SAR TEST REPORT

REPORT NO.:	SA991221E03A
MODEL NO.:	US300 (refer to item 3.1 for more detail)
FCC ID:	V8YFWA810300001W
RECEIVED:	Jan. 28, 2011
TESTED:	Feb. 09, 2011 ~ Mar. 16, 2011
ISSUED:	Mar. 22, 2011

APPLICANT:	Accton Wireless Broadband Corp.
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ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	NA	Mar. 22, 2011

1. CERTIFICATION

PRODUCT: Mobile WiMAX USB Adapter

MODEL: US300 (refer to item 3.1 for more detail)

BRAND: AWB

APPLICANT: Accton Wireless Broadband Corp.

TESTED: Feb. 09, 2011 ~ Mar. 16, 2011

TEST SAMPLE: R&D SAMPLE

STANDARDS: **FCC Part 2 (Section 2.1093)**
FCC OET Bulletin 65, Supplement C (01-01)
RSS-102 Issue 4 (2010-03)

The above equipment (model: WU202) has 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. 22, 2011

APPROVED BY : Gary Chang / Assistant Manager , **DATE :** Mar. 22, 2011

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Mobile WiMAX USB Adapter
MODEL NO.	US300, US300-2.7, US300-2.5
FCC ID	V8YFWA810300001W
POWER SUPPLY	DC 5V from host equipment
MODULATION	QPSK-1/2, -3/4, 16QAM-1/2, -3/4, 64QAM-1/2, -2/3, -3/4
MODULATION TECHNOLOGY	OFDMA
OPERATING FREQUENCY	5MHz: 2502.5 ~ 2687.5MHz 10MHz: 2505 ~ 2685MHz
CHANNEL BANDWIDTH	5MHz & 10MHz
AVERAGE SAR (1g)	1.039W/kg
ANTENNA TYPE	Please see note 2
DATA CABLE	NA
INTERFACE	USB port
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT has three model names which are identical to each other in all aspects except for the following table:

Brand	Product	Model	Description
AWB	Mobile WiMAX USB Adapter	US300	For marketing requirement
		US300-2.7	
		US300-2.5	

From the above models, model: **US300** was selected as representative model for the test and its data was recorded in this report.

2. There are two antennas provided to this EUT, please refer to the following table:

Antenna Type	Antenna Connector	Antenna Gain (dBi)	Frequency range (MHz)	Diversity Function
Printed	NA	2.3	2490~2700	Yes
Printed	NA	2.3	2490~2700	Yes

3. Use the lowest coding rate for each modulation is mentioned on TCB workshop April, 2010 RF Exposure Procedures Update. Therefore only coding rate 1/2 is tested .16/ 64 QAM maximum output power is ≤ ¼ dB higher than QPSK. SAR for 16 / 64 QAM is required when SAR of QPSK is > 0.8 W/kg. The condition is for each test configuration. This reduction condition is mentioned on TCB workshop Oct, 2010 RF Exposure Procedures Update

Up Link		Down Link	
Modulation	**Coding rate**	**Modulation**	**Coding rate**
QPSK	1/2	QPSK	1/2
	3/4		3/4
16QAM	1/2	16QAM	1/2
	3/4		3/4
64QAM	1/2	64QAM	1/2
	2/3		2/3
	3/4		3/4

4. The EUT incorporates a SIMO function for WiMAX. Physically, the EUT provides one completed transmit and two receivers.
5. The EUT embedded a firmware for testing that needs to control from Notebook computer to let EUT with different DL/UL ration.
6. The device has different DL/UL ration in normal operation. It was tested with (DL:UL= 29:18) duty cycle mode for 5MHz and 10MHz, which is the worse mode, and controlled by software. (The detail duty cycle refer to appendix A).
7. The above EUT information was declared by manufacturer and for more detailed feature descriptions, please refers to the manufacturer's specifications or User's Manual.

