FCC SAR Test Report

APPLICANT	:	**Sony Mobile Communications AB**
EQUIPMENT	:	**Smart phone**
BRAND NAME	:	**Sony**
MODEL NAME	:	**PM-0251-BV**
MARKETING NAME	:	**C1605**
FCC ID	:	**PY7PM-0251**
STANDARD	:	**FCC 47 CFR Part 2 (2.1093)** **ANSI/IEEE C95.1-1992** **IEEE 1528-2003** **FCC OET Bulletin 65 Supplement C (Edition 01-01)**

The product was completely tested on Nov. 01, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:

Jones Tsai

Jones Tsai / Manager

ilac-MRA

TAF Testing Laboratory 1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

Table of Contents

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA292717	Rev. 01	Initial issue of report	Nov. 08, 2012
FA292717	Rev. 02	Update report for adding Scaled SAR value in 11.5 Section.	Nov. 21, 2012
FA292717	Rev. 03	Remove Battery picture	Nov. 26, 2012
FA292717	Rev. 04	Revise Section11.5 scaled SAR value	Dec. 10, 2012
FA292717	Rev. 05	1. Address the test reduction used for normal voice call and DTM multi-slot by the test lab and their rational that address the FCC KDB. 2. Revised the SAR table and a statement in the section 1. 3. Removed the section 12.5. 4. Add description for DTM mode measurement in page 27 and 28	Dec. 18, 2012
FA292717	Rev. 06	1. Revise Simultaneous SAR table. 2. Revise Section 11.1 note 2 and 11.2 note 4 3. Revise Section 11.3 the symbol ”V” was added into the tablet to indicate headset plugged 4. Revise Section 5.8 test equipment list 5. Updated the zoom-scan procedure in page 79 ,80,84,85 include 2nd peak zoom-scan procedure.	Dec. 18, 2012

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Sony Mobile Communications AB Smart phone, Sony, PM-0251-BV, C1605** are as follows.

<Standalone SAR>

Technology Mode/Band	Configuration	Channel Number	Mode	Measured output power [dBm]	Maximum Rated Power Including Tolerance [dBm]	Measured SAR(W/kg)	Scaled-up SAR(W/kg)
						1g mass	1g mass
GSM850	Head	189	Data / Voice	31.1	31.5	0.51	0.56
	Hotspot(1cm gap)	251	Data	31.01	31.5	1.09	1.22
	Body-worn(1.5cm gap)	189	Voice	31.1	31.5	0.45	0.49
PCS1900	Head	661	Data / Voice	27.07	27.5	0.57	0.63
	Hotspot(1cm gap)	661	Data	28.88	29	0.64	0.66
	Body-worn(1.5cm gap)	661	Voice	27.07	27.5	0.34	0.38
WiFi 802.11b	Head	6	Data	16.32	16.5	0.21	0.22
	Hotspot(1cm gap)	6	Data	16.32	16.5	0.06	0.07
	Body-worn(1.5cm gap)	6	Data	16.32	16.5	0.04	0.04

<Simultaneous transmission SAR>

	WWAN SAR			Scale WWAN SAR				WLANSAR		Scale WLAN SAR				Sum	Sum(Scaled)
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	WWANSAR + WLAN SAR	WWANSAR + WLANSAR
Back	GSM850	20	1.09	31.01	31.5	1.119	1.220	26	0.064	16.32	16.50	1.042	0.067	1.154	1.287
	GSM1900	7	0.639	28.88	29	1.028	0.657	26	0.064	16.32	16.50	1.042	0.067	0.703	0.724

Note:

"Simultaneous transmission was not evaluated as the sum of the individual SAR for WWAN including DTM mode and WLAN was < 1.6 W/kg. This meets the requirements and simultaneous transmission exclusion specified in FCC KDB publication "648474 D01 - SAR Handsets Multi Xmiter and Ant, v01r05"

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

2. Administration Data

2.1 Testing Laboratory

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

2.2 Applicant

Company Name	Sony Mobile Communications AB
Address	Nya Vattentornet, 22188 Lund, Sweden

2.3 Manufacturer

Company Name	Arima Communications Corp.
Address	6F., No. 866, Jhongjheng Rd., Jhonghe City, Taipei County 23586, Taiwan

2.4 Application Details

Date of Start during the Test	Oct. 27, 2012
Date of End during the Test	Nov. 01, 2012

3. General Information

3.1 Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT	Smart phone
Brand Name	Sony
Model Name	PM-0251-BV
Marketing Name	C1605
FCC ID	PY7PM-0251
EUT Serial No	WUJ012DBTH
IMEI Code	004402146239276
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WLAN2.4G: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Measure Maximum Average Output Power to Antenna	GSM850: 33.92 dBm GSM1900: 30.82 dBm 802.11b: 16.32 dBm 802.11g: 16.00 dBm 802.11n-HT20 (2.4GHz) : 14.08 dBm Bluetooth: 4.60 dBm
Antenna Type	2G: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna
HW Version	AP
SW Version	11.1.A.0.21
Uplink Modulations	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK 802.11b: DSSS (DBPSK / QPSK / CCK) 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth : GFSK Bluetooth EDR : π/4-DQPSK, 8-DPSK
Dual Transfer Mode (DTM) Category	Class A – EUT can support Packet Switched and Circuit Switched Network simultaneously.
EUT Stage	Production Unit
Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

Per KDB 941225 D04 requirement, the required test configuration for this device is as below:

1. This EUT is class A device
2. This EUT supports (E)GPRS multi-slot class 12 (max. uplink : 4, max. downlink : 4, total timeslots : 5)
3. This EUT supports DTM multi-slot class 11 (max. uplink : 3 for 1 CS & 2 PS, max. downlink : 4, total timeslots : 5)
4. The measured maximum conducted power can be referred to section 10.2 of this report
5. For DTM multi-slot class 11 link mode, the device was linked with system emulator (Agilent E5515C) and transmit maximum power on maximum number of Tx slots (one CS timeslot and two PS timeslots per frame).

3.2 Product Photos

Please refer to Appendix D.

3.3 Applied Standard

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2003
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v04
- FCC KDB 648474 D01 v01r05
- FCC KDB 941225 D03 v01
- FCC KDB 941225 D04 v01
- FCC KDB 941225 D06 v01
- FCC KDB 248227 D01 v01r02

3.4 Device Category and SAR Limits

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

3.5 Test Conditions

3.5.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.5.2 Test Configuration

The device was controlled by using a base station emulator. Communication between the device and the emulator was established by air link. The distance between the EUT and the antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during all tests.

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

The maximum rated power of WWAN and WLAN is listed in "Tune-Up Procedure" exhibit; the scaling factor is calculated according to the difference between measured output power and maximum tolerance power on this device.

4. Specific Absorption Rate (SAR)

4.1 Introduction

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

4.2 SAR Definition

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

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

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

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

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

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

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

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

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

5. SAR Measurement System

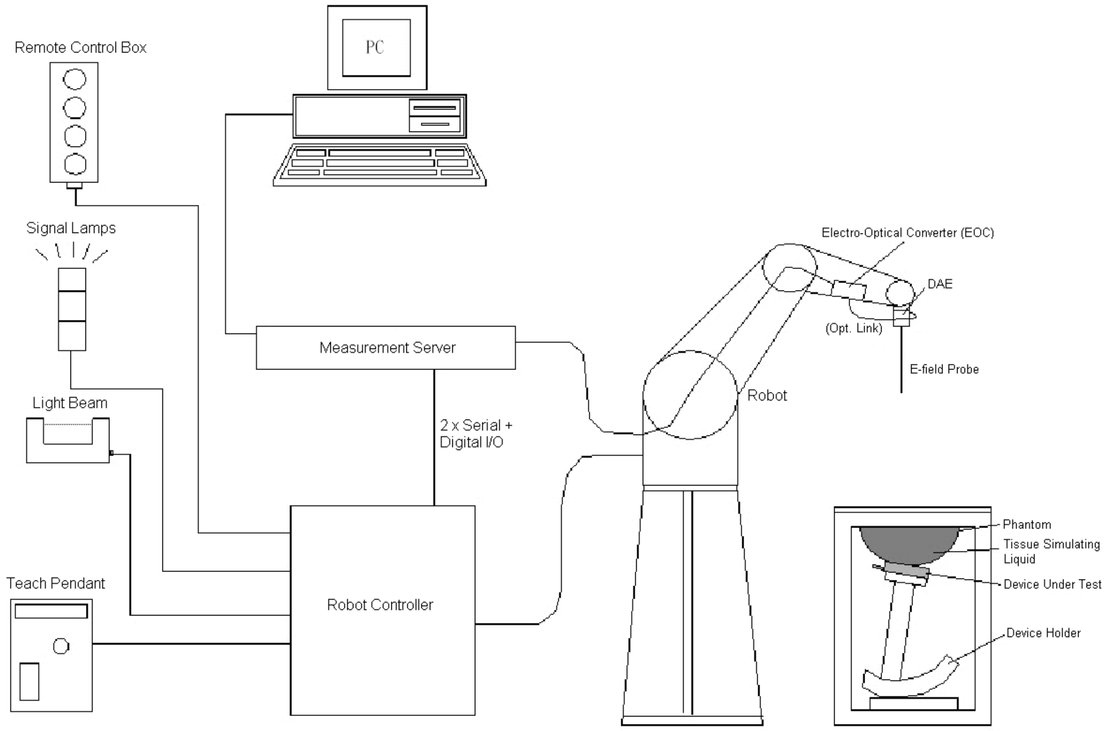


Fig 5.1 SPEAG DASY System Configurations

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

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

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

5.1 E-Field Probe

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

5.1.1 E-Field Probe Specification

<ES3DV3 Probe >

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 3 GHz; Linearity: ± 0.2 dB
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 µW/g to 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 10 mm) Tip diameter: 4 mm (Body: 10 mm) Distance from probe tip to dipole centers: 2.0 mm

Fig 5.2 Photo of ES3DV3

<EX3DV4 Probe>

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 9 mm) Tip diameter: 2.5 mm (Body: 10 mm) Typical distance from probe tip to dipole centers: 1 mm

Fig 5.3 Photo of EX3DV4

5.1.2 E-Field Probe Calibration

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

5.2 Data Acquisition Electronics (DAE)

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

Fig 5.4 Photo of DAE

5.3 Robot

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

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

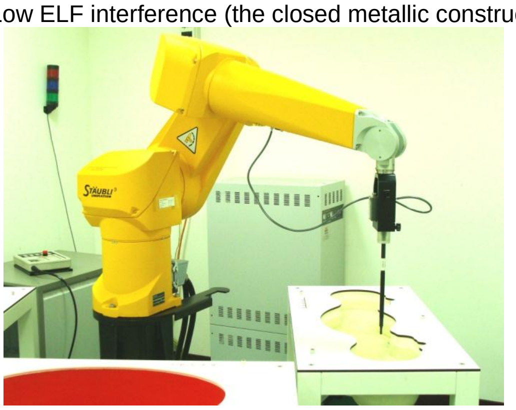


Fig 5.5 Photo of DASY4

Fig 5.6 Photo of DASY5

5.4 Measurement Server

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

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

Fig 5.7 Photo of Server for DASY4

Fig 5.8 Photo of Server for DASY5

5.5 Phantom

<SAM Twin Phantom>

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

Fig 5.9 Photo of SAM Phantom

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

<ELI4 Phantom>

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

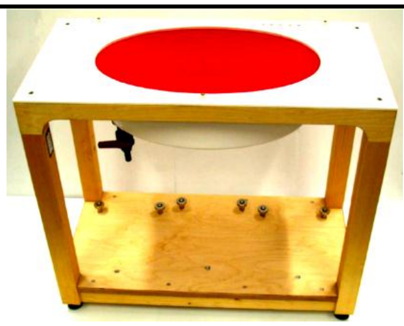


Fig 5.10 Photo of ELI4 Phantom

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

5.6 Device Holder

<Device Holder for SAM Twin Phantom>

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

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

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

Fig 5.11 Device Holder

<Laptop Extension Kit>

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

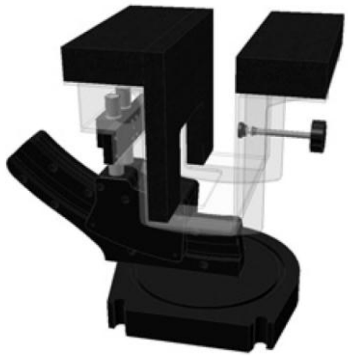


Fig 5.12 Laptop Extension Kit

5.7 Data Storage and Evaluation

5.7.1 Data Storage

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

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

5.7.2 Data Evaluation

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

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

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

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

The formula for each channel can be given as：

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

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

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

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

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

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

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

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

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

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

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

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

5.8 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 22, 2010	Mar. 21, 2013
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 23, 2010	Mar. 22, 2013
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 25, 2011	Jul. 24, 2013
SPEAG	Data Acquisition Electronics	DAE4	915	Jun. 21, 2012	Jun. 20, 2013
SPEAG	Data Acquisition Electronics	DAE4	778	Aug. 27, 2012	Aug. 26, 2013
SPEAG	Dosimetric E-Field Probe	ES3DV3	3270	Sep. 28, 2012	Sep. 27, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3801	Jun. 22, 2012	Jun. 21, 2013
Wisewind	Thermometer	ETP-101	TM560	Nov. 16, 2011	Nov. 15, 2012
Wisewind	Thermometer	HTC-1	TM685	Nov. 16, 2011	Nov. 15, 2012
SPEAG	Device Holder	N/A	N/A	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1303	NCR	NCR
SPEAG	SAM Phantom	QD 000 P41 C	TP-1150	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 CD	TP-1644	NCR	NCR
SPEAG	SAM Phantom	SM 000 T01 DA	TP-1542	NCR	NCR
Agilent	Network Analyzer	E5071C	MY46101588	May 11, 2012	May 10, 2013
Agilent	ESG Vector Series Signal Generator	E4438C	MY49070755	Oct. 02, 2012	Oct. 01, 2013
Anritsu	Power Meter	ML2495A	1132003	Aug. 14, 2012	Aug. 13, 2013
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 05, 2012	Jan. 04, 2014
Agilent	Dual Directional Coupler	778D	50422	Note 4	
Woken	Attenuator 1	WK0602-XX	N/A	Note 4	
PE	Attenuator 2	PE7005-10	N/A	Note 4	
PE	Attenuator 3	PE7005- 3	N/A	Note 4	
Agilent	Dielectric Probe Kit	85070D	US01440205	Note 5	
AR	Power Amplifier	5S1G4M2	0328767	Note 6	
R&S	Spectrum Analyzer	FSP	101131	Jul. 23, 2012	Jul. 22, 2013

Table 5.1 Test Equipment List

Note:

1. The calibration certificate of DASY can be referred to appendix C of this report.
2. Referring to KDB 450824 D02, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole D835V2, SN: 499, D1900V2, SN: 5d041, and D2450V2, SN: 736 can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.
4. The Insertion Loss calibration of Dual Directional Coupler and Attenuator were characterized via the network analyzer and compensated during system check.
5. The dielectric probe kit was calibrated via the network analyzer, with the specified procedure (calibrated in pure water) and calibration kit (standard) short circuit, before the dielectric measurement. The specific procedure and calibration kit are provided by Agilent.
6. In system check we need to monitor the level on the power meter, and adjust the power amplifier level to have 24dBm to the dipole. For system check, power amplifier is deemed not required for correct measurement; the power meter is critical and we do have calibration for it
7. Attenuator 1 insertion loss is calibrated by the network Analyzer, which the calibration is valid, before system check.

6. Tissue Simulating Liquids

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

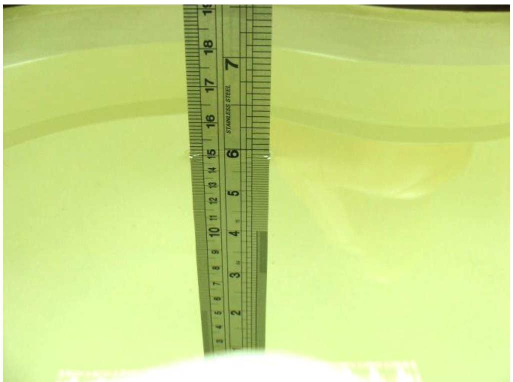


Fig 6.1 Photo of Liquid Height for Head SAR

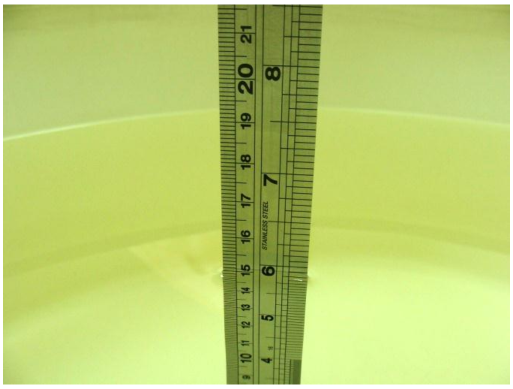


Fig 6.2 Photo of Liquid Height for Body SAR

The following table gives the recipes for tissue simulating liquid.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ε_r)
For Head								
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
For Body								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7

Table 6.1 Recipes of Tissue Simulating Liquid

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

The following table shows the measuring results for simulating liquid.

Freq. (MHz)	Liquid Type	Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Head	21.5	0.906	43	0.90	41.5	0.67	3.61	±5	Oct. 27, 2012
835	Body	21.4	0.963	54.6	0.97	55.2	-0.72	-1.09	±5	Oct. 27, 2012
1900	Head	21.6	1.43	39.2	1.4	40	2.14	-2.00	±5	Oct. 27, 2012
1900	Body	21.5	1.53	52.8	1.52	53.3	0.66	-0.94	±5	Oct. 27, 2012
2450	Head	21.6	1.828	40.584	1.8	39.2	1.56	3.53	±5	Nov. 01, 2012
2450	Body	21.6	2.01	53.813	1.95	52.7	3.08	2.11	±5	Nov. 01, 2012

Table 6.2 Measuring Results for Simulating Liquid

7. SAR Measurement Evaluation

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

7.1 Purpose of System Performance check

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

7.2 System Setup

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

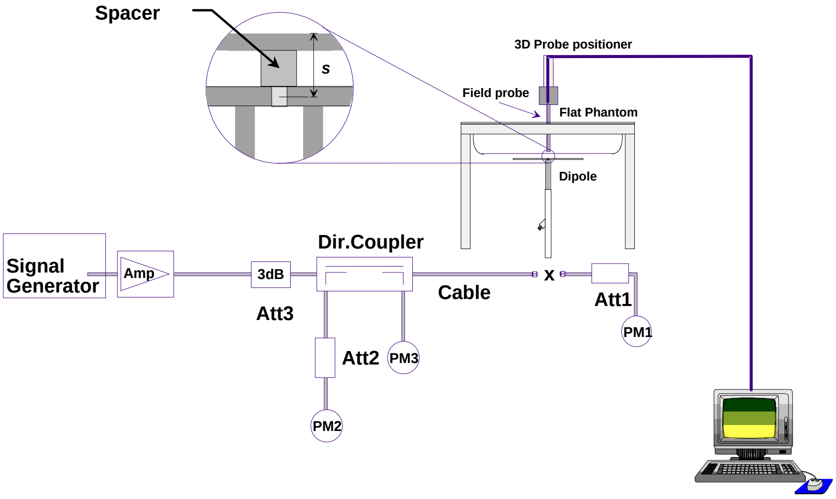


Fig 7.1 System Setup for System Evaluation

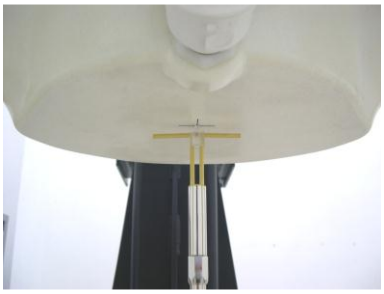


Fig 7.2 Photo of Dipole Setup

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

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

7.3 SAR System Verification Results

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

Measurement Date	Frequency (MHz)	Liquid Type	Targeted SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	Normalized SAR_{1g} (W/kg)	Deviation (%)
Oct. 27, 2012	835	Head	9.71	2.3	9.20	-5.25
Oct. 27, 2012	835	Body	9.82	2.32	9.28	-5.50
Oct. 27, 2012	1900	Head	39.8	9.64	38.56	-3.12
Oct. 27, 2012	1900	Body	40	9.77	39.08	-2.30
Nov. 01, 2012	2450	Head	54.8	13.4	53.60	-2.19
Nov. 01, 2012	2450	Body	52.3	13.8	55.20	5.54

Table 7.1 Target and Measurement SAR after Normalized

8. EUT Testing Position

8.1 Define two imaginary lines on the handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

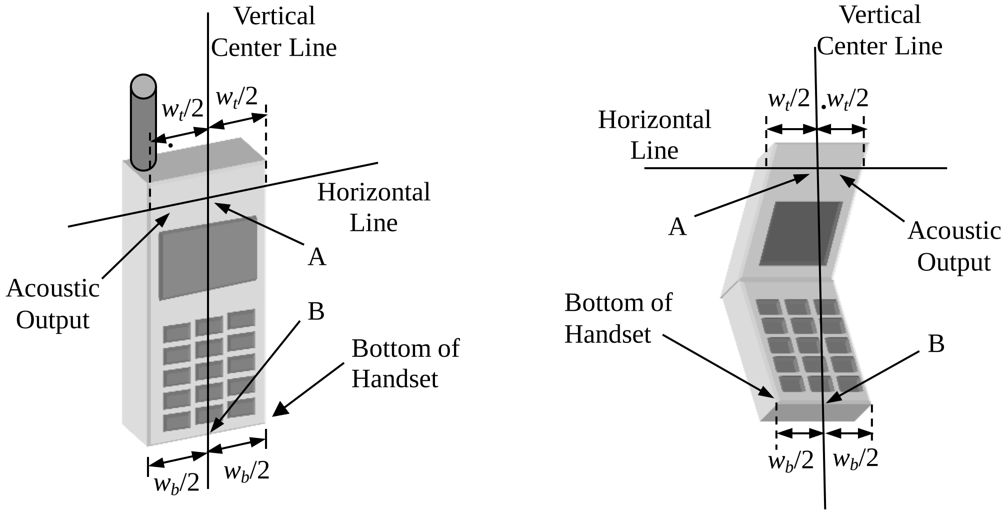


Fig 8.1 Illustration for Handset Vertical and Horizontal Reference Lines

8.2 Cheek Position

(a) 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: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(b) 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. 8.2).

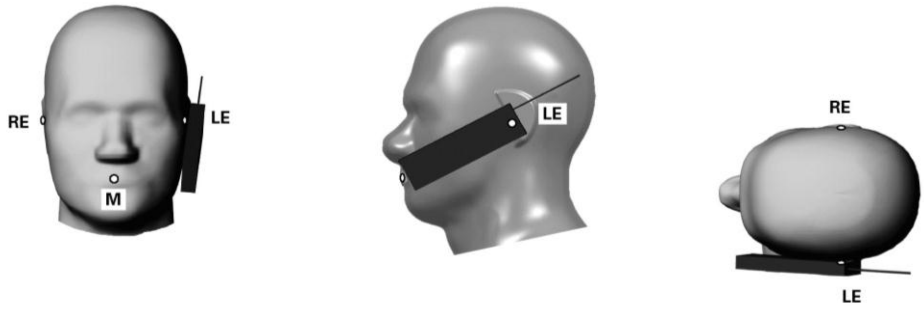


Fig 8.2 Illustration for Cheek Position

8.3 Tilted Position

(a) To position the device in the “cheek” position described above.

(b) 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 (see Fig. 8.3).

