SAR TEST REPORT

(Mobile Phone)

REPORT NO.: SA990203A11-2

MODEL NO.: PCG-11111L

RECEIVED: Feb. 03, 2010

TESTED: Feb. 27, 2010 ~ Mar.06,2010

ISSUED: Mar. 07, 2010

APPLICANT: Sony Corporation

ADDRESS: 1-7-1 Konan Minato-Ku, Tokyo, 108-0075 Japan

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang, Taipei Hsien 244, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

Testing Laboratory
2021

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1. CERTIFICATION

PRODUCT: Personal Computer
MODEL: PCG-11111L
BRAND: SONY
APPLICANT: Sony Corporation
TESTED: Feb. 27, 2010 ~ Mar.06,2010
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 2 (Section 2.1093)**
FCC OET Bulletin 65, Supplement C (01-01)
RSS-102

The above equipment (model: PCG-11111L) have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Andrea Hsia / Specialist , **DATE :** Mar. 07, 2010

TECHNICAL ACCEPTANCE Responsible for RF : Mason Chang / Engineer , **DATE :** Mar. 07, 2010

APPROVED BY : Gary Chang / Assistant Manager , **DATE :** Mar. 07, 2010

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>PRODUCT</td><td colspan="2">Personal Computer</td></tr>
<tr><td>MODEL NO.</td><td colspan="2">PCG-11111L</td></tr>
<tr><td>FCC ID</td><td colspan="2">AK8PCG11111L</td></tr>
<tr><td>IC ID</td><td colspan="2">409B-PCG11111L</td></tr>
<tr><td>POWER SUPPLY</td><td colspan="2">7.4Vdc (Battery)
10.5Vdc (Adapter)</td></tr>
<tr><td>CLASSIFICATION</td><td colspan="2">Portable device, production unit</td></tr>
<tr><td>MODULATION TYPE</td><td colspan="2">OQPSK, HPSK</td></tr>
<tr><td>OPERATING FREQUENCY</td><td colspan="2">824.7MHz ~ 848.3MHz
1851.25MHz ~ 1908.75MHz</td></tr>
<tr><td rowspan="2">CHANNEL FREQUENCIES UNDER TEST AND ITS CONDUCTED OUTPUT POWER</td><td>SO32
(FCH)</td><td>CDMA850 band:
24.30dBm / 824.70MHz for channel 1013
24.34dBm / 836.52MHz for channel 384
24.38dBm / 848.31MHz for channel 777</td></tr>
<tr><td>SO32
(FCH)</td><td>CDMA1900 band:
23.80dBm / 1851.25MHz for channel 25
23.63dBm / 1880.00MHz for channel 600
23.47dBm / 1908.75MHz for channel 1175</td></tr>
<tr><td>MAXIMUM SAR (1g)</td><td colspan="2">CDMA850 band: 0.106W/kg
CDMA1900 band: 0.325W/kg</td></tr>
<tr><td>ANTENNA TYPE</td><td colspan="2">Monopole antenna</td></tr>
<tr><td>MAX. ANTENNA GAIN</td><td>850MHz: 0.56dBi</td><td>1900MHz: 1.09dBi</td></tr>
<tr><td>DATA CABLE</td><td colspan="2">NA</td></tr>
<tr><td>I/O PORTS</td><td colspan="2">Refer to user's manual</td></tr>
<tr><td>ACCESSORY DEVICES</td><td colspan="2">Earphone, Adapter, Battery, Display/LAN Adapter</td></tr>
</table>

NOTE:

1. The EUT is a Personal Computer. The functions of EUT listed as below:

	REFERENCE REPORT
WLAN 802.11b/g/n	SA990203A11-1
CDMA 850 + CDMA 1900	SA990203A11-2
BLUETOOTH	SA990203A11

2. The EUT with modules listed as below:

WLAN MODULE:	AR5BHB95 (Atheros)
BLUETOOTH MODULE:	T77H114 (Foxconn)
CDMA MODULE:	Gobi2000 (Qualcomm)

3. The EUT equipped the following accessories:

ITEM	Brand	Interface
Display/LAN Adapter	SONY	*D-Sub *RJ-45 (10/100/1000Mbps)
Earphone	SONY	-

4. The communicated functions of EUT listed as below:

		850MHz	1900MHz	With WLAN 802.11b/g/n + BT 2.0 with EDR
3G	CDMA	√	√	
	1*EVDO	√	√	

5. The EUT uses the following Li-Lon batteries:

BATTERY 1	
BRAND:	SONY
MODEL:	VGP-BPL23
RATING:	7.4Vdc, 5000mAh, 37Wh

BATTERY 2	
BRAND:	SONY
PART NUMBER:	VGP-BPS23
RATING:	7.4Vdc, 2500mAh, 19Wh

*Battery 1 was chosen as the representative for testing.

6. The EUT were powered by the following adapter:

ADAPTER 1	
BRAND:	SONY
MODEL:	VGP-AC10V2
INPUT:	100-240Vac, 0.48-0.28A, 50/60Hz
OUTPUT:	10.5Vdc, 1.9A
POWER LINE:	DC 1.8m non-shielded cable without core AC 0.6m shielded cable without core

ADAPTER 2	
BRAND:	SONY
MODEL:	VGP-AC10V6
INPUT:	100-240Vac, 0.48-0.28A, 50/60Hz
OUTPUT:	10.5Vdc, 1.9A
POWER LINE:	DC 1.8m non-shielded cable without core AC 0.6m shielded cable without core

*Adapter 2 was chosen as the representative for testing.

7. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

2.2 SAR MEASUREMENT CONDITIONS FOR CDMA

The following procedures were followed according to FCC "SAR Measurement Procedures 3G Devices", Oct. 2007.

1x Ev-Do Data Devices

SAR Measurements

SAR is measured using FTAP/RTAP and FETAP/RETAP respectively for Rev. 0 and Rev. A devices. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations. Both FTAP and FETAP are configured with a Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots. AT power control should be in "All Bits Up" conditions for TAP/ETAP.
Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. SAR for Subtype 2 Physical layer configurations is not required for Rev. A when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for that RF channels in Rev. 0.17 Head SAR is required for Ev-Do devices that support operations next to the ear; for example, with VOIP, using Subtype 2 Physical Layer configurations according to the required handset configurations.

1x RTT Support

For Ev-Do devices that also support 1x RTT voice and/or data operations, SAR is not required for 1x RTT when the maximum average output of each channel is less than ¼ dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0. Otherwise, the 'Body SAR Measurements' procedures in the 'CDMA 2000 1x Handsets' section should be applied.

Conducted power table

WORST CASE CONDUCTED POWER OF 1x EV-DO								
CHANNEL	FREQ. (MHz)	Revision A	Release 0	CORR. FACTOR (dB)	Revision A		Release 0	
					OUTPUT POWER			
		RAW VALUE (dBm)			dBm	mW	dBm	mW
1013	824.70	19.73	19.89	4.2	23.93	247.2	24.09	256.4
384	836.52	19.96	20.01	4.2	24.16	260.6	24.21	263.6
777	848.31	20.14	20.24	4.2	24.34	271.6	24.44	278.0

CDMA 2000 CONDUCTED POWER												
CHAN.	FREQ. (MHz)	CDMA 2000 RC	RAW VALUE (dBm) SO2	SO55	TDSO SO32 (FCH)	TDSO SO32 (FCH+SCH)	CORR. FACTOR (dB)	OUTPUT POWER (dBm) SO2	SO55	TDSO SO32 (FCH)	TDSO SO32 (FCH+SCH)
1013	824.70	RC1	19.91	19.96	-	-	4.2	24.11	24.16	-	-
		RC3	20.05	20.08	20.10	20.07	4.2	24.25	24.28	24.30	24.27
384	836.52	RC1	20.06	20.11	-	-	4.2	24.26	24.31	-	-
		RC3	20.16	20.22	20.14	20.11	4.2	24.36	24.42	24.34	24.31
777	848.31	RC1	20.14	20.16	-	-	4.2	24.34	24.36	-	-
		RC3	20.24	20.26	20.18	20.17	4.2	24.44	24.46	24.38	24.37

WORST CASE CONDUCTED POWER OF 1x EV-DO								
CHANNEL	FREQ. (MHz)	Revision A	Release 0	CORR. FACTOR (dB)	Revision A		Release 0	
		RAW VALUE (dBm)			OUTPUT POWER			
					dBm	mW	dBm	mW
25	1851.25	19.04	19.14	4.5	23.54	225.9	23.64	231.2
600	1880.00	18.90	19.01	4.5	23.40	218.8	23.51	224.4
1175	1908.75	18.62	18.86	4.5	23.10	205.1	23.36	216.8

CDMA 2000 CONDUCTED POWER												
CHAN.	FREQ. (MHz)	CDMA 2000 RC	RAW VALUE (dBm) SO2	SO55	TDSO SO32 (FCH)	TDSO SO32 (FCH+SCH)	CORR. FACTOR (dB)	OUTPUT POWER (dBm) SO2	SO55	TDSO SO32 (FCH)	TDSO SO32 (FCH+SCH)
25	1851.25	RC1	19.20	19.25	-	-	4.5	23.70	23.75	-	-
		RC3	19.26	19.32	19.30	19.11	4.5	23.76	23.82	23.80	23.61
600	1880.00	RC1	19.14	19.15	-	-	4.5	23.64	23.65	-	-
		RC3	19.22	19.24	19.13	19.02	4.5	23.72	23.74	23.63	23.52
1175	1908.75	RC1	18.72	18.84	-	-	4.5	23.22	23.34	-	-
		RC3	18.94	18.99	18.97	18.93	4.5	23.44	23.49	23.47	23.43

2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to the specifications of the manufacturer, this product must comply with the requirements of the following standards:

FCC 47 CFR Part 2 (2.1093)

FCC OET Bulletin 65, Supplement C (01- 01)

RSS-102

IEEE 1528-2003

All test items have been performed and recorded as per the above standards.

2.4 GENERAL INOFRMATION OF THE SAR SYSTEM

DASY4 (software 4.0 Build 80) consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY4 software defined. The DASY4 software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.

EX3DV4 ISOTROPIC E-FIELD 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 (30 MHz to 6 GHz)
DIRECTIVITY	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
DYNAMIC RANGE	10 μW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
DIMENSIONS	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
APPLICATION	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

NOTE

1. The Probe parameters have been calibrated by the SPEAG. Please reference "APPENDIX D" for the Calibration Certification Report.
2. For frequencies above 800MHz, calibration in a rectangular wave-guide is used, because wave-guide size is manageable.
3. For frequencies below 800MHz, temperature transfer calibration is used because the wave-guide size becomes relatively large.

TWIN SAM V4.0

CONSTRUCTION	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-2003, EN 62209-1 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.
SHELL THICKNESS	2 ± 0.2mm
FILLING VOLUME	Approx. 25liters
DIMENSIONS	Height: 810mm; Length: 1000mm; Width: 500mm

SYSTEM VALIDATION KITS:

CONSTRUCTION	Symmetrical dipole with l/4 balun enables measurement of feedpoint impedance with NWA matched for use near flat phantoms filled with brain simulating solutions. Includes distance holder and tripod adaptor
CALIBRATION	Calibrated SAR value for specified position and input power at the flat phantom in brain simulating solutions
FREQUENCY	850MHz, 1900MHz
RETURN LOSS	> 20dB at specified validation position
POWER CAPABILITY	> 100W (f < 1GHz); > 40W (f > 1GHz)
OPTIONS	Dipoles for other frequencies or solutions and other calibration conditions upon request

DEVICE HOLDER FOR SAM TWIN PHANTOM

CONSTRUCTION

The device holder for the mobile phone device 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 centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles. The holder has been made out 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. The device holder for the portable device makes up of the polyethylene foam. The dielectric parameters of material close to the dielectric parameters of the air.

DATA ACQUISITION ELECTRONICS

CONSTRUCTION

The data acquisition electronics (DAE4) consists of a highly sensitive electrometer grade preamplifier with auto-zeroing, a channel and gain-switching multiplex, a fast 16 bit AD converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The mechanical probe is mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of the DAE4 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

2.5 GENERAL DESCRIPTION OF THE SPATIAL PEAK SAR EVALUATION

The DASY4 post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the micro-volt 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

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

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

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:

$$\text{E-fieldprobes: } E_i = \sqrt{\frac{V_1}{Norm_i \cdot ConvF}}$$

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

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

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

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

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

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

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/cm3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid. The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

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

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). 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 5mm.

3. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

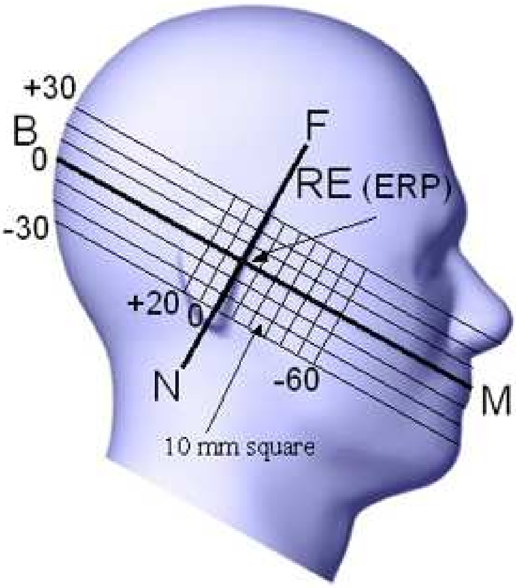
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.
1	Universal Radio Communication Tester	R&S	CMU200	11726

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

NOTE: All power cords of the above support units are non shielded (1.8m).