2.2 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 2 (2.1093)

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

RSS-102 Issue 4 (2010-03)

IEEE 1528-2003

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

2.3 GENERAL INOFRMATION OF THE SAR SYSTEM

DASY5 (software 5.2 Build 162) 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 DASY5 software defined. The DASY5 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	2600MHz
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 (DAE3) 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 DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

2.4 TEST EQUIPMENT

FOR SAR MEASURENENT

ITEM	NAME	BRAND	TYPE	SERIES NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	SAM Phantom	S & P	QD000 P40 CA	TP-1485	NA	NA
2	SAM Phantom	S & P	QD000 P40 CA	TP-1202	NA	NA
3	Signal Generator	Anritsu	68247B	984703	May 31, 2010	May. 30, 2011
4	E-Field Probe	S & P	EX3DV4	3650	Jan. 24, 2011	Jan. 23, 2012
5	E-Field Probe	S & P	EX3DV4	3590	Feb. 25, 2011	Feb. 24, 2012
6	DAE	S & P	DAE 3	510	Oct. 04, 2010	Oct. 03, 2011
7	DAE	S & P	DAE 3	579	Sep. 20, 2010	Sep. 19, 2011
8	Robot Positioner	Staubli Unimation	NA	NA	NA	NA
9	Validation Dipole	S & P	D2600V2	1003	Jan. 27, 2011	Jan. 26, 2012

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

FOR TISSUE PROPERTY

ITEM	NAME	BRAND	TYPE	SERIES NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	Network Analyzer	Agilent	E5071C	MY46104190	Apr. 06, 2010	Apr. 05, 2011
2	Dielectric Probe	Agilent	85070D	US01440176	NA	NA

NOTE:

1. Before starting, all test equipment shall be warmed up for 30min.
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.

2.5 GENERAL DESCRIPTION OF THE SPATIAL PEAK SAR EVALUATION

The DASY5 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 1g and 10g 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 1g and 10g.

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.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7 x 7 x 7 scans. The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30 x 30 x 30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume in a 1mm grid (42875 points). In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is the moved around until the highest averaged SAR is found. If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

3. DESCRIPTION OF SUPPORT UNITS

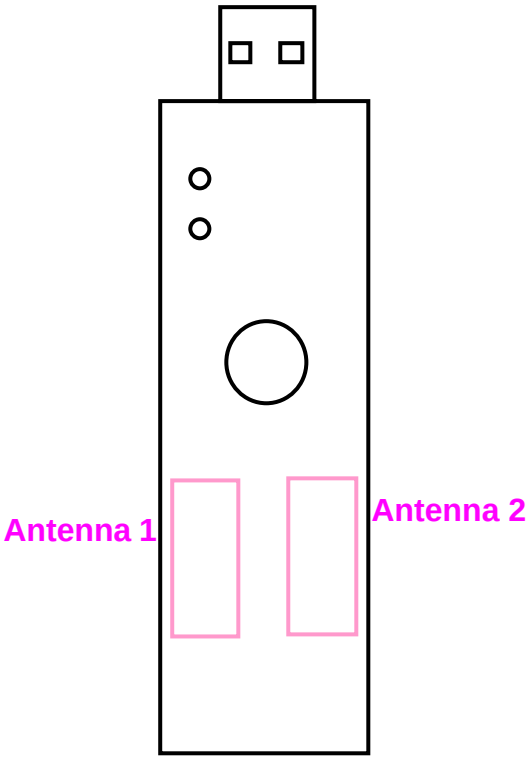
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	D630	29144041120	CXSMM01BRD02D330

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 ANTENNA LOCATION



5. 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
- **DGMBE-** Diethylenglycol-monobuthyl ether (DGMBE), Fluka Chemie GmbH, CAS # 112-34-5 - to reduce relative permittivity

THE RECIPES FOR 2600MHz SIMULATING LIQUID TABLE

Ingredient	Muscle Simulating Liquid 2600MHz (MSL-2600)
Water	69.83%
DGMBE	30.17%
Salt	NA
Dielectric Parameters at 22℃	f= 2600MHz ε= 52.5 ± 5% σ= 2.16 ± 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 30min. 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 DASY5 for the frequencies necessary for the measurements and press ‘Option’-button.
14. Select the current medium for the frequency of the validation.