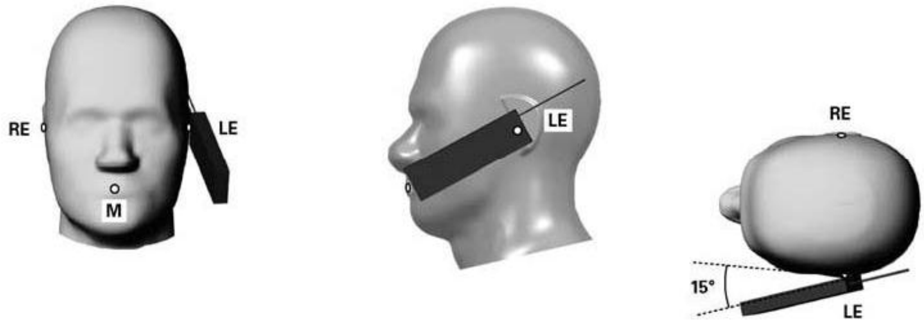


Fig 8.3 Illustration for Tilted Position

8.4 Body Worn Position

(a) To position the device parallel to the phantom surface with either keypad up or down.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device surface and the flat phantom to 1.5 cm.

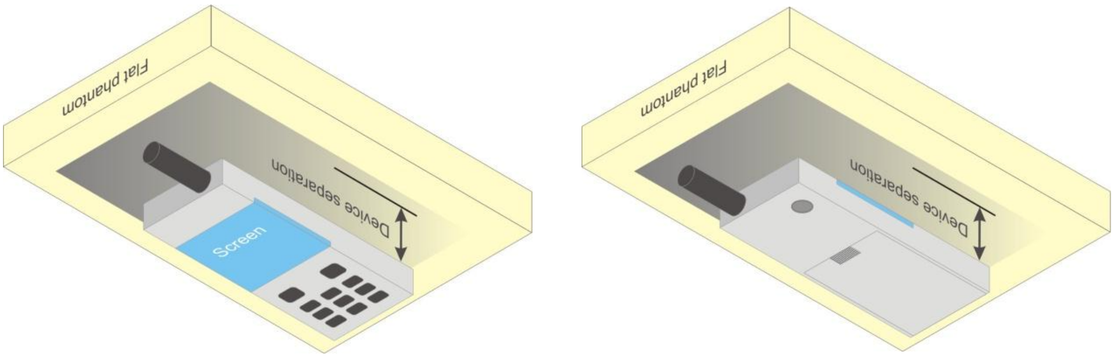


Fig 8.4 Illustration for Body Worn Position

8.5 Hotspot Position

(a) To position the device parallel to the phantom surface with all sides and either keypad up or down.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device and the flat phantom to 1.0cm.

<EUT Setup Photos>

Please refer to Appendix E for the test setup photos.

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

9.1 Spatial Peak SAR Evaluation

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

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

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

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

9.2 Area & Zoom Scan Procedures

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

For any secondary peaks found in the area scan which are within 2 dB of the maximum peak and are not within this zoom scan, the zoom scan should be repeated.

9.3 Volume Scan Procedures

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

9.4 SAR Averaged Methods

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

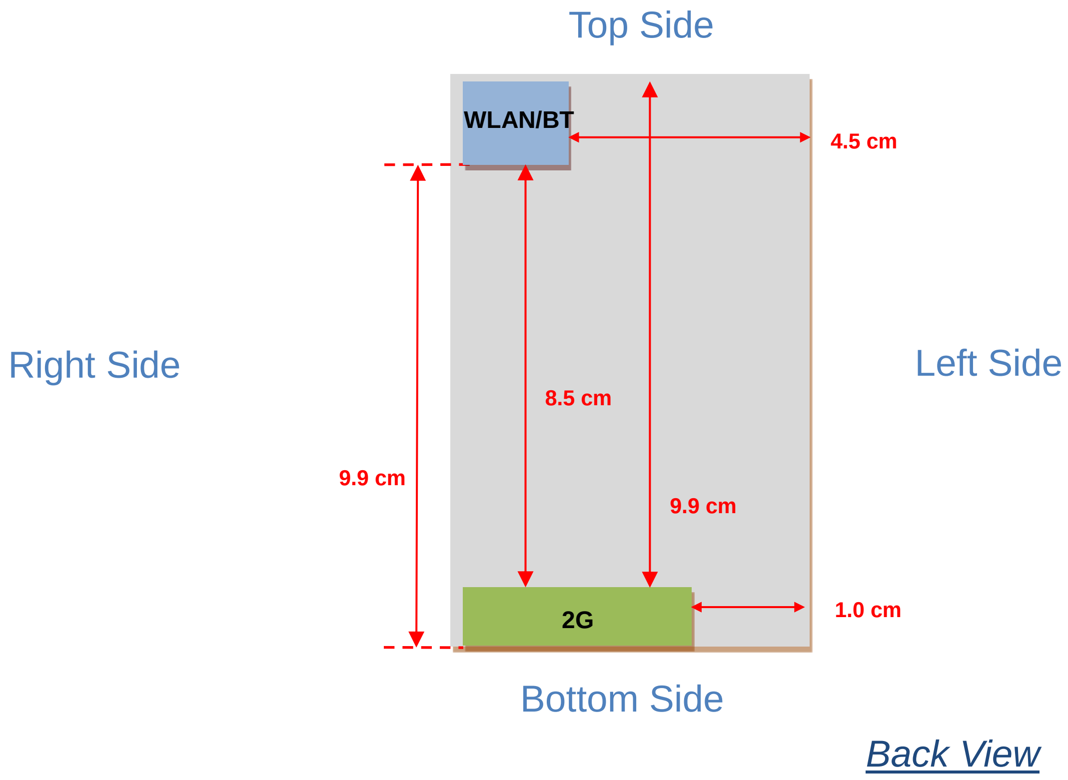
Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty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

9.5 Power Drift Monitoring

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

10. SAR Test Configurations

10.1 Exposure Positions Consideration



EUT Length: 11.3 cm
EUT Width: 6.3 cm

Antennas	Wireless Interface
2G Antenna (Tx / Rx)	GSM 850/1900
WLAN/BT Antenna (Tx / Rx)	WLAN 2.4GHz Bluetooth

Sides for Head SAR tests				
Antennas	Right Cheek	Left Cheek	Right Tilt	Left Tilt
2G	YES	YES	YES	YES
WLAN/BT	YES	YES	YES	YES

Sides for SAR tests; Hotspot mode Test distance: 10 mm						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
2G	YES	YES	NO	YES	YES	YES
WLAN/BT	YES	YES	YES	NO	YES	NO

Sides for SAR tests; Body-worn mode Test distance: 15 mm		
Antennas	Back w/ headset	Front w/ headset
2G	YES	YES
WLAN/BT	YES	YES

Note:

1. Head/Body-worn/Hotspot mode SAR assessments are required.
2. Referring to KDB 941225 D06, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.
3. For 2G antenna, SAR measurements at Top side is not required since the distance between the transmitting antenna and surface of device is > 25mm.
4. For BT&WLAN antenna, SAR measurements Bottom/Left side are not required since the distance between the transmitting antenna and surface of device is > 25mm.
5. Per KDB 648474 D01, Bluetooth output power ≤ 2*P_{Ref} and the distance to other antennas ≥ 5cm, therefore, stand-alone SAR is not required.

10.2 Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

Band: GSM850		Burst Average Power (dBm)			Frame-Average Power (dBm)		
Channel		128	189	251	128	189	251
Frequency (MHz)		824.2	836.4	848.8	824.2	836.4	848.8
GSM (GMSK, 1 Tx slot)		33.89	33.92	33.86	24.89	24.92	24.86
GPRS (GMSK, 1 Tx slot) – CS1		33.86	33.90	33.84	24.86	24.90	24.84
GPRS (GMSK, 2 Tx slots) – CS1		31.05	31.09	31.01	25.05	25.09	25.01
GPRS (GMSK, 3 Tx slots) – CS1		29.32	29.33	29.21	25.06	25.07	24.95
GPRS (GMSK, 4 Tx slots) – CS1		28.01	28.06	28.02	25.01	25.06	25.02
EDGE (GMSK, 1 Tx slot) – MCS1		33.21	33.25	33.12	24.21	24.25	24.12
EDGE (GMSK, 2 Tx slots) – MCS1		31.04	31.08	31.03	25.04	25.08	25.03
EDGE (GMSK, 3 Tx slots) – MCS1		29.31	29.32	29.18	25.05	25.06	24.92
EDGE (GMSK, 4 Tx slots) – MCS1		27.97	28.03	28.00	24.97	25.03	25.00
EDGE (8PSK, 1 Tx slot) – MCS5		29.18	29.34	29.26	20.18	20.34	20.26
EDGE (8PSK, 2 Tx slots) – MCS5		26.09	26.25	26.18	20.09	20.25	20.18
EDGE (8PSK, 3 Tx slots) – MCS5		24.30	24.24	24.18	20.04	19.98	19.92
EDGE (8PSK, 4 Tx slots) – MCS5		23.11	23.27	23.16	20.11	20.27	20.16
DTM 5 (2Tx slots)	GSM (GMSK, 1 Tx slot)	31.05	31.10	31.02	25.02	25.07	24.99
	GPRS (GMSK, 1 Tx slot) – CS1	31.04	31.08	31.00			
DTM 9 (2Tx slots)	GSM (GMSK, 1 Tx slot)	31.04	31.09	31.01	25.01	25.06	24.97
	GPRS (GMSK, 1 Tx slot) – CS1	31.02	31.08	30.98			
DTM 11 (3Tx slots)	GSM (GMSK, 1 Tx slot)	29.28	29.30	29.23	25.01	25.03	24.96
	GPRS (GMSK, 2 Tx slots) – CS1	29.27	29.28	29.21			
DTM 5 (2Tx slots)	GSM (GMSK, 1 Tx slot)	31.04	31.09	31.06	23.25	23.28	23.25
	EDGE (8PSK, 1 Tx slot) – MCS5	26.22	26.21	26.18			
DTM 9 (2Tx slots)	GSM (GMSK, 1 Tx slot)	31.01	31.07	31.05	23.22	23.26	23.23
	EDGE (8PSK, 1 Tx slot) – MCS5	26.19	26.20	26.14			
DTM 11 (3Tx slots)	GSM (GMSK, 1 Tx slot)	29.21	29.30	29.26	22.35	22.39	22.31
	EDGE (8PSK, 2 Tx slots) – MCS5	24.31	24.27	24.14			

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

Note:

1. For Head SAR testing, GSM and DTM should be evaluated, therefore the EUT was set in DTM Multi-slot class 5 for GSM850 due to its highest frame-average power.
2. For Body worn SAR testing, GSM and DTM should be evaluated, therefore the EUT was set in DTM Multi-slot class 5 for GSM850 due to its highest frame-average power.
3. For hotspot mode SAR testing, GPRS, EDGE and DTM should be evaluated, therefore the EUT was set in GPRS 2 Tx slots for GSM850 due to its highest frame-average power.
4. Per KDB 648474, the maximum output power channel is used for SAR testing and for further SAR test reduction.
5. Agilent E5515C was used to setup the device operated under DTM mode for power measurement and SAR testing. For conducted power, the power of the burst for voice and the power of the bursts for data was reported separately in the table above, and the frame-average power is derived below to determine SAR testing.

*DTM frame average power (dBm) = 10*log [∑(power of each slot, in mW)/8]*

Band: GSM1900		Burst Average Power (dBm)			Frame-Average Power (dBm)		
Channel		512	661	810	512	661	810
Frequency (MHz)		1850.2	1880.0	1909.8	1850.2	1880.0	1909.8
GSM (GMSK, 1 Tx slot)		30.68	30.77	30.76	21.68	21.77	21.76
GPRS (GMSK, 1 Tx slot) – CS1		30.72	30.82	30.81	21.72	21.82	21.81
GPRS (GMSK, 2 Tx slots) – CS1		28.80	28.88	28.84	22.80	22.88	22.84
GPRS (GMSK, 3 Tx slots) – CS1		27.01	27.08	27.00	22.75	22.82	22.74
GPRS (GMSK, 4 Tx slots) – CS1		25.59	25.66	25.63	22.59	22.66	22.63
EDGE (GMSK, 1 Tx slot) – MCS1		30.70	30.80	30.76	21.70	21.80	21.76
EDGE (GMSK, 2 Tx slots) – MCS1		28.67	28.76	28.73	22.67	22.76	22.73
EDGE (GMSK, 3 Tx slots) – MCS1		27.00	27.05	26.96	22.74	22.79	22.70
EDGE (GMSK, 4 Tx slots) – MCS1		25.57	25.63	25.62	22.57	22.63	22.62
EDGE (8PSK, 1 Tx slot) – MCS5		26.96	27.08	26.99	17.96	18.08	17.99
EDGE (8PSK, 2 Tx slots) – MCS5		25.75	25.85	25.78	19.75	19.85	19.78
EDGE (8PSK, 3 Tx slots) – MCS5		24.01	24.11	24.02	19.75	19.85	19.76
EDGE (8PSK, 4 Tx slots) – MCS5		22.86	22.97	22.90	19.86	19.97	19.90
DTM 5 (2Tx slots)	GSM (GMSK, 1 Tx slot)	28.50	28.64	28.55	22.47	22.60	22.51
	GPRS (GMSK, 1 Tx slot) – CS1	28.48	28.60	28.52			
DTM 9 (2Tx slots)	GSM (GMSK, 1 Tx slot)	28.44	28.58	28.49	22.41	22.54	22.45
	GPRS (GMSK, 1 Tx slot) – CS1	28.43	28.54	28.46			
DTM 11 (3Txslots)	GSM (GMSK, 1 Tx slot)	26.97	27.07	27.01	22.66	22.76	22.70
	GPRS (GMSK, 2 Tx slots) –CS1	26.89	27.00	26.93			
DTM 5 (2Tx slots)	GSM (GMSK, 1 Tx slot)	28.91	28.99	28.96	21.58	21.65	21.63
	EDGE (8PSK, 1 Tx slot) –MCS5	25.72	25.78	25.76			
DTM 9 (2Tx slots)	GSM (GMSK, 1 Tx slot)	28.86	28.94	28.92	21.54	21.61	21.59
	EDGE (8PSK, 1 Tx slot) –MCS5	25.69	25.76	25.73			
DTM 11(3Tx slots)	GSM (GMSK, 1 Tx slot)	26.54	26.65	26.58	20.64	20.75	20.68
	EDGE (8PSK, 2 Tx slots) MCS5	23.77	23.88	23.81			

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

Note:

1. For Head SAR testing, GSM and DTM should be evaluated, therefore the EUT was set in DTM Multi-slot class 11 for GSM1900 due to its highest frame-average power.
2. For Body worn SAR testing, GSM and DTM should be evaluated, therefore the EUT was set in DTM Multi-slot class 11 for GSM1900 due to its highest frame-average power.
3. For hotspot mode SAR testing, GPRS, EDGE and DTM should be evaluated, therefore the EUT was set in GPRS 2 Tx slots for GSM1900 due to its highest frame-average power.
4. Per KDB 648474, the maximum output power channel is used for SAR testing and for further SAR test reduction.
5. Agilent E5515C was used to setup the device operated under DTM mode for power measurement and SAR testing. For conducted power, the power of the burst for voice and the power of the bursts for data was reported separately in the table above, and the frame-average power is derived below to determine SAR testing.

*DTM frame average power (dBm) = 10*log [∑(power of each slot, in mW)/8]*

<WLAN 2.4GHz Conducted Power>

WLAN 2.4G 802.11b Average Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
CH 01	2412	15.96	06	16.24	16.00	15.90
CH 06	2437	16.32				
CH 11	2462	15.79				

WLAN 2.4G 802.11g Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)						
		6M		9M	12M	18M	24M	36M	48M	54M
CH 01	2412	15.99	11	15.89	15.92	15.98	15.70	15.38	15.44	15.77
CH 06	2437	15.75								
CH 11	2462	16.00								

WLAN 2.4G 802.11n (BW 20MHz) Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	14.03	11	13.53	13.64	13.42	13.38	13.46	12.63	9.93
CH 06	2437	14.06								
CH 11	2462	14.08								

Note:

1. Per KDB 248227, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227, 11g and 11n-HT20 output power is less than 0.25dB higher than 11b mode, thus the SAR can be excluded.
3. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 0.25dB higher than those measured at the lowest data rate.

<Bluetooth Conducted Power>

Channel	Frequency (MHz)	Average power (dBm)		
		Mode		
		GFSK	π/4-DQPSK	8-DPSK
CH 0	2402	3.92	2.34	2.34
CH 39	2441	4.19	2.63	2.62
CH 78	2480	4.60	3.07	3.06

Note: Per KDB 648474, 2.4GHz Bluetooth SAR is excluded due to highest output power ≤ 60/f (GHz) mW, where 60/f (GHz) = 24mW = 13.8dBm.

11. SAR Test Results

11.1 Test Records for Head SAR Test

<GSM SAR>

Plot No.	Band	Mode	Modulation Type	Test Position	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Power Drift (dB)	SAR_{1g} (W/kg)	SAR_{10g} (W/kg)
12	**GSM850**	**DTM Multi-slot class 5**	**GMSK**	**Right Cheek**	**189**	**836.4**	**31.1**	**-0.158**	**0.507**	**0.382**
13	GSM850	DTM Multi-slot class 5	GMSK	Right Tilted	189	836.4	31.1	0.124	0.263	0.2
14	GSM850	DTM Multi-slot class 5	GMSK	Left Cheek	189	836.4	31.1	-0.141	0.432	0.325
15	GSM850	DTM Multi-slot class 5	GMSK	Left Tilted	189	836.4	31.1	0.053	0.248	0.191
1	GSM1900	DTM Multi-slot class 11	GMSK	Right Cheek	661	1880	27.07	0.126	0.424	0.267
2	GSM1900	DTM Multi-slot class 11	GMSK	Right Tilted	661	1880	27.07	0.122	0.244	0.144
3	**GSM1900**	**DTM Multi-slot class 11**	**GMSK**	**Left Cheek**	**661**	**1880**	**27.07**	**0.194**	**0.571**	**0.331**
4	GSM1900	DTM Multi-slot class 11	GMSK	Left Tilted	661	1880	27.07	-0.073	0.211	0.133

Note:

1. Per KDB 648474 and KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
2. Considering GSM voice call and DTM mode RF exposure at the head exposure positions, per KDB 941225 D03 for TDMA application, the mode of the highest source-based time-averaged power was selected for SAR testing to show RF exposure compliance and cover the mode with lower source-based time-average power. DTM (1CS, 1PS) was chosen for cellular band, and DTM (1CS, 2PS) was chosen for PCS band.

<WLAN SAR>

Plot No.	Band	Mode	Modulation Type	Data Rate	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Power Drift (dB)	SAR_{1g} (W/kg)	SAR_{10g} (W/kg)
31	WLAN2.4G	802.11b	DBPSK	1Mbps	Right Cheek	6	2437	16.32	-0.03	0.119	0.066
32	WLAN2.4G	802.11b	DBPSK	1Mbps	Right Tilted	6	2437	16.32	0.16	0.134	0.069
33	**WLAN2.4G**	**802.11b**	**DBPSK**	**1Mbps**	**Left Cheek**	**6**	**2437**	**16.32**	**0.18**	**0.208**	**0.106**
34	WLAN2.4G	802.11b	DBPSK	1Mbps	Left Tilted	6	2437	16.32	0.17	0.135	0.066

Note: Per KDB 648474 and KDB 248227, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

11.2 Test Records for Hotspot SAR Test

<GSM SAR>

Plot No.	Band	Mode	Modulation Type	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Power Drift (dB)	SAR_{1g} (W/kg)	SAR_{10g} (W/kg)
16	GSM850	GPRS (2 Tx slots)	GMSK	Front	1cm	189	836.4	31.09	-0.03	0.55	0.408
18	GSM850	GPRS (2 Tx slots)	GMSK	Back	1cm	189	836.4	31.09	-0.176	0.869	0.627
19	GSM850	GPRS (2 Tx slots)	GMSK	Back	1cm	128	824.2	31.05	0.187	0.687	0.495
20	**GSM850**	**GPRS (2 Tx slots)**	**GMSK**	**Back**	**1cm**	**251**	**848.8**	**31.01**	**-0.152**	**1.09**	**0.785**
22	GSM850	GPRS (2 Tx slots)	GMSK	Left Side	1cm	189	836.4	31.09	-0.112	0.42	0.303
23	GSM850	GPRS (2 Tx slots)	GMSK	Right Side	1cm	189	836.4	31.09	0.061	0.445	0.324
24	GSM850	GPRS (2 Tx slots)	GMSK	Bottom Side	1cm	189	836.4	31.09	0.128	0.058	0.034
5	GSM1900	GPRS (2 Tx slots)	GMSK	Front	1cm	661	1880	28.88	-0.039	0.533	0.318
7	**GSM1900**	**GPRS (2 Tx slots)**	**GMSK**	**Back**	**1cm**	**661**	**1880**	**28.88**	**0.131**	**0.639**	**0.372**
9	GSM1900	GPRS (2 Tx slots)	GMSK	Left Side	1cm	661	1880	28.88	-0.009	0.147	0.087
10	GSM1900	GPRS (2 Tx slots)	GMSK	Right Side	1cm	661	1880	28.88	0.063	0.135	0.08
11	GSM1900	GPRS (2 Tx slots)	GMSK	Bottom Side	1cm	661	1880	28.88	0.063	0.407	0.221

Note:

1. Per KDB 941225 D06, for EUT dimension ≥ 9cm*5cm, the test distance is 1cm. SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.
2. As in (1), SAR for Front / Back / Bottom Side / Left Side / Right Side is necessary.
3. Per KDB 648474 and KDB 447498 if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
4. Hotspot mode for head was addressed as the device was tested using the highest source-based time-average power channel of GSM850 band DTM mode. The sum of SAR level for simultaneous transmission for head mode WWAN and WLAN was also < 1.6 w/kg. For GSM1900 band DTM mode was found to give the highest source-based time-average power, this mode addressed data allocated mode and the possible use of hotspot mode in the head configuration. The sum of SAR level for simultaneous transmission for head mode WWAN and WLAN was also < 1.6 w/kg.

<WLAN SAR>

Plot No.	Band	Mode	Modulation Type	Data Rate	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Power Drift (dB)	SAR_{1g} (W/kg)	SAR_{10g} (W/kg)
	WLAN2.4G	802.11b	DBPSK	1Mbps	Front	1cm	6	2437	16.32	0.12	0.045	0.027
26	**WLAN2.4G**	**802.11b**	**DBPSK**	**1Mbps**	**Back**	**1cm**	**6**	**2437**	**16.32**	**0.14**	**0.064**	**0.032**
27	WLAN2.4G	802.11b	DBPSK	1Mbps	Right Side	1cm	6	2437	16.32	0.12	0.048	0.026
28	WLAN2.4G	802.11b	DBPSK	1Mbps	Top Side	1cm	6	2437	16.32	0.17	0.048	0.026

Note:

1. Per KDB 941225 D06, for EUT dimension ≥ 9cm*5cm, the test distance is 1cm. SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.
2. As in (1), SAR for Front / Back / Top Side / Right Side is necessary.
3. Per KDB 648474 and KDB 248227, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

11.3 Test Records for Body-worn SAR Test

<GSM SAR>

Plot No.	Band	Mode	Modulation Type	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Power Drift (dB)	SAR_{1g} (W/kg)	SAR_{10g} (W/kg)
17	GSM850	DTM Multi-slot class 5	GMSK	Front	1.5cm	V	189	836.4	31.1	-0.168	0.313	0.232
21	**GSM850**	**DTM Multi-slot class 5**	**GMSK**	**Back**	**1.5cm**	**V**	**189**	**836.4**	**31.1**	**0.161**	**0.448**	**0.322**
6	GSM1900	DTM Multi-slot class 11	GMSK	Front	1.5cm	V	661	1880	27.07	0.03	0.301	0.184
8	**GSM1900**	**DTM Multi-slot class 11**	**GMSK**	**Back**	**1.5cm**	**V**	**661**	**1880**	**27.07**	**-0.191**	**0.339**	**0.202**

Note:
1. Per KDB 648474 and KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
2. “V” in the Headset column means the Headset is plugged during SAR testing.