4. DESCRIPTION OF TEST POSITION

4.1 DESCRIPTION OF TEST POSITION



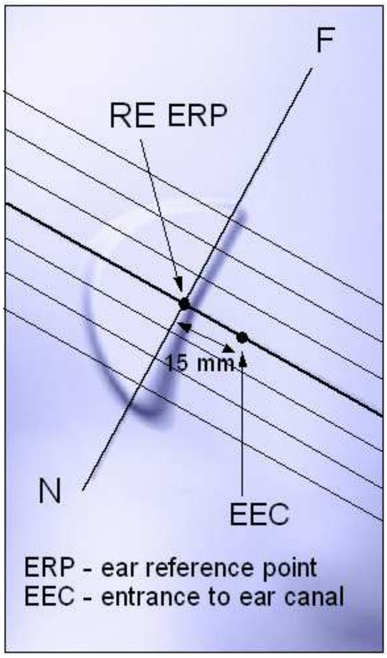


FIGURE 3.1

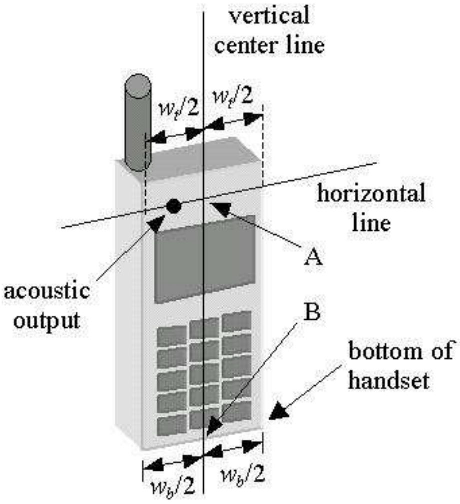


FIGURE 3.1a

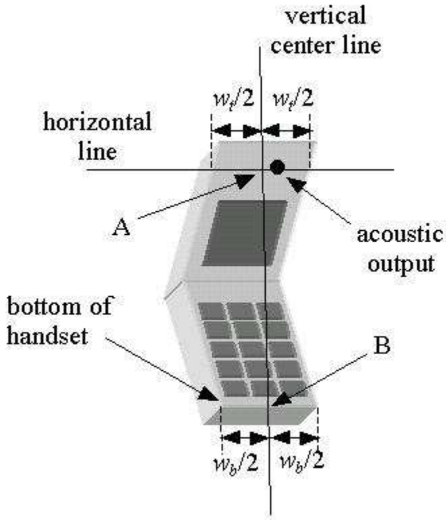
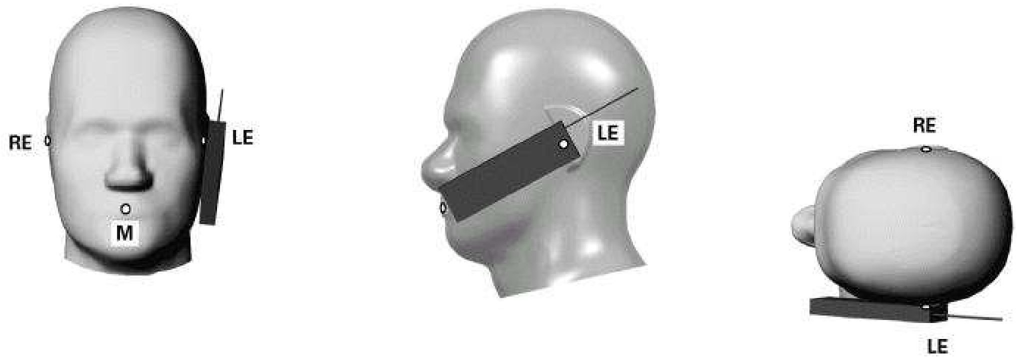


FIGURE 3.1b

4.2.1 TOUCH/CHEEK TEST POSITION

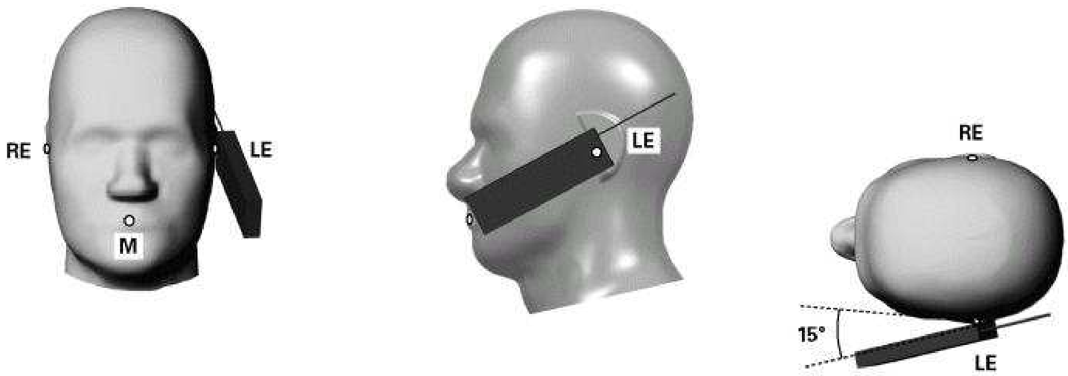
The head position in Figure 3.1, the ear reference points ERP are 15mm above entrance to ear canal along the B-M line. The line N-F (Neck-Front) is perpendicular to the B-M (Back Mouth) line. The handset device in Figure 3.1a and 3.1b,The vertical centerline pass through two points on the front side of handset: the midpoint of the width wt of the handset at the level of the acoustic output (point A) and the midpoint of the width Wb of the bottom of the handset (point B). The vertical centerline is perpendicular to the horizontal line and pass through the center of the acoustic output. The point A touches the ERP and the vertical centerline of the handset is parallel to the B-M line. While maintaining the point A contact with the ear(ERP), rotate the handset about the line NF until any point on handset is in contact with the cheek of the phantom



TOUCH/CHEEK POSITION FIGURE

4.2.2 TILT TEST POSITION

Adjust the device in the cheek position. While maintaining a point of the handset contact in the ear, move the bottom of the handset away from the mouth by an angle of 15 degrees.



TILT POSITION FIGURE

4.2.3 BODY-WORN CONFIGURATION

The handset device attached the belt clip or the holster. The keypad face of the handset is against with the bottom of the flat phantom face and the bottom of the keypad face contact to the bottom of the flat phantom.

When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only accessory that dictates the closest spacing to the body must be tested.

5. TEST RESULTS

5.1 TEST PROCEDURES

The EUT makes a phone call to the communication simulator station. Establish the simulation communication configuration rather the actual communication. Then the EUT could continuous the transmission mode. Adjust the PCL of the base station could controlled the EUT to transmitted the maximum output power. The base station also could control the transmission channel. The SAR value was calculated via the 3D spline interpolation algorithm that has been implemented in the software of DASY4 SAR measurement system manufactured and calibrated by SPEAG. According to the IEEE 1528 / EN 62209-1, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- Power reference measurement
- Verification of the power reference measurement
- Area scan
- Zoom scan
- Power reference measurement

The area scan with 15mm x 15mm grid was performed for the highest spatial SAR location. Consist of 11 x 13 points while the scan size is the 150mm x 180mm. The zoom scan with 30mm x 30mm x 30mm volume was performed for SAR value averaged over 1g and 10g spatial volumes.

In the zoom scan, the distance between the measurement point at the probe sensor location (geometric center behind the probe tip) and the phantom surface is 4.0 mm and maintained at a constant distance of ±1.0 mm during a zoom scan to determine peak SAR locations. The distance is 4mm between the first measurement point and the bottom surface of the phantom. The secondary measurement point to the bottom surface of the phantom is with 9mm separation distance. The cube size is 7 x 7 x 7 points consist of 343 points and the grid space is 5mm.

The measurement time is 0.5 s at each point of the zoom scan. The probe boundary effect compensation shall be applied during the SAR test. Because of the tip of the probe to the Phantom surface separated distances are longer than half a tip probe diameter.

In the area scan, the separation distance is 4mm between the each measurement point and the phantom surface. The scan size shall be included the transmission portion of the EUT. The measurement time is the same as the zoom scan. At last the reference power drift shall be less than ±5%.

5.2 MEASURED SAR RESULTS

Test condition

TEST DATE	TISSUE TYPE / FREQ.	TEST MODE	TEMPERATURE (℃)		HUMIDITY (%RH)	TESTED BY
			AIMBENT	LIQUID		
2010/2/27	MSL 850	1,2	23.1	22.8	64	Aaron Liang
2010/2/27	MSL 1900	3,4	22.9	22.6	63	Aaron Liang
2010/3/6	MSL 850	5~8	22.6	21.5	60	Aaron Liang
2010/3/6	MSL 1900	9~12	22.3	21.4	60	Aaron Liang

CDMA MODE

BATTERY	TEST MODE	CHAN.	FREQ. (MHz)	MODULATION	MEASURED 1g SAR (W/kg)
Battery 1	1	1013	824.7	CDMA	0.102
Battery 1	1	384	836.52	CDMA	**0.106**
Battery 1	1	777	848.31	CDMA	0.104
Battery 2	2	384	836.52	CDMA	0.096
Battery 1	3	25	1851.25	CDMA	0.269
Battery 1	3	600	1880.0	CDMA	0.292
Battery 1	3	1175	1908.75	CDMA	**0.325**
Battery 2	4	1175	1908.75	CDMA	0.289

EVDO MODE

BATTERY	TEST MODE	CHAN.	FREQ. (MHz)	MODULATION	MEASURED 1g SAR (W/kg)
Battery 1	5	777	848.31	REV-0	0.102
Battery 2	6	777	848.31	REV-0	0.098
Battery 1	7	777	848.31	REV-A	0.095
Battery 2	8	777	848.31	REV-A	0.092
Battery 1	9	25	1851.25	REV-0	0.274
Battery 1	9	600	1880.0	REV-0	0.305
Battery 1	9	1175	1908.75	REV-0	0.316
Battery 2	10	1175	1908.75	REV-0	0.294
Battery 1	11	25	1851.25	REV-A	0.263
Battery 1	11	600	1880.0	REV-A	0.309
Battery 1	11	1175	1908.75	REV-A	0.312
Battery 2	12	1175	1908.75	REV-A	0.288

5.3 SAR LIMITS

HUMAN EXPOSURE	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / controlled Exposure Environment)
Spatial Average (whole body)	0.08	0.4
Spatial Peak (averaged over 1 g)	**1.6**	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

NOTE:

1. This limits accord to 47 CFR 2.1093 – Safety Limit.
2. The EUT property been complied with the partial body exposure limit under the general population environment.

5.4 RECIPES FOR TISSUE SIMULATING LIQUIDS

For the measurement of the field distribution inside the SAM phantom, the phantom must be filled with 25 litters of tissue simulation liquid.

The following ingredients are used：

• **WATER-**	Deionized water (pure H20), resistivity _16 M - as basis for the liquid
• **SUGAR-**	Refined sugar in crystals, as available in food shops - to reduce relative permittivity
• **SALT-**	Pure NaCl - to increase conductivity
• **CELLULOSE-**	Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2% in water, 20_C), CAS # 54290 - to increase viscosity and to keep sugar in solution
• **PRESERVATIVE-**	Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 - to prevent the spread of bacteria and molds
• **DGMBE-**	Diethylenglycol-monobuthyl ether (DGMBE), Fluka Chemie GmbH, CAS # 112-34-5 - to reduce relative permittivity

THE RECIPES FOR 835MHz SIMULATING LIQUID TABLE

INGREDIENT	HEAD SIMULATING LIQUID 835MHz (HSL-835)	MUSCLE SIMULATING LIQUID 835MHz (MSL-835)
Water	40.28%	50.07%
Cellulose	02.41%	NA
Salt	01.38%	0.94%
Preventtol D-7	00.18%	0.09%
Sugar	57.97%	48.2%
Dielectric Parameters at 22℃	f = 835MHz ε= 41.5 ± 5% σ= 0.97 ± 5% S/m	f= 835MHz ε= 55.0 ± 5% σ= 1.05 ± 5% S/m

THE RECIPES FOR 1900MHz SIMULATING LIQUID TABLE

INGREDIENT	HEAD SIMULATING LIQUID 1900MHz (HSL-1900)	MUSCLE SIMULATING LIQUID 1900MHz (MSL-1900)
Water	55.24%	70.16%
DGMBE	44.45%	29.44%
Salt	0.306%	00.39%
Dielectric Parameters at 22℃	f= 1900MHz ε= 40.0 ± 5% σ= 1.40 ± 5% S/m	f= 1900MHz ε= 53.3 ± 5% σ= 1.52 ± 5% S/m

Testing the liquids using the Agilent Network Analyzer E8358A and Agilent Dielectric Probe Kit 85070D.The testing procedure is following as

1. Turn Network Analyzer on and allow at least 30 min. warm up.
2. Mount dielectric probe kit so that interconnecting cable to Network Analyzer will not be moved during measurements or calibration.
3. Pour de-ionized water and measure water temperature (±1°).
4. Set water temperature in Agilent-Software (Calibration Setup).
5. Perform calibration.
6. Validate calibration with dielectric material of known properties (e.g. polished ceramic slab with >8mm thickness ε'=10.0, ε''=0.0). If measured parameters do not fit within tolerance, repeat calibration (±0.2 for ε': ±0.1 for ε'').
7. Conductivity can be calculated from ε'' by $\sigma = \omega \varepsilon_0 \varepsilon'' = \varepsilon'' f$ [GHz] / 18.
8. Measure liquid shortly after calibration. Repeat calibration every hour.
9. Stir the liquid to be measured. Take a sample (~50ml) with a syringe from the center of the liquid container.
10. Pour the liquid into a small glass flask. Hold the syringe at the bottom of the flask to avoid air bubbles.
11. Put the dielectric probe in the glass flask. Check that there are no air bubbles in front of the opening in the dielectric probe kit.
12. Perform measurements.
13. Adjust medium parameters in DASY4 for the frequencies necessary for the measurements (‘Setup Config’, select medium (e.g. Brain 900 MHz) and press ‘Option’-button.

Select the current medium for the frequency of the validation (e.g. Setup Medium Brain 900 MHz).

FOR 850 BAND SIMULATING LIQUID

LIQUID TYPE		MSL-835		
LIQUID TEMP.		22.8		
TESTED DATE		Feb. 27, 2010		
TESTED BY		Aaron Liang		
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)
824.70	Permitivity (ε)	55.20	54.00	-2.17
835.00		55.20	53.90	-2.36
836.52		55.20	53.90	-2.36
848.31		55.20	53.80	-2.54
824.70	Conductivity (σ) S/m	0.97	0.96	-1.03
835.00		0.97	0.97	0.00
836.52		0.97	0.97	0.00
848.31		0.99	0.98	-1.01

FOR CDMA1900 BAND SIMULATING LIQUID

LIQUID TYPE		MSL-1900		
LIQUID TEMP.		22.6		
TESTED DATE		Feb. 27, 2010		
TESTED BY		Aaron Liang		
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)
1851.25	Permitivity (ε)	53.3	53.1	-0.38
1880.00		53.3	53.1	-0.38
1900.00		53.3	53.1	-0.38
1908.75		53.3	53.0	-0.56
1851.25	Conductivity (σ) S/m	1.52	1.48	-2.63
1880.00		1.52	1.51	-0.66
1900.00		1.52	1.52	0.00
1908.75		1.52	1.53	0.66

FOR 850 BAND SIMULATING LIQUID

LIQUID TYPE		MSL-835		
LIQUID TEMP.		21.5		
TESTED DATE		Mar. 6, 2010		
TESTED BY		Aaron Liang		
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)
835	Permitivity (ε)	55.2	54.3	-1.63
848.31		55.2	54.1	-1.99
835	Conductivity (σ) S/m	0.97	0.98	1.03
848.31		0.99	1	1.01

FOR 1900 BAND SIMULATING LIQUID

LIQUID TYPE		MSL-1900		
LIQUID TEMP.		21.4		
TESTED DATE		Mar. 6, 2010		
TESTED BY		Aaron Liang		
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)
1851.25	Permitivity (ε)	53.3	54.1	1.50
1880.00		53.3	54	1.31
1900.00		53.3	53.9	1.13
1908.75		53.3	53.8	0.94
1851.25	Conductivity (σ) S/m	1.52	1.51	-0.66
1880.00		1.52	1.54	1.32
1900.00		1.52	1.55	1.97
1908.75		1.52	1.56	2.63

5.5 TEST EQUIPMENT FOR TISSUE PROPERTY

ITEM	NAME	BRAND	TYPE	SERIES NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	Network Analyzer	Agilent	E5071C	MY46104190	Apr. 10, 2009	Apr. 09, 2010
2	Dielectric Probe	Agilent	85070D	US01440176	NA	NA

NOTE:

1. Before testing the measurement, all test equipment shall have 30 min warm up.
2. The tolerance (k=1) specified by Agilent for general dielectric measurements, deriving from inaccuracies in the calibration data, analyzer drift, and random errors, are usually ±2.5% and ±5% for measured permittivity and conductivity, respectively. However, the tolerances for the conductivity is smaller for material with large loss tangents, i.e., less than ±2.5% (k=1). It can be substantially smaller if more accurate methods are applied.

6. SYSTEM VALIDATION

The system validation was performed in the flat phantom with equipment listed in the following table. Since the SAR value is calculated from the measured electric field, dielectric constant and conductivity of the body tissue and the SAR is proportional to the square of the electric field. So, the SAR value will be also proportional to the RF power input to the system validation dipole under the same test environment. In our system validation test, 250mW RF input power was used.

6.1 TEST EQUIPMENT

ITEM	NAME	BRAND	TYPE	SERIES NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	SAM Phantom	S & P	QD000 P40 CA	TP-1150	NA	NA
2	Signal Generator	Anritsu	68247B	984703	May 21, 2009	May 20, 2010
3	E-Field Probe	S & P	EX3DV4	3590	Apr. 28, 2009	Apr. 27, 2010
4	DAE	S & P	DAE4	861	Jan. 22, 2010	Jan. 21, 2011
5	Robot Positioner	Staubli Unimation	NA	NA	NA	NA
6	Validation Dipole	S & P	D835V2	4d021	May 25, 2009	May 24, 2010
7			D1900V2	5d022	Mar. 17, 2009	Mar. 16, 2010

NOTE: Before starting the measurement, all test equipment shall be warmed up for 30min.