FOR SIMULATING LIQUID

LIQUID TYPE		MSL-2600			
SIMULATING LIQUID TEMP.		21.7			
TEST DATE		Feb. 09, 2011			
TESTED BY		Van Lin			
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
2502.5	Permitivity (ε)	52.63	53.68	2.00	±5
2505.0		52.63	53.64	1.92	
2600.0		52.51	53.24	1.39	
2685.0		52.40	53.08	1.30	
2687.5		52.40	53.02	1.18	
2502.5	Conductivity (σ) S/m	2.02	2.06	1.98	
2505.0		2.03	2.07	1.97	
2600.0		2.16	2.17	0.46	
2685.0		2.28	2.25	-1.32	
2687.5		2.29	2.26	-1.31	

LIQUID TYPE		MSL-2600			
SIMULATING LIQUID TEMP.		21.2			
TEST DATE		Mar. 16, 2011			
TESTED BY		Van Lin			
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
2502.5	Permitivity (ε)	52.63	54.02	2.64	±5
2505.0		52.63	53.98	2.57	
2600.0		52.51	53.58	2.04	
2685.0		52.40	53.42	1.95	
2687.5		52.40	53.36	1.83	
2502.5	Conductivity (σ) S/m	2.02	2.04	0.99	
2505.0		2.03	2.05	0.99	
2600.0		2.16	2.15	-0.46	
2685.0		2.28	2.23	-2.19	
2687.5		2.29	2.24	-2.18	

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 PROCEDURE

Before the system performance check, we need only to tell the system which components (probe, medium, and device) are used for the system performance check; the system will take care of all parameters. The dipole must be placed beneath the flat 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 mobile phones 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 ±0.02dB.

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 DASY5 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%.

6.2 VALIDATION RESULTS

SYSTEM VALIDATION TEST OF SIMULATING LIQUID					
FREQUENCY (MHz)	**REQUIRED SAR (mW/g)**	**MEASURED SAR (mW/g)**	**DEVIATION (%)**	**SEPARATION DISTANCE**	**TESTED DATE**
MSL2600	13.9 (1g)	13.0	-6.47	10mm	Feb. 09, 2011
MSL2600	13.9 (1g)	14.5	4.32	10mm	Mar. 16, 2011

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

6.3 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	0.25	Rectangular	√3	0.7	0.7	0.10	0.10	∞
Hemispherical Isotropy	1.30	Rectangular	√3	0.7	0.7	0.53	0.53	∞
Boundary effects	1.00	Rectangular	√3	1	1	0.58	0.58	∞
Linearity	0.30	Rectangular	√3	1	1	0.17	0.17	∞
System Detection Limits	1.00	Rectangular	√3	1	1	0.58	0.58	∞
Readout Electronics	0.30	Normal	1	1	1	0.30	0.30	∞
Response Time	0.80	Rectangular	√3	1	1	0.46	0.46	∞
Integration Time	2.60	Rectangular	√3	1	1	1.50	1.50	∞
RF Ambient Noise	3.00	Rectangular	√3	1	1	1.73	1.73	9
RF Ambient Reflections	3.00	Rectangular	√3	1	1	1.73	1.73	9
Probe Positioner	0.40	Rectangular	√3	1	1	0.23	0.23	∞
Probe Positioning	2.90	Rectangular	√3	1	1	1.67	1.67	∞
Max. SAR Eval.	1.00	Rectangular	√3	1	1	0.58	0.58	∞
Test sample related								
Sample positioning	1.90	Normal	1	1	1	1.90	1.90	4
Device holder uncertainty	2.80	Normal	1	1	1	2.80	2.80	4
Output power variation-SAR drift	4.50	Rectangular	√3	1	1	2.60	2.60	1
Dipole Related								
Dipole Axis to Liquid Distance	1.60	Rectangular	√3	1	1	0.92	0.92	4
Input Power Drift	1.62	Rectangular	√3	1	1	0.94	0.94	1
Phantom and Tissue parameters								
Phantom Uncertainty	4.00	Rectangular	√3	1	1	2.31	2.31	∞
Liquid Conductivity (target)	5.00	Rectangular	√3	0.64	0.43	1.85	1.24	∞
Liquid Conductivity (measurement)	1.98	Normal	1	0.64	0.43	1.27	0.85	9
Liquid Permittivity (target)	5.00	Rectangular	√3	0.6	0.49	1.73	1.41	∞
Liquid Permittivity (measurement)	2.00	Normal	1	0.6	0.49	1.20	0.98	9
Combined Standard Uncertainty						**8.82**	**8.57**	
Coverage Factor for 95%						**Kp=2**		
Expanded Uncertainty (K=2)						**17.63**	**17.14**	

