battery1

DUT: 920713

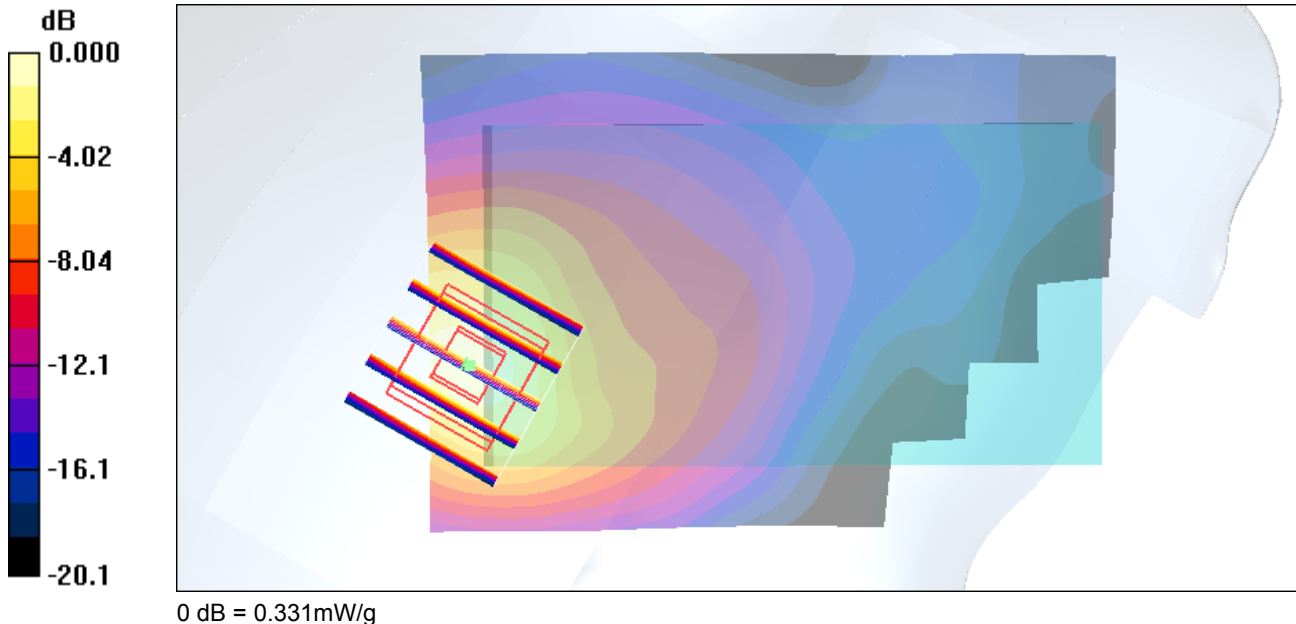
Communication System: Wimax; Frequency: 2501 MHz;Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2501$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 38.7$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.6 °C; Liquid Temperature : 21.4 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2501/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.295 mW/g

Ch2501/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.41 V/m; Power Drift = -0.077 dB
Peak SAR (extrapolated) = 0.609 W/kg
SAR(1 g) = 0.291 mW/g; SAR(10 g) = 0.137 mW/g
Maximum value of SAR (measured) = 0.331 mW/g





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

Date: 2009/3/31

Right Tilted_802.16e Ch2_16QAM 3/4_Battery1

DUT: 920713

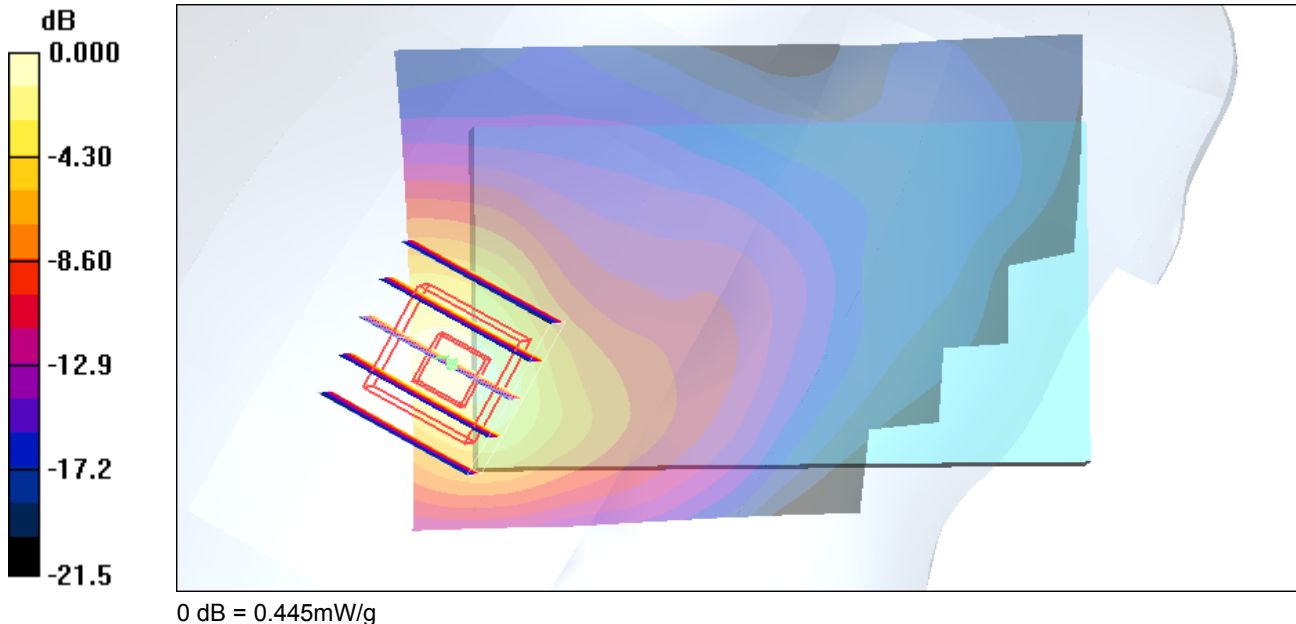
Communication System: Wimax; Frequency: 2685 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2685$ MHz; $\sigma = 2.06$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.7 °C; Liquid Temperature : 21.4 °C

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2685/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.395 mW/g

Ch2685/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.21 V/m; Power Drift = 0.041 dB
Peak SAR (extrapolated) = 0.873 W/kg
SAR(1 g) = 0.392 mW/g; SAR(10 g) = 0.176 mW/g
Maximum value of SAR (measured) = 0.445 mW/g





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

Date: 2009/2/28

Body_802.16e Ch1_Bottom with 1.5cm Gap_QPSK 1/2_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 2.19$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.213 mW/g

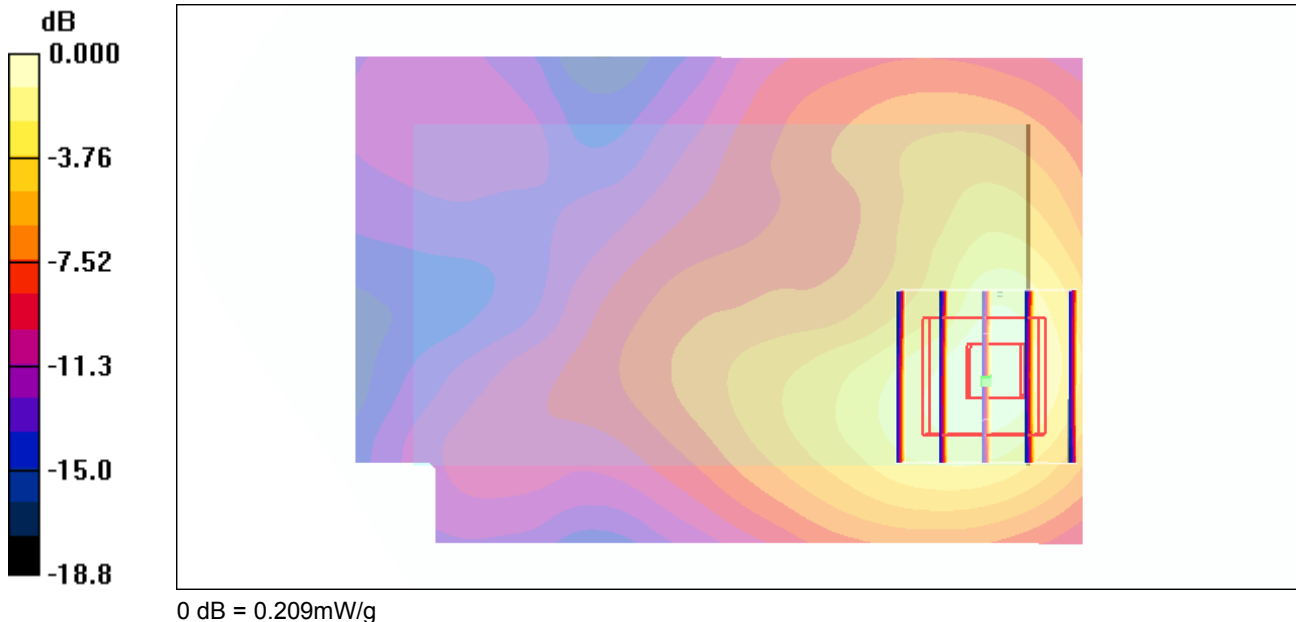
Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.96 V/m; Power Drift = -0.041 dB