6.2 TEST PROCEDURE

Before you start the system performance check, need only to tell the system with which components (probe, medium, and device) are performing the system performance check; the system will take care of all parameters. The dipole must be placed beneath the flat phantom section of the SAM Twin Phantom with the correct distance holder in place. The distance holder should touch the phantom surface with a light pressure at the reference marking (little cross) and be oriented parallel to the long side of the phantom. Accurate positioning is not necessary, since the system will search for the peak SAR location, except that the dipole arms should be parallel to the surface. The device holder for the EUT can be left in place but should be rotated away from the dipole.

1.The ”Power Reference Measurement” and ”Power Drift Measurement” jobs are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the amplifier output power. If it is too high (above ±0.1 dB), the system performance check should be repeated; some amplifiers have very high drift during warm-up. A stable amplifier gives drift results in the DASY system below ±0.02 dB.

2.The ”Surface Check” job tests the optical surface detection system of the DASY system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ±0.1mm). In that case it is better to abort the system performance check and stir the liquid.

3. The ”Area Scan” job measures the SAR above the dipole on a plane parallel to the surface. It is used to locate the approximate location of the peak SAR. The proposed scan uses large grid spacing for faster measurement; due to the symmetric field, the peak detection is reliable. If a finer graphic is desired, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result.

4. The ”Zoom Scan” job measures the field in a volume around the peak SAR value assessed in the previous ”Area Scan” job (for more information see the application note on SAR evaluation).

About the validation dipole positioning uncertainty, the constant and low loss dielectric spacer is used to establish the correct distance between the top surface of the dipole and the bottom surface of the phantom, the error component introduced by the uncertainty of the distance between the liquid (i.e., phantom shell) and the validation dipole in the DASY4 system is less than ±0.1mm.

$$SAR_{tolerance}[\%] = 100 \times (\frac{(a+d)^2}{a^2} - 1)$$

As the closest distance is 10mm, the resulting tolerance $SAR_{tolerance}[\%]$ is <2%.

6.3 VALIDATION RESULTS

SYSTEM VALIDATION TEST OF SIMULATING LIQUID					
FREQUENCY (MHz)	REQUIRED SAR (mW/g)	MEASURED SAR (mW/g)	DEVIATION (%)	SEPARATION DISTANCE	TESTED DATE
MSL 835	2.54 (1g)	2.49	-1.97	15mm	Feb. 27, 2010
MSL 1900	10.20 (1g)	10.20	0.00	10mm	Feb. 27, 2010
MSL 835	2.54(1g)	2.48	-2.36	15mm	Mar. 6, 2010
MSL 1900	10.20(1g)	9.65	-5.39	10mm	Mar. 6, 2010
TESTED BY	Aaron Liang				

NOTE: Please see Appendix for the photo of system validation test.

6.4 SYSTEM VALIDATION UNCERTAINTIES

In the table below, the system validation uncertainty with respect to the analytically assessed SAR value of a dipole source as given in the IEEE 1528 standard is given. This uncertainty is smaller than the expected uncertainty for mobile phone measurements due to the simplified setup and the symmetric field distribution.

Error Description	Tolerance (±%)	Probability Distribution	Divisor	(C_i)		Standard Uncertainty (±%)		(v_i)
				(1g)	(10g)	(1g)	(10g)	
Measurement System								
Probe Calibration	5.50	Normal	1	1	1	5.50	5.50	∞
Axial Isotropy	4.70	Rectangular	$\sqrt{3}$	0.7	0.7	1.90	1.90	∞
Hemispherical Isotropy	9.60	Rectangular	$\sqrt{3}$	0.7	0.7	3.88	3.88	∞
Boundary effects	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	4.70	Rectangular	$\sqrt{3}$	1	1	2.71	2.71	∞
System Detection Limits	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Readout Electronics	0.30	Normal	1	1	1	0.30	0.30	∞
Response Time	0.80	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Integration Time	2.60	Rectangular	$\sqrt{3}$	1	1	1.50	1.50	∞
RF Ambient Noise	3.00	Rectangular	$\sqrt{3}$	1	1	1.73	1.73	∞
RF Ambient Reflections	3.00	Rectangular	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe Positioner	0.40	Rectangular	$\sqrt{3}$	1	1	0.23	0.23	∞
Probe Positioning	2.90	Rectangular	$\sqrt{3}$	1	1	1.67	1.67	∞
Max. SAR Eval.	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Dipole								
Dipole Axis to Liquid Distance	2.00	Rectangular	$\sqrt{3}$	1	1	1.15	1.15	145
Input Power Drift	5.00	Rectangular	$\sqrt{3}$	1	1	2.89	2.89	∞
Phantom and Tissue Parameters								
Phantom Uncertainty	4.00	Rectangular	$\sqrt{3}$	1	1	2.31	2.31	∞
Liquid Conductivity (target)	5.00	Rectangular	$\sqrt{3}$	0.64	0.43	1.85	1.24	∞
Liquid Conductivity (measurement)	3.32	Normal	1	0.64	0.43	2.12	1.43	∞
Liquid Permittivity (target)	5.00	Rectangular	$\sqrt{3}$	0.6	0.49	1.73	1.41	∞
Liquid Permittivity (measurement)	3.25	Normal	1	0.6	0.49	1.95	1.59	∞
Combined Standard Uncertainty						**9.92**	**9.58**	
Coverage Factor for 95%						**Kp=2**		
Expanded Uncertainty (K=2)						**19.84**	**19.16**	

NOTE: About the system validation uncertainty assessment, please reference the section 7.

7. MEASUREMENT SAR PROCEDURE UNCERTAINTIES

The assessment of spatial peak SAR of the hand handheld devices is according to IEEE 1528. All testing situation shall be met below these requirements.

- The system is used by an experienced engineer who follows the manual and the guidelines taught during the training provided by SPEAG.
- The probe has been calibrated within the requested period and the stated uncertainty for the relevant frequency bands does not exceed 4.8% (k=1).
- The validation dipole has been calibrated within the requested period and the system performance check has been successful.
- The DAE unit has been calibrated within the within the requested period.
- The minimum distance between the probe sensor and inner phantom shell is selected to be between 4 and 5mm.
- The operational mode of the DUT is CW, CDMA, FDMA or TDMA (GSM, DCS, PCS, IS136 and PDC) and the measurement/integration time per point is >500 ms.
- The dielectric parameters of the liquid have been assessed using Agilent 85070D dielectric probe kit or a more accurate method.
- The dielectric parameters are within 5% of the target values.
- The DUT has been positioned as described in section 3.

7.1 PROBE CALIBRATION UNCERTAINTY

SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEEE 1528, EN 62209-1, IEC 62209, etc.) under ISO17025. The uncertainties are stated on the calibration certificate. For the most relevant frequency bands, these values do not exceed 4.8% (k=1). If evaluations of other bands are performed for which the uncertainty exceeds these values, the uncertainty tables given in the summary have to be revised accordingly.

7.2 ISOTROPY UNCERTAINTY

The axial isotropy tolerance accounts for probe rotation around its axis while the hemispherical isotropy error includes all probe orientations and field polarizations. These parameters are assessed by SPEAG during initial calibration. In 2001, SPEAG further tightened its quality controls and warrants that the maximal deviation from axial isotropy is ±0.20 dB, while the maximum deviation of hemispherical isotropy is ±0.40 dB, corresponding to ±4.7% and ±9.6%, respectively. A weighting factor of cp equal to 0.5 can be applied, since the axis of the probe deviates less than 30 degrees from the normal surface orientation.

7.3 BOUNDARY EFFECT UNCERTAINTY

The effect can be estimated according to the following error approximation formula

$$SAR_{tolerance}[\%] = SAR_{be}[\%] \times \frac{(d_{be} + d_{step})^2}{2d_{step}} \frac{e^{-\frac{d_{be}}{\delta/2}}}{\delta/2}$$

$$d_{be} + d_{step} < 10mm$$

The parameter d_{be} is the distance in mm between the surface and the closest measurement point used in the averaging process; d_{step} is the separation distance in mm between the first and second measurement points; δ is the minimum penetration depth in mm within the head tissue equivalent liquids (i.e., δ= 13.95 mm at 3GHz); SAR_{be} is the deviation between the measured SAR value at the distance d_{be} from the boundary and the wave-guide analytical value SAR_{ref}.DASY4 applies a boundary effect compensation algorithm according to IEEE 1528, which is possible since the axis of the probe never deviates more than 30 degrees from the normal surface orientation. SAR_{be}[%] is assessed during the calibration process and SPEAG warrants that the uncertainty at distances larger than 4mm is always less than 1%.In summary, the worst case boundary effect SAR tolerance[%] for scanning distances larger than 4mm is < ± 0.8%.

7.4 PROBE LINEARITY UNCERTAINTY

Field probe linearity uncertainty includes errors from the assessment and compensation of the diode compression effects for CW and pulsed signals with known duty cycles. This error is assessed using the procedure described in IEEE 1528. For SPEAG field probes, the measured difference between CW and pulsed signals, with pulse frequencies between 10 Hz and 1 kHz and duty cycles between 1 and 100, is < ±0.20 dB (< ±4.7%).

7.5 READOUT ELECTRONICS UNCERTAINTY

All uncertainties related to the probe readout electronics (DAE unit), including the gain and linearity of the instrumentation amplifier, its loading effect on the probe, and accuracy of the signal conversion algorithm, have been assessed accordingly to IEEE 1528.The combination (root-sum-square RSS method) of these components results in an overall maximum error of ±1.0%.

7.6 RESPONSE TIME UNCERTAINTY

The time response of the field probes is assessed by exposing the probe to a well-controlled electric field producing SAR larger than 2.0 W/kg at the tissue medium surface. The signal response time is evaluated as the time required by the system to reach 90% of the expected final value after an on/of switch of the power source. Analytically, it can be expressed as:

$$SAR_{tolerance}[\%] = 100 \times \left(\frac{T_m}{T_m + \tau e^{-T_m/\tau} - \tau} - 1 \right)$$

where Tm is 500 ms, i.e., the time between measurement samples, and $_{T}$ the time constant. The response time $_{T}$ of SPEAG's probes is <5 ms. In the current implementation, DASY4 waits longer than 100 ms after having reached the grid point before starting a measurement, i.e., the response time uncertainty is negligible.

7.7 INTEGRATION TIME UNCERTAINTY

If the device under test does not emit a CW signal, the integration time applied to measure the electric field at a specific point may introduce additional uncertainties due to the discretization and can be assessed as follows

$$SAR_{tolerance}[\%] = 100 \times \sum_{allsub-frames} \frac{t_{frame}}{t_{\text{int}egration}} \frac{slot_{idle}}{slot_{total}}$$

The tolerances for the different systems are given in Table 7.1, whereby the worst-case $SAR_{tolerance}$ is 2.6%.

System	$SAR_{tolerance}$ %
CW	0
CDMA*	0
WCDMA*	0
FDMA	0
IS-136	2.6
PDC	2.6
GSM/DCS/PCS	1.7
DECT	1.9
Worst-Case	2.6

TABLE 7.1

7.8 PROBE POSITIONER MECHANICAL TOLERANCE

The mechanical tolerance of the field probe positioner can introduce probe positioning uncertainties. The resulting SAR uncertainty is assessed by comparing the SAR obtained according to the specifications of the probe positioner with respect to the actual position defined by the geometric enter of the probe sensors. The tolerance is determined as:

$$SAR_{tolerance}[\%] = 100 \times \frac{d_{ph}}{\delta/2}$$

The specified repeatability of the RX robot family used in DASY4 systems is ±25 µm. The absolute accuracy for short distance movements is better than ±0.1mm, i.e., the $SAR_{tolerance}[\%]$ is better than 1.5% (rectangular).

7.9 PROBE POSITIONING

The probe positioning procedures affect the tolerance of the separation distance between the probe tip and the phantom surface as:

$$SAR_{tolerance}[\%] = 100 \times \frac{d_{ph}}{\delta/2}$$

where d_{ph} is the maximum deviation of the distance between the probe tip and the phantom surface. The optical surface detection has a precision of better than 0.2 mm, resulting in an $SAR_{tolerance}[\%]$ of <2.9% (rectangular distribution). Since the mechanical detection provides better accuracy, 2.9% is a worst-case figure for DASY4 system.

7.10 PHANTOM UNCERTAINTY

The SAR measurement uncertainty due to SPEAG phantom shell production tolerances has been evaluated using

$$SAR_{tolerance}[\%] \cong 100 \times \frac{2d}{a}, \qquad d << a$$

For a maximum deviation d of the inner and outer shell of the phantom from that specified in the CAD file of ±0.2 mm, and a 10mm spacing a between source and tissue liquid, the calculated phantom uncertainty is ±4.0%.

7.11 DASY4 UNCERTAINTY BUDGET

Error Description	Tolerance (±%)	Probability Distribution	Divisor	(C_i)		Standard Uncertainty (±%)		(v_i)
				(1g)	(10g)	(1g)	(10g)	
Measurement Equipment								
Probe Calibration	5.50	Normal	1	1	1	5.50	5.50	∞
Axial Isotropy	4.70	Rectangular	$\sqrt{3}$	0.7	0.7	1.90	1.90	∞
Hemispherical Isotropy	9.60	Rectangular	$\sqrt{3}$	0.7	0.7	3.88	3.88	∞
Boundary effects	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	4.70	Rectangular	$\sqrt{3}$	1	1	2.71	2.71	∞
System Detection Limits	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Readout Electronics	0.30	Normal	1	1	1	0.30	0.30	∞
Response Time	0.80	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Integration Time	2.60	Rectangular	$\sqrt{3}$	1	1	1.50	1.50	∞
RF Ambient Noise	3.00	Rectangular	$\sqrt{3}$	1	1	1.73	1.73	∞
RF Ambient Reflections	3.00	Rectangular	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe Positioner	0.40	Rectangular	$\sqrt{3}$	1	1	0.23	0.23	∞
Probe Positioning	2.90	Rectangular	$\sqrt{3}$	1	1	1.67	1.67	∞
Max. SAR Eval.	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Mechanical Constraints								
Device Positioning	0.89	Normal	1	1	1	0.89	0.89	9
Device Holder	3.60	Normal	1	1	1	3.60	3.60	5
Power Drift	5.00	Rectangular	$\sqrt{3}$	1	1	2.89	2.89	∞
Physical Parameters								
Phantom Uncertainty	4.00	Rectangular	$\sqrt{3}$	1	1	2.31	2.31	∞
Liquid Conductivity (target)	5.00	Rectangular	$\sqrt{3}$	0.64	0.43	1.85	1.24	∞
Liquid Conductivity (measurement)	3.32	Normal	1	0.64	0.43	2.12	1.43	∞
Liquid Permittivity (target)	5.00	Rectangular	$\sqrt{3}$	0.6	0.49	1.73	1.41	∞
Liquid Permittivity (measurement)	3.25	Normal	1	0.6	0.49	1.95	1.59	∞
Combined Standard Uncertainty						**10.53**	**10.21**	
Coverage Factor for 95%						**Kp=2**		
Expanded Uncertainty (K=2)						**21.06**	**20.42**	