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

7. 802.16e/WiMax DEVICE AND SYSTEM OPERATING PARAMETERS

DESCRIPTION	PARAMETER		COMMENT
FCC ID	V8YFWA810300001W		Identify all related FCC ID
Radio Service	Part 27 subpart M		Rule parts
Transmit Frequency Range (MHz)	5MHz BW: 2502.5~2687.5 MHz 10MHz BW:2505.0~2685.0 MHz		System parameter
System/Channel Bandwidth (MHz)	5MHz	10MHz	System parameter
System Profile	Revision 1.7.0		Defined by WiMAX Forum
Modulation Schemes	QPSK1/2, QPSK3/4 16QAM1/2, 16QAM3/4 64QAM1/2,2/3,3/4		Identify all applicable UL modulations
Sampling Factor	28/25		System parameter
Sampling Frequency (MHz)	5.6MHz (3A-5)	11.2MHz (3A-10)	(Fs)
Sample Time (ns)	178.581ns (3A-5)	89.3ns (3A-10)	(1/Fs)
FFT Size (NFFT)	512 (3A-5)	1024 (3A-10)	(NFFT)
Sub-Carrier Spacing (kHz)	10.9375KHz		(Δf)
Useful Symbol time (μs)	91.43μs		(Tb=1/Δf)
Guard Time (μs)	11.43μs		(Tg=Tb/cp); cp = cyclic prefix
OFDMA Symbol Time (μs)	102.857us		(Ts=Tb+Tg)
Frame Size (ms)	5ms		System parameter
TTG + RTG (μs or number of symbols)	165.7143us		Idle time, system parameter
Number of DL OFDMA Symbols per Frame	Max: 29		Identify the allowed & maximum symbols, including both traffic & control symbols
Number of UL OFDMA Symbols per Frame	Max: 18		
DL:UL Symbol Ratio	Max 29:18		For determining UL duty factor
Power Class (dBm) Identify power	Power class 2 23.5dBm+/-0.5		Identify power class and tolerance
Wave1 / Wave2	Wave2: Two antennas for TX/RX diversity. ANT1 and ANT2 cannot transmit simultaneously.		Describe antenna diversity info and MIMO requirements separately
UL Zone Types (FUSC, PUSC, OFUSC, OPUSC, AMC, TUSC1, TUSC2)	PUSC		Describe separately the symbol and sub-carrier/sub-channel structures applicable to each zone type
Maximum Number of UL Sub-Carriers	**5 MHz BW**	**10 MHz BW**	Identify the allowed and tested/to be tested parameters; include separate
	409	841	
UL Burst Maximum Average Power	**ANT 1 (Main)**	**ANT 2 (AUX)**	
	24dBm @ 10MHz	24dBm @ 10MHz	
	24dBm @ 5MHz	24dBm @ 5MHz	
Number and type of UL Control Symbols	3 PUSC symbols (used for ranging, CQICH and ACK/NACK)		

DESCRIPTION	PARAMETER		COMMENT
UL Control Symbol Maximum Average Power	**ANT 1(Main)**	**Calculation**	Identify the allowed and tested/to be tested parameters; include separate
	73.88mW (5MHz/QPSK)	251.19mW x 5/17	
	73.88mW (5MHz/16QAM)	251.19mW x 5/17	
	73.88mW (5MHz/64QAM)	251.19mW x 5/17	
	35.88mW (10MHz/QPSK)	251.19mW x 5/35	
	35.88mW (10MHz/16QAM)	251.19mW x 5/35	
	35.88mW (10MHz/64QAM)	251.19mW x 5/35	
	ANT 2(AUX)	**Calculation**	
	73.88mW (5MHz/QPSK)	251.19mW x 5/17	
	73.88mW (5MHz/16QAM)	251.19mW x 5/17	
	73.88mW (5MHz/64QAM)	251.19mW x 5/17	
	35.88mW (10MHz/QPSK)	251.19mW x 5/35	
	35.88mW (10MHz/16QAM)	251.19mW x 5/35	
	35.88mW (10MHz/64QAM)	251.19mW x 5/35	
UL Burst Peak-to-Average Power Ratio (PAR)	With DL:UL ratio=29:18, PAR is between 7.41 to 8.08 dB.		Identify the expected range and measured/tested PAR; explain separately the methods used / to be used to address SAR probe calibration and measurement error issues
Frame Averaged UL Transmission Duty Factor	The duty cycle is 31.25%. 15/48 = 0.3125 Crest factor is 1/0.3125=3.2 with 29:18 DL:UL ratio. Control symbols are accounted by S.F. (scaling factor) S.F. = (CCP x 3 control symbols + MROP x 15 Traffic symbols) / (actual_OP x 15) CCP: Control Channel Power MROP: Maximum Rated Output Power Actual_OP: actual (measured) maximum power		Show calculations separately and explain how the applicable CF (crest factor) used / to be use in the SAR measurements is derived and how the control symbols are accounted for