<WLAN SAR>

Plot No.	Band	Mode	Modulation Type	Data Rate	Test Position	Gap (cm)	Headset	Ch.	Freq. (MHz)	Average Power (dBm)	Power Drift (dB)	SAR_{1g} (W/kg)	SAR_{10g} (W/kg)
29	WLAN2.4G	802.11b	DBPSK	1Mbps	Front	1.5cm	V	6	2437	16.32	0.15	0.02	0.012
30	**WLAN2.4G**	**802.11b**	**DBPSK**	**1Mbps**	**Back**	**1.5cm**	**V**	**6**	**2437**	**16.32**	**0.13**	**0.035**	**0.02**

Note:
1. Per KDB 648474 and KDB 248227, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
2. “V” in the Headset column means the Headset is plugged during SAR testing.

11.4 Simultaneous Multi-band Transmission Analysis

No.	Applicable Simultaneous Transmission Combination
1.	GSM (voice) + BT
2.	GSM (voice) + WLAN 2.4G (data)
3.	GPRS/EGPRS(data) + WLAN 2.4G (router)
4.	DTM(voice/data)+ WLAN(router)

Note:
1. WLAN and BT share the same antenna, and cannot transmit simultaneously.
2. The maximum SAR summation is calculated based on the same configuration and test position.
3. Per KDB 648474, Bluetooth simultaneous SAR consideration is not required due to power < 2*P_{ref} and the distance to the WWAN antenna is >5cm.
4. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary.

<Head SAR>

Position	WWAN			WLAN		WWAN + WLAN
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Plot No	Max. WLAN SAR (W/kg)	
Right Cheek	GSM850	12	0.507	31	0.119	0.63
	GSM1900	1	0.424	31	0.119	0.54
Right Tilted	GSM850	13	0.263	32	0.134	0.40
	GSM1900	2	0.244	32	0.134	0.38
Left Cheek	GSM850	14	0.432	33	0.208	0.64
	GSM1900	3	0.571	33	0.208	0.78
Left Tilted	GSM850	15	0.248	34	0.135	0.38
	GSM1900	4	0.211	34	0.135	0.35

<Hotspot SAR>

Position	WWAN			WLAN		WWAN + WLAN
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Plot No	Max. WLAN SAR (W/kg)	
Front	GSM850	16	0.55	25	0.045	0.60
	GSM1900	5	0.533	25	0.045	0.58
Back	GSM850	20	1.09	26	0.064	1.15
	GSM1900	7	0.639	26	0.064	0.70
Left Side	GSM850	22	0.42	-	-	0.42
	GSM1900	9	0.147	-	-	0.15
Right Side	GSM850	23	0.445	27	0.048	0.49
	GSM1900	10	0.135	27	0.048	0.18
Top Side	GSM850	-	-	28	0.048	0.05
	GSM1900	-	-	28	0.048	0.05
Bottom Side	GSM850	24	0.058	-	-	0.06
	GSM1900	11	0.407	-	-	0.41

<Body-worn SAR>

Position	WWAN			WLAN		WWAN + WLAN
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Plot No	Max. WLAN SAR (W/kg)	
Front (w/ Headset)	GSM850	17	0.313	29	0.02	0.33
	GSM1900	6	0.301	29	0.02	0.32
Back (w/ Headset)	GSM850	21	0.448	30	0.035	0.48
	GSM1900	**8**	0.339	30	0.035	0.37

Test Engineer： Ken Li and San Lin

12. Uncertainty Assessment

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

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

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

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

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

(b) κ is the coverage factor

Table 12.1 Standard Uncertainty for Assumed Distribution

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

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

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

Table 12.2 Uncertainty Budget of DASY for frequency range 300 MHz to 3 GHz According to IEEE1528-2003

13. References

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

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

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

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

[5] SPEAG DASY System Handbook

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

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

[8] FCC KDB 648474 D01 v01r05, “SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas”, September 2008

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

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

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

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

Appendix A. Plots of System Performance Check

The plots are shown as follows.

System Check_Head_835MHz_121027

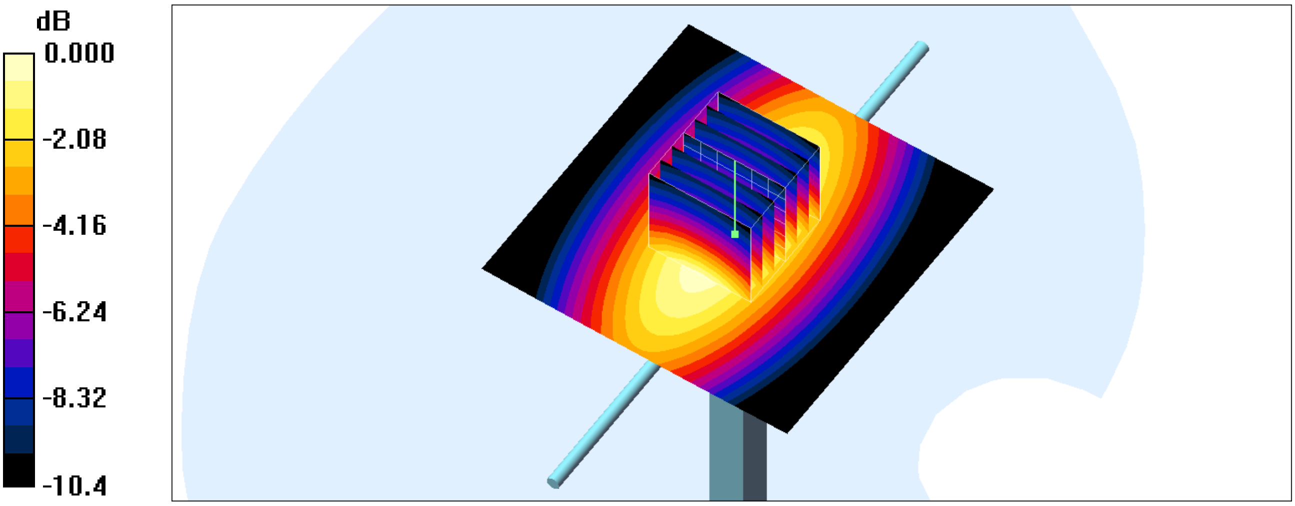
DUT: D835V2-SN:499

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL_850_121027 Medium parameters used: f = 835 MHz; σ = 0.906 mho/m; ε_r = 43; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.48 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.1 V/m; Power Drift = 0.021 dB
Peak SAR (extrapolated) = 3.39 W/kg
SAR(1 g) = 2.3 mW/g; SAR(10 g) = 1.5 mW/g
Maximum value of SAR (measured) = 2.48 mW/g



0 dB = 2.48mW/g

System Check_Body_835MHz_121027

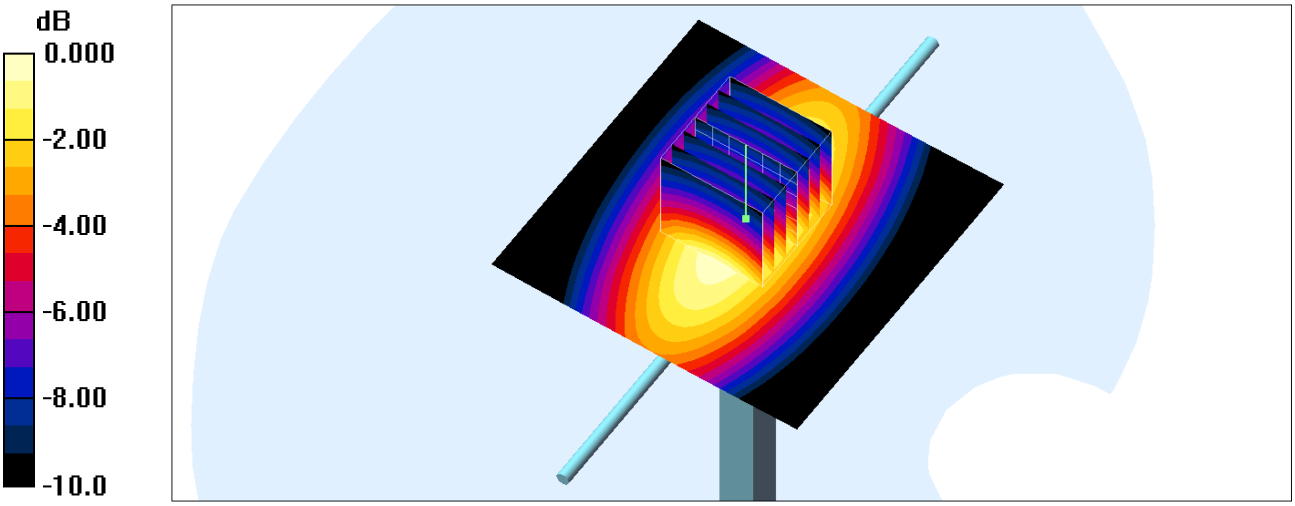
DUT: D835V2-SN:499

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_850_121027 Medium parameters used: f = 835 MHz; σ = 0.963 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.51 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.0 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 3.34 W/kg
SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.53 mW/g
Maximum value of SAR (measured) = 2.50 mW/g



0 dB = 2.50mW/g

System Check_Head_1900MHz_121027

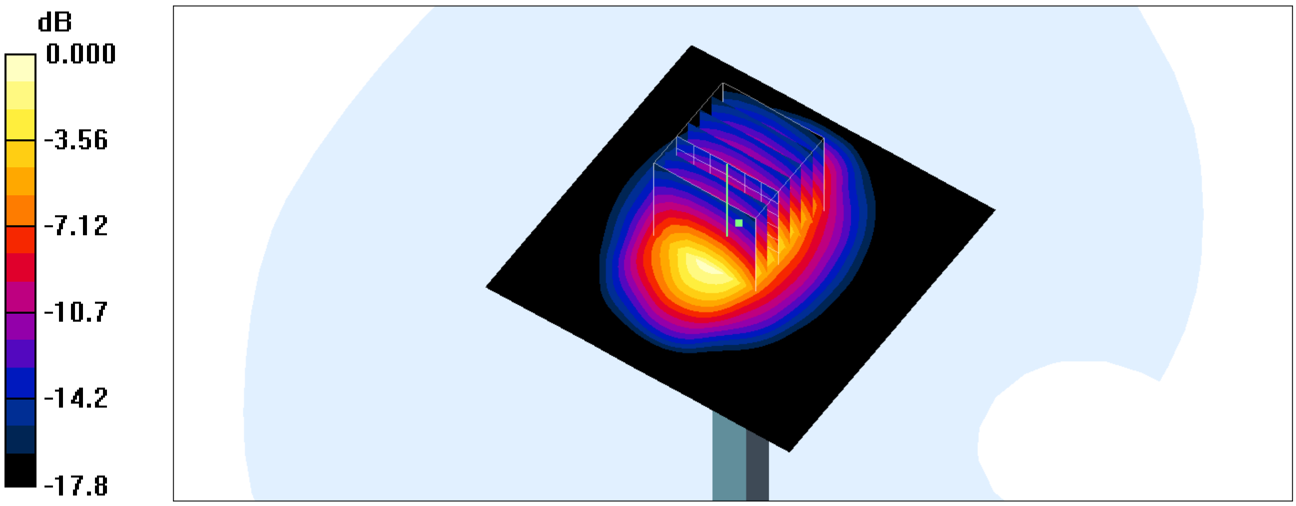
DUT: D1900V2-SN:5d041

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL_1900_121027 Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε_r = 39.2; ρ = 1000 kg/m^3
Ambient Temperature：22.4℃; Liquid Temperature：21.6 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.1 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 84.5 V/m; Power Drift = 0.107 dB
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 9.64 mW/g; SAR(10 g) = 4.96 mW/g
Maximum value of SAR (measured) = 10.7 mW/g



0 dB = 10.7mW/g

System Check_Body_1900MHz_121027

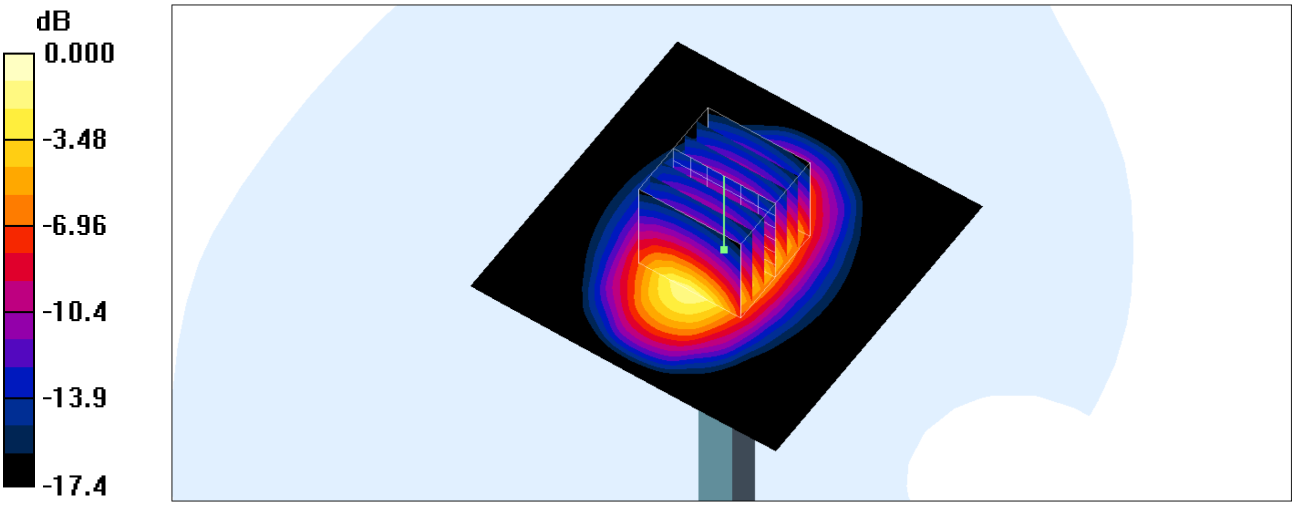
DUT: D1900V2-SN:5d041

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_121027 Medium parameters used: f = 1900 MHz; σ = 1.53 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3
Ambient Temperature：22.5℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 11.2 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 86.0 V/m; Power Drift = -0.009 dB
Peak SAR (extrapolated) = 18.3 W/kg
SAR(1 g) = 9.77 mW/g; SAR(10 g) = 5.02 mW/g
Maximum value of SAR (measured) = 11.0 mW/g



0 dB = 11.0mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/11/1

System Check_Head_2450MHz_121101

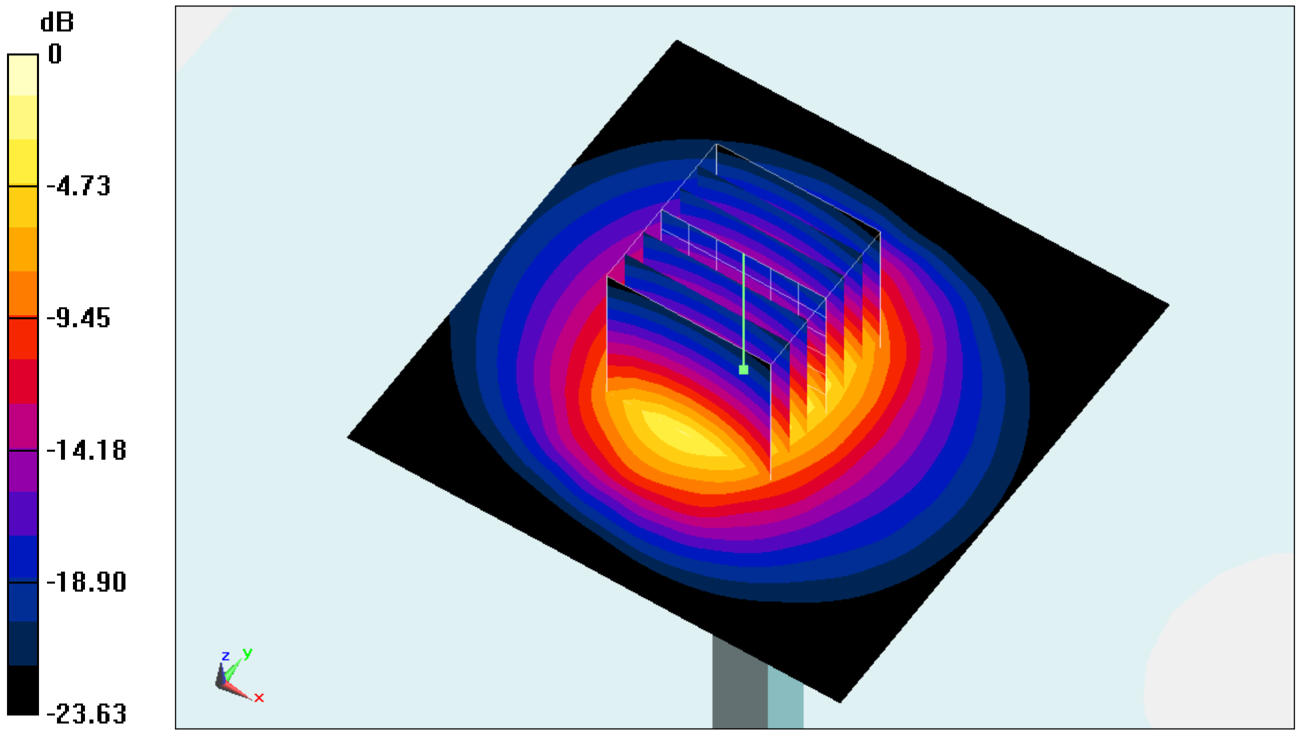
DUT: D2450V2-SN:736

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL_2450_121101 Medium parameters used: f = 2450 MHz; σ = 1.828 mho/m; ε_r = 40.584; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.7, 6.7, 6.7); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Left; Type: QD000P40CD; Serial: TP:1542
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 15.5 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.411 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 30.323 mW/g
SAR(1 g) = 13.4 mW/g; SAR(10 g) = 5.98 mW/g
Maximum value of SAR (measured) = 15.3 W/kg



0 dB = 15.3 W/kg = 23.69 dB W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/11/1

System Check_Body_2450MHz_121101

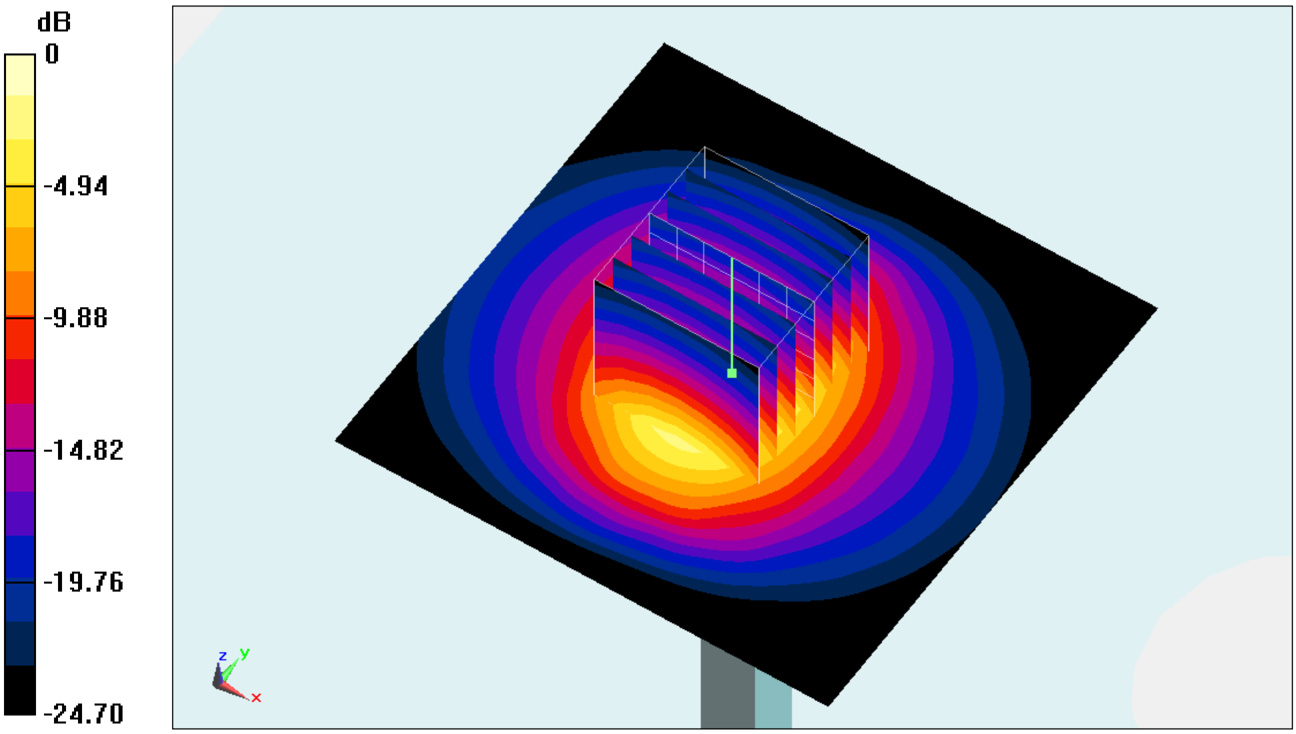
DUT: D2450V2-SN:736

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_121101 Medium parameters used: f = 2450 MHz; σ = 2.01 mho/m; ε_r = 53.813; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.59, 6.59, 6.59); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 15.9 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 86.022 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 32.488 mW/g
SAR(1 g) = 13.8 mW/g; SAR(10 g) = 6.04 mW/g
Maximum value of SAR (measured) = 15.6 W/kg



0 dB = 15.6 W/kg = 23.86 dB W/kg

Appendix B. Plots of SAR Measurement

The plots are shown as follows.