TABLE 7.2

8. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

Web Site: www.adt.com.tw

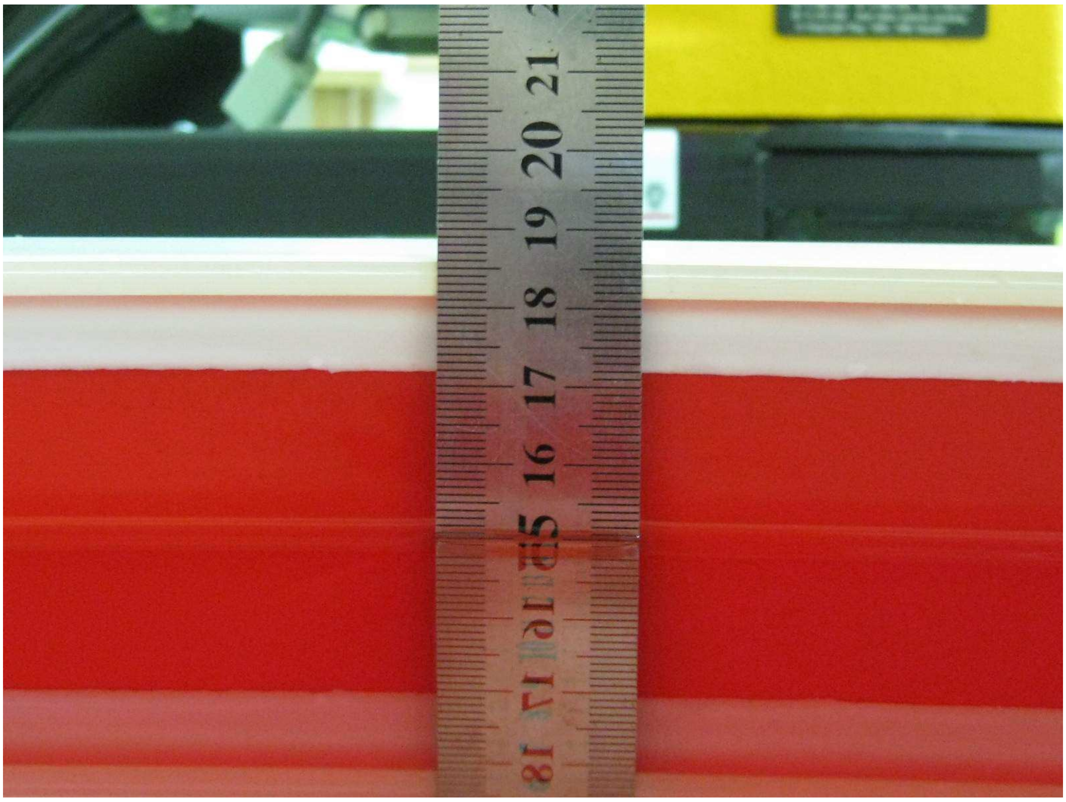
The address and road map of all our labs can be found in our web site also.

---END---

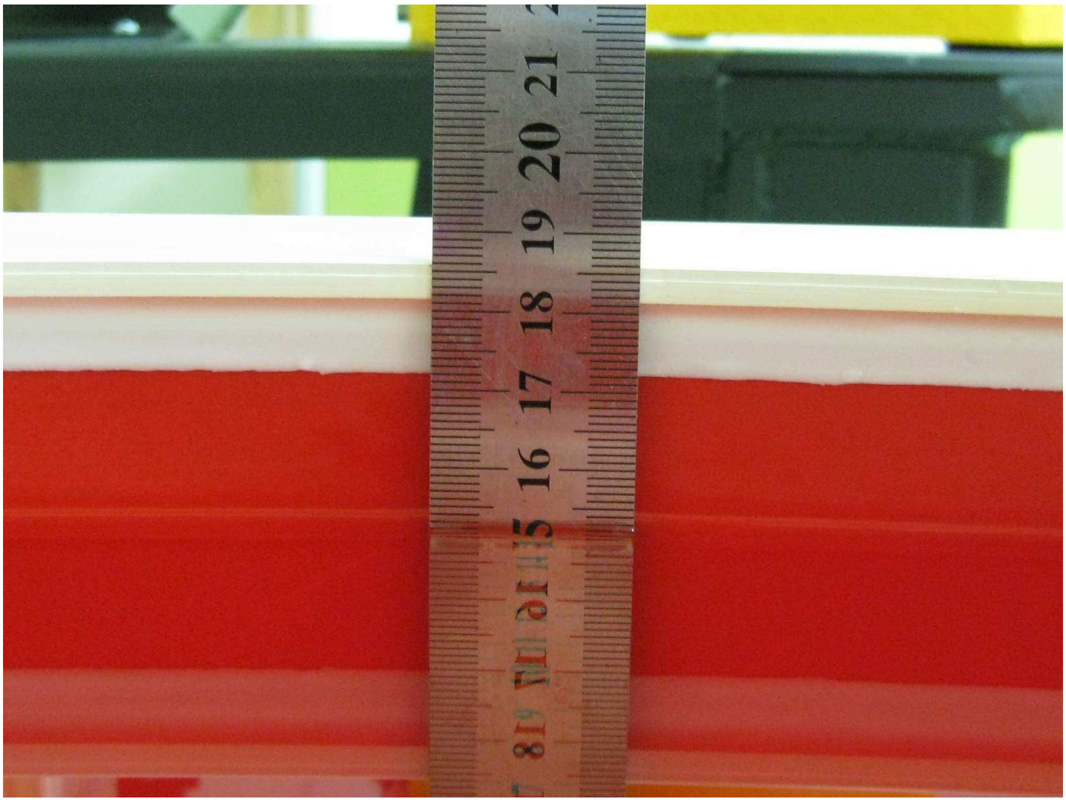
APPENDIX A: TEST DATA

Liquid Level Photo

Tissue MSL 835 MHz D=151mm



Tissue MSL 1900 MHz D=153mm



Date/Time: 2010/2/27 02:37:57

Test Laboratory: Bureau Veritas ADT

M01-Body Bottom CDMA2000 850 Ch1013

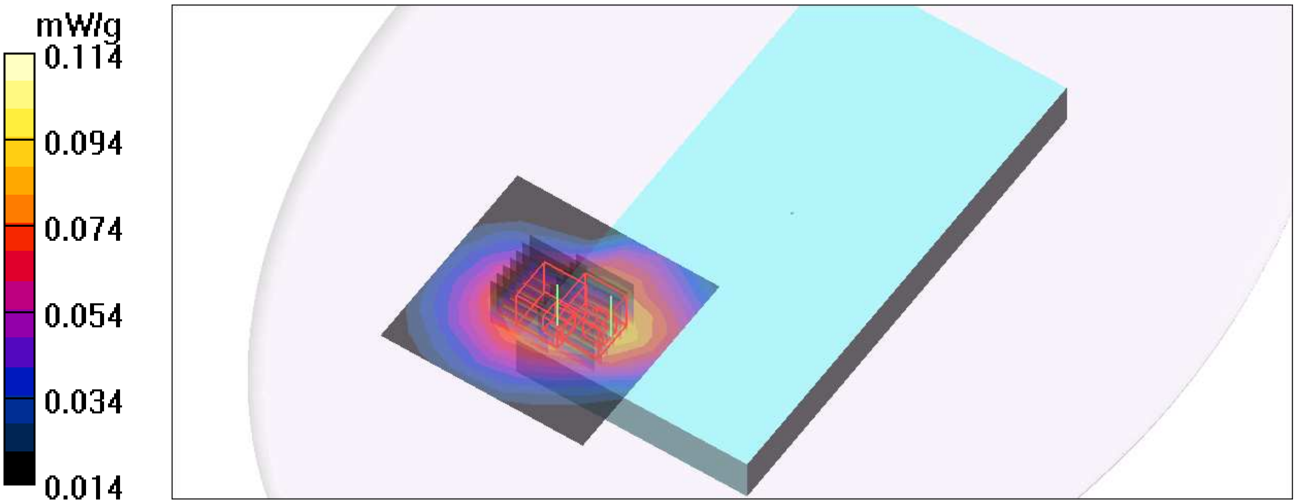
DUT: NB ; Type: PCG-11111N
Communication System: CDMA850 ; Frequency: 824.7 MHz ; Duty Cycle: 1:1
Medium: MSL835 Medium parameters used: f = 824.7 MHz; σ = 0.96 mho/m; ε_r = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: OQPSK
Separation Distance : 0 mm (The back side of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(9.93, 9.93, 9.93) ; Calibrated: 2009/4/28
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0 ; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel 1013/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.112 mW/g

Low Channel 1013/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.44 V/m; Power Drift = -0.080 dB
Peak SAR (extrapolated) = 0.141 W/kg
SAR(1 g) = 0.102 mW/g; SAR(10 g) = 0.077 mW/g
Maximum value of SAR (measured) = 0.115 mW/g

Low Channel 1013/Zoom Scan (7x7x11)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.44 V/m; Power Drift = -0.080 dB
Peak SAR (extrapolated) = 0.140 W/kg
SAR(1 g) = 0.101 mW/g; SAR(10 g) = 0.073 mW/g
Maximum value of SAR (measured) = 0.114 mW/g



Date/Time: 2010/2/27 03:23:35

Test Laboratory: Bureau Veritas ADT

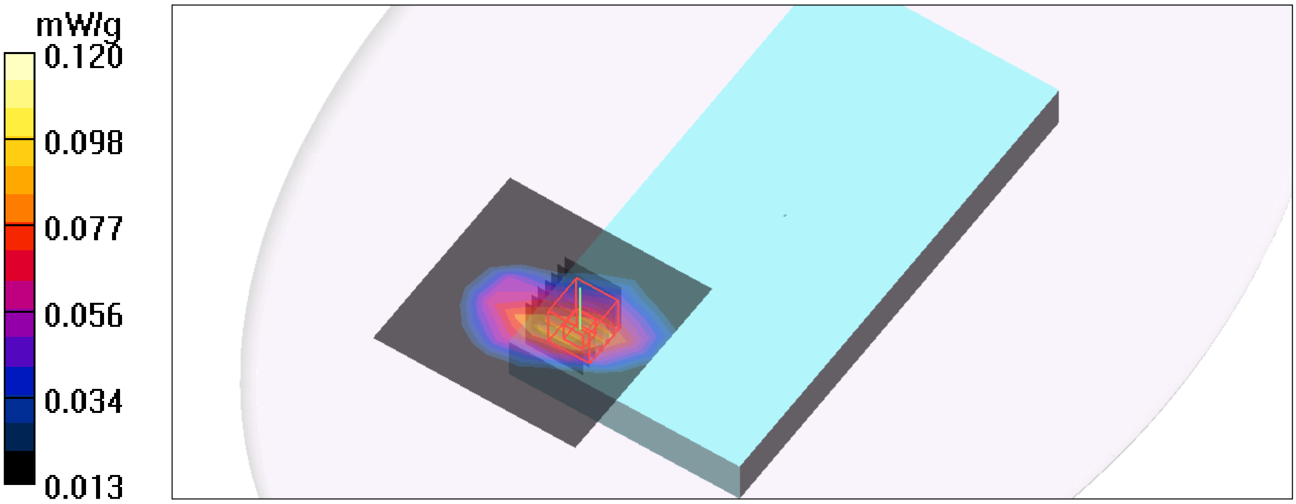
M01-Body Bottom CDMA2000 850 Ch384

DUT: NB ; Type: PCG-11111N
Communication System: CDMA850 ; Frequency: 836.52 MHz ; Duty Cycle: 1:1
Medium: MSL835 Medium parameters used: f = 836.52 MHz; σ = 0.97 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: OQPSK
Separation Distance : 0 mm (The back side of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(9.93, 9.93, 9.93) ; Calibrated: 2009/4/28
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0 ; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel 384/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.116 mW/g

Mid Channel 384/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 2.93 V/m; Power Drift = 0.122 dB
Peak SAR (extrapolated) = 0.146 W/kg
SAR(1 g) = 0.106 mW/g; SAR(10 g) = 0.078 mW/g
Maximum value of SAR (measured) = 0.120 mW/g



Date/Time: 2010/2/27   04:05:53

Test Laboratory: Bureau Veritas ADT

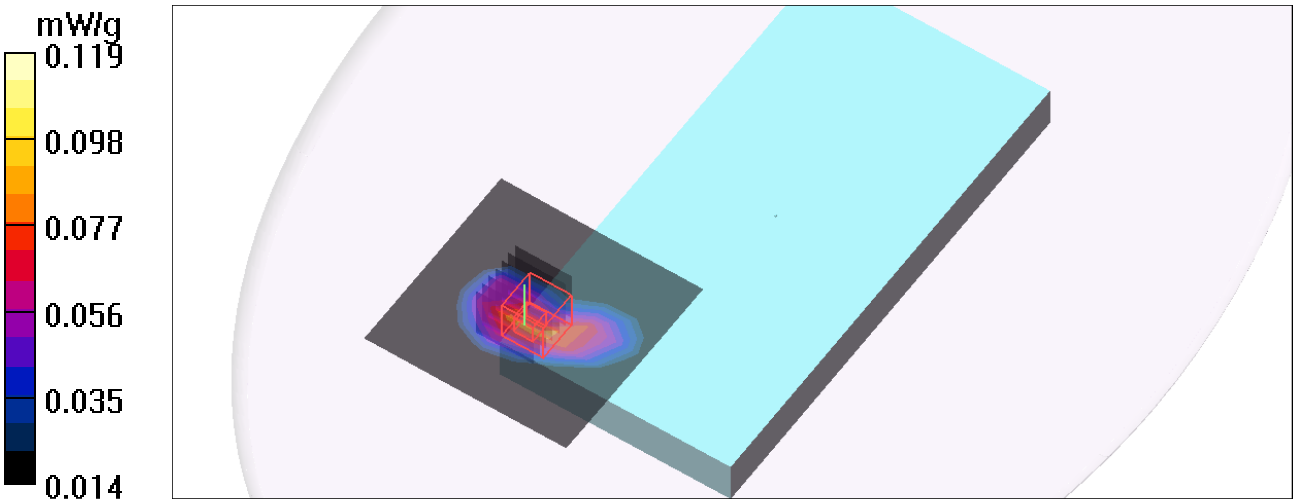
M01-Body Bottom CDMA2000 850 Ch777

DUT: NB ; Type: PCG-11111N
Communication System: CDMA850 ; Frequency: 848.31 MHz ; Duty Cycle: 1:1
Medium: MSL835 Medium parameters used: f = 848.31 MHz; σ = 0.98 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: OQPSK
Separation Distance : 0 mm (The back side of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(9.93, 9.93, 9.93) ; Calibrated: 2009/4/28
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0 ; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel 777/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.115 mW/g

High Channel 777/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 2.06 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.149 W/kg
SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.074 mW/g
Maximum value of SAR (measured) = 0.119 mW/g



Date/Time: 2010/2/27 05:08:48

Test Laboratory: Bureau Veritas ADT

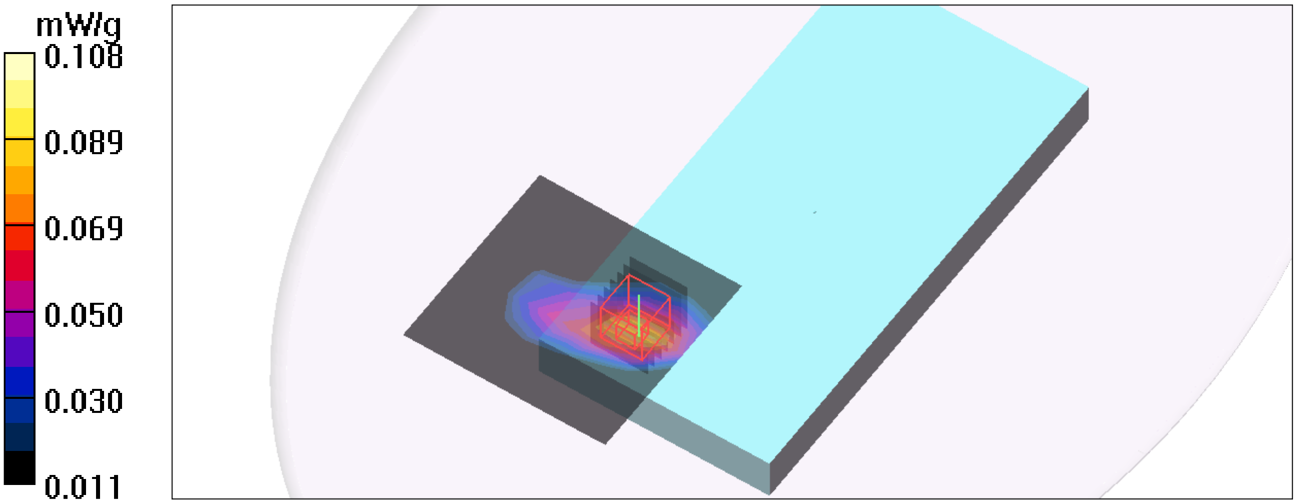
M01-Body Bottom CDMA2000 850 Ch384 / Thick Battery