8. WIMAX/802.16e DEVICE SPECIFICATION

8.1 WIMAX ZONE TYPES

The device and its system are both transmitting using only PUSC zone type. This enables multiple users to transmit simultaneously within the system. The maximum DL:UL symbol ratio can be determined according to the PUSC requirements. The system transmit an odd number of symbols using DL-PUSC consisting of even multiples of traffics and control symbols plus one symbol for the preamble. Multiples of three symbols are transmitted by the device using UL-PUSC. The OFDMA symbol time allows up to 48 downlink and uplink symbols in each 5 ms frame. TTG and RTG are also included in each frame as DL/UL transmission gaps; therefore, the system can only allow 47 or less symbols per frame.

8.2 POWER MEASUREMENT

Set the transmitter under transmission condition continuously at specific mode with maximum output. 15 traffic symbols are transmitting at max. power and three control symbols are not used nor activate.

The power meter was used to read the response of the power sensor. Record the power level and PK to AV ratio.

The maximum conducted output power is measured for the uplink burst at DL:UL ratio=29:18 that is measured for the uplink bursts through triggering and gating.

The measured results are as below table:

OUTPUT POWER TABLE

Chain 0 output power for WiMAX Antenna 1

Channel Bandwidth	UL zone type / DL/UL Ratio	CH Freq. (MHz)	Conducted Power (dBm)		Peak to Average ratio (dB)	UL modulation
			AV	PK		
5MHz	PUSC / 29:18	2502.5	23.24	31.26	8.02	QPSK
			23.22	31.21	7.99	16QAM
			23.16	31.34	8.18	64QAM
		2600	23.20	31.25	8.04	QPSK
			23.16	31.13	7.97	16QAM
			23.01	30.81	7.80	64QAM
		2687.5	23.18	31.50	8.32	QPSK
			23.20	31.47	8.26	16QAM
			23.01	30.96	7.95	64QAM
10MHz	PUSC / 29:18	2505	23.27	31.52	8.25	QPSK
			23.23	31.21	7.98	16QAM
			23.15	30.99	7.84	64QAM
		2600	23.12	31.02	7.90	QPSK
			23.07	30.92	7.85	16QAM
			23.06	31.07	8.01	64QAM
		2685	23.21	30.99	7.78	QPSK
			23.20	31.14	7.94	16QAM
			23.13	31.13	8.00	64QAM