#12_GSM850_DTM Multi-slot class 5_Right Cheek_Ch189

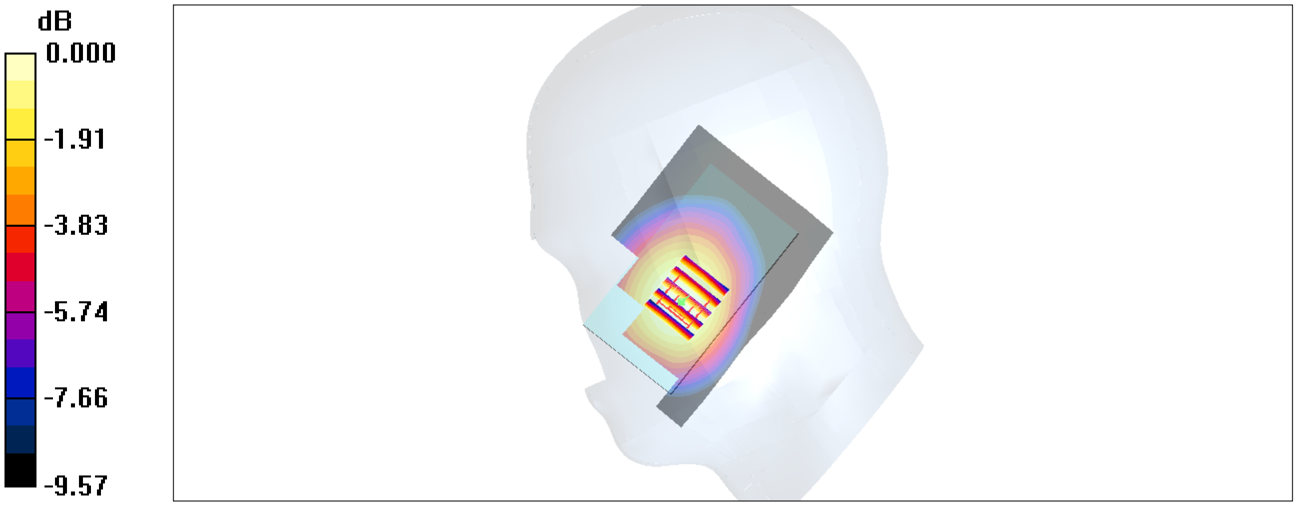
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: HSL_850_121027 Medium parameters used: f = 836.4 MHz; $\sigma = 0.907$ mho/m; $\varepsilon_r = 42.9$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.535 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.83 V/m; Power Drift = -0.158 dB
Peak SAR (extrapolated) = 0.611 W/kg
SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.382 mW/g
Maximum value of SAR (measured) = 0.534 mW/g



0 dB = 0.534mW/g

#12_GSM850_DTM Multi-slot class 5_Right Cheek_Ch189_2D

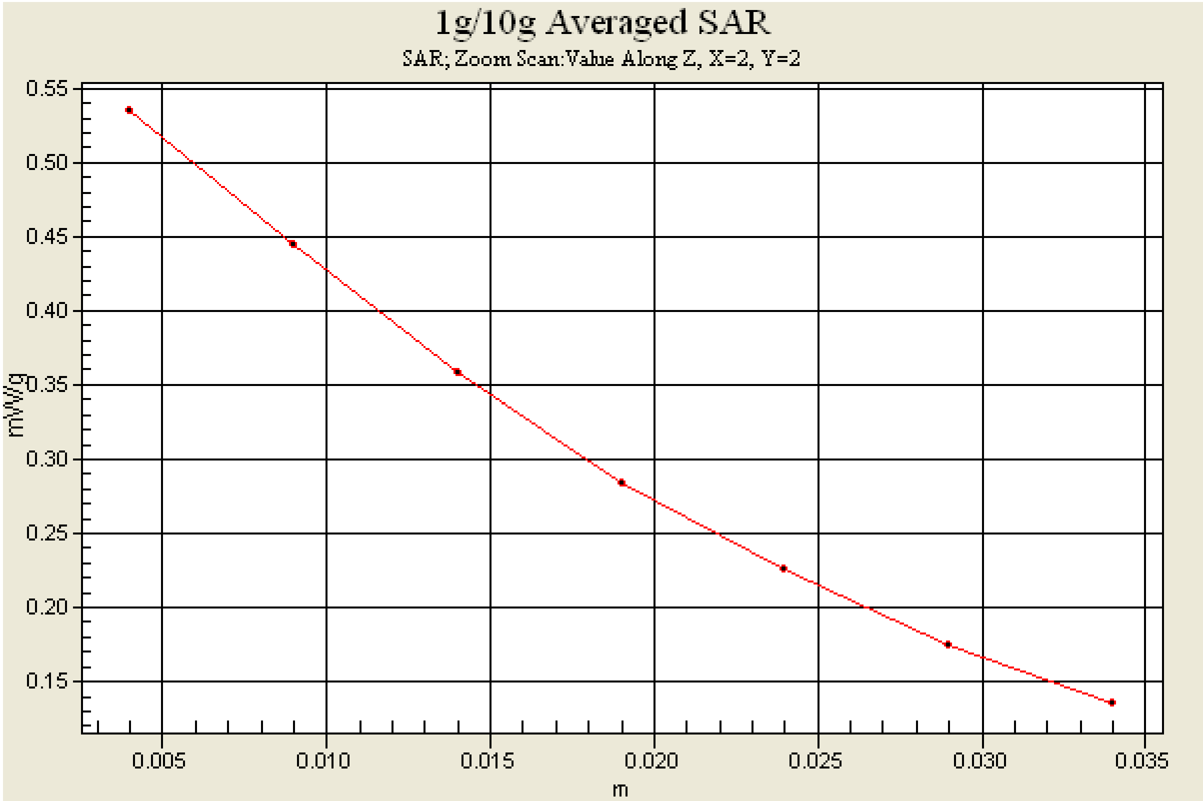
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: HSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.907 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.535 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.83 V/m; Power Drift = -0.158 dB
Peak SAR (extrapolated) = 0.611 W/kg
SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.382 mW/g
Maximum value of SAR (measured) = 0.534 mW/g



#13_GSM850_DTM Multi-slot class 5_Right Tilted_Ch189

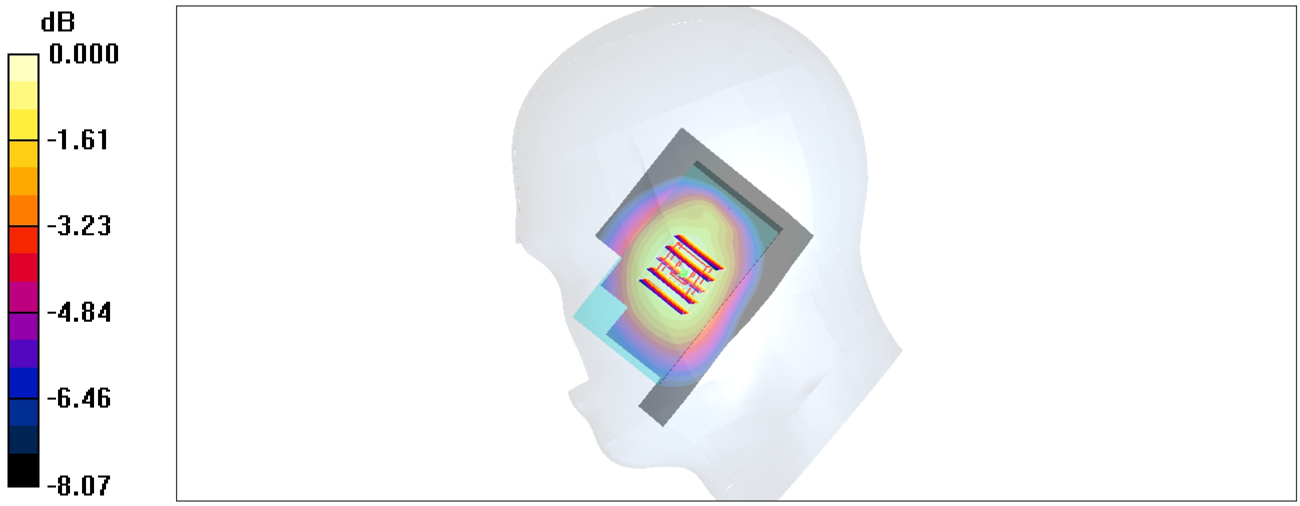
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: HSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.907 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.272 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.1 V/m; Power Drift = 0.124 dB
Peak SAR (extrapolated) = 0.328 W/kg
SAR(1 g) = 0.263 mW/g; SAR(10 g) = 0.200 mW/g
Maximum value of SAR (measured) = 0.269 mW/g



0 dB = 0.269mW/g

#14_GSM850_DTM Multi-slot class 5_Left Cheek_Ch189

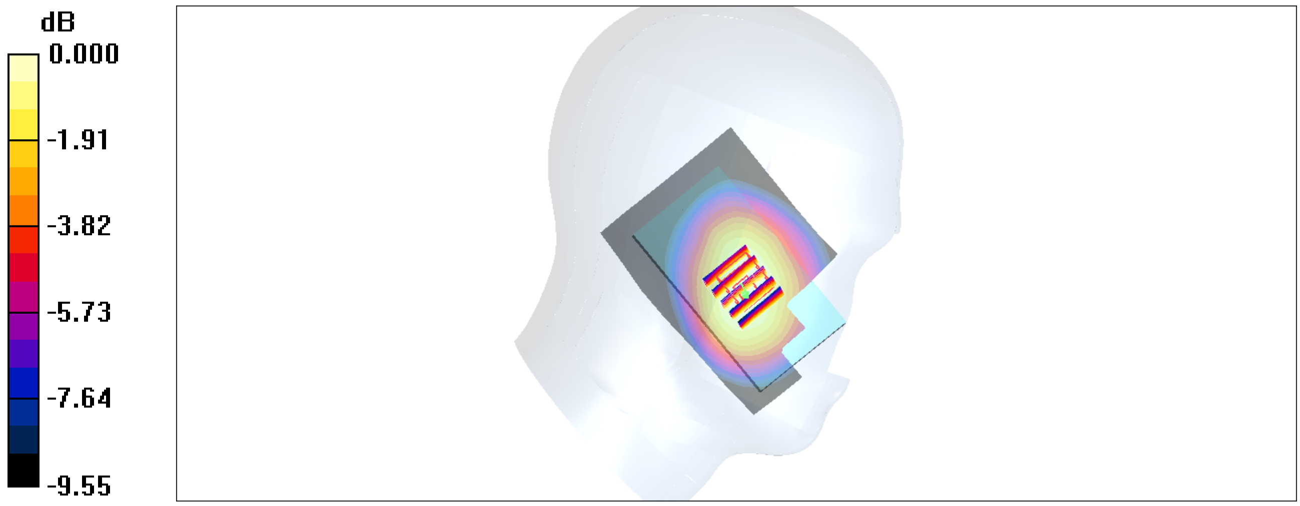
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: HSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.907 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.472 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.09 V/m; Power Drift = -0.141 dB
Peak SAR (extrapolated) = 0.560 W/kg
SAR(1 g) = 0.432 mW/g; SAR(10 g) = 0.325 mW/g
Maximum value of SAR (measured) = 0.465 mW/g



0 dB = 0.465mW/g

#15_GSM850_DTM Multi-slot class 5_Left Tilted_Ch189

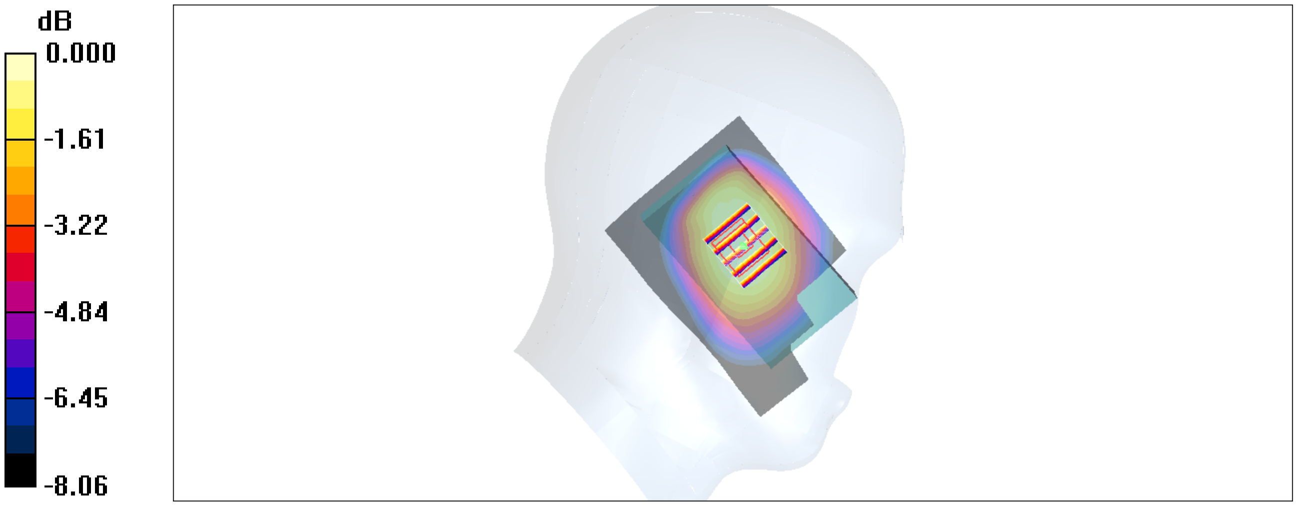
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: HSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.907 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.254 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.0 V/m; Power Drift = 0.053 dB
Peak SAR (extrapolated) = 0.300 W/kg
SAR(1 g) = 0.248 mW/g; SAR(10 g) = 0.191 mW/g
Maximum value of SAR (measured) = 0.258 mW/g



0 dB = 0.258mW/g

#01_GSM1900_DTM Multi-slot class 11_Right Cheek_Ch661

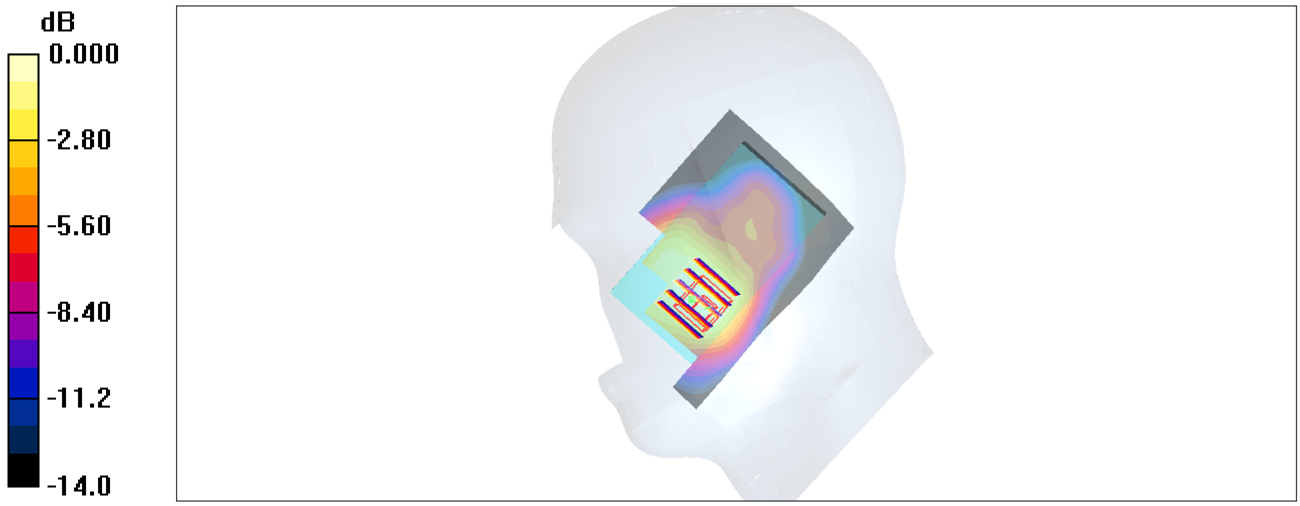
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:2.67
Medium: HSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Ambient Temperature：22.4℃; Liquid Temperature：21.6 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.457 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.07 V/m; Power Drift = 0.126 dB
Peak SAR (extrapolated) = 0.615 W/kg
SAR(1 g) = 0.424 mW/g; SAR(10 g) = 0.267 mW/g
Maximum value of SAR (measured) = 0.458 mW/g



0 dB = 0.458mW/g

#02_GSM1900_DTM Multi-slot class 11_Right Tilted_Ch661

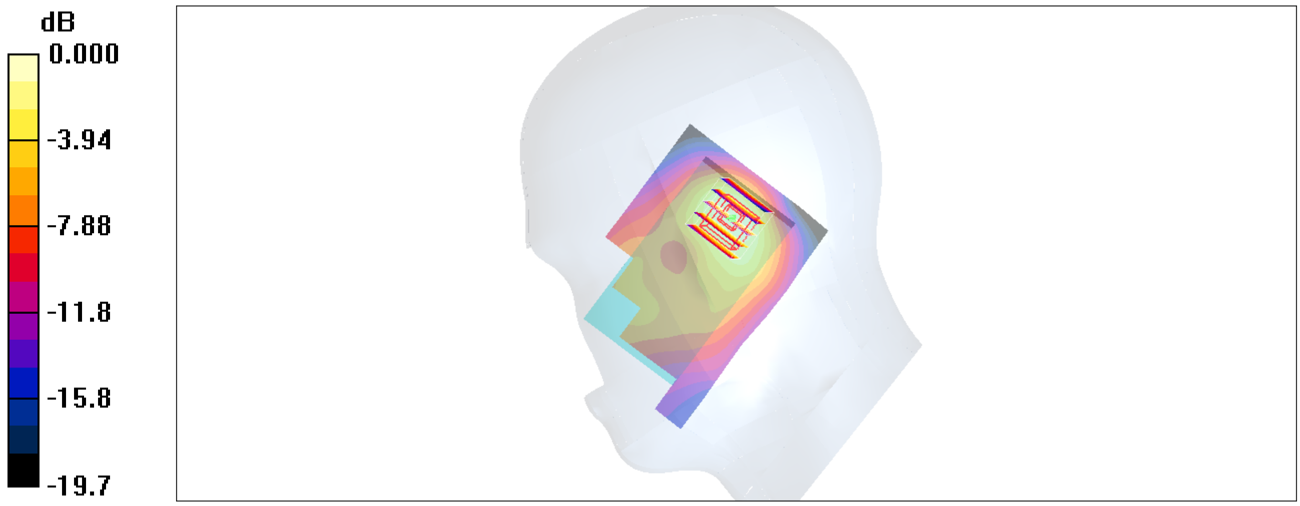
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:2.67
Medium: HSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Ambient Temperature：22.4℃; Liquid Temperature：21.6 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.308 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.1 V/m; Power Drift = 0.122 dB
Peak SAR (extrapolated) = 0.396 W/kg
SAR(1 g) = 0.244 mW/g; SAR(10 g) = 0.144 mW/g
Maximum value of SAR (measured) = 0.267 mW/g



0 dB = 0.267mW/g

#03_GSM1900_DTM Multi-slot class 11_Left Cheek_Ch661

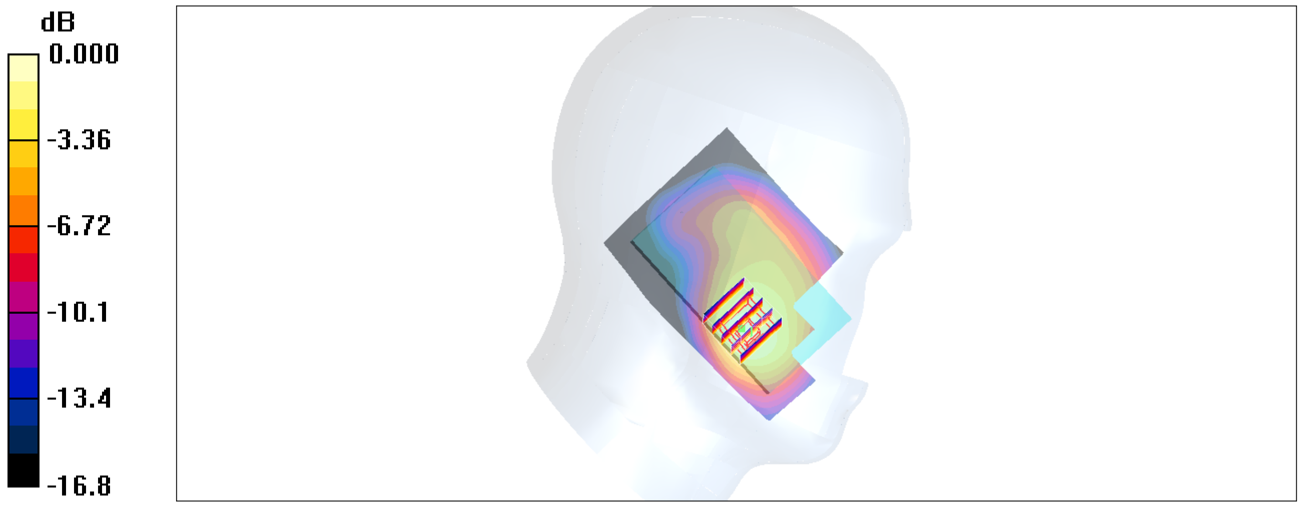
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:2.67
Medium: HSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Ambient Temperature：22.4℃; Liquid Temperature：21.6 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.569 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.47 V/m; Power Drift = 0.194 dB
Peak SAR (extrapolated) = 0.932 W/kg
SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.331 mW/g
Maximum value of SAR (measured) = 0.625 mW/g



0 dB = 0.625mW/g

#03_GSM1900_DTM Multi-slot class 11_Left Cheek_Ch661_2D

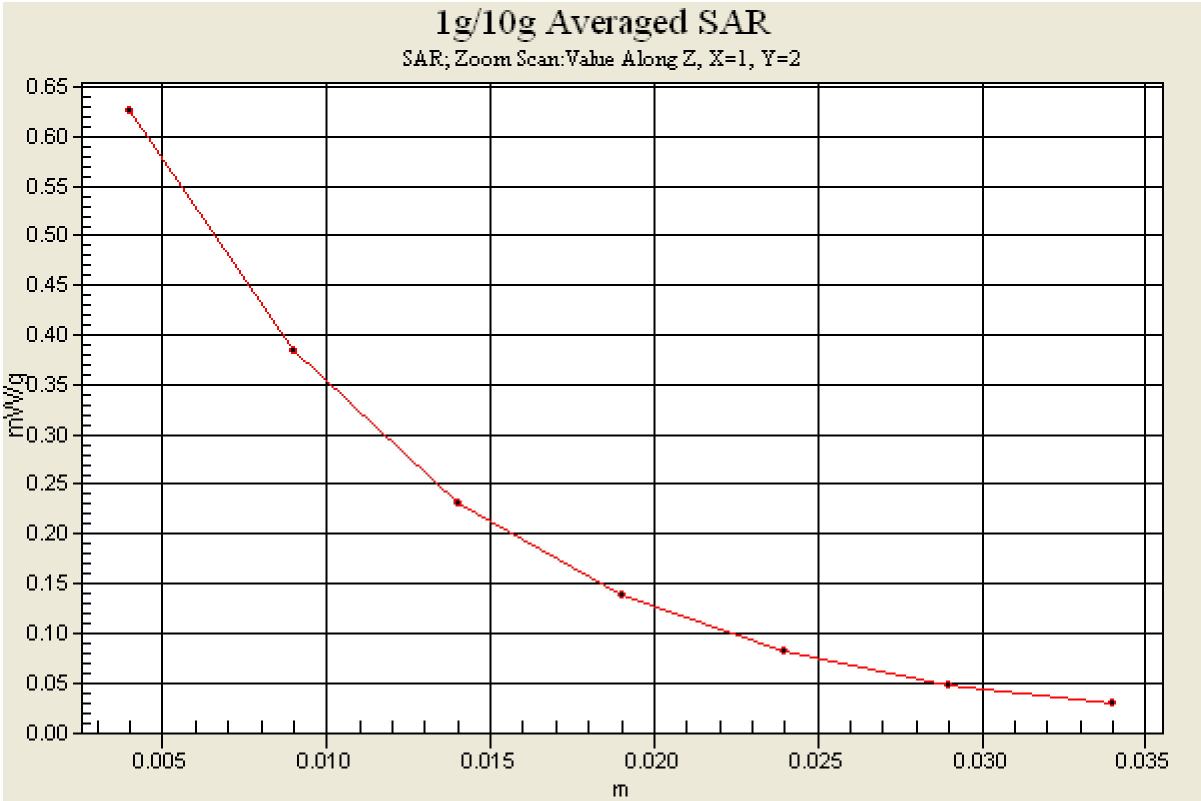
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:2.67
Medium: HSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.6 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.569 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.47 V/m; Power Drift = 0.194 dB
Peak SAR (extrapolated) = 0.932 W/kg
SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.331 mW/g
Maximum value of SAR (measured) = 0.625 mW/g