Peak SAR (extrapolated) = 0.354 W/kg

SAR(1 g) = 0.190 mW/g; SAR(10 g) = 0.101 mW/g

Maximum value of SAR (measured) = 0.209 mW/g





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

Date: 2009/2/28

Body_802.16e Ch1_Bottom with 1.5cm Gap_QPSK 1/2_Battery2_Earphone2

DUT: 920713

Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 2.19$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.214 mW/g

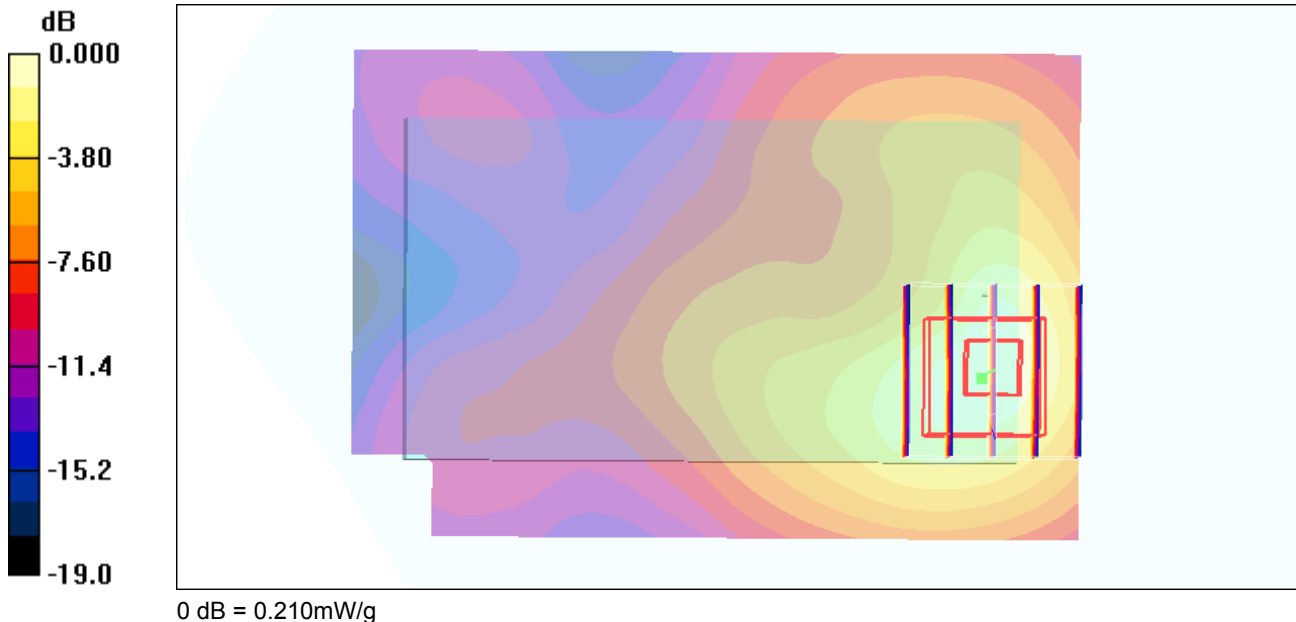
Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.14 V/m; Power Drift = -0.173 dB

Peak SAR (extrapolated) = 0.348 W/kg

SAR(1 g) = 0.189 mW/g; SAR(10 g) = 0.101 mW/g

Maximum value of SAR (measured) = 0.210 mW/g





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

Date: 2009/2/28

Body_802.16e Ch1_Face with 1.5cm Gap_QPSK 1/2_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 2.19$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.073 mW/g

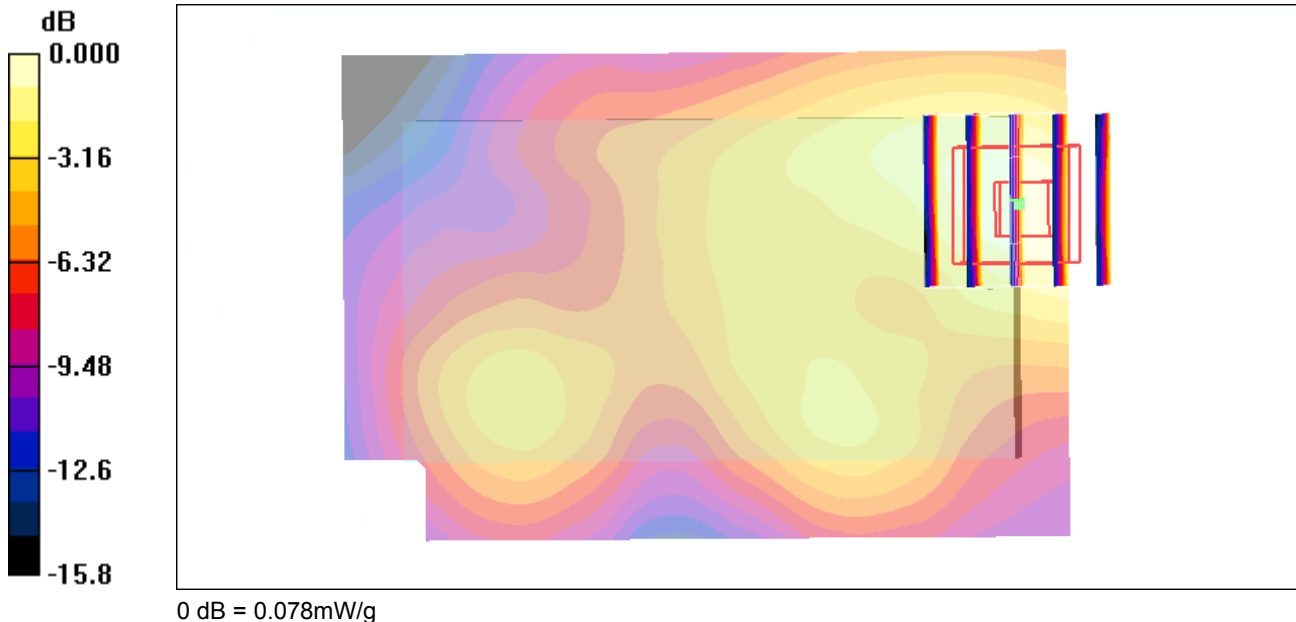
Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.32 V/m; Power Drift = 0.097 dB

Peak SAR (extrapolated) = 0.128 W/kg

SAR(1 g) = 0.071 mW/g; SAR(10 g) = 0.040 mW/g

Maximum value of SAR (measured) = 0.078 mW/g





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

Date: 2009/2/28

Body_802.16e Ch0_Bottom with 1.5cm Gap_QPSK 1/2_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2501 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2501$ MHz; $\sigma = 2.07$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2501/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.177 mW/g