Chain 0 output power for WiMAX Antenna 2

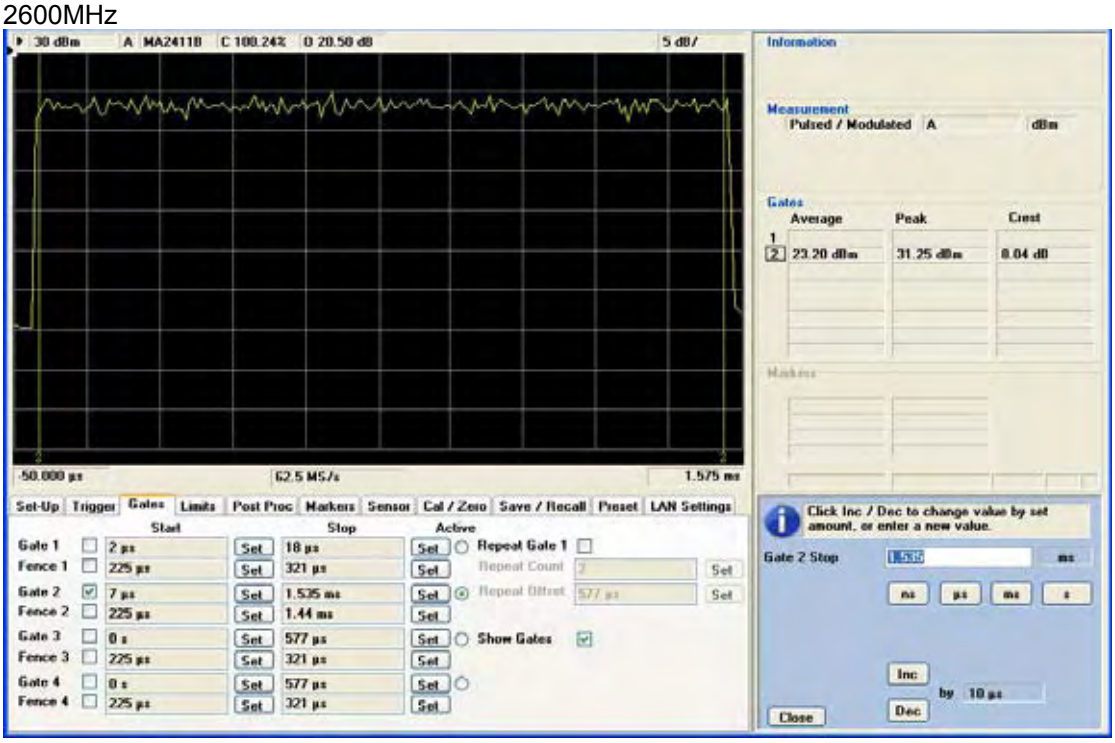
Channel Bandwidth	UL zone type / DL/UL Ratio	CH Freq. (MHz)	Conducted Power (dBm)		Peak to Average ratio (dB)	UL modulation
			AV	PK		
5MHz	PUSC / 29:18	2502.5	23.34	31.35	8.01	QPSK
			23.29	31.41	8.12	16QAM
			23.33	31.33	8.00	64QAM
		2600	23.23	31.46	8.23	QPSK
			23.22	31.32	8.10	16QAM
			23.21	31.09	7.88	64QAM
		2687.5	23.26	31.44	8.18	QPSK
			23.22	31.40	8.18	16QAM
			23.11	31.25	8.14	64QAM
10MHz	PUSC / 29:18	2505	23.31	31.54	8.23	QPSK
			23.27	31.23	7.95	16QAM
			23.27	31.08	7.81	64QAM
		2600	23.23	31.47	8.24	QPSK
			23.21	31.33	8.12	16QAM
			23.21	30.97	7.76	64QAM
		2685	23.27	31.28	8.00	QPSK
			23.25	31.34	8.09	16QAM
			23.11	31.13	8.03	64QAM