DUT: NB ; Type: PCG-11111N
Communication System: CDMA850 ; Frequency: 836.52 MHz ; Duty Cycle: 1:1
Medium: MSL835 Medium parameters used: f = 836.52 MHz; σ = 0.97 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: OQPSK
Separation Distance : 0 mm (The back side of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(9.93, 9.93, 9.93) ; Calibrated: 2009/4/28
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0 ; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel 384/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.106 mW/g

Mid Channel 384/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.64 V/m; Power Drift = 0.060 dB
Peak SAR (extrapolated) = 0.131 W/kg
SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.071 mW/g
Maximum value of SAR (measured) = 0.108 mW/g



Date/Time: 2010/2/27 06:53:14

Test Laboratory: Bureau Veritas ADT

M03-Body Bottom CDMA2000 1900 Ch25

DUT: NB ; Type: PCG-11111N

Communication System: CDMA1900 ; Frequency: 1851.25 MHz ; Duty Cycle: 1:1

Medium: MSL1900 Medium parameters used: f = 1851.25 MHz; σ = 1.48 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3

Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: OQPSK

Separation Distance : 0 mm (The back side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590 ; ConvF(8.39, 8.39, 8.39) ; Calibrated: 2009/4/28
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0 ; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel 25/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.299 mW/g

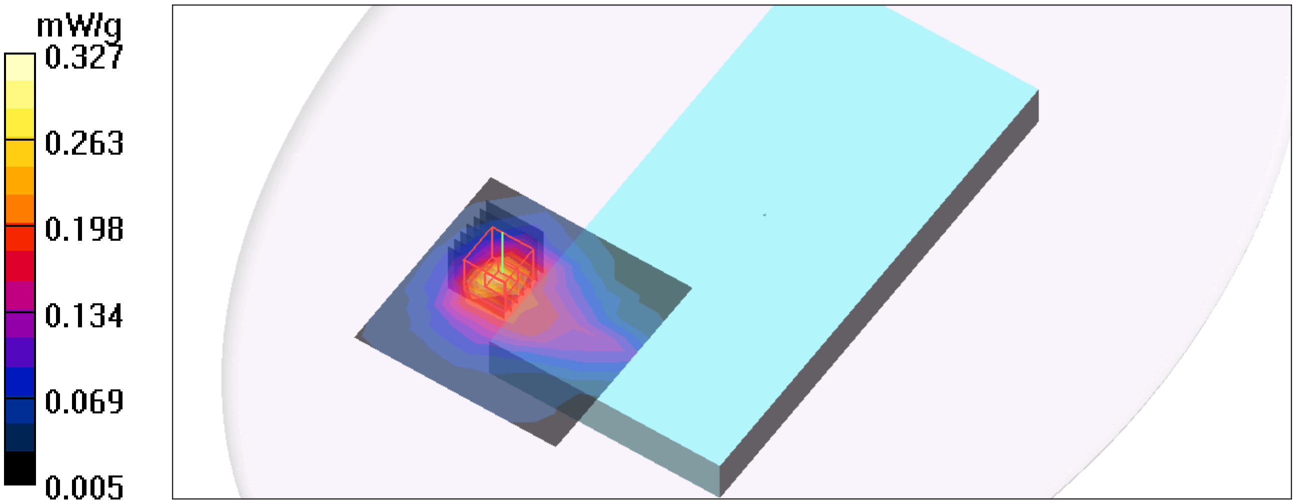
Low Channel 25/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 5.35 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 0.471 W/kg

SAR(1 g) = 0.269 mW/g; SAR(10 g) = 0.146 mW/g

Maximum value of SAR (measured) = 0.327 mW/g



Date/Time: 2010/2/27 07:36:05

Test Laboratory: Bureau Veritas ADT

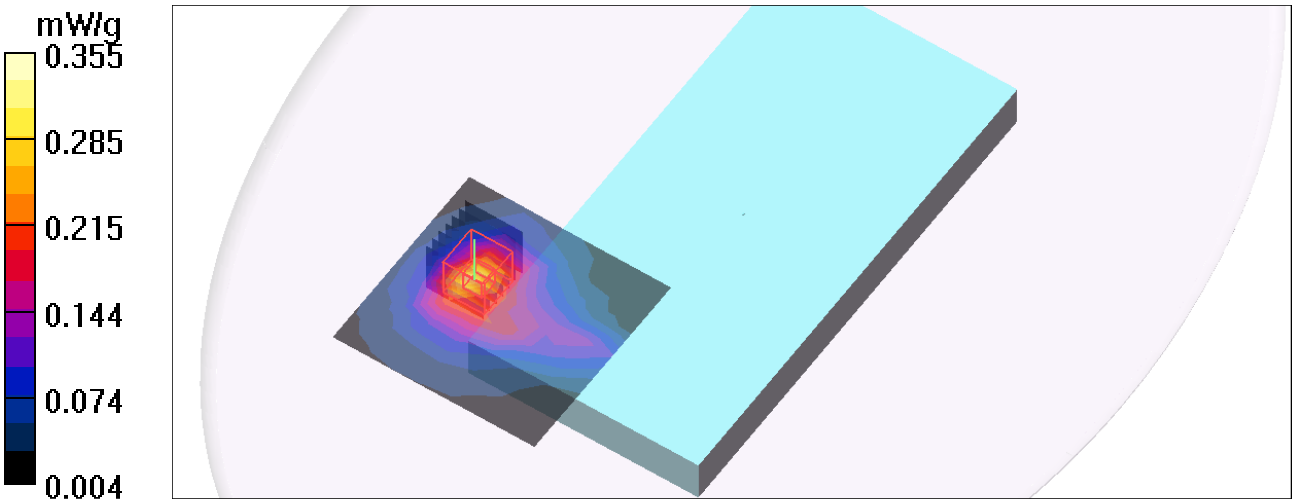
M03-Body Bottom CDMA2000 1900 Ch600

DUT: NB ; Type: PCG-11111N
Communication System: CDMA1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:1
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: OQPSK
Separation Distance : 0 mm (The back side of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(8.39, 8.39, 8.39) ; Calibrated: 2009/4/28
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0 ; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel 600/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.327 mW/g

Mid Channel 600/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 4.90 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 0.505 W/kg
SAR(1 g) = 0.292 mW/g; SAR(10 g) = 0.158 mW/g
Maximum value of SAR (measured) = 0.355 mW/g



Date/Time: 2010/2/27 08:29:20

Test Laboratory: Bureau Veritas ADT

M03-Body Bottom CDMA2000 1900 Ch1175

DUT: NB ; Type: PCG-11111N

Communication System: CDMA1900 ; Frequency: 1908.75 MHz ; Duty Cycle: 1:1

Medium: MSL1900 Medium parameters used: f = 1908.75 MHz; σ = 1.53 mho/m; ε_r = 53; ρ = 1000 kg/m^3

Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: OQPSK

Separation Distance : 0 mm (The back side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590 ; ConvF(8.39, 8.39, 8.39) ; Calibrated: 2009/4/28
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0 ; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel 1175/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.347 mW/g

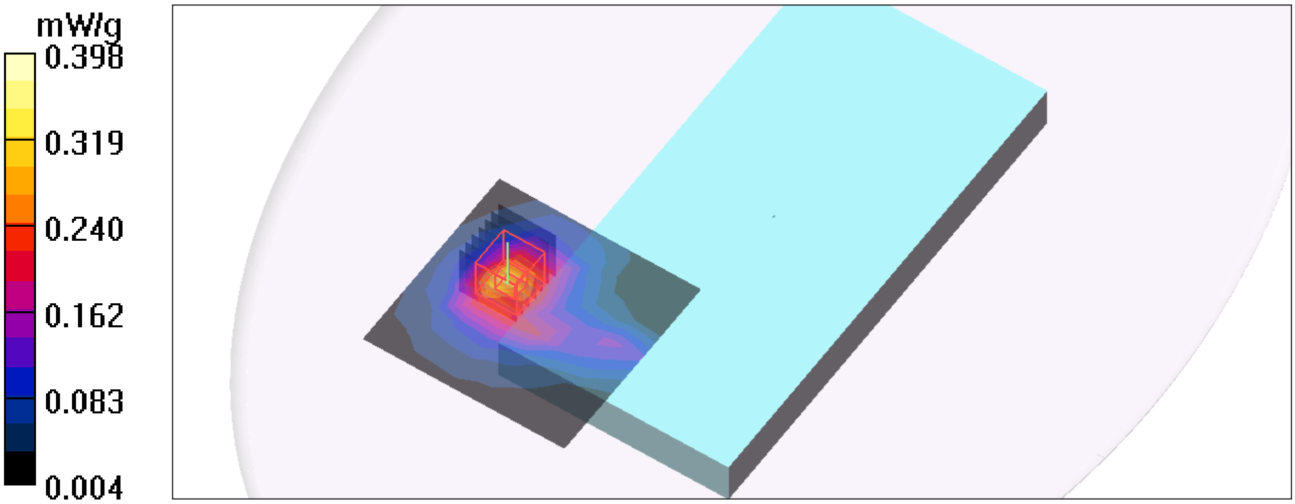
High Channel 1175/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 4.29 V/m; Power Drift = -0.091 dB

Peak SAR (extrapolated) = 0.585 W/kg

SAR(1 g) = 0.325 mW/g; SAR(10 g) = 0.175 mW/g

Maximum value of SAR (measured) = 0.398 mW/g



Date/Time: 2010/2/27 09:08:28

Test Laboratory: Bureau Veritas ADT

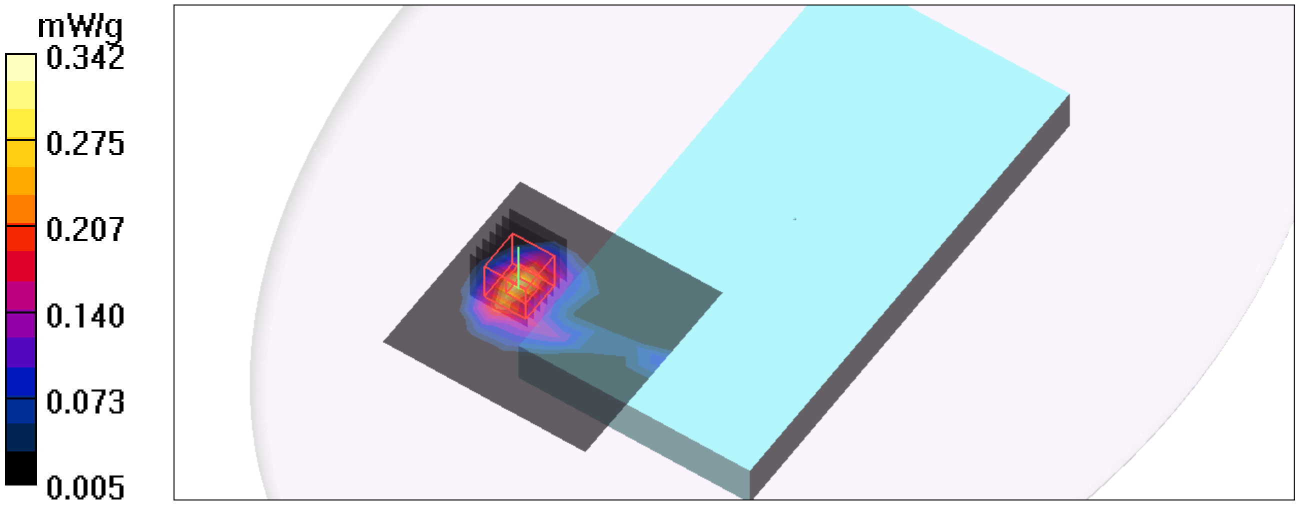
M04-Body Bottom CDMA2000 1900 Ch1175 / Thick Battery

DUT: NB ; Type: PCG-11111N
Communication System: CDMA1900 ; Frequency: 1908.75 MHz ; Duty Cycle: 1:1
Medium: MSL1900 Medium parameters used: f = 1908.75 MHz; σ = 1.53 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: GMSK
Separation Distance : 0 mm (The back side of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(8.39, 8.39, 8.39) ; Calibrated: 2009/4/28
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0 ; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel 1175/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.340 mW/g

High Channel 1175/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 4.75 V/m; Power Drift = -0.101 dB
Peak SAR (extrapolated) = 0.478 W/kg
SAR(1 g) = 0.289 mW/g; SAR(10 g) = 0.170 mW/g
Maximum value of SAR (measured) = 0.342 mW/g



Date/Time: 2010/2/27 00:25:30

Test Laboratory: Bureau Veritas ADT

System Validation Check-MSL 835MHz

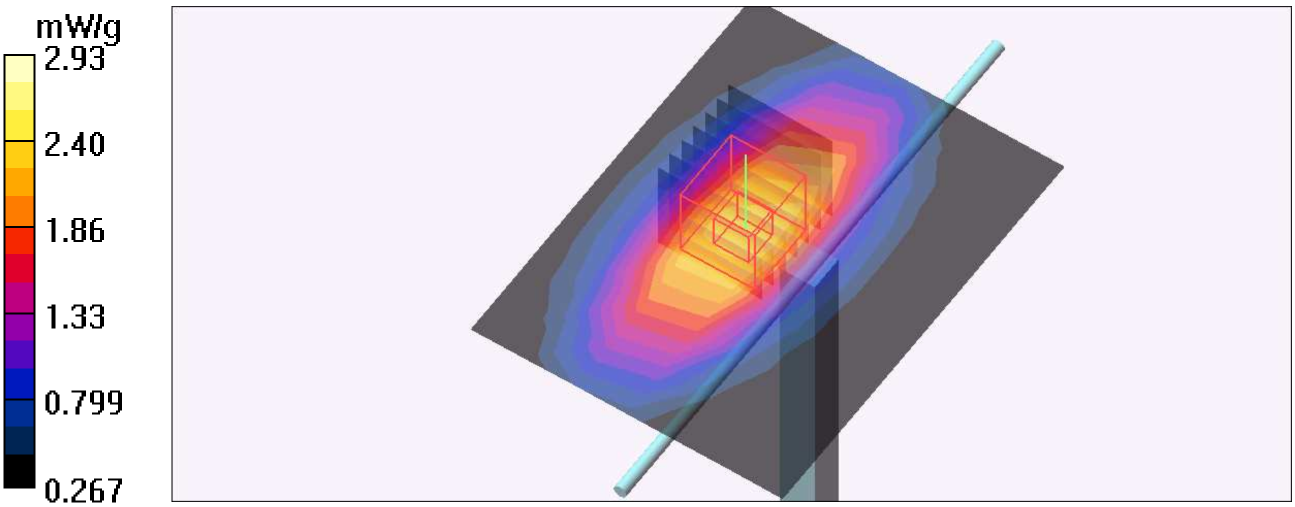
DUT: Dipole 850 MHz ; Type: D835V2 ; Serial: 4d021 ; Test Frequency: 835 MHz

Communication System: CW ; Frequency: 835 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL835;Medium parameters used: f = 835 MHz; $\sigma = 0.97$ mho/m; $\varepsilon_r = 53.9$; $\rho = 1000$ kg/m^3 ;
Liquid level : 151 mm
Phantom section: Flat Section ; Separation distance : 15 mm (The feetpoint of the dipole to the Phantom)Air temp. : 23.1 degrees ; Liquid temp. : 22.8 degrees