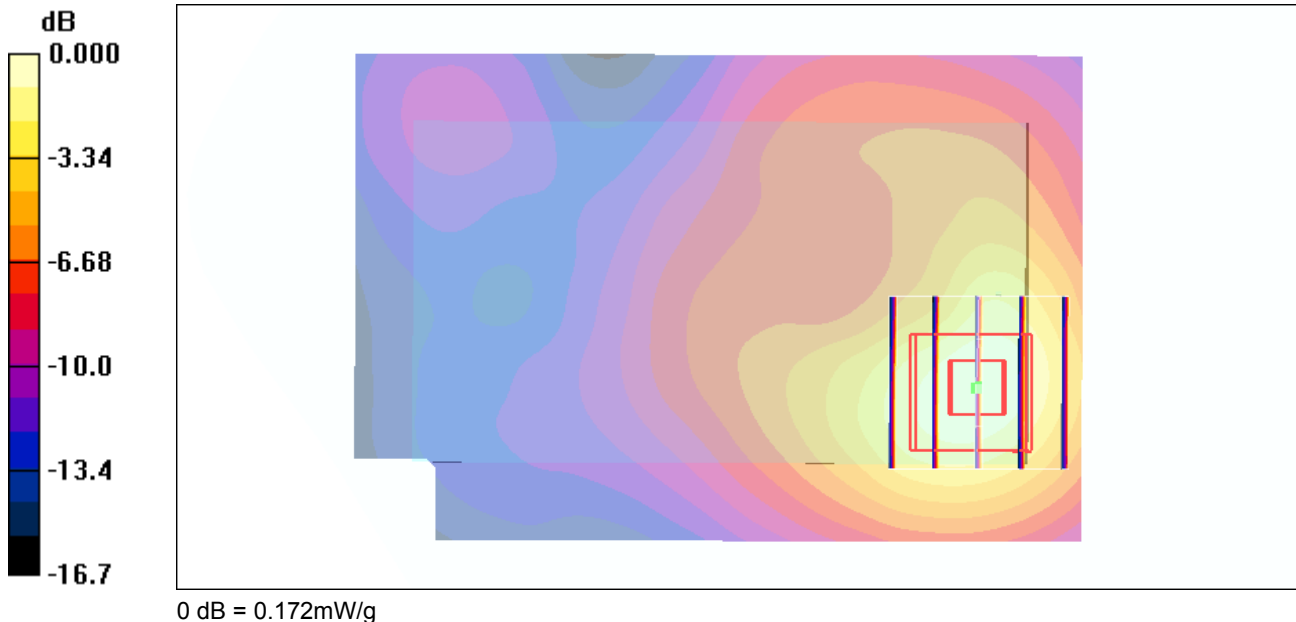
Ch2501/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.82 V/m; Power Drift = -0.141 dB

Peak SAR (extrapolated) = 0.280 W/kg

SAR(1 g) = 0.156 mW/g; SAR(10 g) = 0.085 mW/g

Maximum value of SAR (measured) = 0.172 mW/g





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

Date: 2009/2/28

Body_802.16e Ch2_Bottom with 1.5cm Gap_QPSK 1/2_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2685 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2685$ MHz; $\sigma = 2.25$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2685/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.261 mW/g

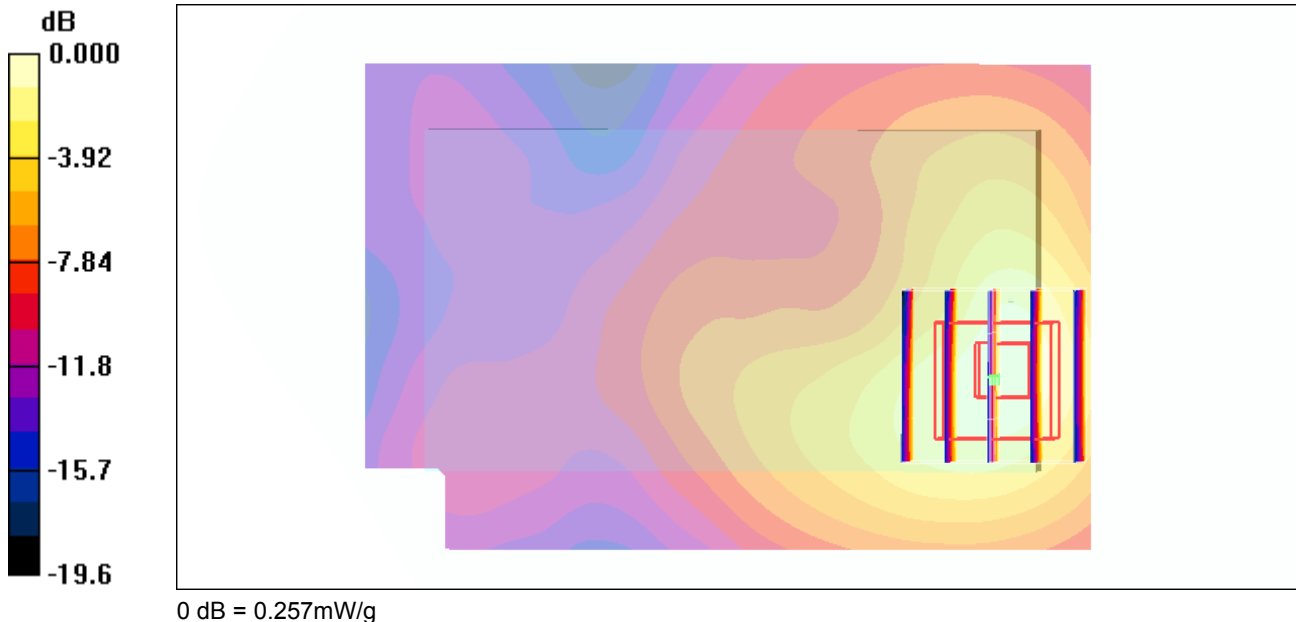
Ch2685/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.10 V/m; Power Drift = -0.138 dB

Peak SAR (extrapolated) = 0.441 W/kg

SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.123 mW/g

Maximum value of SAR (measured) = 0.257 mW/g





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

Date: 2009/3/31

Body_802.16e Ch1_Bottom with 1.5cm Gap_QPSK 3/4_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 2.19$ mho/m; $\epsilon_r = 52.8$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.6 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.211 mW/g

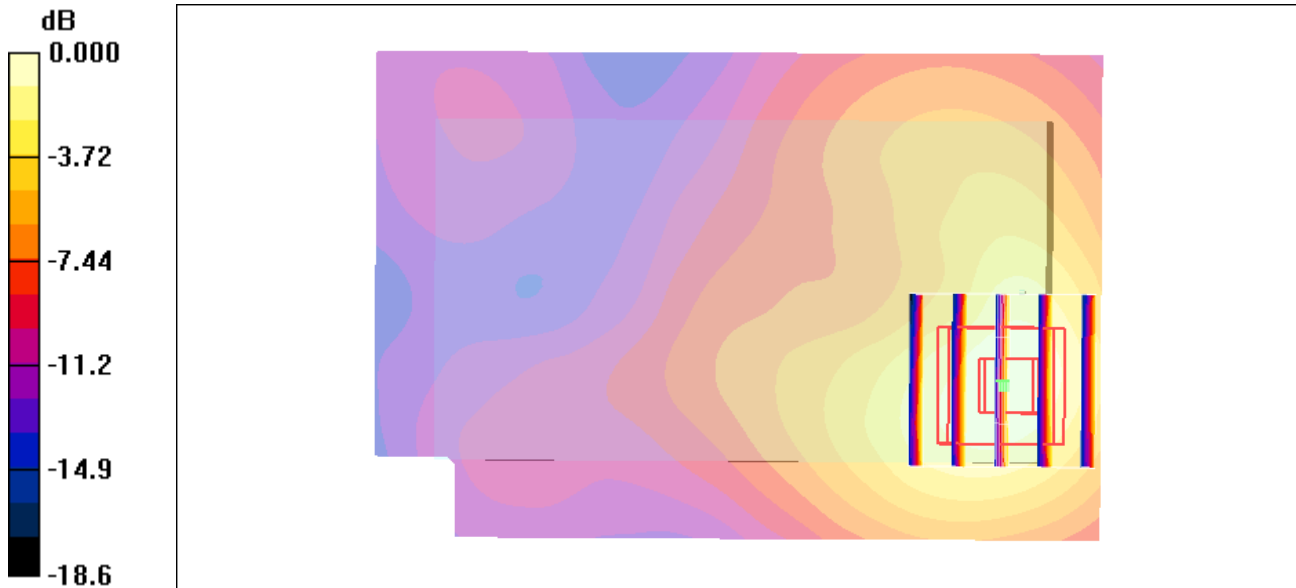
Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.54 V/m; Power Drift = -0.163 dB