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/10/27

#04_GSM1900_DTM Multi-slot class 11_Left Tilted_Ch661

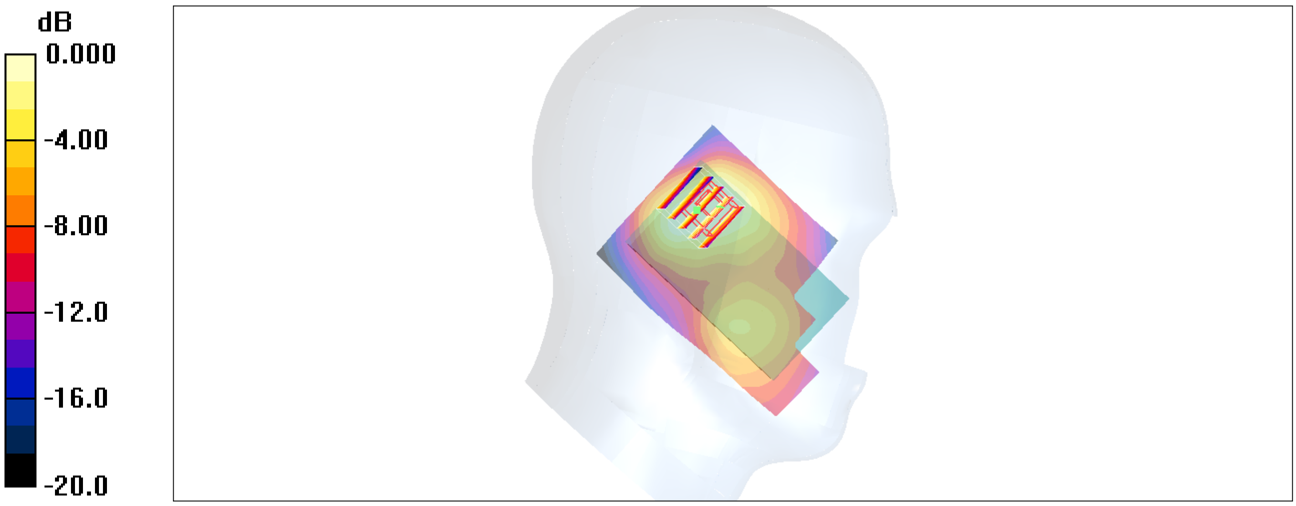
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:2.67
Medium: HSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Ambient Temperature：22.4℃; Liquid Temperature：21.6 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.270 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.3 V/m; Power Drift = -0.073 dB
Peak SAR (extrapolated) = 0.323 W/kg
SAR(1 g) = 0.211 mW/g; SAR(10 g) = 0.133 mW/g
Maximum value of SAR (measured) = 0.221 mW/g



0 dB = 0.221mW/g

#31_WLAN2.4G_802.11b_Right Cheek_Ch6

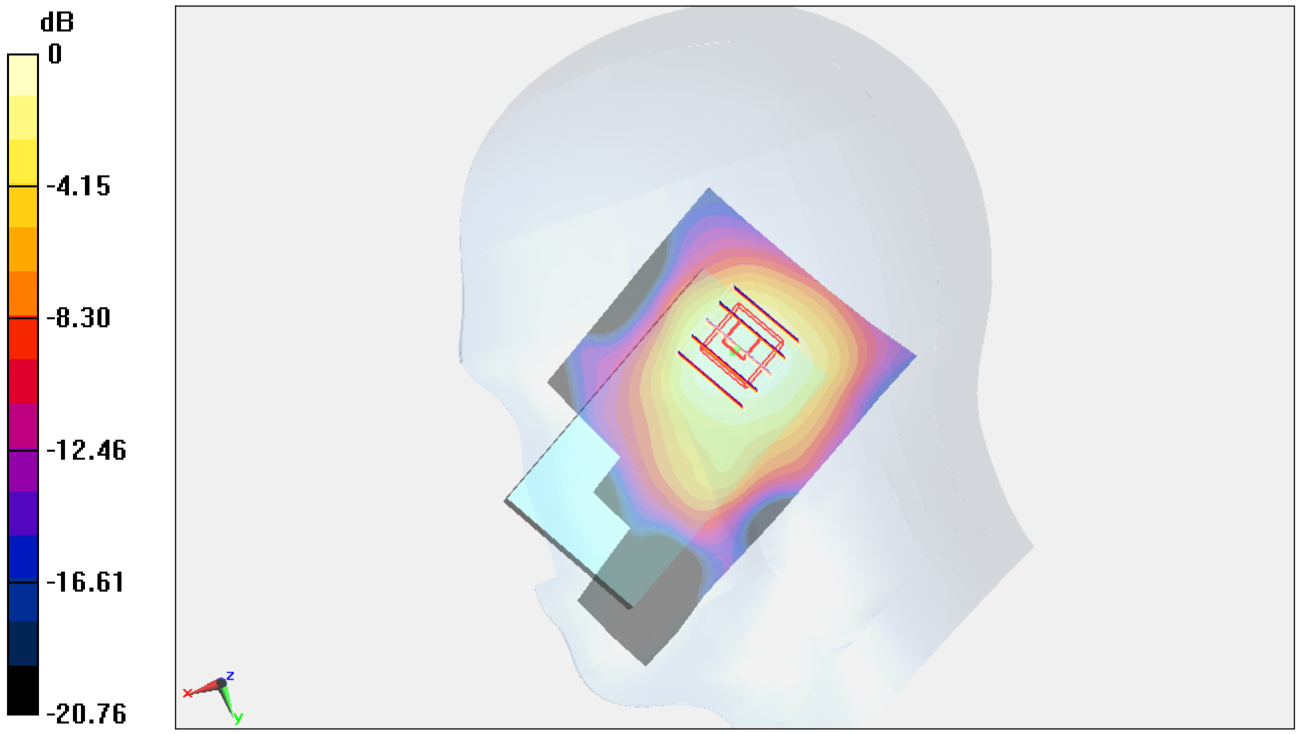
DUT: 292717

Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: HSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.815 mho/m; ε_r = 40.648; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.7, 6.7, 6.7); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Left; Type: QD000P40CD; Serial: TP:1542
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (51x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.153 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.373 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.207 mW/g
SAR(1 g) = 0.119 mW/g; SAR(10 g) = 0.066 mW/g
Maximum value of SAR (measured) = 0.126 W/kg



0 dB = 0.126 W/kg = -17.99 dB W/kg

#32_WLAN2.4G_802.11b_Right Tilted_Ch6

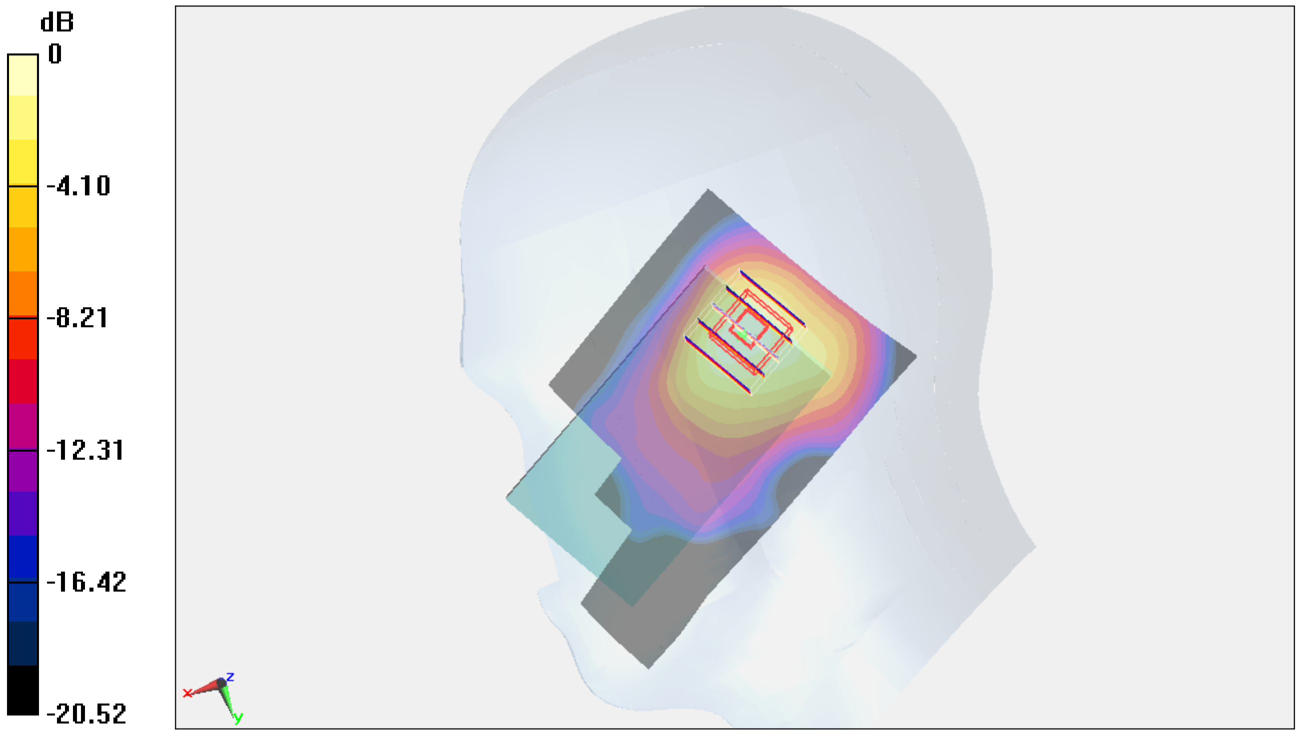
DUT: 292717

Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: HSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.815 mho/m; ε_r = 40.648; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.7, 6.7, 6.7); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Left; Type: QD000P40CD; Serial: TP:1542
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (51x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.140 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.858 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.254 mW/g
SAR(1 g) = 0.134 mW/g; SAR(10 g) = 0.069 mW/g
Maximum value of SAR (measured) = 0.147 W/kg



0 dB = 0.147 W/kg = -16.65 dB W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/11/1

#33_WLAN2.4G_802.11b_Left Cheek_Ch6

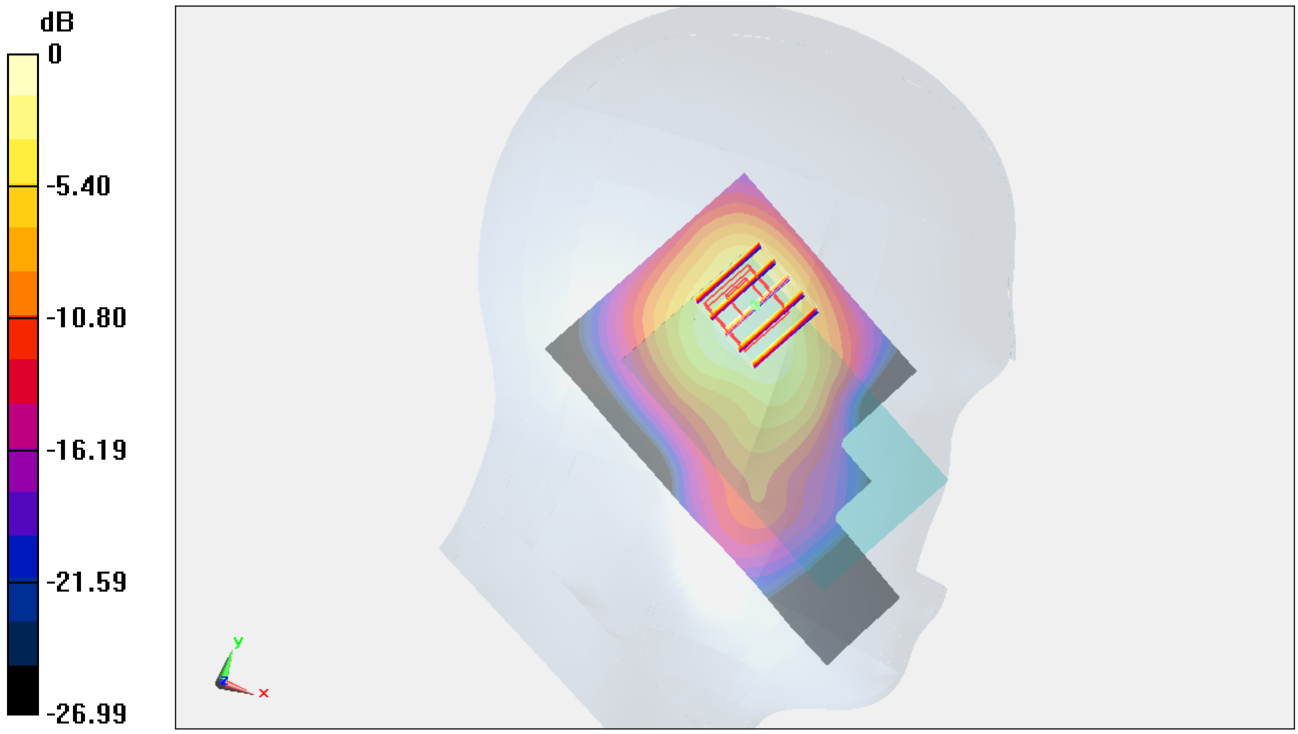
DUT: 292717

Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: HSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.815 mho/m; ε_r = 40.648; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.7, 6.7, 6.7); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Left; Type: QD000P40CD; Serial: TP:1542
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (51x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.210 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.428 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.441 mW/g
SAR(1 g) = 0.208 mW/g; SAR(10 g) = 0.106 mW/g
Maximum value of SAR (measured) = 0.216 W/kg



0 dB = 0.216 W/kg = -13.31 dB W/kg

#33_WLAN2.4G_802.11b_Left Cheek_Ch6_2D

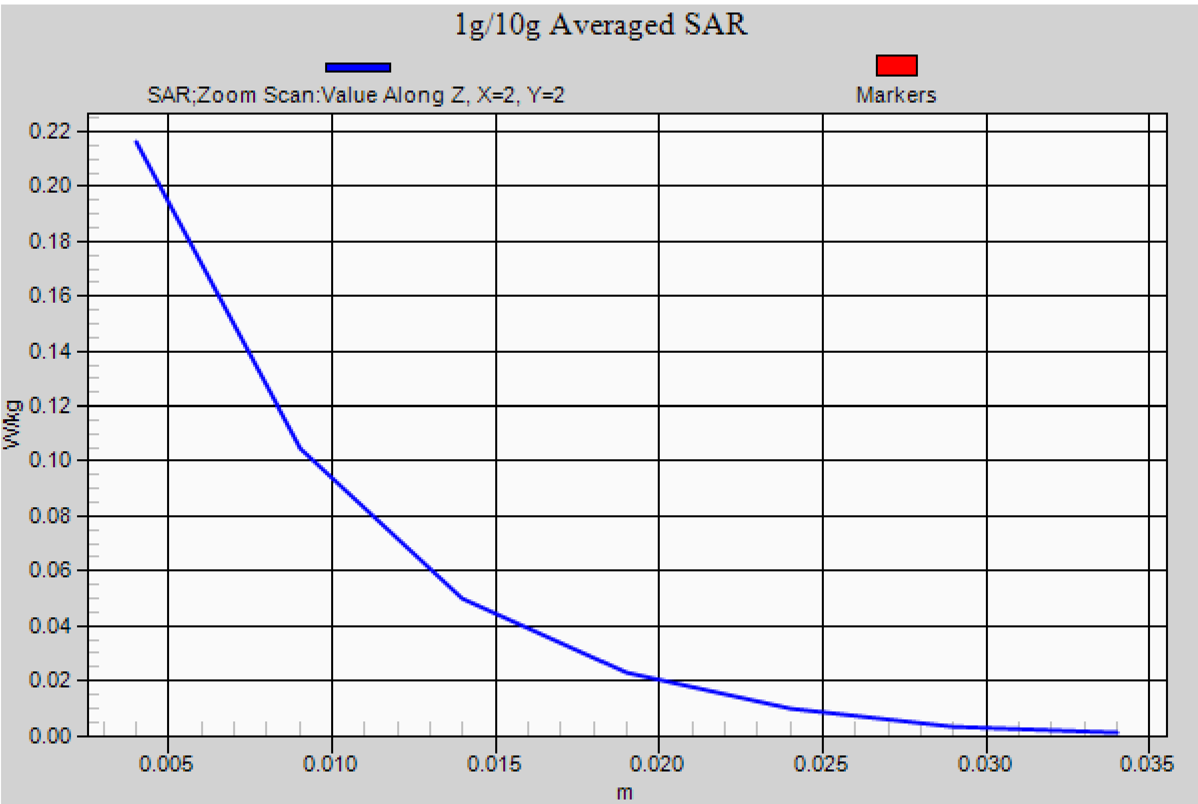
DUT: 292717

Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: HSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.815 mho/m; ε_r = 40.648; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.7, 6.7, 6.7); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Left; Type: QD000P40CD; Serial: TP:1542
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (51x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.210 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.428 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.441 mW/g
SAR(1 g) = 0.208 mW/g; SAR(10 g) = 0.106 mW/g
Maximum value of SAR (measured) = 0.216 W/kg



#34_WLAN2.4G_802.11b_Left Tilted_Ch6

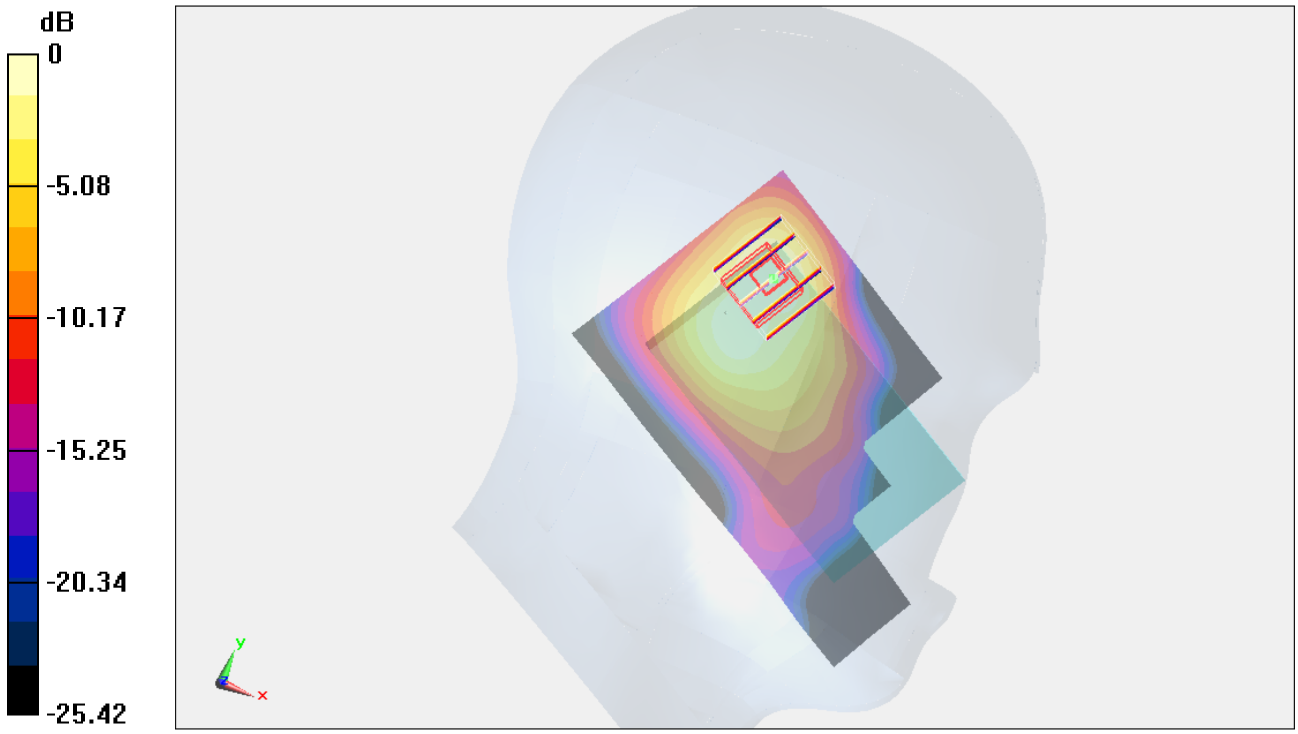
DUT: 292717

Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: HSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.815 mho/m; ε_r = 40.648; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.7, 6.7, 6.7); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Left; Type: QD000P40CD; Serial: TP:1542
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (51x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.140 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.039 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.305 mW/g
SAR(1 g) = 0.135 mW/g; SAR(10 g) = 0.066 mW/g
Maximum value of SAR (measured) = 0.149 W/kg



0 dB = 0.149 W/kg = -16.54 dB W/kg

#16_GSM850_GPRS (2 Tx slots)_Front_1cm_Ch189

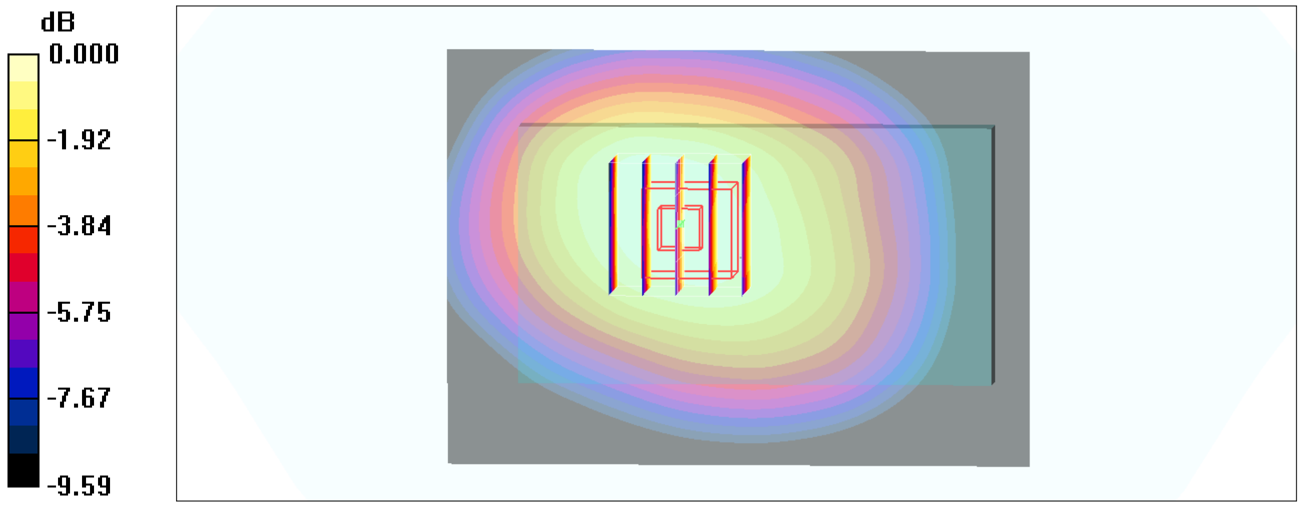
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: MSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.964 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.579 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.6 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 0.691 W/kg
SAR(1 g) = 0.550 mW/g; SAR(10 g) = 0.408 mW/g
Maximum value of SAR (measured) = 0.578 mW/g



0 dB = 0.578mW/g

#18_GSM850_GPRS (2 Tx slots)_Back_1cm_Ch189

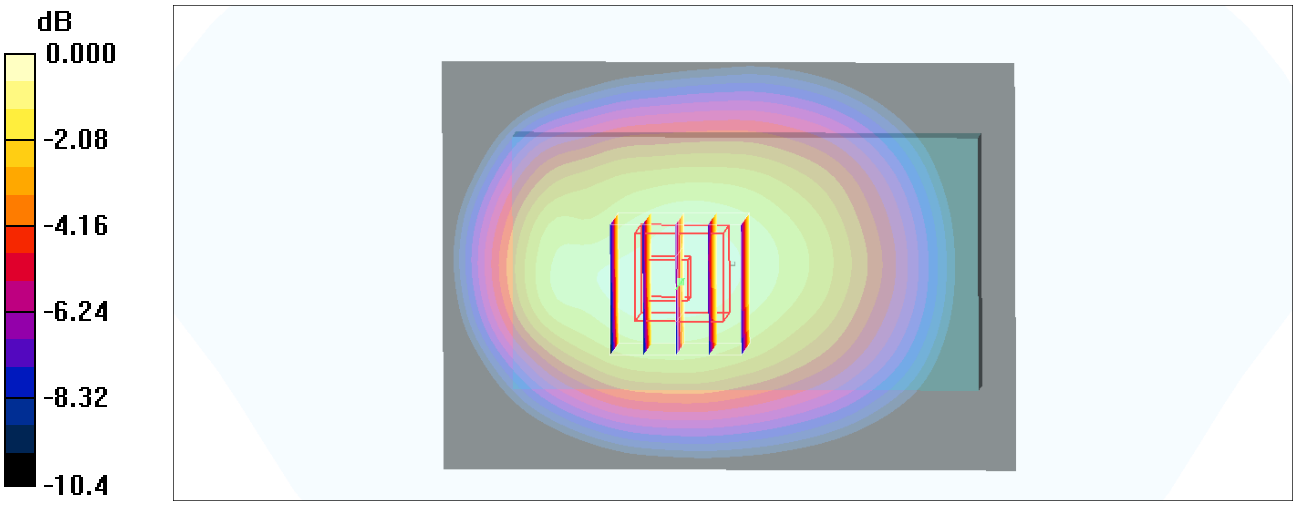
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: MSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.964 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.891 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.7 V/m; Power Drift = -0.176 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.869 mW/g; SAR(10 g) = 0.627 mW/g
Maximum value of SAR (measured) = 0.919 mW/g