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(9.93, 9.93, 9.93) ; Calibrated: 2009/4/28
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=15mm, Pin=250mW/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.51 mW/g

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 42.6 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 3.78 W/kg
SAR(1 g) = 2.49 mW/g; SAR(10 g) = 1.63 mW/g
Maximum value of SAR (measured) = 2.93 mW/g



Date/Time: 2010/2/27 06:11:29

Test Laboratory: Bureau Veritas ADT

System Validation Check-MSL 1900MHz

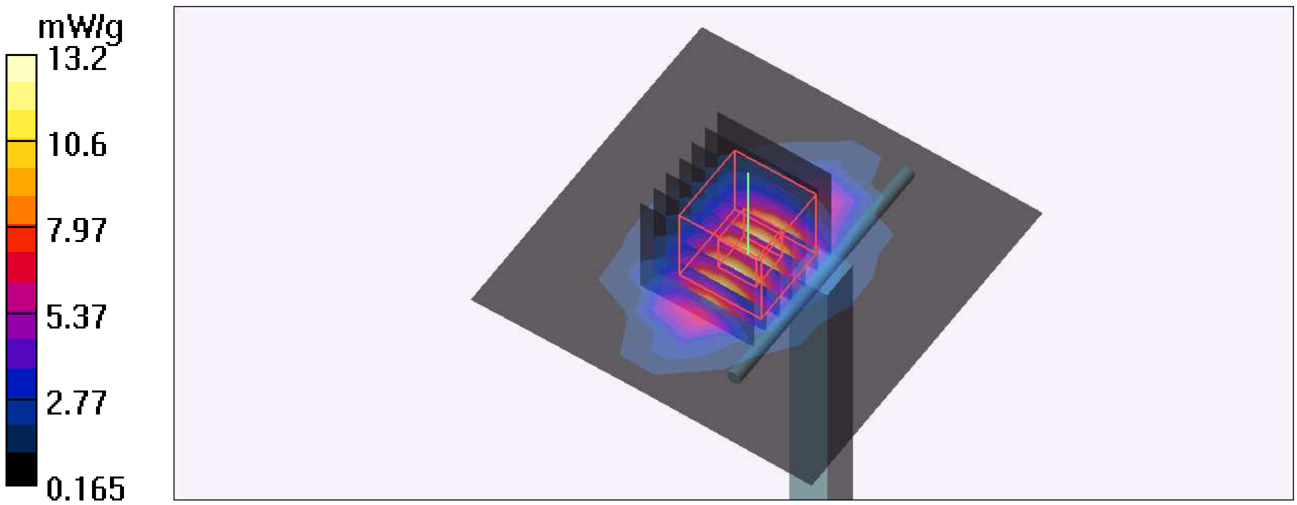
DUT: Dipole 1900 MHz ; Type: D1900V2 ; Serial: 5d022 ; Test Frequency: 1900 MHz

Communication System: CW ; Frequency: 1900 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL1900;Medium parameters used: f = 1900 MHz; σ = 1.52 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3 ; Liquid level : 153 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feetpoint of the dipole to the Phantom)Air temp. : 22.9 degrees ; Liquid temp. : 22.6 degrees

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(8.39, 8.39, 8.39) ; Calibrated: 2009/4/28
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 13.2 mW/g

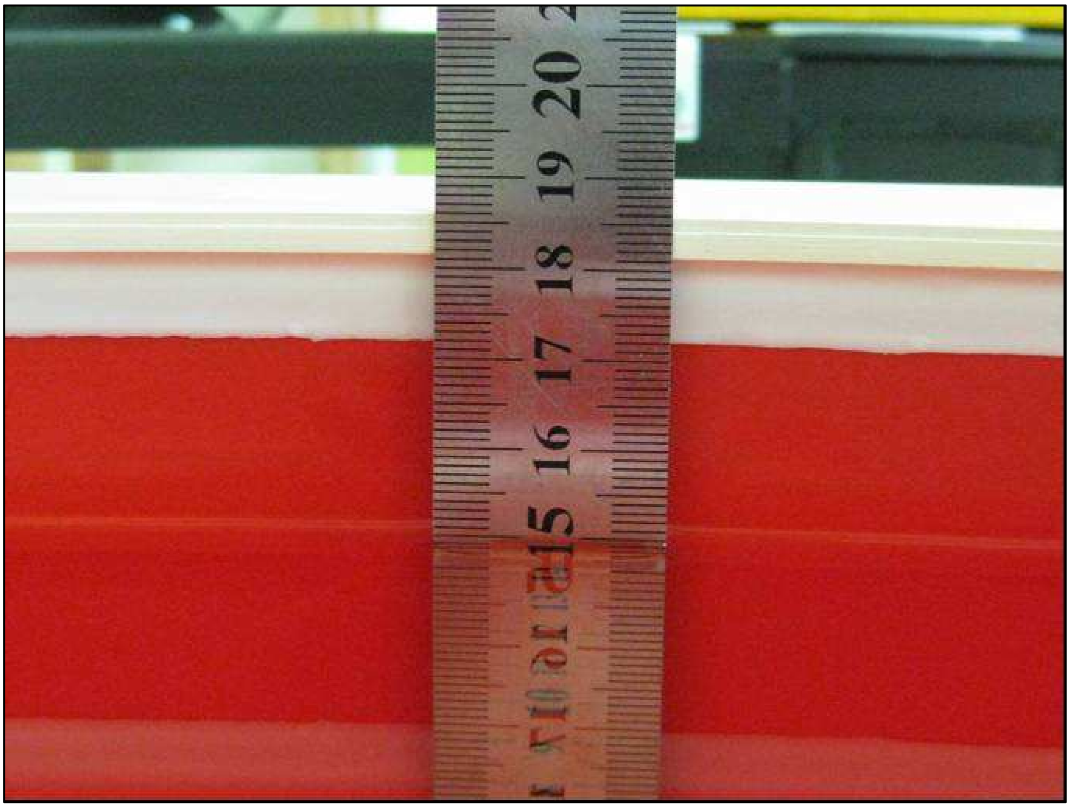
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.0 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 19.5 W/kg
SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.18 mW/g



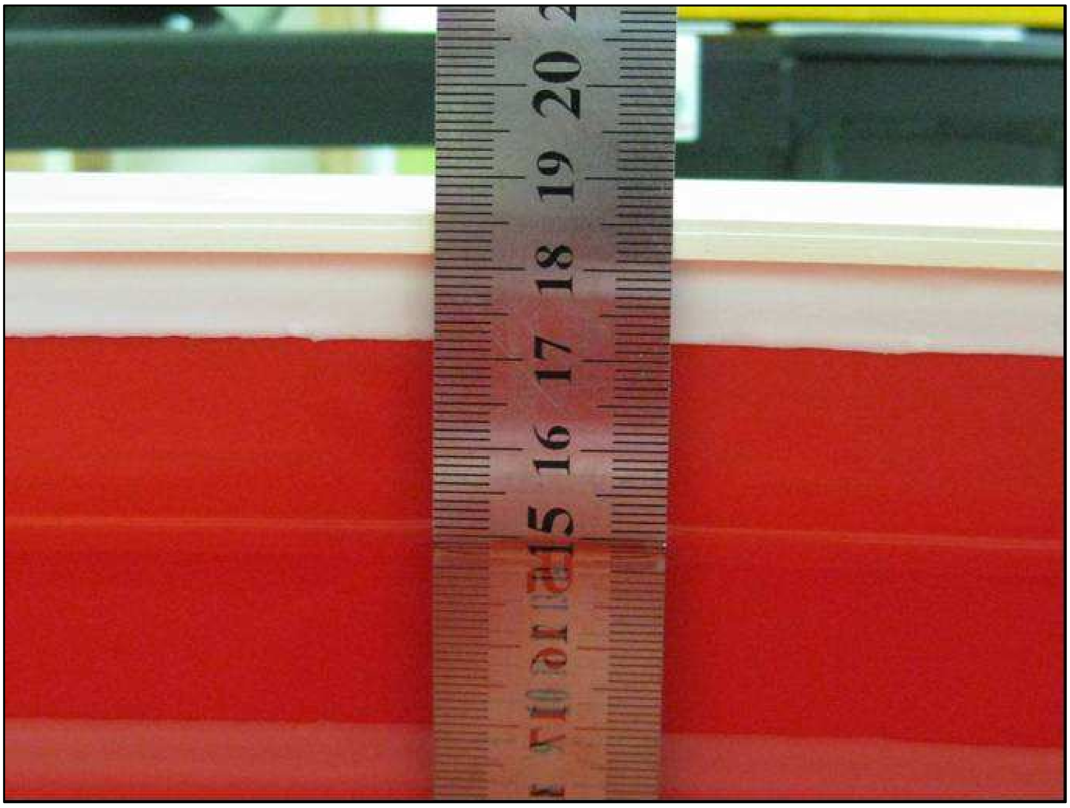
APPENDIX A: TEST DATA

Liquid Level Photo

Tissue MSL 835 MHz D=150mm



Tissue MSL 1900 MHz D=150mm



Date/Time: 2010/3/6 10:26:17

Test Laboratory: Bureau Veritas ADT

M05-EVDO850-Ch777 Bat1

DUT: NB ; Type: PCG-11111N

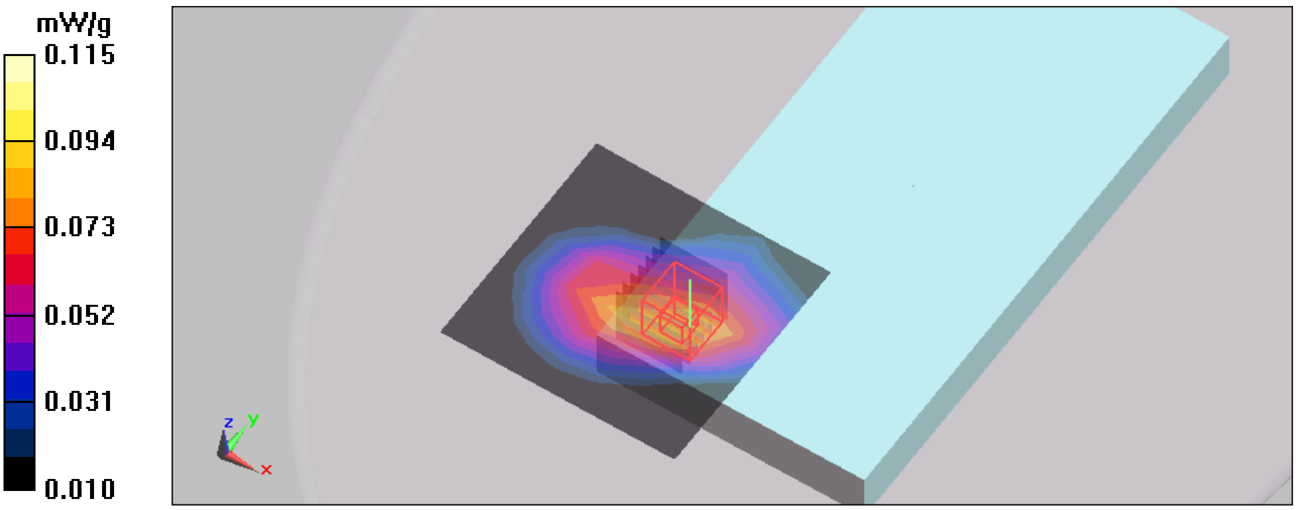
Communication System: EVDO850 ; Frequency: 848.31 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL835 Medium parameters used: f = 848.31 MHz; σ = 1 mho/m; εr = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(9.93, 9.93, 9.93);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

High Channel 777/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.112 mW/g

High Channel 777/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.82 V/m; Power Drift = -0.083 dB
Peak SAR (extrapolated) = 0.140 W/kg
SAR(1 g) = 0.102 mW/g; SAR(10 g) = 0.075 mW/g
Maximum value of SAR (measured) = 0.115 mW/g



Date/Time: 2010/3/6 11:32:51

Test Laboratory: Bureau Veritas ADT

M06-EVDO850-Ch777 Bat2

DUT: NB ; Type: PCG-11111N

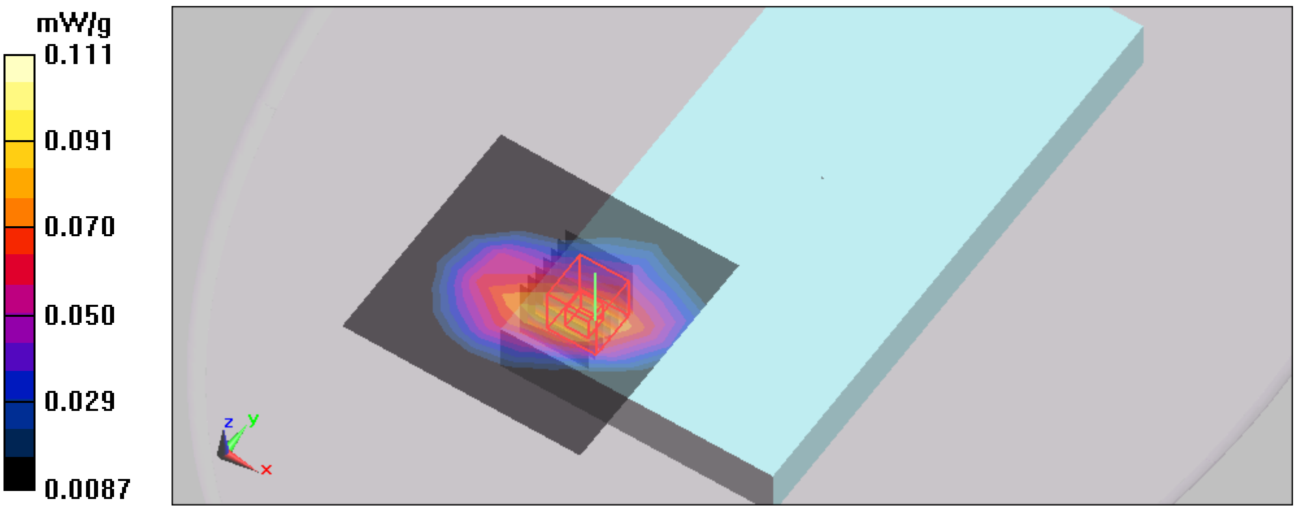
Communication System: EVDO850 ; Frequency: 848.31 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL835 Medium parameters used: f = 848.31 MHz; σ = 1 mho/m; εr = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(9.93, 9.93, 9.93);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

High Channel 777/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.107 mW/g

High Channel 777/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.71 V/m; Power Drift = -0.122 dB
Peak SAR (extrapolated) = 0.135 W/kg
SAR(1 g) = 0.098 mW/g; SAR(10 g) = 0.072 mW/g
Maximum value of SAR (measured) = 0.111 mW/g