Peak SAR (extrapolated) = 0.335 W/kg

SAR(1 g) = 0.180 mW/g; SAR(10 g) = 0.097 mW/g

Maximum value of SAR (measured) = 0.199 mW/g



0 dB = 0.199mW/g



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

Date: 2009/3/31

Body_802.16e Ch1_Face with 1.5cm Gap_QPSK3-4_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2593 MHz;Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 2.19$ mho/m; $\epsilon_r = 52.8$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.7 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.067 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.20 V/m; Power Drift = 0.112 dB

Peak SAR (extrapolated) = 0.120 W/kg

SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.038 mW/g

Maximum value of SAR (measured) = 0.073 mW/g

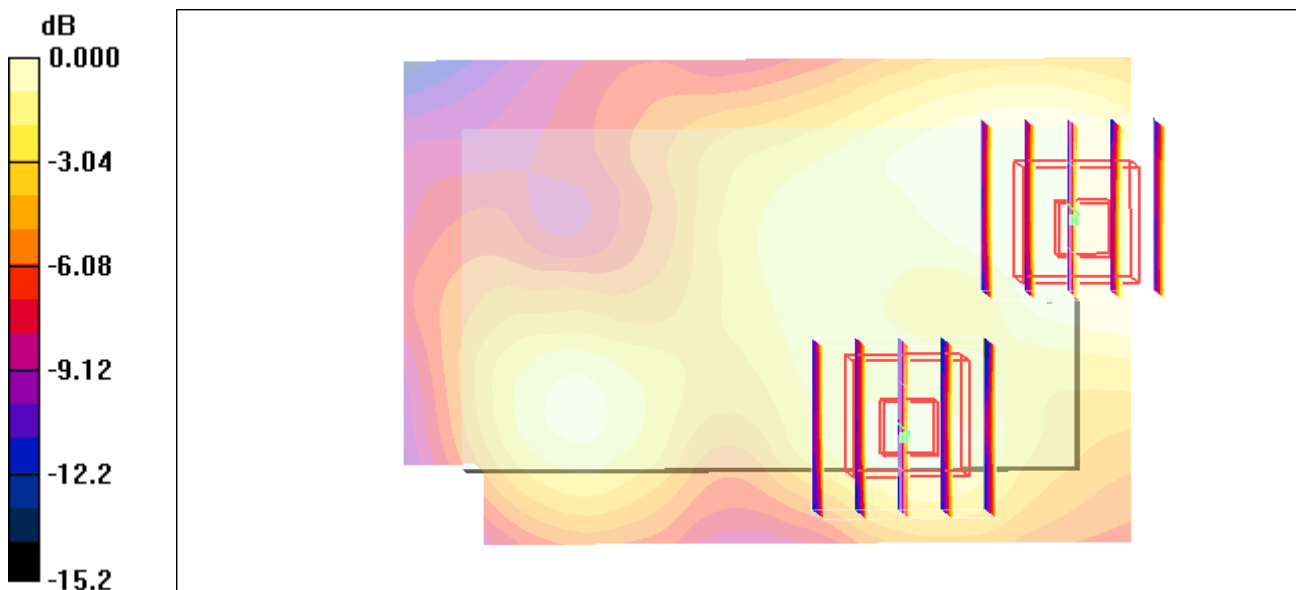
Ch2593/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.20 V/m; Power Drift = 0.112 dB

Peak SAR (extrapolated) = 0.072 W/kg

SAR(1 g) = 0.041 mW/g; SAR(10 g) = 0.024 mW/g

Maximum value of SAR (measured) = 0.045 mW/g



0 dB = 0.045mW/g



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

Date: 2009/3/31

Body_802.16e Ch0_Bottom with 1.5cm Gap_QPSK 3/4_Battery1_Earphone1

DUT: 920713

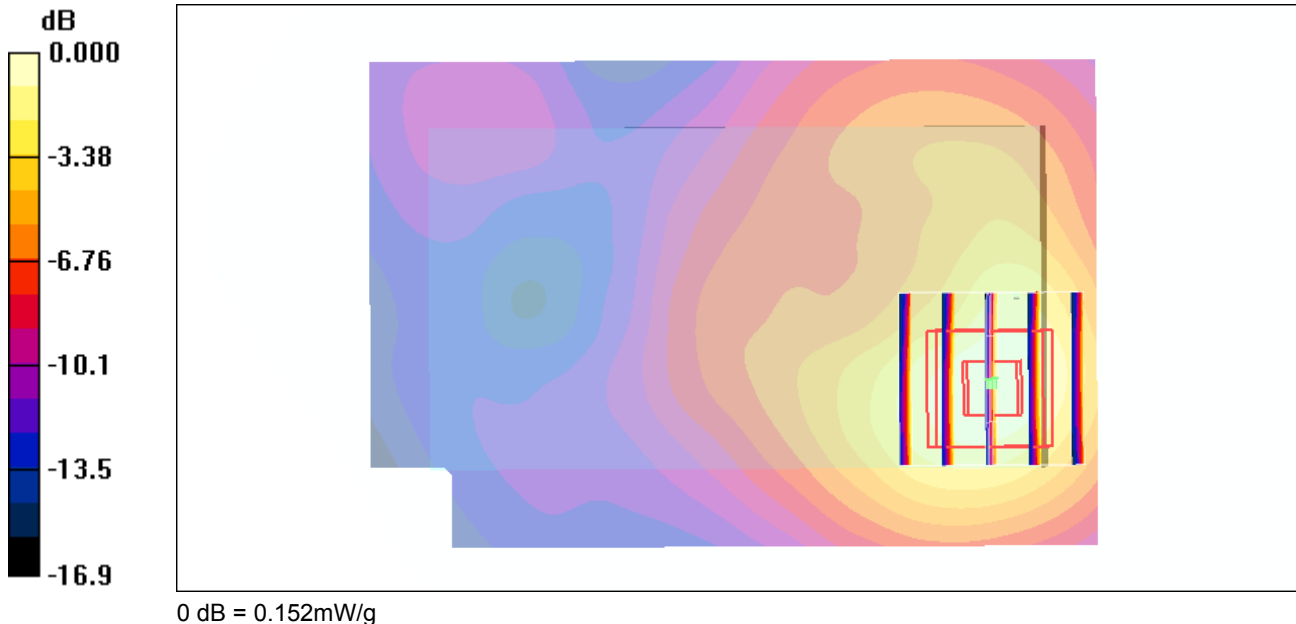
Communication System: Wimax; Frequency: 2501 MHz; Duty Cycle: 1:3.15
Medium: MSL_2600 Medium parameters used: $f = 2501$ MHz; $\sigma = 2.07$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.7 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2501/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.159 mW/g

Ch2501/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.66 V/m; Power Drift = -0.126 dB
Peak SAR (extrapolated) = 0.249 W/kg
SAR(1 g) = 0.138 mW/g; SAR(10 g) = 0.075 mW/g
Maximum value of SAR (measured) = 0.152 mW/g





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

Date: 2009/3/31

Body_802.16e Ch2_Bottom with 1.5cm Gap_QPSK 3/4_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2685 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2685$ MHz; $\sigma = 2.25$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.6 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2685/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.167 mW/g