0 dB = 0.919mW/g

#19_GSM850_GPRS (2 Tx slots)_Back_1cm_Ch128

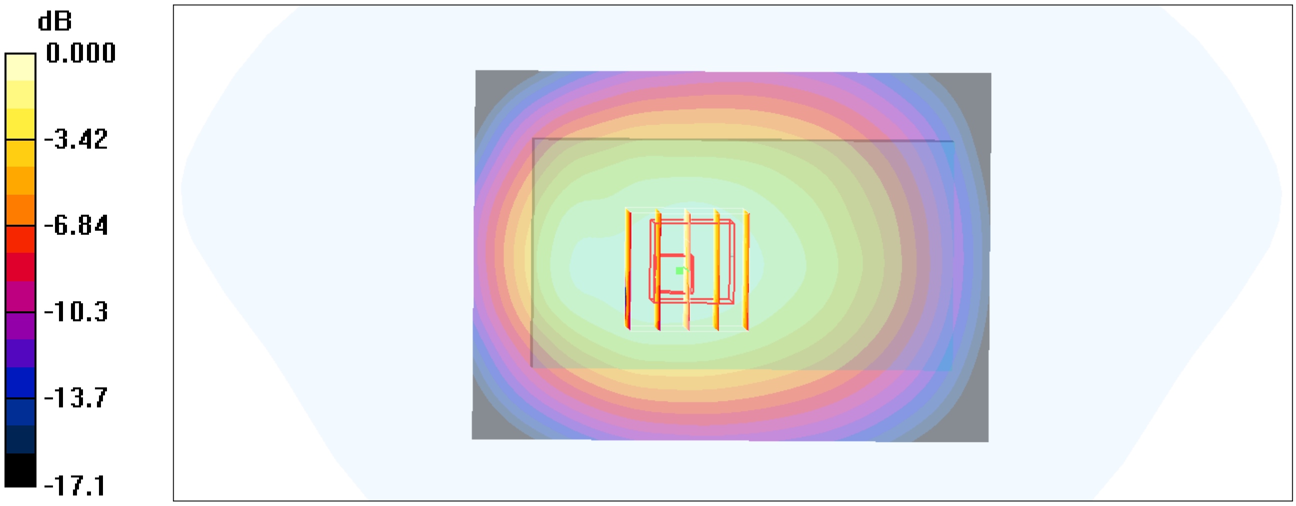
DUT: 292717

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:4
Medium: MSL_850_121027 Medium parameters used: f = 824.2 MHz; σ = 0.953 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch128/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.734 mW/g

Ch128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.0 V/m; Power Drift = 0.187 dB
Peak SAR (extrapolated) = 1.53 W/kg
SAR(1 g) = 0.687 mW/g; SAR(10 g) = 0.495 mW/g
Maximum value of SAR (measured) = 0.716 mW/g



0 dB = 0.716mW/g

#20_GSM850_GPRS (2 Tx slots)_Back_1cm_Ch251

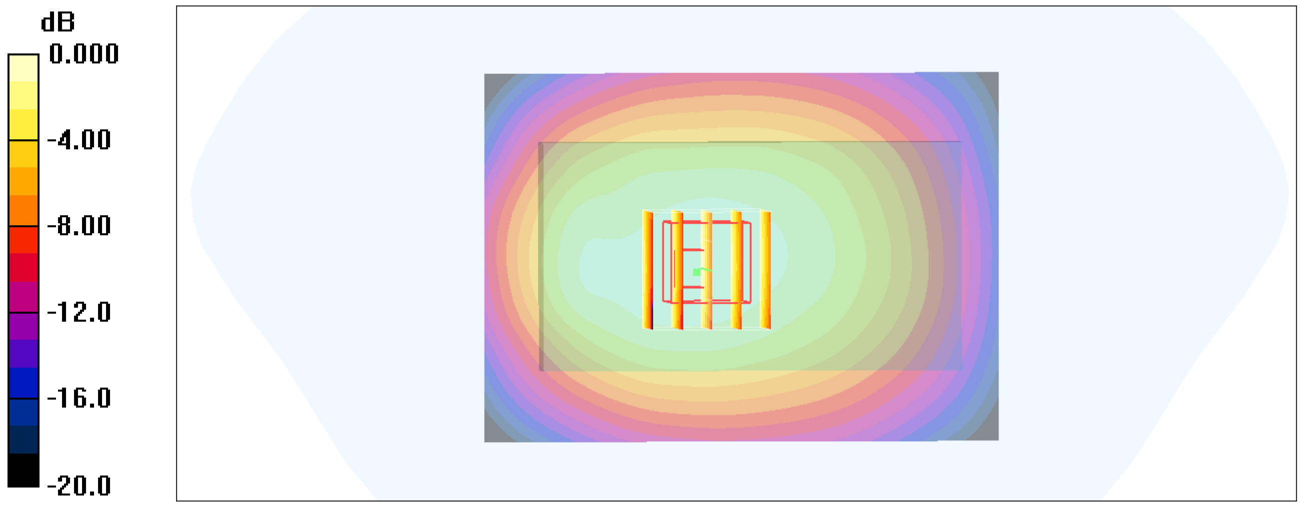
DUT: 292717

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:4
Medium: MSL_850_121027 Medium parameters used: f = 849 MHz; σ = 0.976 mho/m; ε_r = 54.4; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.16 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.7 V/m; Power Drift = -0.152 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.785 mW/g
Maximum value of SAR (measured) = 1.16 mW/g



0 dB = 1.16mW/g

#20_GSM850_GPRS (2 Tx slots)_Back_1cm_Ch251_2D

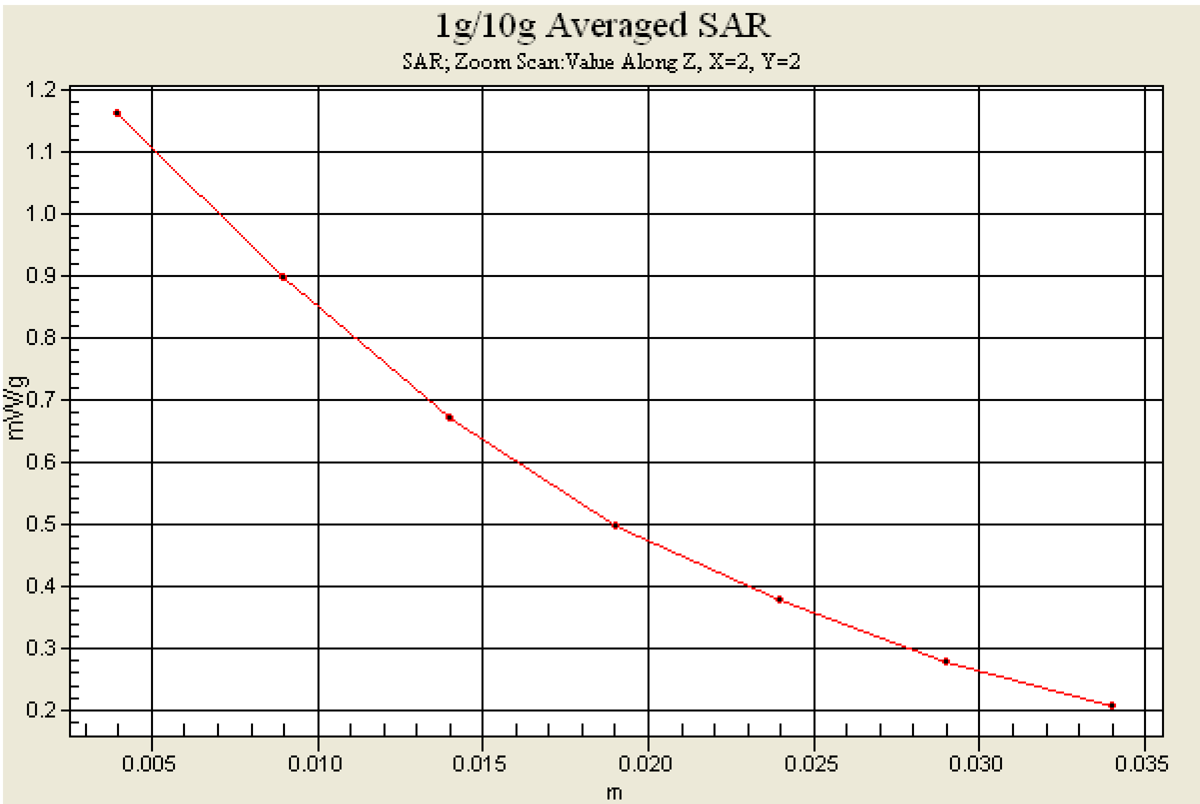
DUT: 292717

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:4
Medium: MSL_850_121027 Medium parameters used: f = 849 MHz; $\sigma = 0.976$ mho/m; $\varepsilon_r = 54.4$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.16 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.7 V/m; Power Drift = -0.152 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.785 mW/g
Maximum value of SAR (measured) = 1.16 mW/g



#22_GSM850_GPRS (2 Tx slots)_Left Side_1cm_Ch189

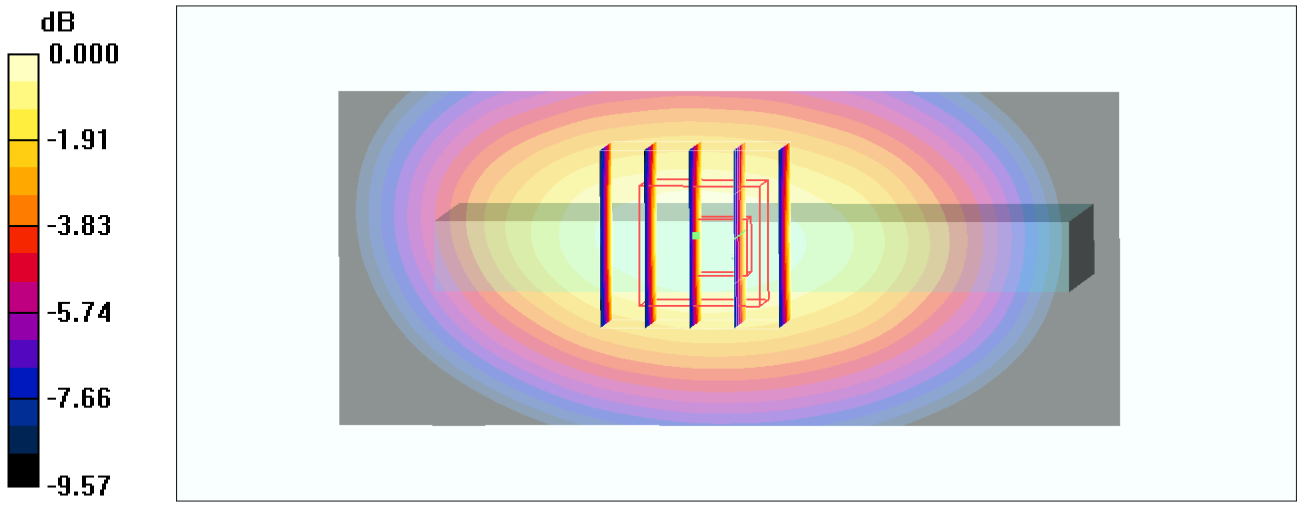
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: MSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.964 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (31x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.458 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.3 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 0.599 W/kg
SAR(1 g) = 0.420 mW/g; SAR(10 g) = 0.303 mW/g
Maximum value of SAR (measured) = 0.461 mW/g



0 dB = 0.461mW/g

#23_GSM850_GPRS (2 Tx slots)_Right Side_1cm_Ch189

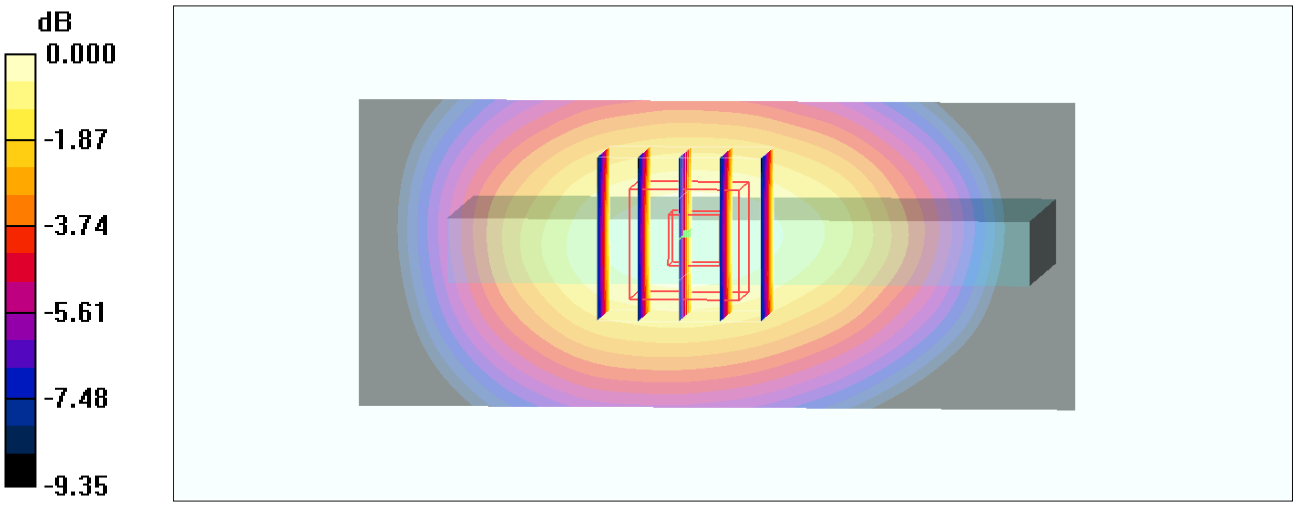
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: MSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.964 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (31x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.477 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.5 V/m; Power Drift = 0.061 dB
Peak SAR (extrapolated) = 0.628 W/kg
SAR(1 g) = 0.445 mW/g; SAR(10 g) = 0.324 mW/g
Maximum value of SAR (measured) = 0.487 mW/g



0 dB = 0.487mW/g

#24_GSM850_GPRS (2 Tx slots)_Bottom Side_1cm_Ch189

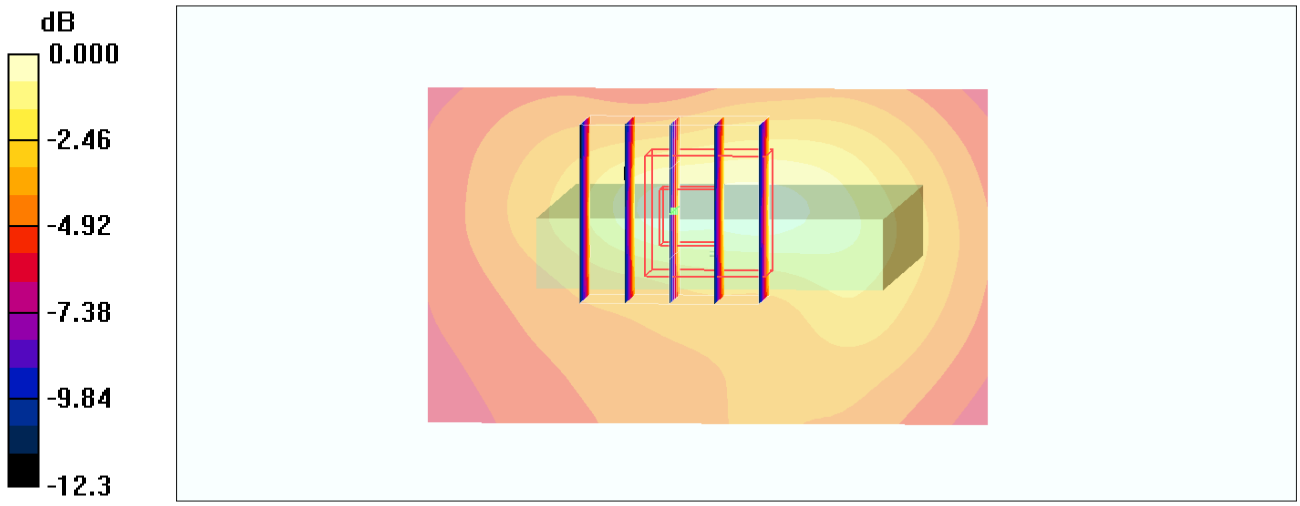
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: MSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.964 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (31x51x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.059 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.25 V/m; Power Drift = 0.128 dB
Peak SAR (extrapolated) = 0.099 W/kg
SAR(1 g) = 0.058 mW/g; SAR(10 g) = 0.034 mW/g
Maximum value of SAR (measured) = 0.063 mW/g



0 dB = 0.063mW/g

#17_GSM850_DTM Multi-slot class 5_Front_1.5cm_Ch189;Headset

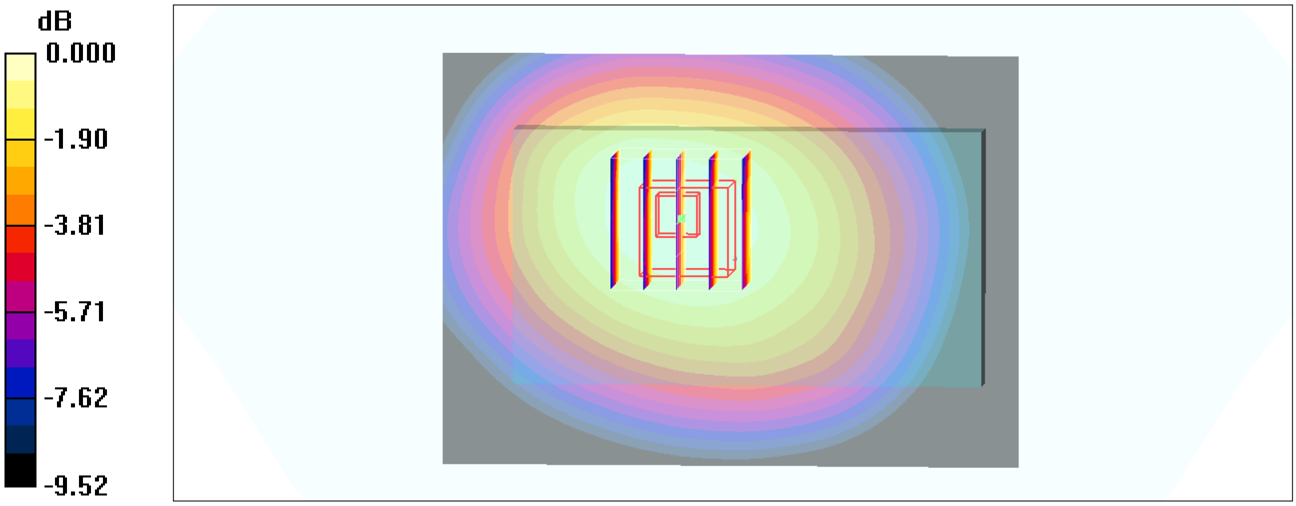
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: MSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.964 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.332 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.2 V/m; Power Drift = -0.168 dB
Peak SAR (extrapolated) = 0.393 W/kg
SAR(1 g) = 0.313 mW/g; SAR(10 g) = 0.232 mW/g
Maximum value of SAR (measured) = 0.331 mW/g



0 dB = 0.331mW/g

#21_GSM850_DTM Multi-slot class 5_Back_1.5cm_Ch189;Headset

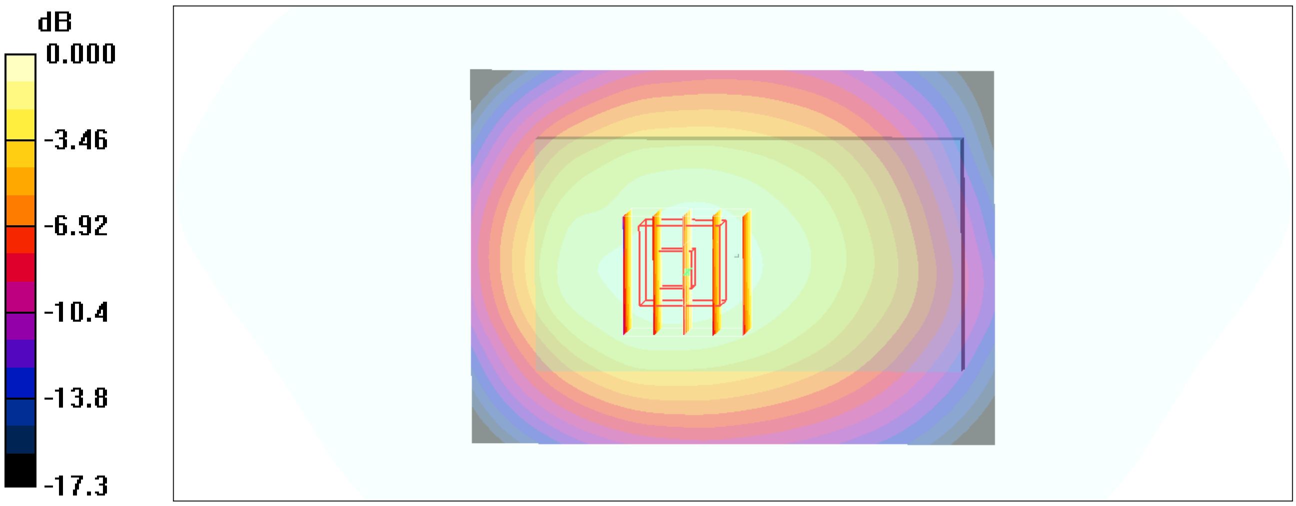
DUT: 292717

Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: MSL_850_121027 Medium parameters used: f = 836.4 MHz; σ = 0.964 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.16, 6.16, 6.16); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch189/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.455 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.0 V/m; Power Drift = 0.161 dB
Peak SAR (extrapolated) = 0.595 W/kg
SAR(1 g) = 0.448 mW/g; SAR(10 g) = 0.322 mW/g
Maximum value of SAR (measured) = 0.471 mW/g