Date/Time: 2010/3/6 12:37:15

Test Laboratory: Bureau Veritas ADT

M07-EVDO850-Ch777 Bat1

DUT: NB ; Type: PCG-11111N

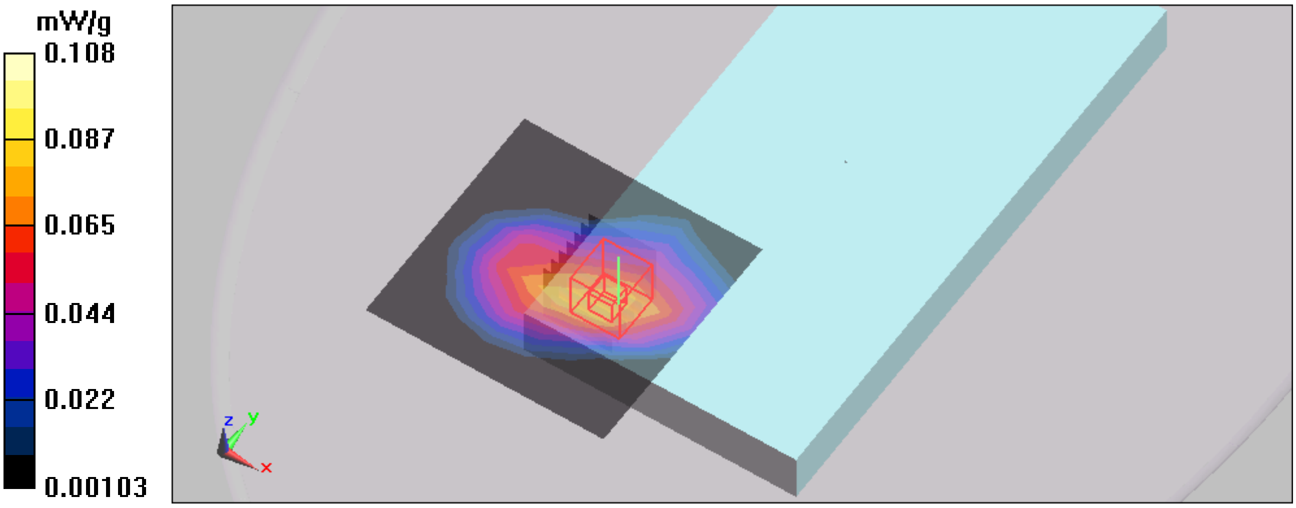
Communication System: EVDO850 ; Frequency: 848.31 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL835 Medium parameters used: f = 848.31 MHz; σ = 1 mho/m; εr = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(9.93, 9.93, 9.93);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

High Channel 777/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.104 mW/g

High Channel 777/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.63 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 0.146 W/kg
SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.070 mW/g
Maximum value of SAR (measured) = 0.108 mW/g



Date/Time: 2010/3/6 13:41:32

Test Laboratory: Bureau Veritas ADT

M08-EVDO850-Ch777 Bat2

DUT: NB ; Type: PCG-11111N

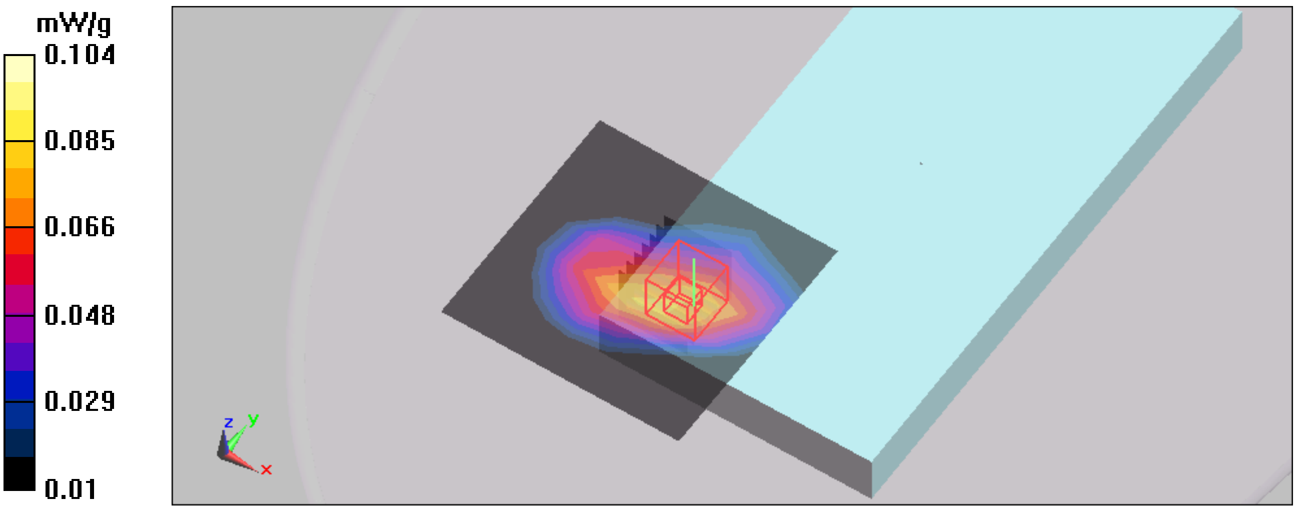
Communication System: EVDO850 ; Frequency: 848.31 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL835 Medium parameters used: f = 848.31 MHz; σ = 1 mho/m; εr = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(9.93, 9.93, 9.93);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

High Channel 777/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.101 mW/g

High Channel 777/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.54 V/m; Power Drift = -0.102 dB
Peak SAR (extrapolated) = 0.127 W/kg
SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.068 mW/g
Maximum value of SAR (measured) = 0.104 mW/g



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Test Laboratory: Bureau Veritas ADT

M09-EVDO1900-Ch25 Bat1

DUT: NB ; Type: PCG-11111N

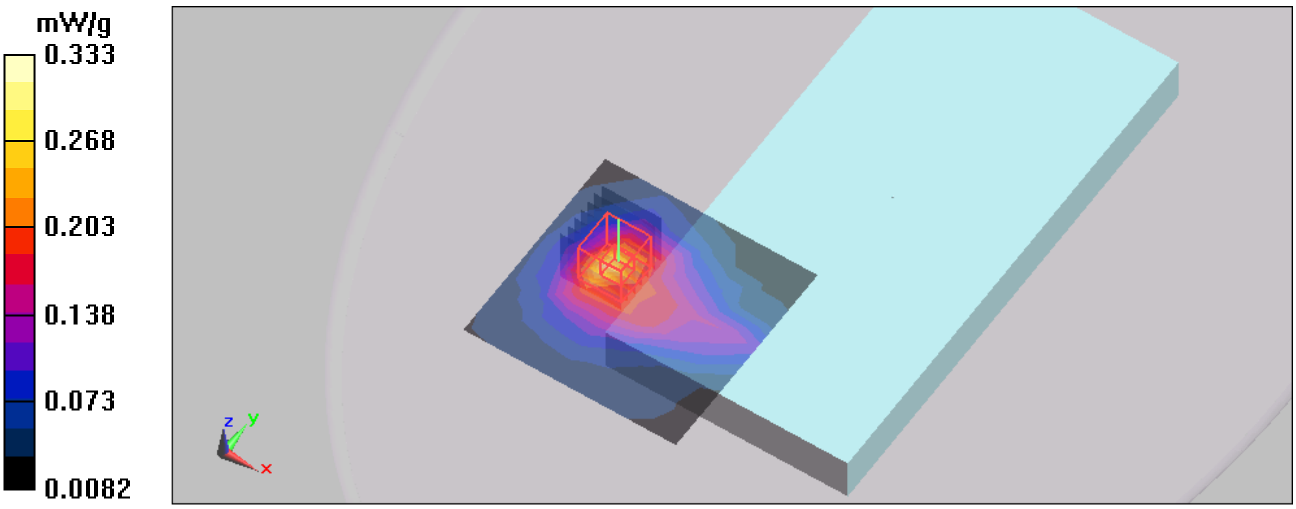
Communication System: EVDO1900 ; Frequency: 1851.25 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL1900 Medium parameters used: f = 1851.25 MHz; σ = 1.51 mho/m; εr = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(8.39, 8.39, 8.39);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

Low Channel 25/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.305 mW/g

Low Channel 25/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.63 V/m; Power Drift = -0.143 dB
Peak SAR (extrapolated) = 0.480 W/kg
SAR(1 g) = 0.274 mW/g; SAR(10 g) = 0.149 mW/g
Maximum value of SAR (measured) = 0.333 mW/g



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Test Laboratory: Bureau Veritas ADT

M09-EVDO1900-Ch600 Bat1

DUT: NB ; Type: PCG-11111N

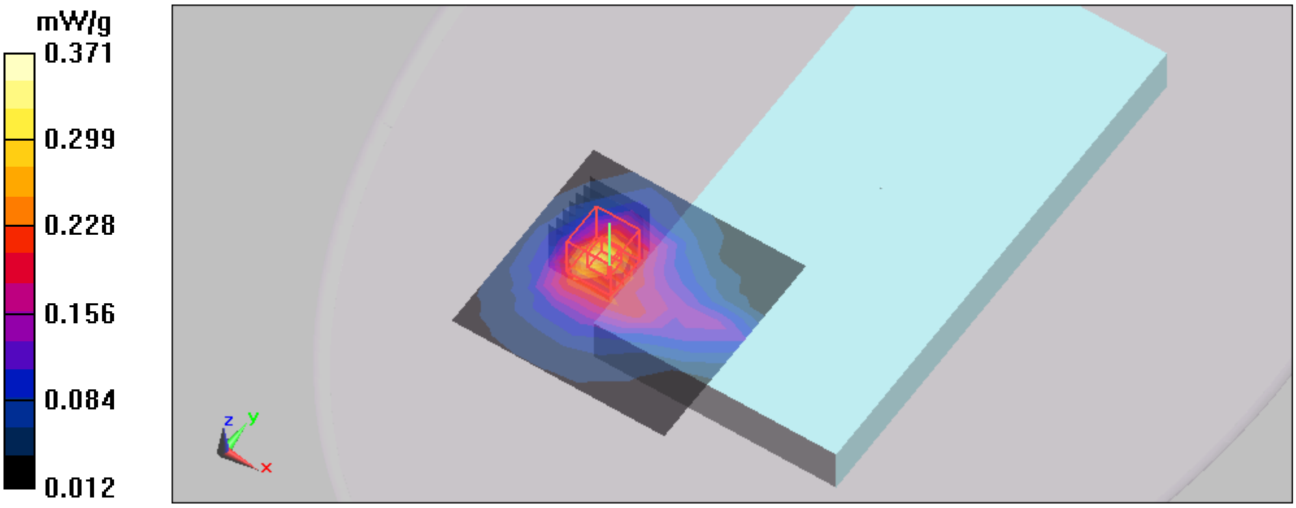
Communication System: EVDO1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; εr = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(8.39, 8.39, 8.39);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

Mid Channel 600/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.342 mW/g

Mid Channel 600/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.97 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 0.527 W/kg
SAR(1 g) = 0.305 mW/g; SAR(10 g) = 0.165 mW/g
Maximum value of SAR (measured) = 0.371 mW/g



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Test Laboratory: Bureau Veritas ADT

M09-EVDO1900-Ch1175 Bat1

DUT: NB ; Type: PCG-11111N

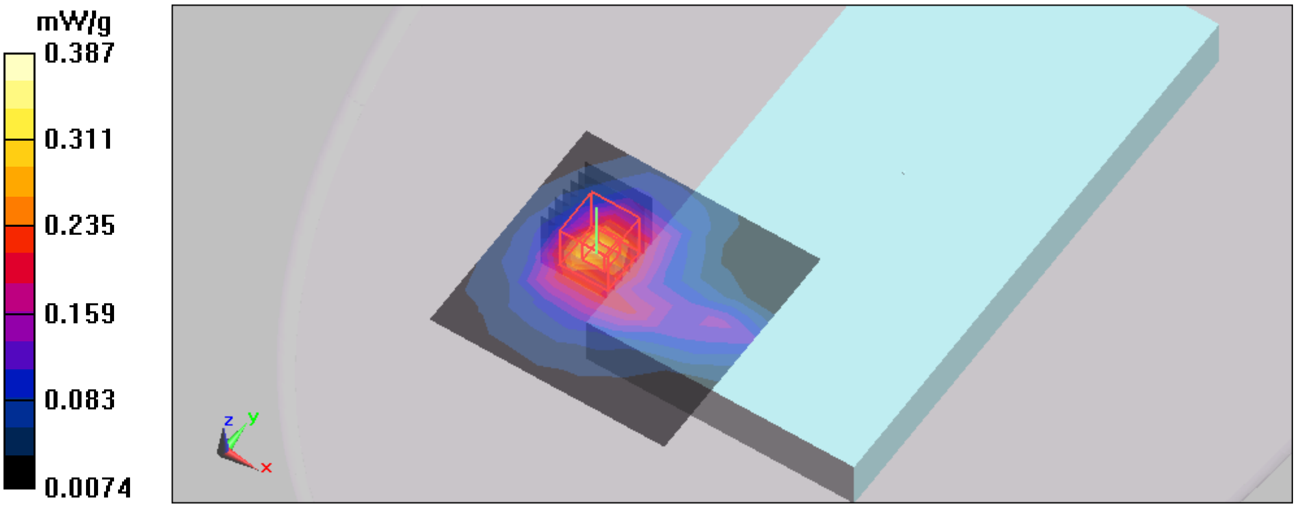
Communication System: EVDO1900 ; Frequency: 1908.75 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL1900 Medium parameters used: f = 1908.75 MHz; σ = 1.56 mho/m; εr = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(8.39, 8.39, 8.39);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

High Channel 1175/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.337 mW/g

High Channel 1175/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.29 V/m; Power Drift = -0.126 dB
Peak SAR (extrapolated) = 0.569 W/kg
SAR(1 g) = 0.316 mW/g; SAR(10 g) = 0.170 mW/g
Maximum value of SAR (measured) = 0.387 mW/g



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Test Laboratory: Bureau Veritas ADT

M10-EVDO1900-Ch1175 Bat2

DUT: NB ; Type: PCG-11111N

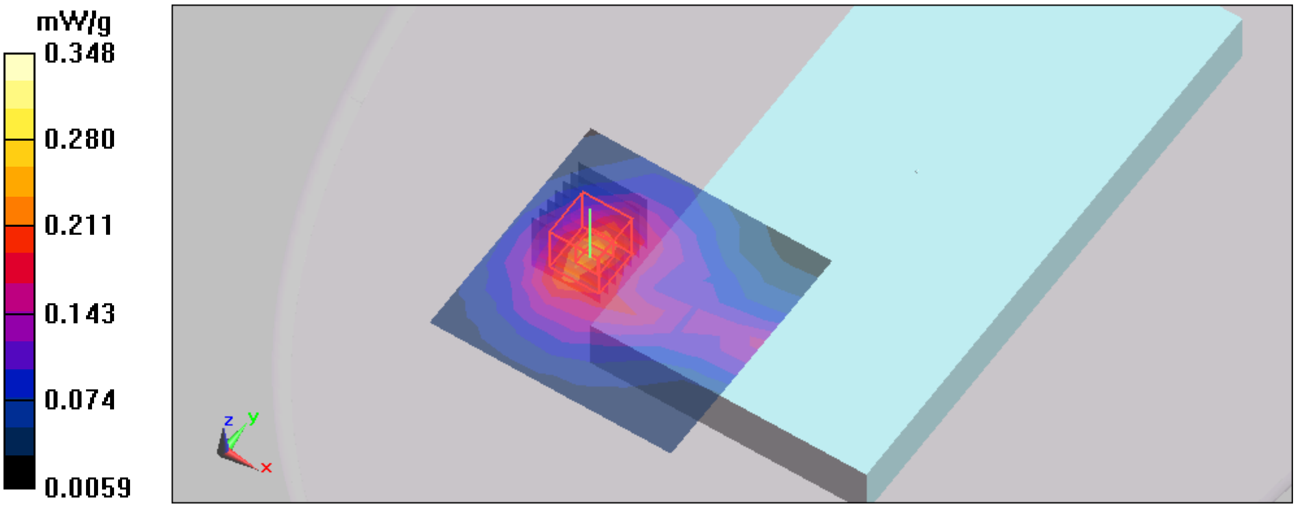
Communication System: EVDO1900 ; Frequency: 1908.75 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL1900 Medium parameters used: f = 1908.75 MHz; σ = 1.56 mho/m; εr = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(8.39, 8.39, 8.39);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

High Channel 1175/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.332 mW/g

High Channel 1175/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.87 V/m; Power Drift = 0.026 dB
Peak SAR (extrapolated) = 0.488 W/kg
SAR(1 g) = 0.294 mW/g; SAR(10 g) = 0.173 mW/g
Maximum value of SAR (measured) = 0.348 mW/g