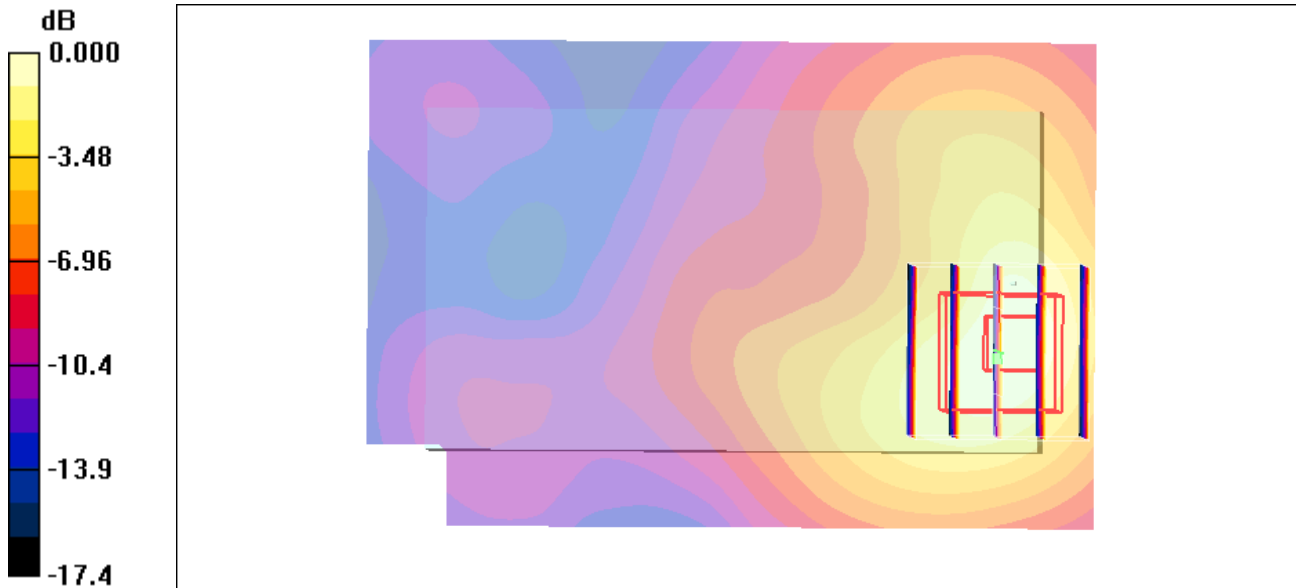
Ch2685/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.38 V/m; Power Drift = -0.139 dB

Peak SAR (extrapolated) = 0.277 W/kg

SAR(1 g) = 0.149 mW/g; SAR(10 g) = 0.078 mW/g

Maximum value of SAR (measured) = 0.164 mW/g



0 dB = 0.164mW/g



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

Date: 2009/2/28

Body_802.16e Ch1_Bottom with 1.5cm Gap_16QAM 1/2_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 2.19$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

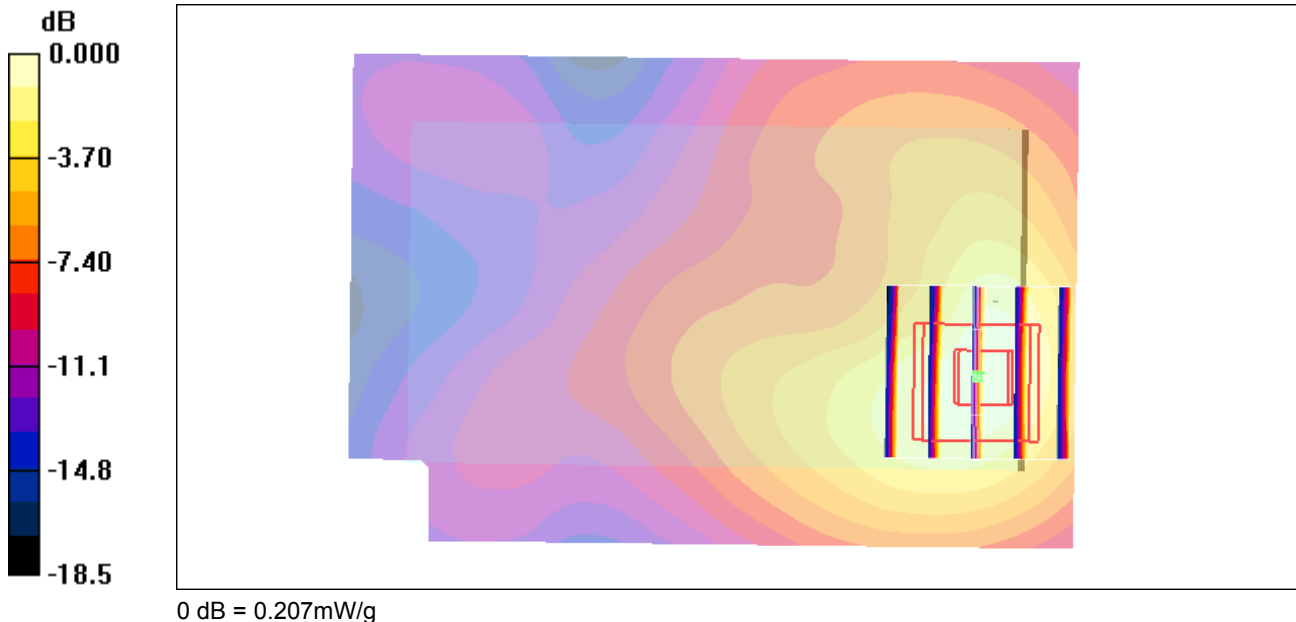
Ambient Temperature : 22.5 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.213 mW/g

Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.03 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 0.344 W/kg
SAR(1 g) = 0.186 mW/g; SAR(10 g) = 0.099 mW/g
Maximum value of SAR (measured) = 0.207 mW/g





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

Date: 2009/2/28

Body_802.16e Ch1_Face with 1.5cm Gap_16QAM 1/2_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 2.19$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.6 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.073 mW/g

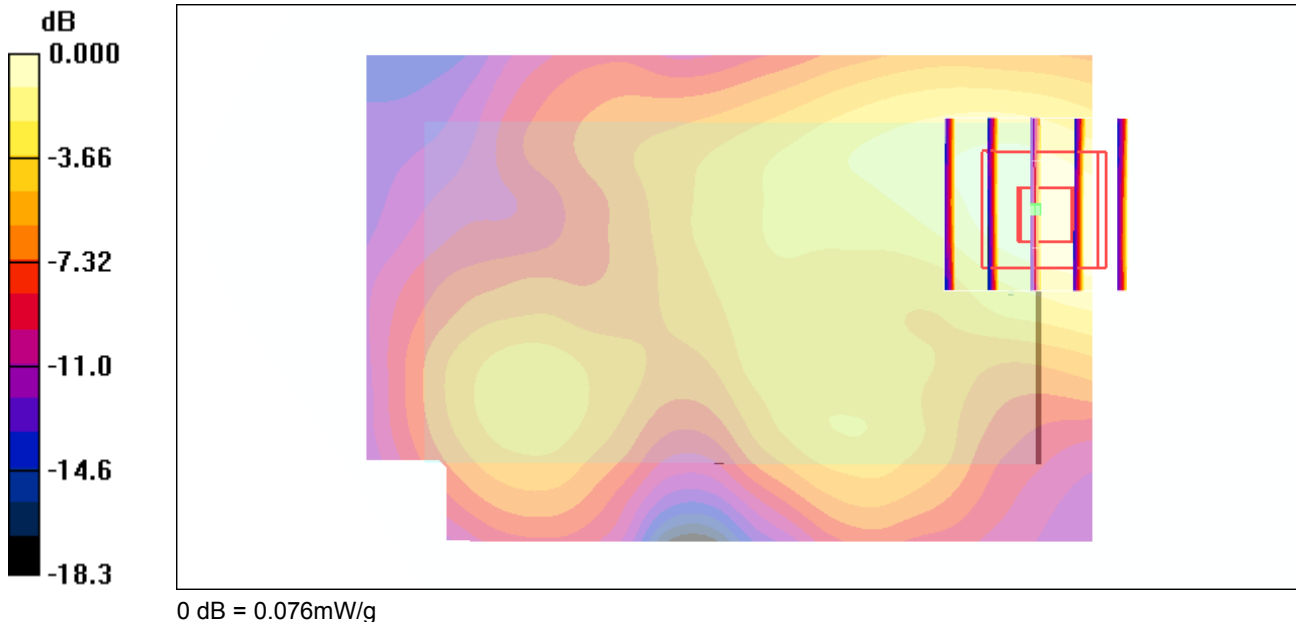
Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.26 V/m; Power Drift = 0.014 dB