0 dB = 0.471mW/g

#05_GSM1900_GPRS (2 Tx slots)_Front_1cm_Ch661

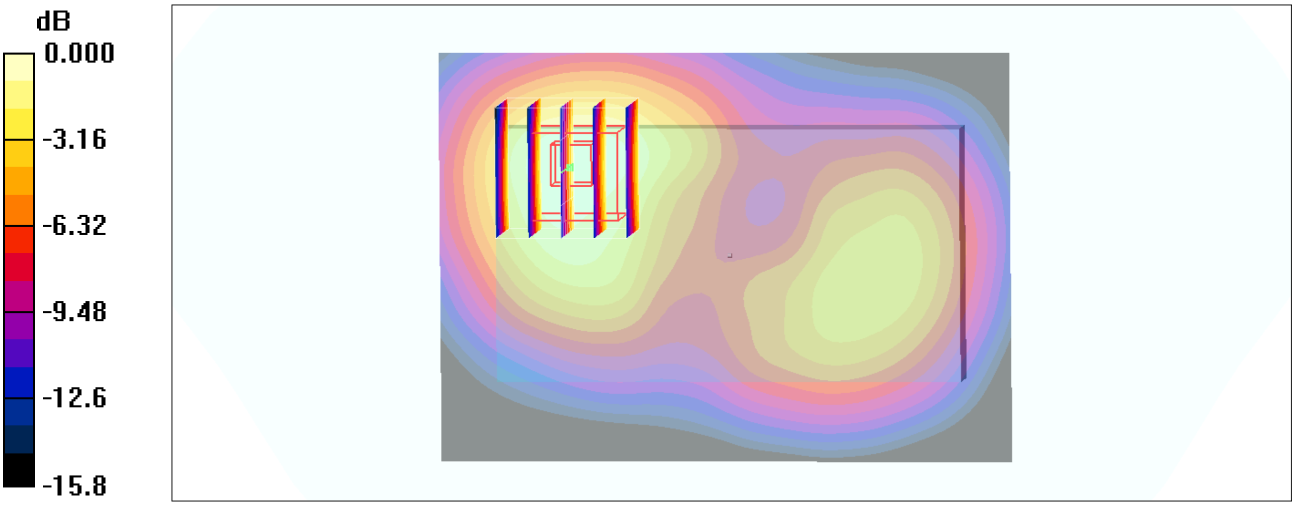
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium: MSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Ambient Temperature：22.5℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.615 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.33 V/m; Power Drift = -0.039 dB
Peak SAR (extrapolated) = 0.910 W/kg
SAR(1 g) = 0.533 mW/g; SAR(10 g) = 0.318 mW/g
Maximum value of SAR (measured) = 0.582 mW/g



0 dB = 0.582mW/g

#07_GSM1900_GPRS (2 Tx slots)_Back_1cm_Ch661

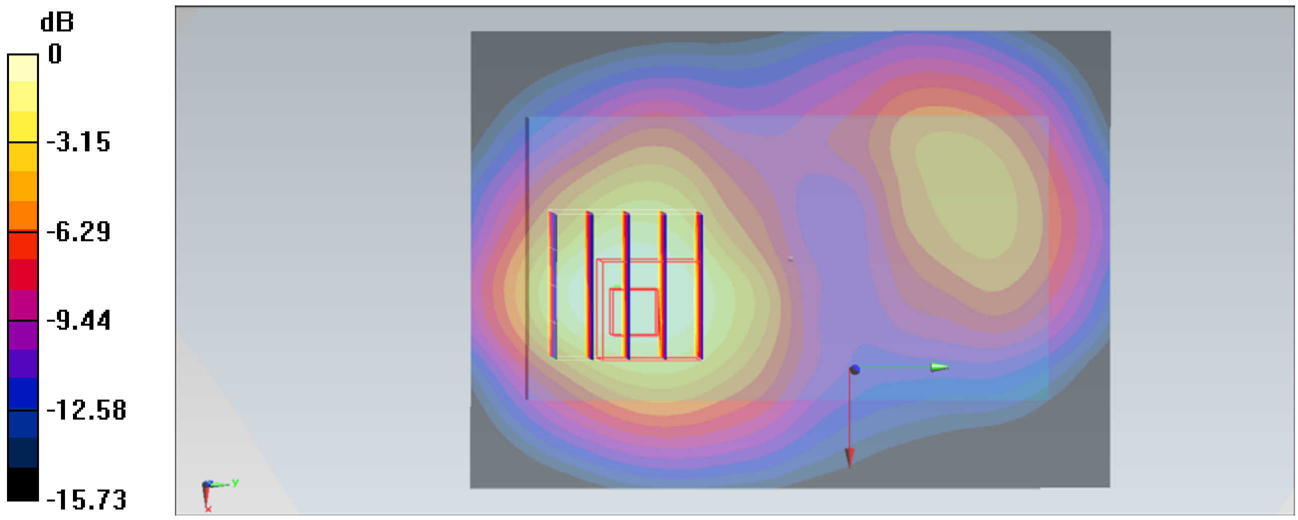
DUT: 12-4-167

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium: MSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.509 mho/m; ε_r = 52.919; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.793 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.482 V/m; Power Drift = 0.131 dB
Peak SAR (extrapolated) = 1.432 mW/g
SAR(1 g) = 0.639 mW/g; SAR(10 g) = 0.372 mW/g
Maximum value of SAR (measured) = 0.651 mW/g



0 dB = 0.712 mW/g = -2.95 dB mW/g

#07_GSM1900_GPRS (2 Tx slots)_Back_1cm_Ch661_2D

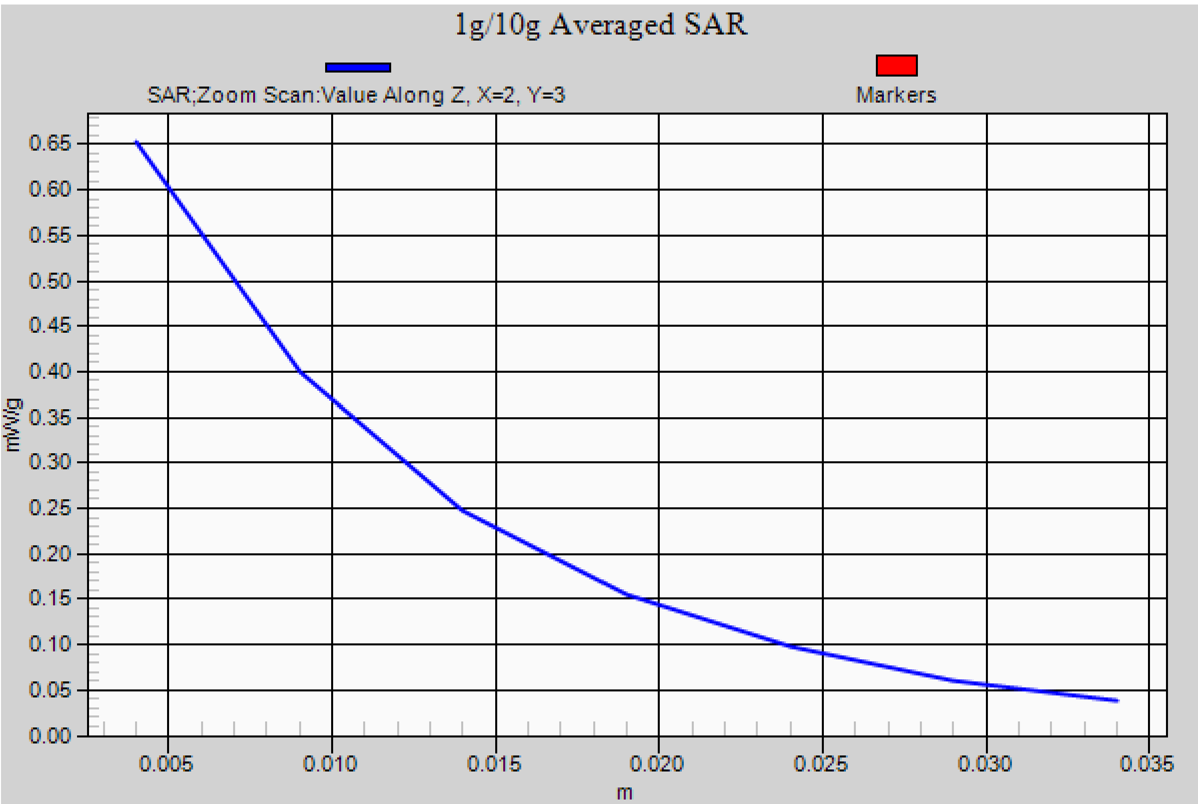
DUT: 12-4-167

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium: MSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.509 mho/m; ε_r = 52.919; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.793 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.482 V/m; Power Drift = 0.131 dB
Peak SAR (extrapolated) = 1.432 mW/g
SAR(1 g) = 0.639 mW/g; SAR(10 g) = 0.372 mW/g
Maximum value of SAR (measured) = 0.651 mW/g



#09_GSM1900_GPRS (2 Tx slots)_Left Side_1cm_Ch661

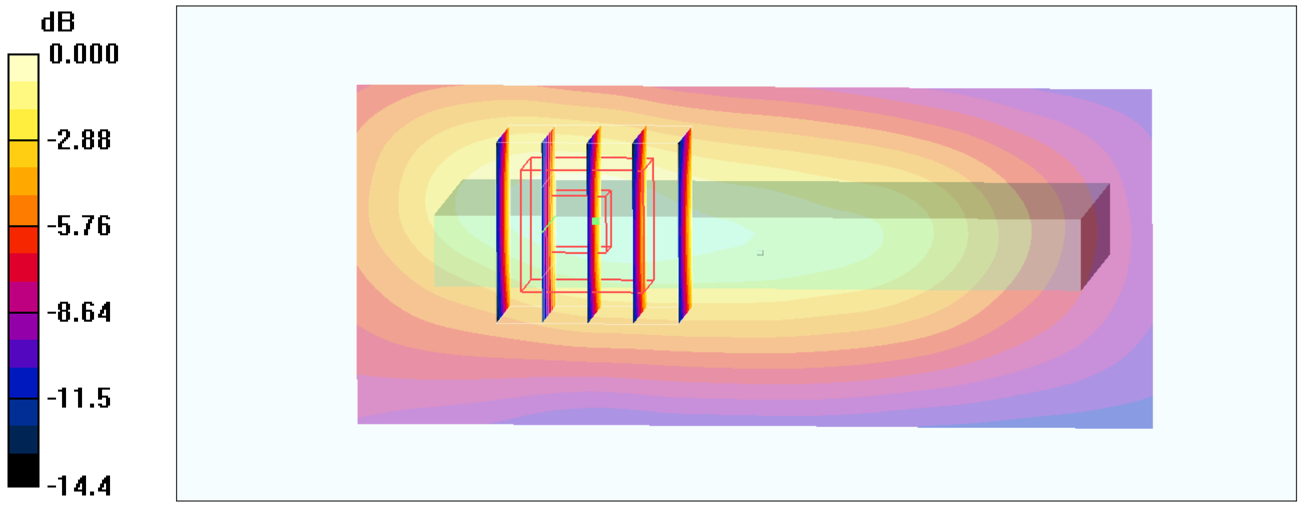
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium: MSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (31x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.159 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.96 V/m; Power Drift = -0.009 dB
Peak SAR (extrapolated) = 0.241 W/kg
SAR(1 g) = 0.147 mW/g; SAR(10 g) = 0.087 mW/g
Maximum value of SAR (measured) = 0.158 mW/g



0 dB = 0.158mW/g

#10_GSM1900_GPRS (2 Tx slots)_Right Side_1cm_Ch661

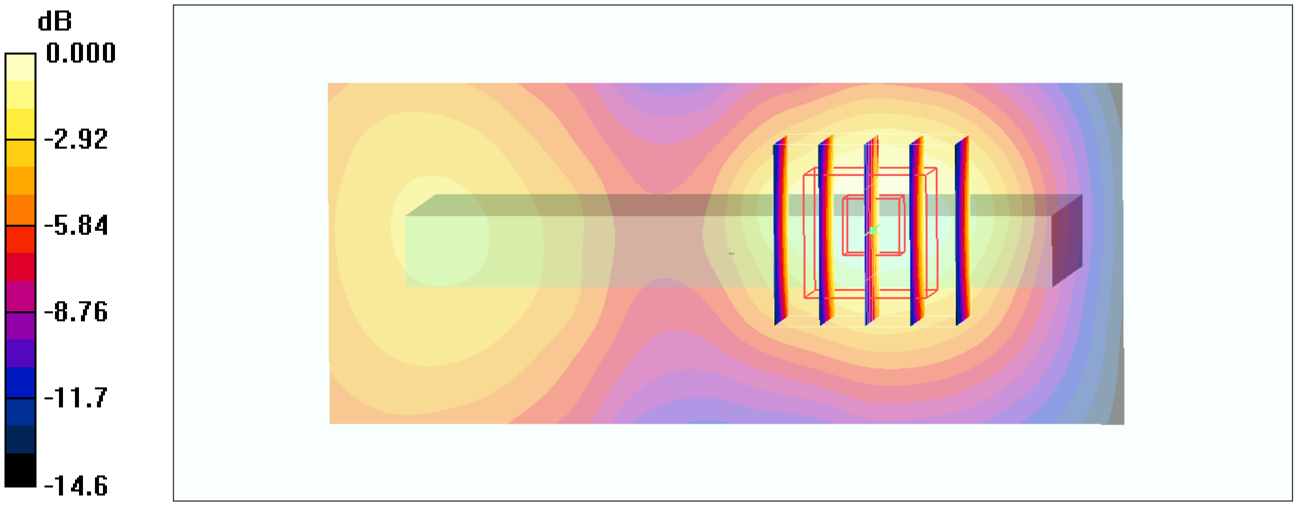
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium: MSL_1900_121027 Medium parameters used: f = 1880 MHz; $\sigma = 1.51$ mho/m; $\varepsilon_r = 52.9$; $\rho = 1000$ kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (31x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.151 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.13 V/m; Power Drift = 0.063 dB
Peak SAR (extrapolated) = 0.219 W/kg
SAR(1 g) = 0.135 mW/g; SAR(10 g) = 0.080 mW/g
Maximum value of SAR (measured) = 0.146 mW/g



0 dB = 0.146mW/g

#11_GSM1900_GPRS (2 Tx slots)_Bottom Side_1cm_Ch661

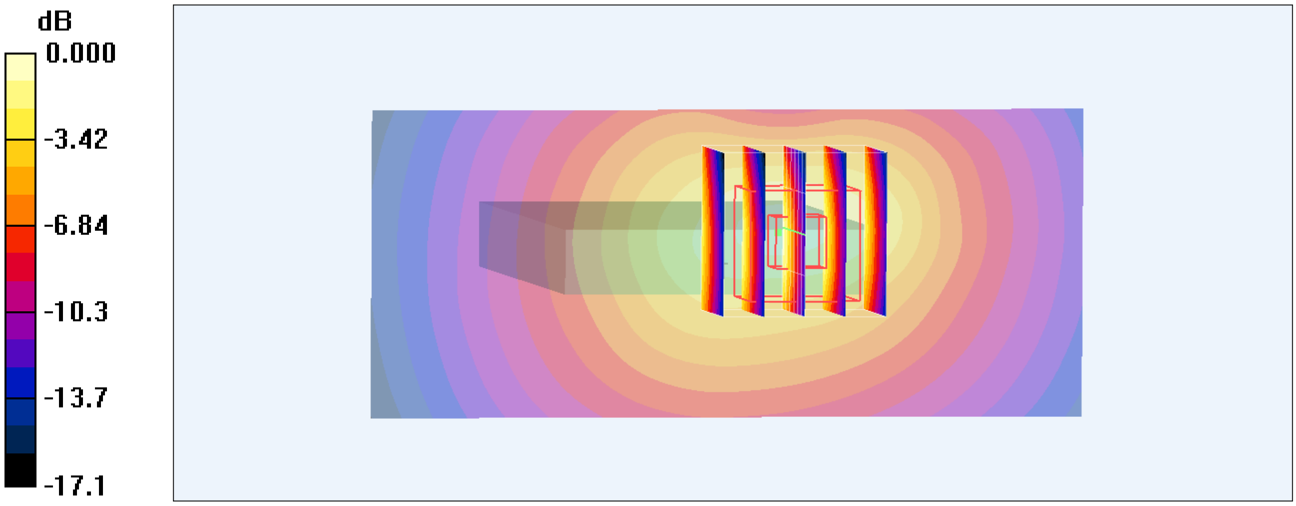
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium: MSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (31x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.383 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = 0.063 dB
Peak SAR (extrapolated) = 0.699 W/kg
SAR(1 g) = 0.407 mW/g; SAR(10 g) = 0.221 mW/g
Maximum value of SAR (measured) = 0.440 mW/g



0 dB = 0.440mW/g

#06_GSM1900_DTM Multi-slot class 11_Front_1.5cm_Ch661;Headset

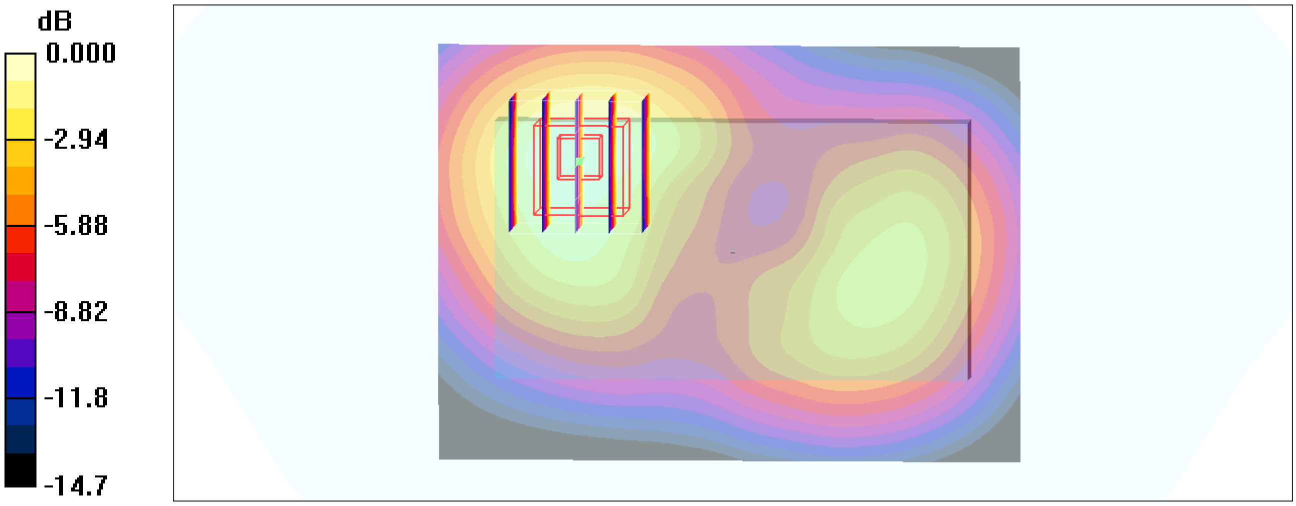
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:2.67
Medium: MSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Ambient Temperature：22.5℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.336 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.63 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 0.491 W/kg
SAR(1 g) = 0.301 mW/g; SAR(10 g) = 0.184 mW/g
Maximum value of SAR (measured) = 0.328 mW/g



0 dB = 0.328mW/g

#08_GSM1900_DTM Multi-slot class 11_Back_1.5cm_Ch661;Headset

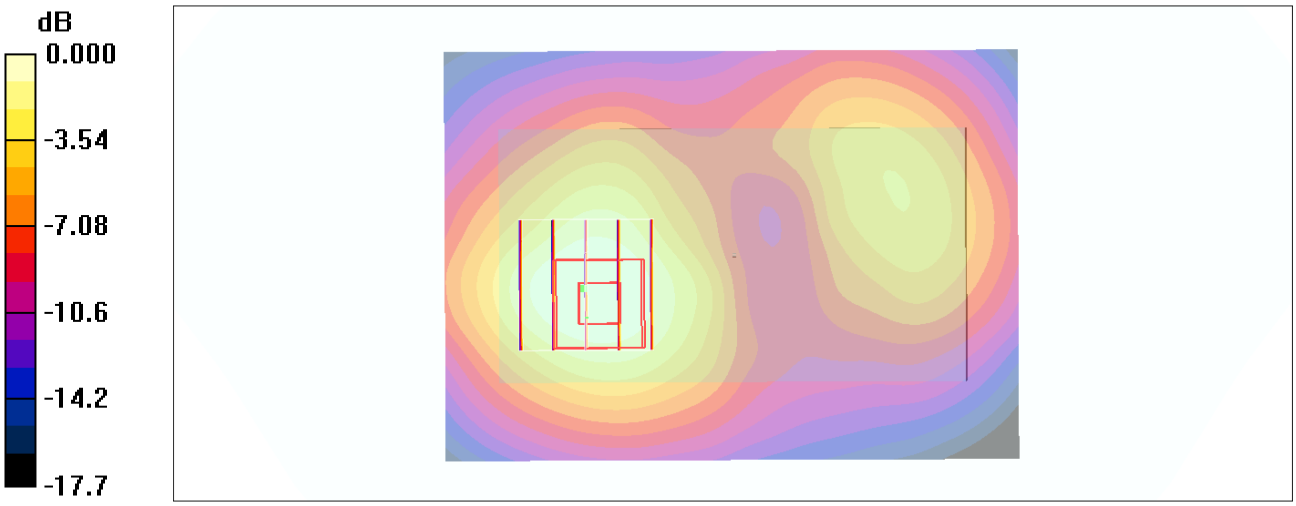
DUT: 292717

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:2.67
Medium: MSL_1900_121027 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Ambient Temperature：22.5℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.67, 4.67, 4.67); Calibrated: 2012/9/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn915; Calibrated: 2012/6/21
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch661/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.382 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.37 V/m; Power Drift = -0.191 dB
Peak SAR (extrapolated) = 0.565 W/kg
SAR(1 g) = 0.339 mW/g; SAR(10 g) = 0.202 mW/g
Maximum value of SAR (measured) = 0.360 mW/g



0 dB = 0.360mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab　　　　　Date: 2012/11/1

#25_WLAN2.4G_802.11b_Front_1cm_Ch6

DUT: 292717

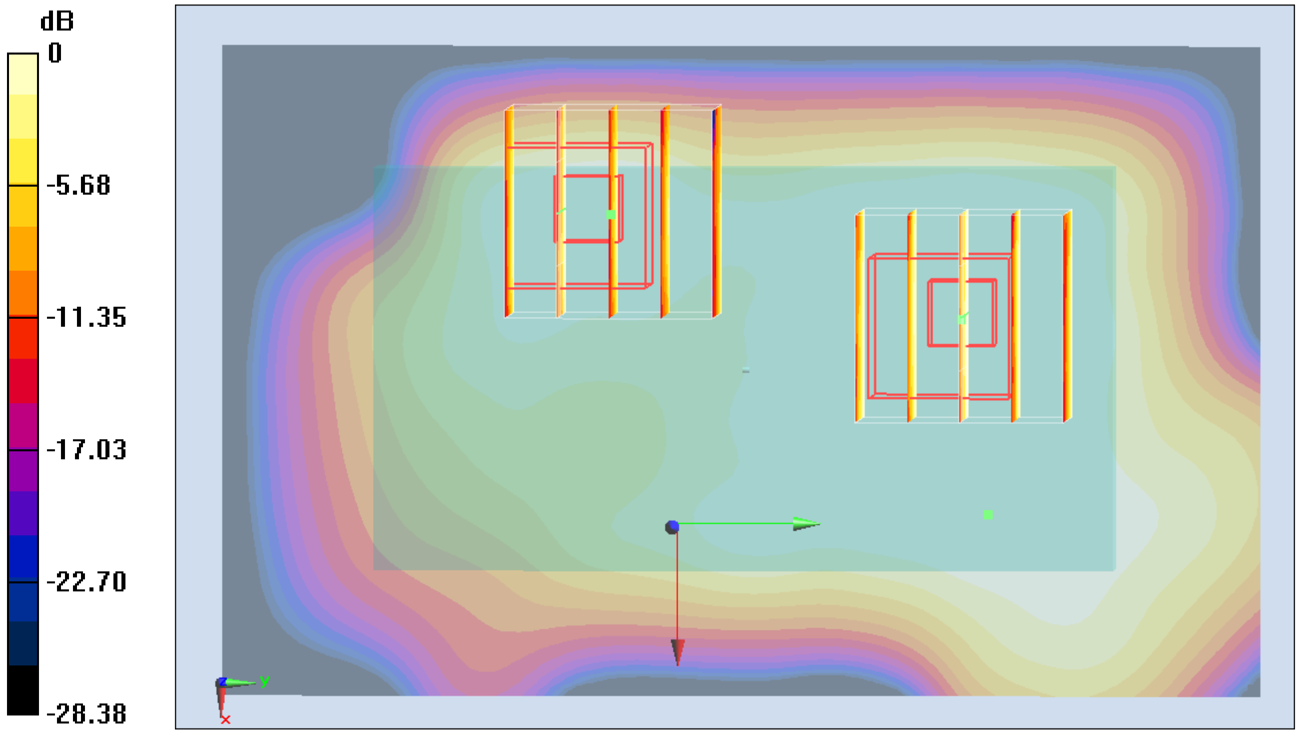
Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.991 mho/m; ε_r = 53.834; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.59, 6.59, 6.59); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (51x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.0558 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.133 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.072 mW/g
SAR(1 g) = 0.045 mW/g; SAR(10 g) = 0.027 mW/g
Maximum value of SAR (measured) = 0.0496 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.133 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.047 mW/g
SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.016 mW/g
Maximum value of SAR (measured) = 0.0306 W/kg