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Test Laboratory: Bureau Veritas ADT

M11-EVDO1900-Ch25 Bat1

DUT: NB ; Type: PCG-11111N

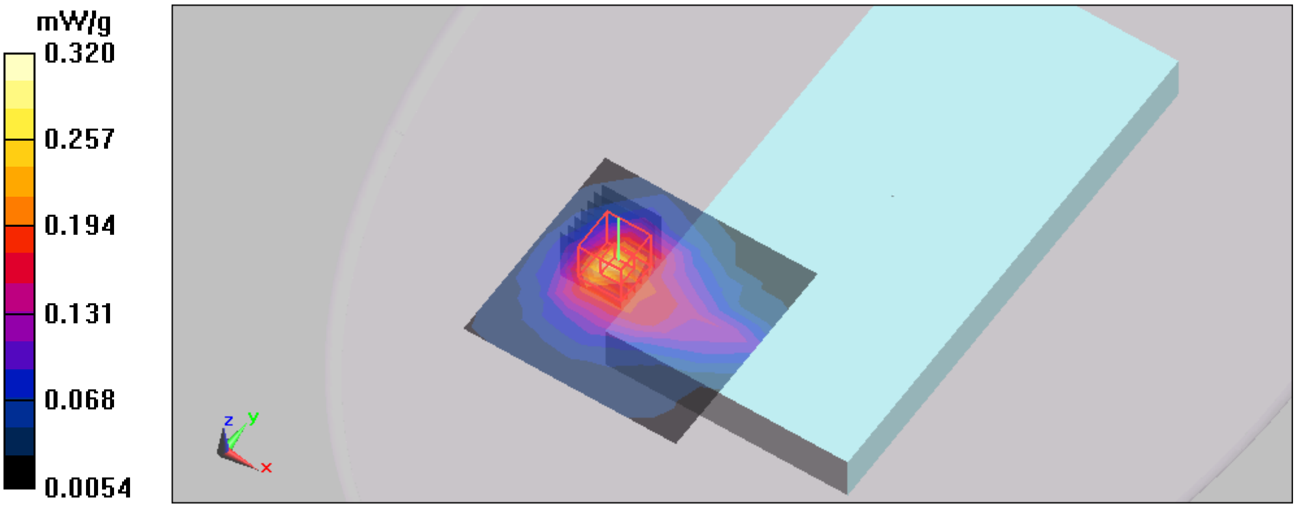
Communication System: EVDO1900 ; Frequency: 1851.25 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL1900 Medium parameters used: f = 1851.25 MHz; σ = 1.51 mho/m; εr = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(8.39, 8.39, 8.39);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

Low Channel 25/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.293 mW/g

Low Channel 25/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.12 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 0.461 W/kg
SAR(1 g) = 0.263 mW/g; SAR(10 g) = 0.143 mW/g
Maximum value of SAR (measured) = 0.320 mW/g



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Test Laboratory: Bureau Veritas ADT

M11-EVDO1900-Ch600 Bat1

DUT: NB ; Type: PCG-11111N

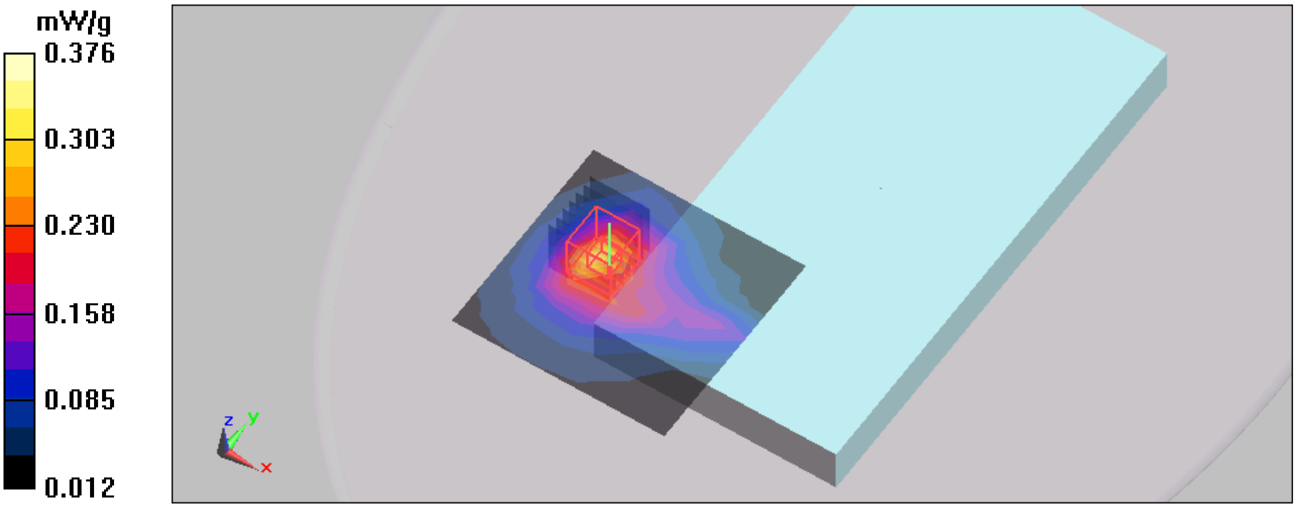
Communication System: EVDO1900 ; Frequency: 1880 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; εr = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(8.39, 8.39, 8.39);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

Mid Channel 600/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.346 mW/g

Mid Channel 600/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.26 V/m; Power Drift = -0.157 dB
Peak SAR (extrapolated) = 0.534 W/kg
SAR(1 g) = 0.309 mW/g; SAR(10 g) = 0.167 mW/g
Maximum value of SAR (measured) = 0.376 mW/g



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Test Laboratory: Bureau Veritas ADT

M11-EVDO1900-Ch1175 Bat1

DUT: NB ; Type: PCG-11111N

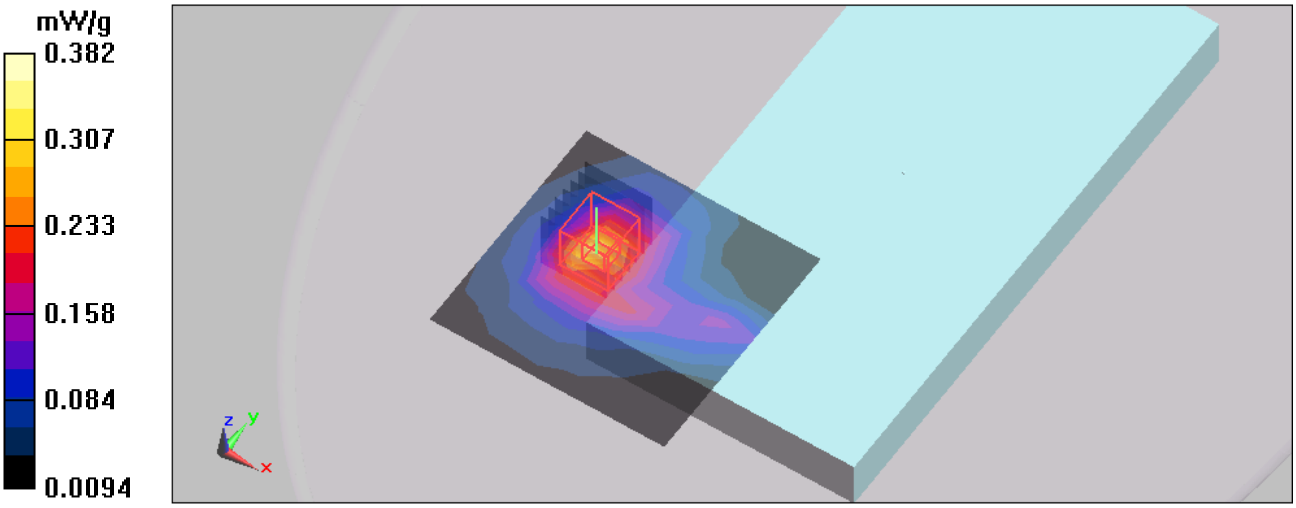
Communication System: EVDO1900 ; Frequency: 1908.75 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL1900 Medium parameters used: f = 1908.75 MHz; σ = 1.56 mho/m; εr = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(8.39, 8.39, 8.39);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

High Channel 1175/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.333 mW/g

High Channel 1175/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.95 V/m; Power Drift = -0.083 dB
Peak SAR (extrapolated) = 0.562 W/kg
SAR(1 g) = 0.312 mW/g; SAR(10 g) = 0.168 mW/g
Maximum value of SAR (measured) = 0.382 mW/g



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Test Laboratory: Bureau Veritas ADT

M12-EVDO1900-Ch1175 Bat2

DUT: NB ; Type: PCG-11111N

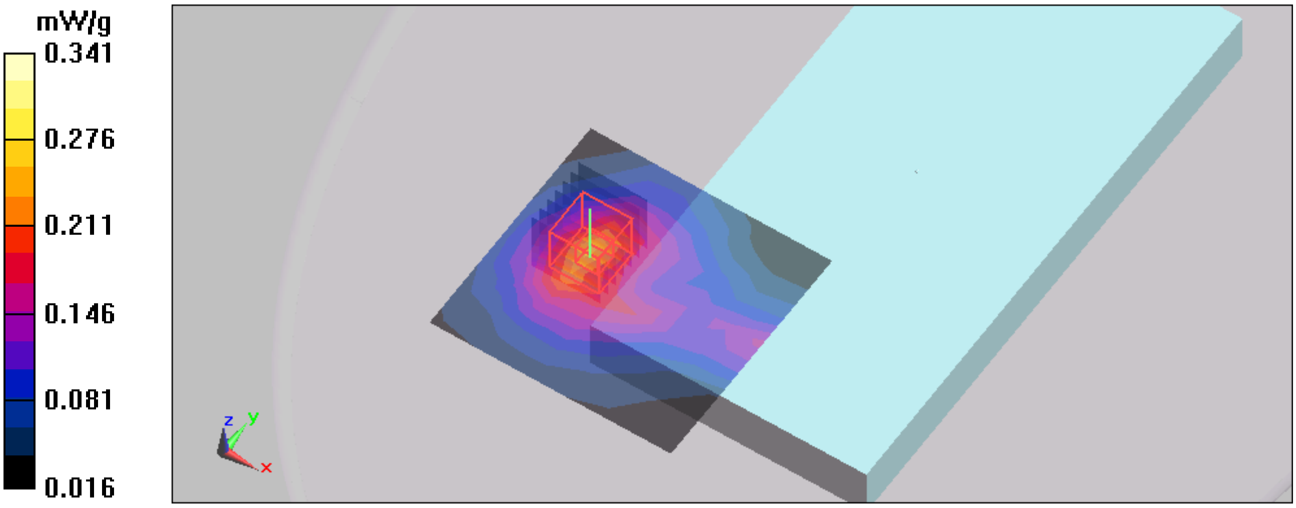
Communication System: EVDO1900 ; Frequency: 1908.75 MHz ; Duty Cycle: 1:1 ; Modulation type: HPSK
Medium: MSL1900 Medium parameters used: f = 1908.75 MHz; σ = 1.56 mho/m; εr = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 0 mm (The back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(8.39, 8.39, 8.39);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

High Channel 1175/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.325 mW/g

High Channel 1175/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.13 V/m; Power Drift = -0.138 dB
Peak SAR (extrapolated) = 0.478 W/kg
SAR(1 g) = 0.288 mW/g; SAR(10 g) = 0.169 mW/g
Maximum value of SAR (measured) = 0.341 mW/g



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Test Laboratory: Bureau Veritas ADT

SystemPerformanceCheck-MSL835 MHz

DUT: Dipole 835 MHz ; Type: D835V2 ; Serial: 4d021 ; Test Frequency: 835 MHz

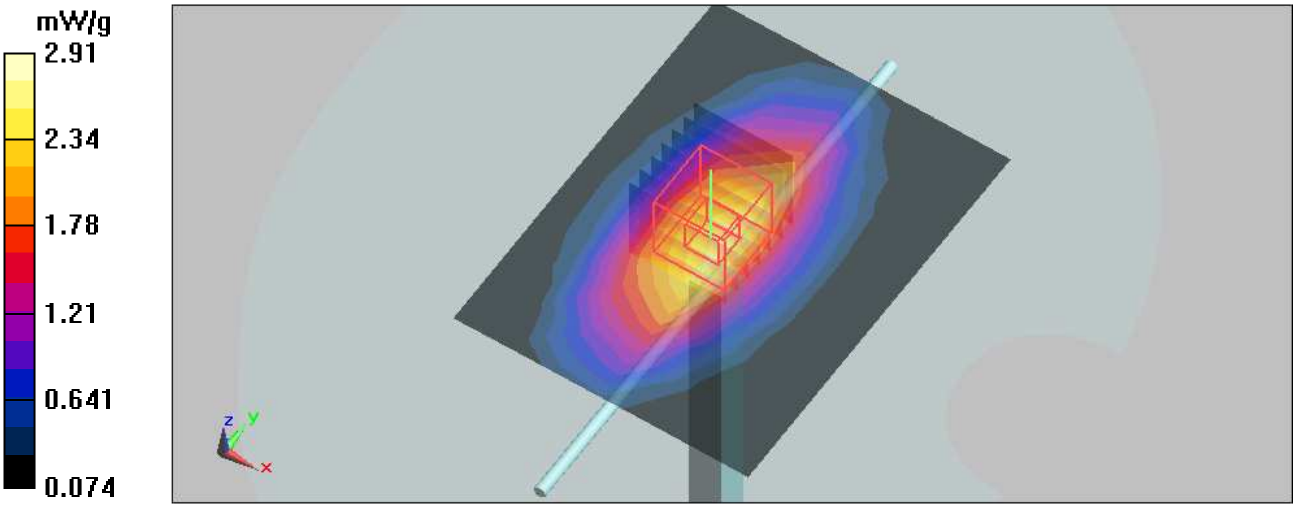
Communication System: CW ; Frequency: 835 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL900;Medium parameters used: f = 835 MHz; $\sigma = 0.98$ mho/m; $\varepsilon_r = 54.3$; $\rho = 1000$ kg/m^3 ;
Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 15 mm (The feetpoint of the dipole to the Phantom)Air temp. : 22.6 degrees ; Liquid temp. : 21.5 degrees

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(9.93, 9.93, 9.93);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

System Performance Check at Frequencies 835 MHz/d=15mm, Pin=250 mW, dist=3.0mm /Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.73 mW/g

System Performance Check at Frequencies 835 MHz/d=15mm, Pin=250 mW, dist=3.0mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.7 V/m; Power Drift = -0.078 dB
Peak SAR (extrapolated) = 3.74 W/kg
SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.61 mW/g
Maximum value of SAR (measured) = 2.91 mW/g



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Test Laboratory: Bureau Veritas ADT

SystemPerformanceCheck-MSL1900 MHz

DUT: Dipole 1900 MHz ; Type: D1900V2 ; Serial: 5d022 ; Test Frequency: 1900 MHz

Communication System: CW ; Frequency: 1900 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL1900;Medium parameters used: f = 1900 MHz; σ = 1.55 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3 ; Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feetpoint of the dipole to the Phantom)Air temp. : 22.3 degrees ; Liquid temp. : 21.4 degrees

DASY5 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(8.39, 8.39, 8.39);
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2010/1/22
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1039
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 57

System Performance Check at Frequencies 1.9 GHz/d=10mm, Pin=250 mW, dist=3.0mm /Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 10.2 mW/g

System Performance Check at Frequencies 1.9 GHz/d=10mm, Pin=250 mW, dist=3.0mm /Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.5 V/m; Power Drift = -0.088 dB
Peak SAR (extrapolated) = 18.1 W/kg
SAR(1 g) = 9.65 mW/g; SAR(10 g) = 5.06 mW/g
Maximum value of SAR (measured) = 12.1 mW/g