Peak SAR (extrapolated) = 0.129 W/kg

SAR(1 g) = 0.070 mW/g; SAR(10 g) = 0.039 mW/g

Maximum value of SAR (measured) = 0.076 mW/g





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

Date: 2009/2/28

Body_802.16e Ch0_Bottom with 1.5cm Gap_16QAM 1/2_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2501 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2501$ MHz; $\sigma = 2.07$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2501/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.177 mW/g

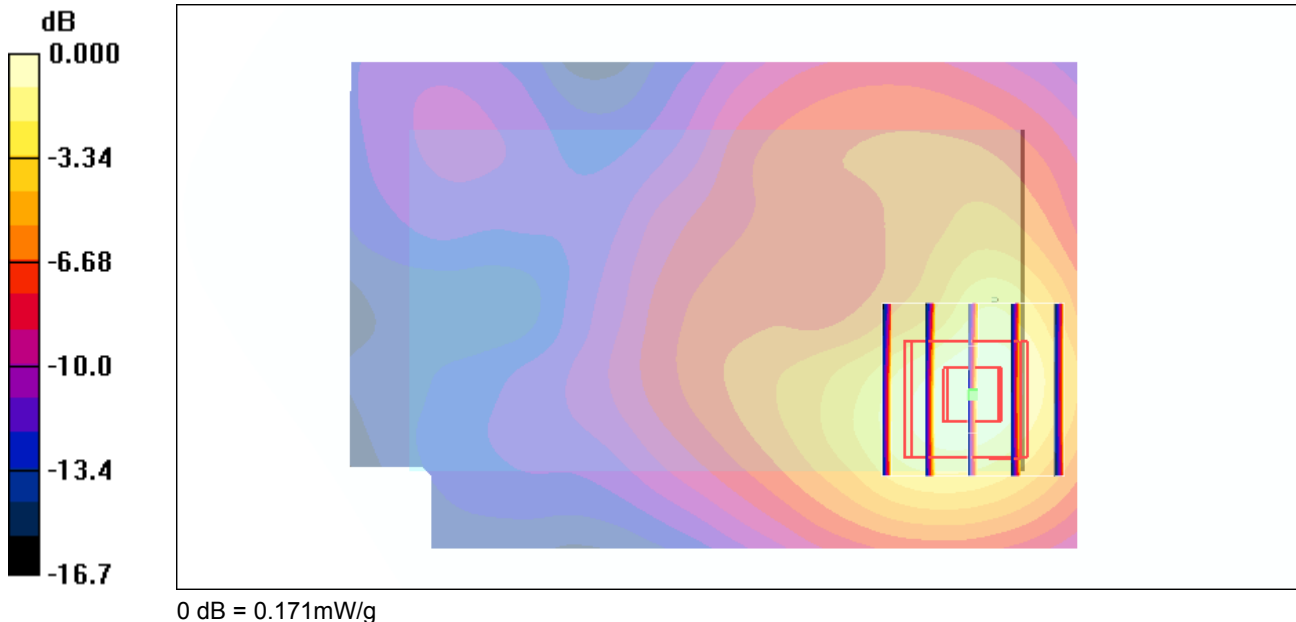
Ch2501/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.84 V/m; Power Drift = -0.169 dB

Peak SAR (extrapolated) = 0.278 W/kg

SAR(1 g) = 0.155 mW/g; SAR(10 g) = 0.084 mW/g

Maximum value of SAR (measured) = 0.171 mW/g





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

Date: 2009/2/28

Body_802.16e Ch2_Bottom with 1.5cm Gap_16QAM 1/2_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2685 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2685$ MHz; $\sigma = 2.25$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2685/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.254 mW/g

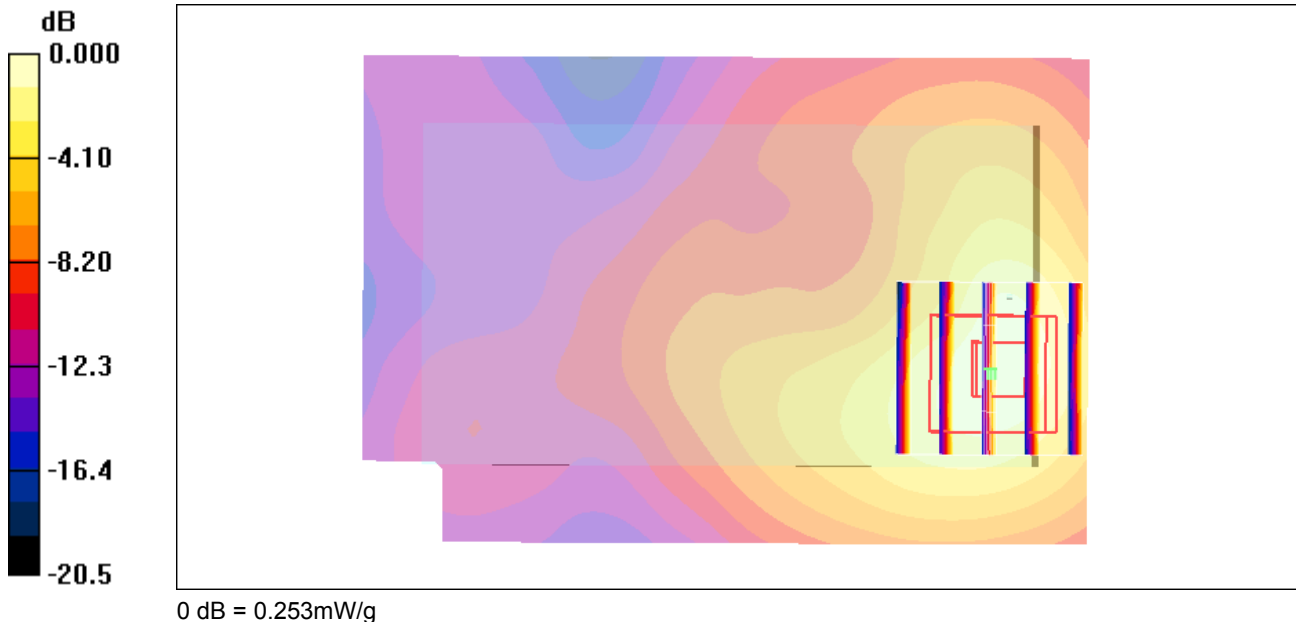
Ch2685/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.91 V/m; Power Drift = -0.111 dB

Peak SAR (extrapolated) = 0.434 W/kg

SAR(1 g) = 0.229 mW/g; SAR(10 g) = 0.121 mW/g

Maximum value of SAR (measured) = 0.253 mW/g





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

Date: 2009/3/31

Body_802.16e Ch1_Bottom with 1.5cm Gap_16QAM 3/4_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 2.19$ mho/m; $\epsilon_r = 52.8$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.7 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.197 mW/g