0 dB = 0.0306 W/kg = -30.29 dB W/kg
For any 2nd peak found in area scan within 2 dB of the maximum peak and greater than 0.012W/kg, and is not within the zoom scan, zoom scan is repeated.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/11/1

#26_WLAN2.4G_802.11b_Back_1cm_Ch6

DUT: 292717

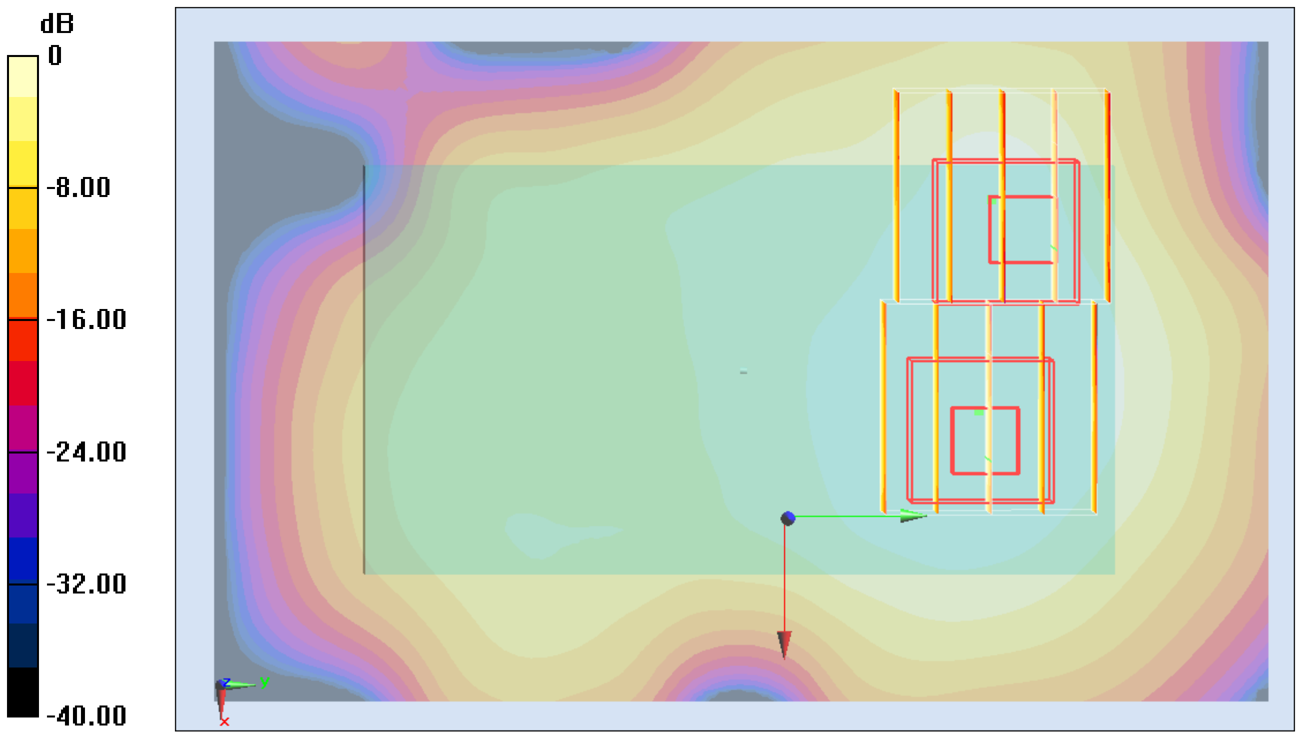
Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.991 mho/m; ε_r = 53.834; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.59, 6.59, 6.59); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (51x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.0706 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.389 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.117 mW/g
SAR(1 g) = 0.064 mW/g; SAR(10 g) = 0.032 mW/g
Maximum value of SAR (measured) = 0.0674 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.389 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.100 mW/g
SAR(1 g) = 0.061 mW/g; SAR(10 g) = 0.035 mW/g
Maximum value of SAR (measured) = 0.0657 W/kg



0 dB = 0.0657 W/kg = -23.65 dB W/kg
For any 2nd peak found in area scan within 2 dB of the maximum peak
and greater than 0.012W/kg, and is not within the zoom scan, zoom scan is repeated.

#26_WLAN2.4G_802.11b_Back_1cm_Ch6_2D

DUT: 292717

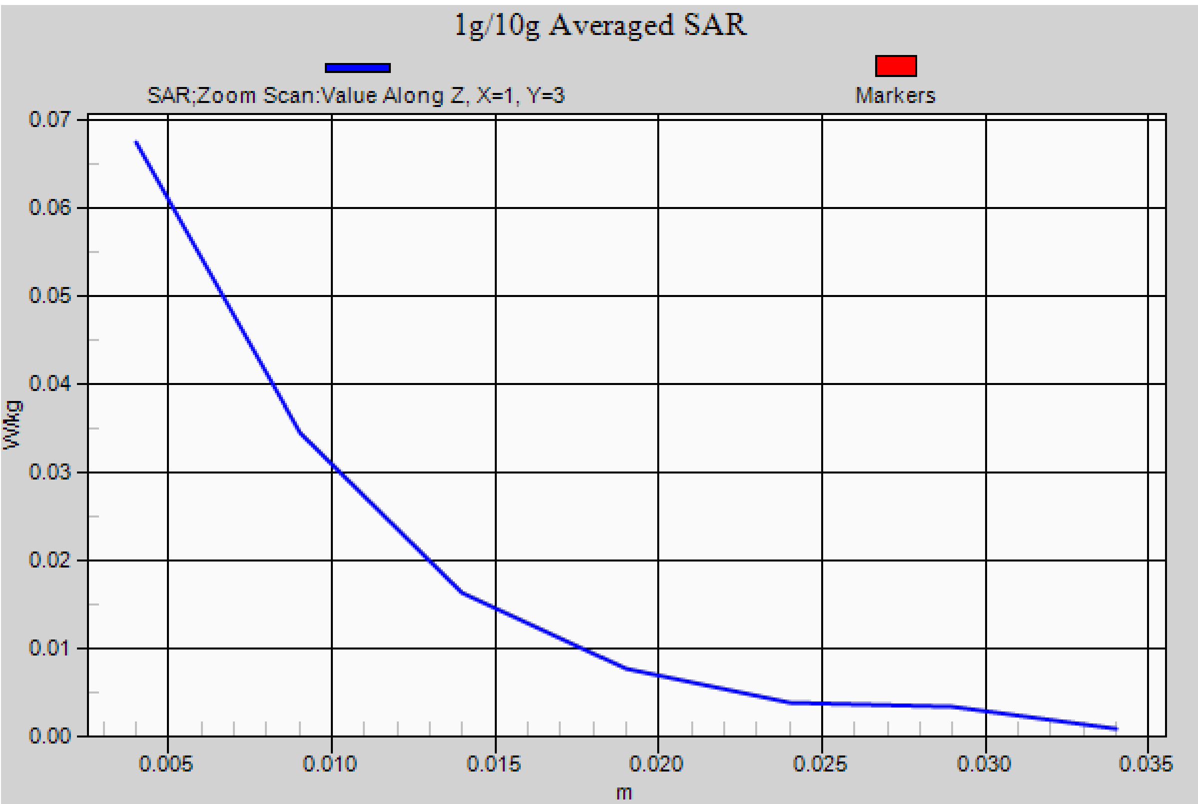
Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.991 mho/m; ε_r = 53.834; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.59, 6.59, 6.59); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (51x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.0706 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.389 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.117 mW/g
SAR(1 g) = 0.064 mW/g; SAR(10 g) = 0.032 mW/g
Maximum value of SAR (measured) = 0.0674 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.389 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.100 mW/g
SAR(1 g) = 0.061 mW/g; SAR(10 g) = 0.035 mW/g
Maximum value of SAR (measured) = 0.0657 W/kg



#27_WLAN2.4G_802.11b_Right Side_1cm_Ch6

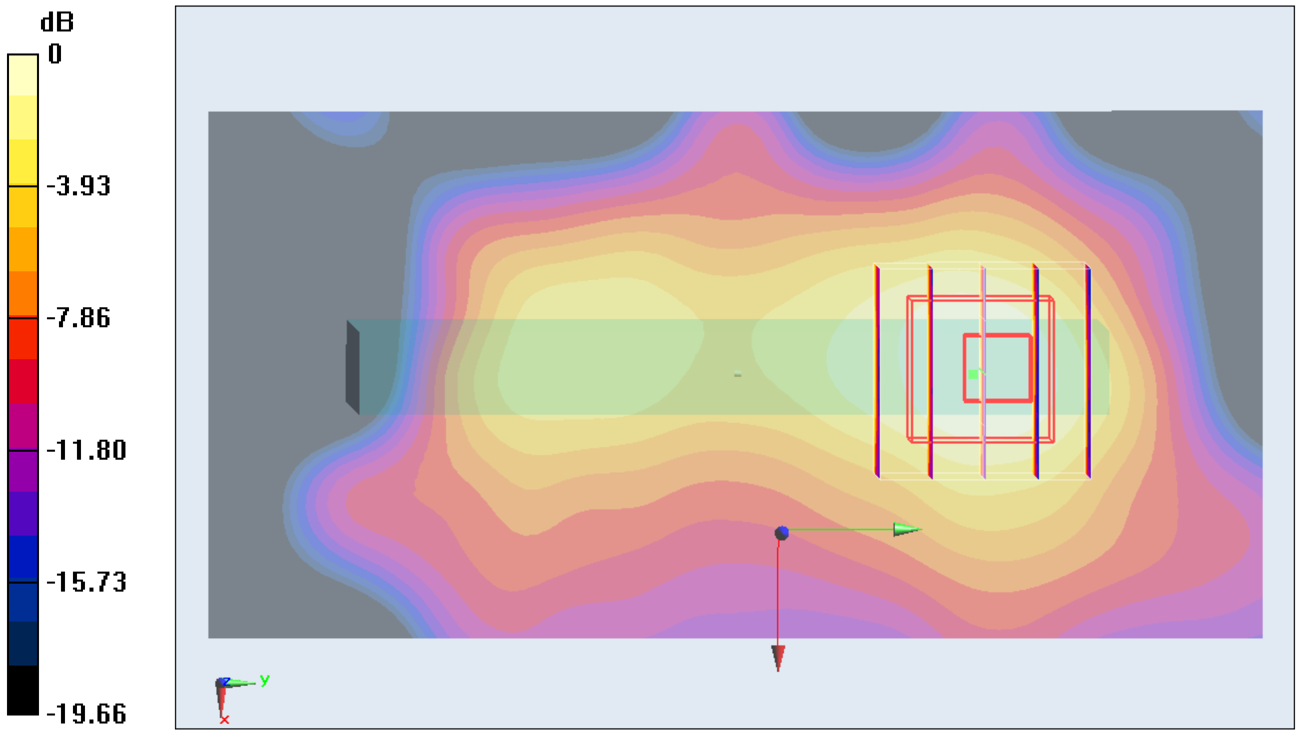
DUT: 292717

Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.991 mho/m; ε_r = 53.834; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.59, 6.59, 6.59); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (41x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.0612 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.350 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.091 mW/g
SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.026 mW/g
Maximum value of SAR (measured) = 0.0538 W/kg



0 dB = 0.0538 W/kg = -25.38 dB W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/11/1

#28_WLAN2.4G_802.11b_Top Side_1cm_Ch6

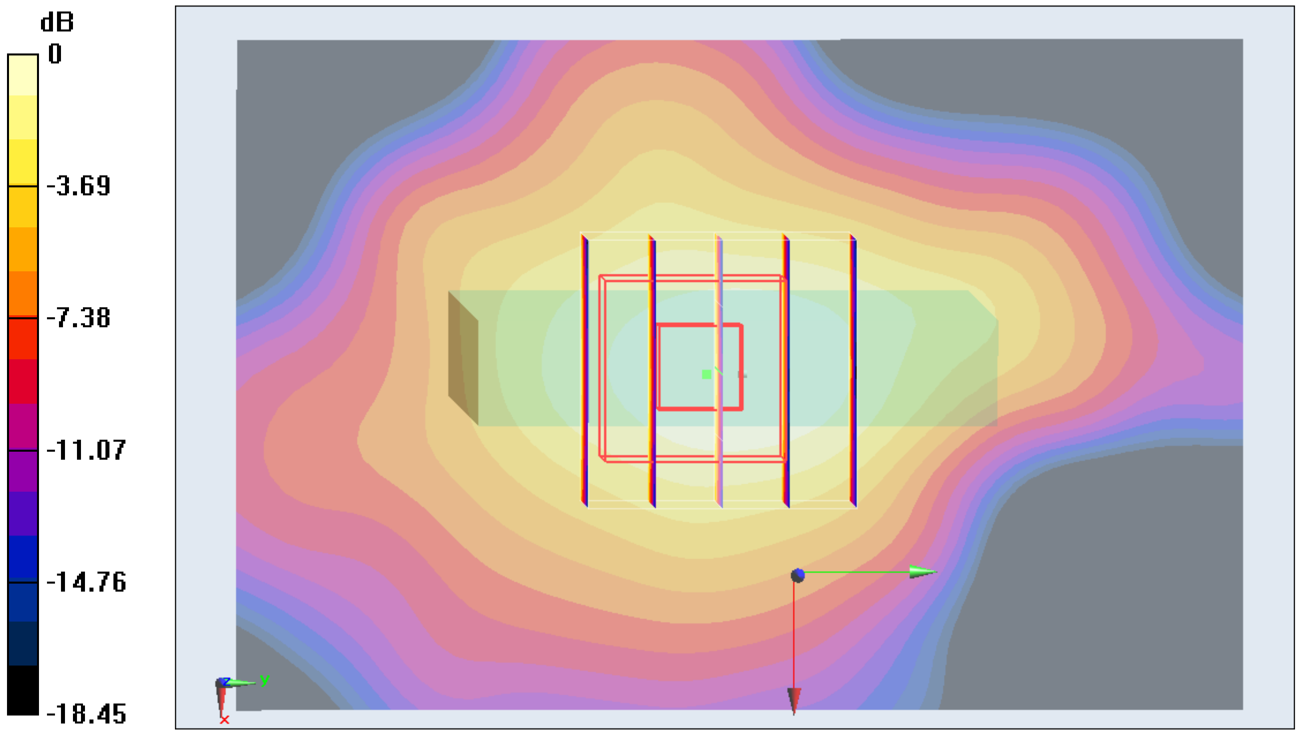
DUT: 292717

Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.991 mho/m; ε_r = 53.834; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.59, 6.59, 6.59); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (41x61x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.0514 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.043 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.086 mW/g
SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.026 mW/g
Maximum value of SAR (measured) = 0.0518 W/kg



0 dB = 0.0518 W/kg = -25.71 dB W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/11/1

#29_WLAN2.4G_802.11b_Front_1.5cm_Ch6;Headset

DUT: 292717

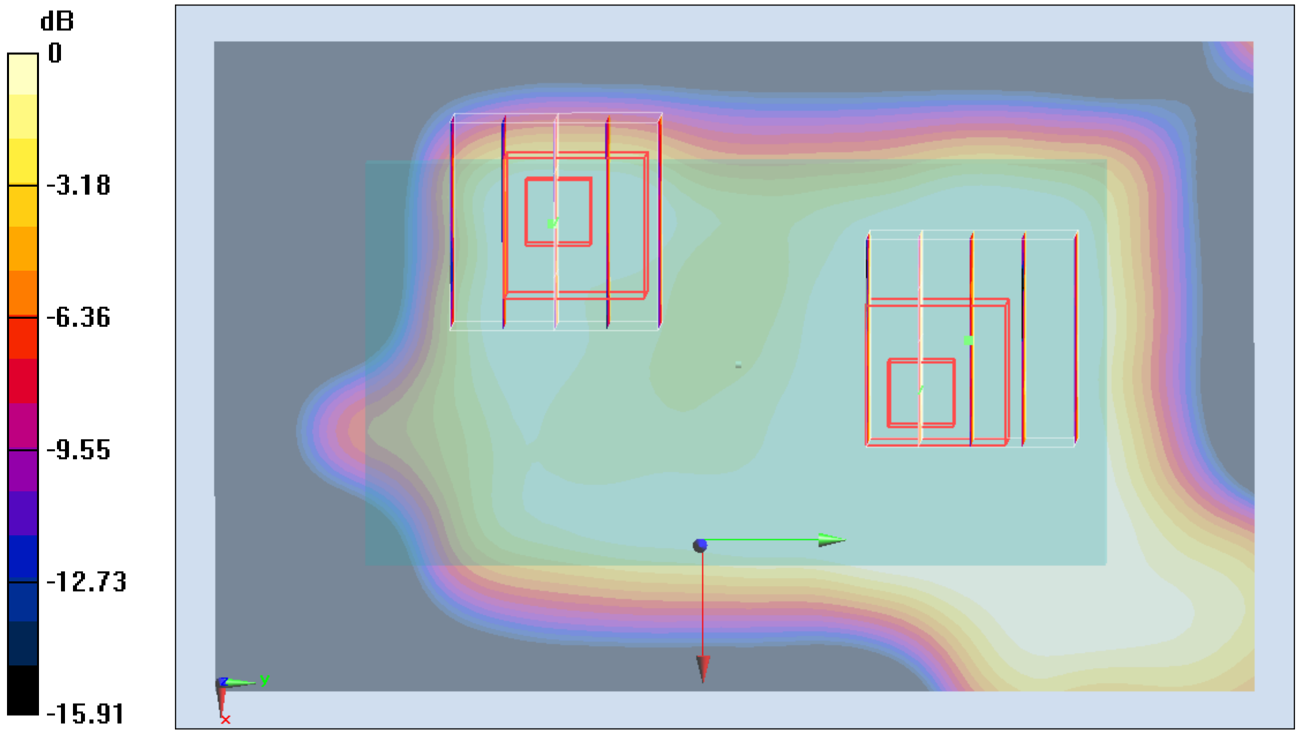
Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.991 mho/m; ε_r = 53.834; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.59, 6.59, 6.59); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (51x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.0262 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.091 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.035 mW/g
SAR(1 g) = 0.020 mW/g; SAR(10 g) = 0.012 mW/g
Maximum value of SAR (measured) = 0.0220 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.091 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.037 mW/g
SAR(1 g) = 0.014 mW/g; SAR(10 g) = 0.00827 mW/g
Maximum value of SAR (measured) = 0.0152 W/kg



0 dB = 0.0152 W/kg = -36.36 dB W/kg
For any 2nd peak found in area scan within 2 dB of the maximum peak
and greater than 0.012W/kg, and is not within the zoom scan, zoom scan is repeated.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2012/11/1

#30_WLAN2.4G_802.11b_Back_1.5cm_Ch6;Headset

DUT: 292717

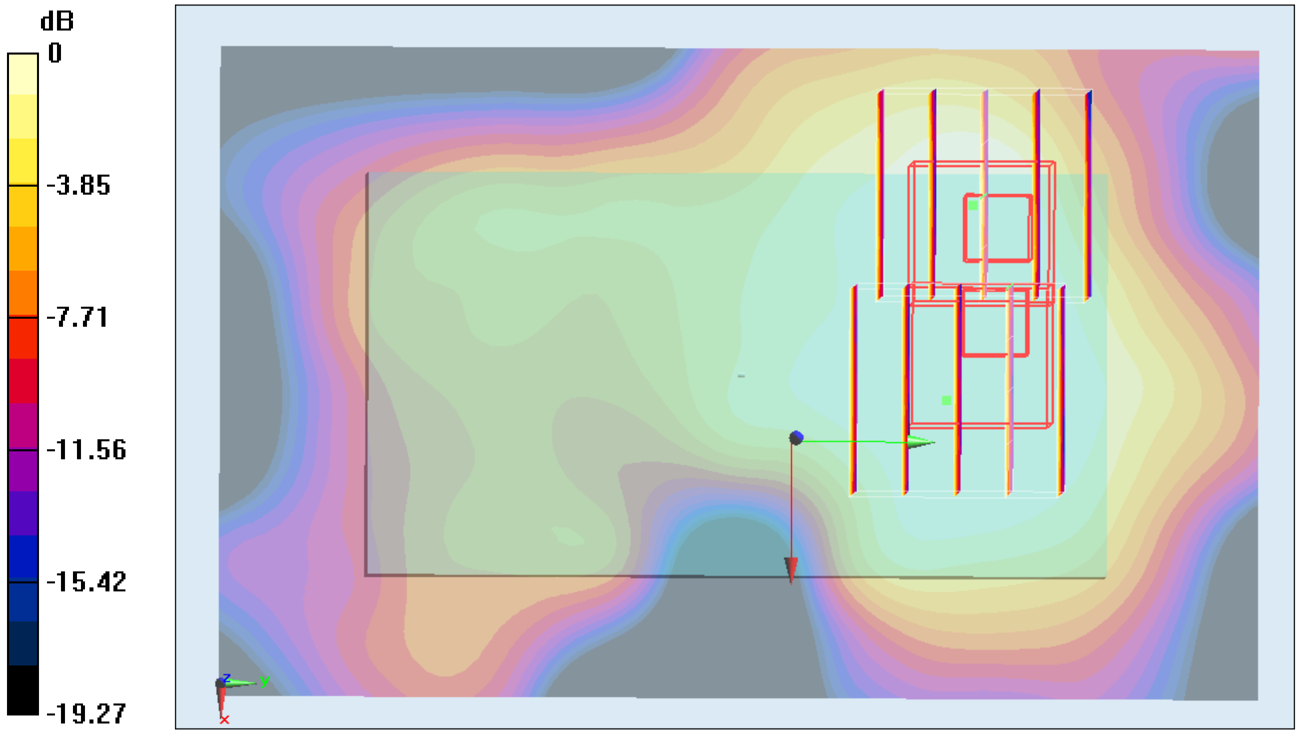
Communication System: 802.11b; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: MSL_2450_121101 Medium parameters used: f = 2437 MHz; σ = 1.991 mho/m; ε_r = 53.834; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3801; ConvF(6.59, 6.59, 6.59); Calibrated: 2012/6/22;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM Right; Type: QD000P40CD; Serial: TP:1644
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Ch6/Area Scan (51x81x1): Measurement grid: dx=20 mm, dy=20 mm
Maximum value of SAR (interpolated) = 0.0422 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.681 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.066 mW/g
SAR(1 g) = 0.035 mW/g; SAR(10 g) = 0.020 mW/g
Maximum value of SAR (measured) = 0.0380 W/kg

Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.681 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.053 mW/g
SAR(1 g) = 0.027 mW/g; SAR(10 g) = 0.017 mW/g
Maximum value of SAR (measured) = 0.0335 W/kg



0 dB = 0.0335 W/kg = -29.50 dB W/kg
For any 2nd peak found in area scan within 2 dB of the maximum peak
and greater than 0.012W/kg, and is not within the zoom scan, zoom scan is repeated.

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.