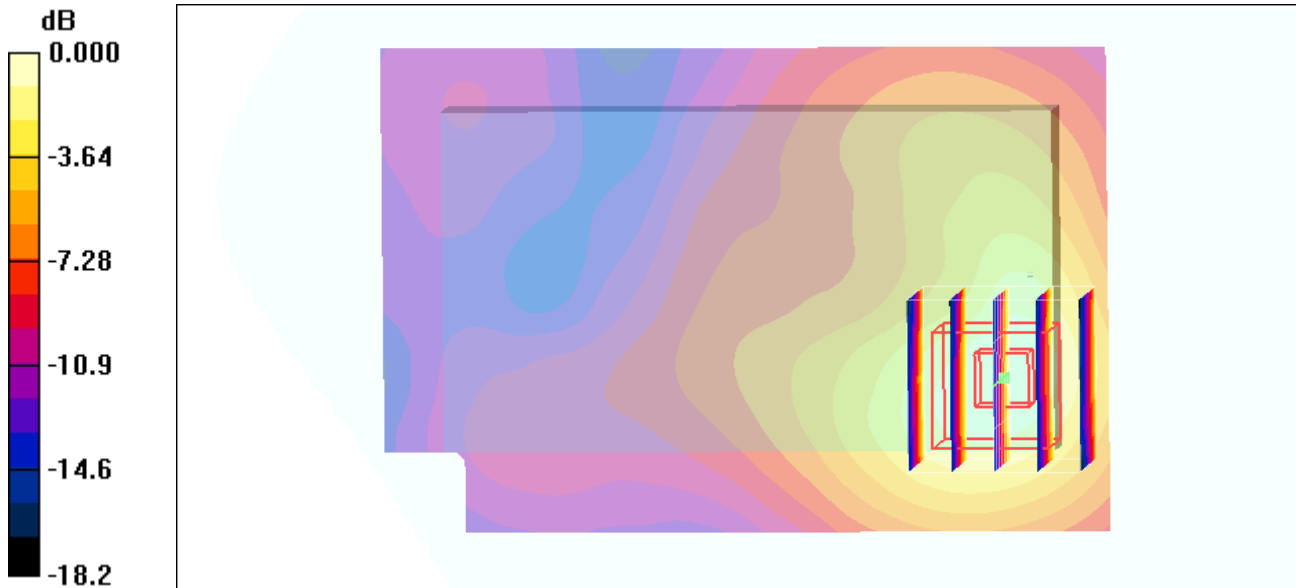
Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.34 V/m; Power Drift = -0.173 dB

Peak SAR (extrapolated) = 0.311 W/kg

SAR(1 g) = 0.170 mW/g; SAR(10 g) = 0.091 mW/g

Maximum value of SAR (measured) = 0.187 mW/g



0 dB = 0.187mW/g



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

Date: 2009/3/31

Body_802.16e Ch1_Face with 1.5cm Gap_16QAM 3/4_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2593 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2593$ MHz; $\sigma = 2.19$ mho/m; $\epsilon_r = 52.8$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.6 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2593/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.068 mW/g

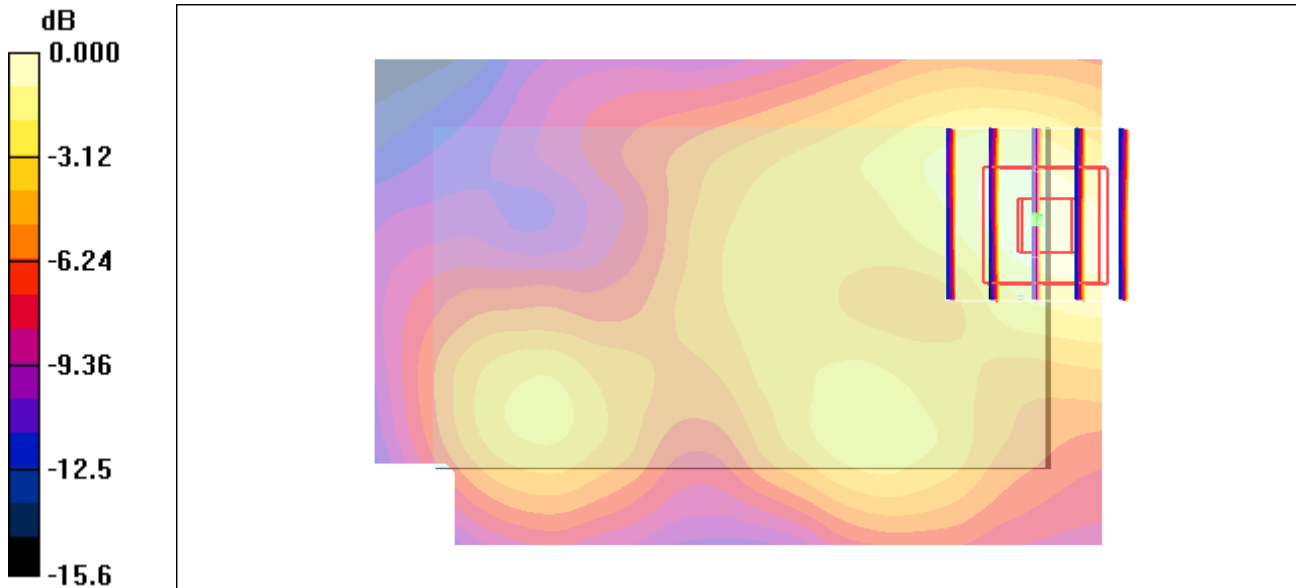
Ch2593/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.15 V/m; Power Drift = 0.199 dB

Peak SAR (extrapolated) = 0.117 W/kg

SAR(1 g) = 0.064 mW/g; SAR(10 g) = 0.035 mW/g

Maximum value of SAR (measured) = 0.069 mW/g





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

Date: 2009/3/31

Body_802.16e Ch0_Bottom with 1.5cm Gap_16QAM 3/4_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2501 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2501$ MHz; $\sigma = 2.07$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.7 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn778; Calibrated: 2008/9/22

- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2501/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.151 mW/g

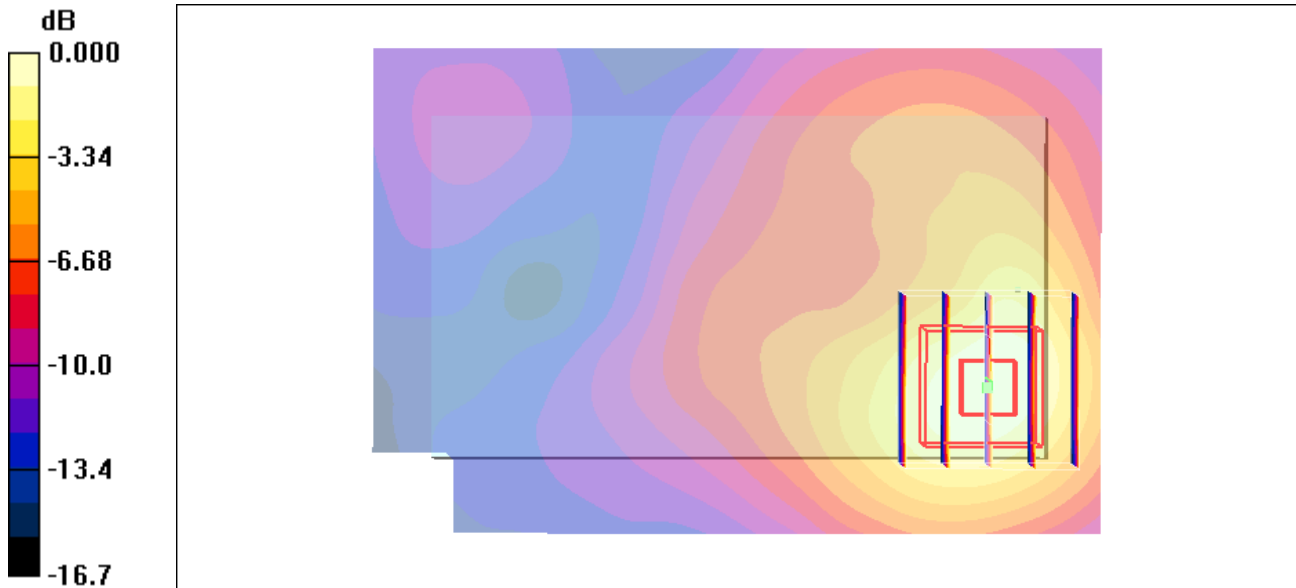
Ch2501/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.05 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 0.238 W/kg

SAR(1 g) = 0.133 mW/g; SAR(10 g) = 0.072 mW/g

Maximum value of SAR (measured) = 0.146 mW/g





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

Date: 2009/3/31

Body_802.16e Ch2_Bottom with 1.5cm Gap_16QAM 3/4_Battery1_Earphone1

DUT: 920713

Communication System: Wimax; Frequency: 2685 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2685$ MHz; $\sigma = 2.25$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

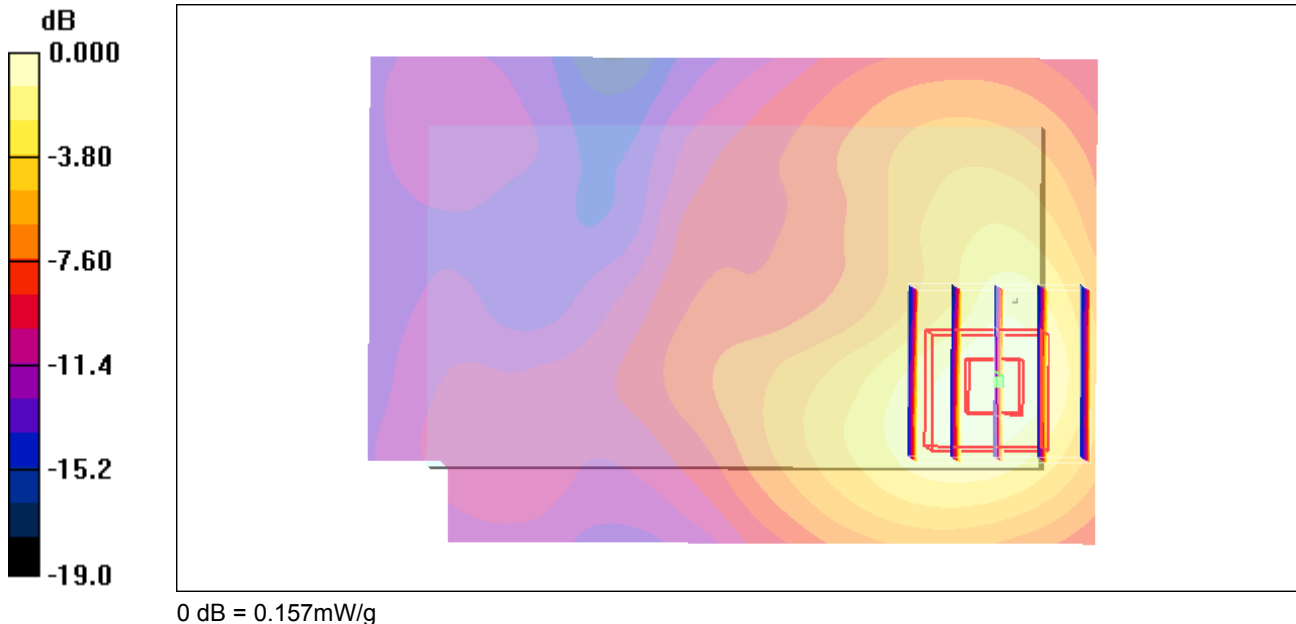
Ambient Temperature : 22.8 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2685/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.162 mW/g

Ch2685/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.76 V/m; Power Drift = -0.107 dB
Peak SAR (extrapolated) = 0.270 W/kg
SAR(1 g) = 0.143 mW/g; SAR(10 g) = 0.076 mW/g
Maximum value of SAR (measured) = 0.157 mW/g





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

Date: 2009/2/28

Right Tilted_802.16e Ch2_QPSK 1-2_Battery1_2D

DUT: 920713

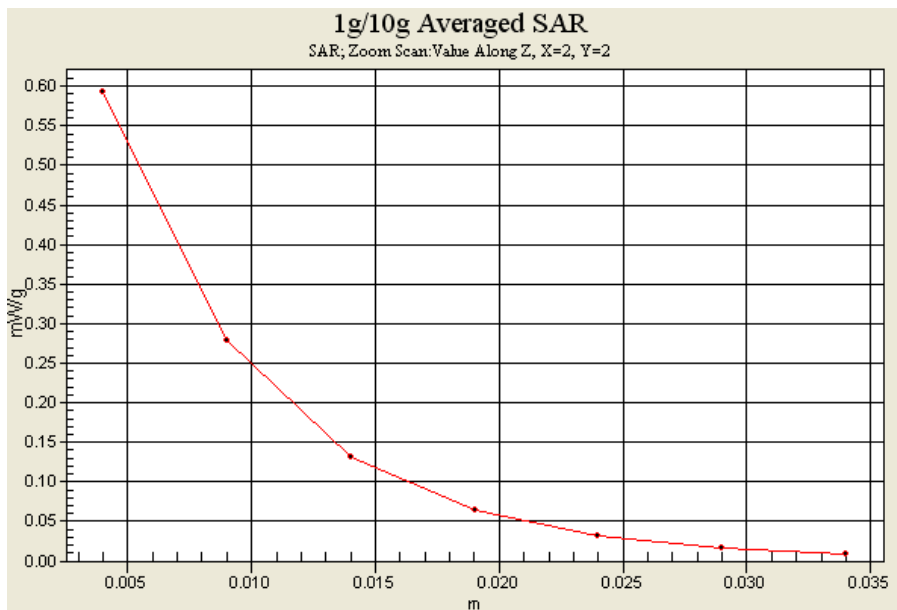
Communication System: Wimax; Frequency: 2685 MHz; Duty Cycle: 1:3.15
Medium: HSL_2600 Medium parameters used: $f = 2685$ MHz; $\sigma = 2.05$ mho/m; $\epsilon_r = 37.9$; $\rho = 1000$ kg/m³
Ambient Temperature : 22.4 ; Liquid Temperature : 21.3

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.34, 7.34, 7.34); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2685/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.561 mW/g

Ch2685/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = 0.014 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.527 mW/g; SAR(10 g) = 0.240 mW/g
Maximum value of SAR (measured) = 0.593 mW/g





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

Date: 2009/2/28

Body_802.16e Ch2_Bottom with 1.5cm Gap_QPSK 1-2_Battery1_Earphone1_2D

DUT: 920713

Communication System: Wimax; Frequency: 2685 MHz; Duty Cycle: 1:3.15

Medium: MSL_2600 Medium parameters used: $f = 2685$ MHz; $\sigma = 2.25$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 ; Liquid Temperature : 21.5

DASY4 Configuration:

- Probe: EX3DV3 - SN3514; ConvF(7.2, 7.2, 7.2); Calibrated: 2009/1/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2008/9/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch2685/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.261 mW/g

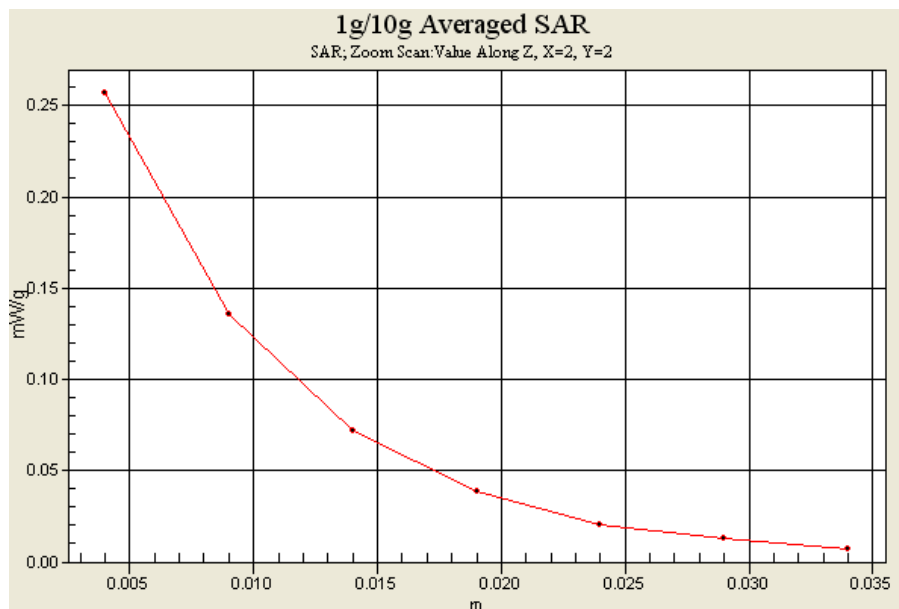
Ch2685/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.10 V/m; Power Drift = -0.138 dB

Peak SAR (extrapolated) = 0.441 W/kg

SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.123 mW/g

Maximum value of SAR (measured) = 0.257 mW/g





Appendix C – Calibration Data

Please refer to the calibration certificates of DASY as below.