Test plots of conducted power and PAR ratio for middle channel

For Antenna 1

Bandwidth 5MHz / Modulation : QPSK

2600MHz

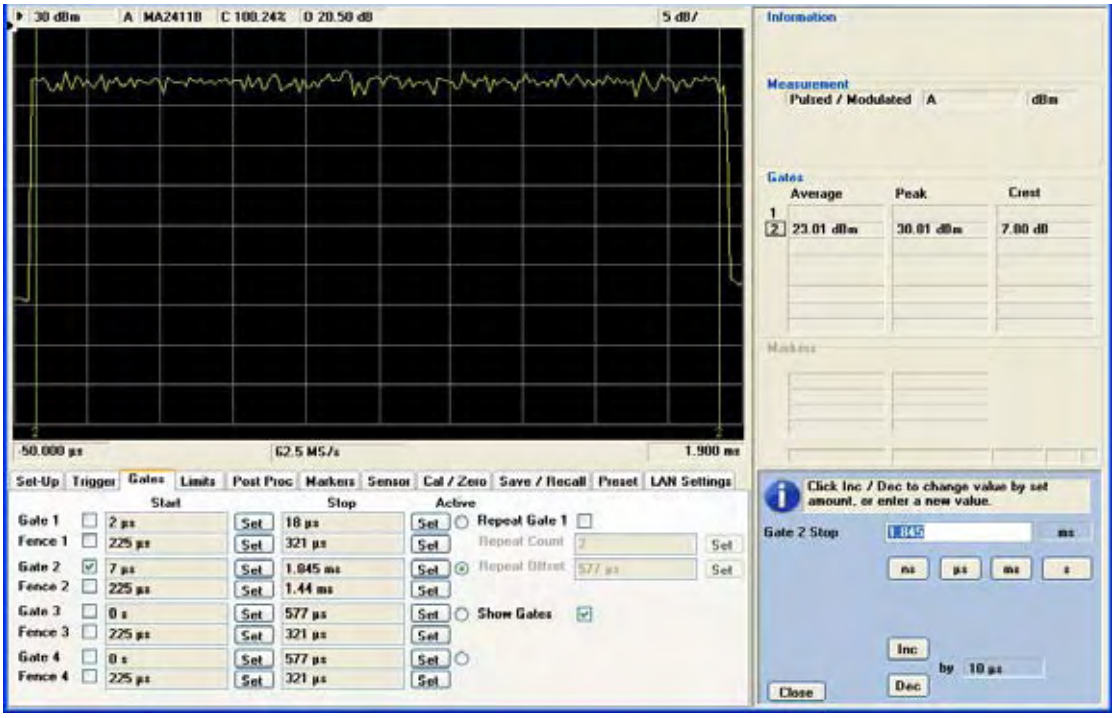


Bandwidth 5MHz / Modulation : 16QAM

2600MHz

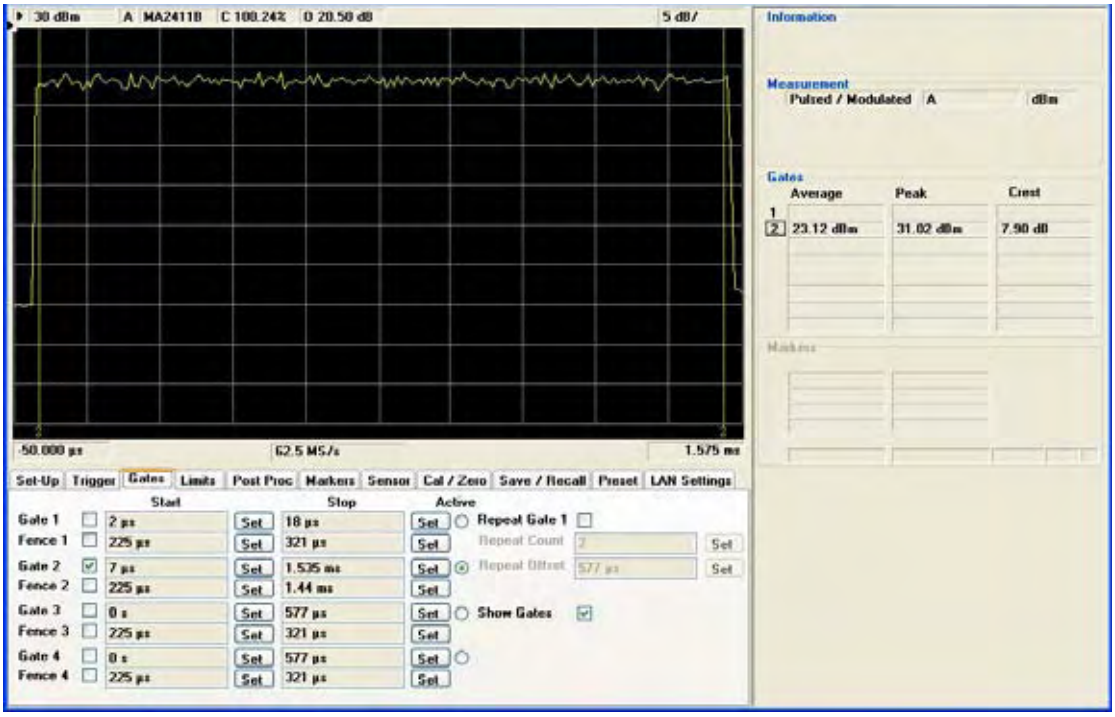
Bandwidth 5MHz / Modulation : 64QAM

2600MHz



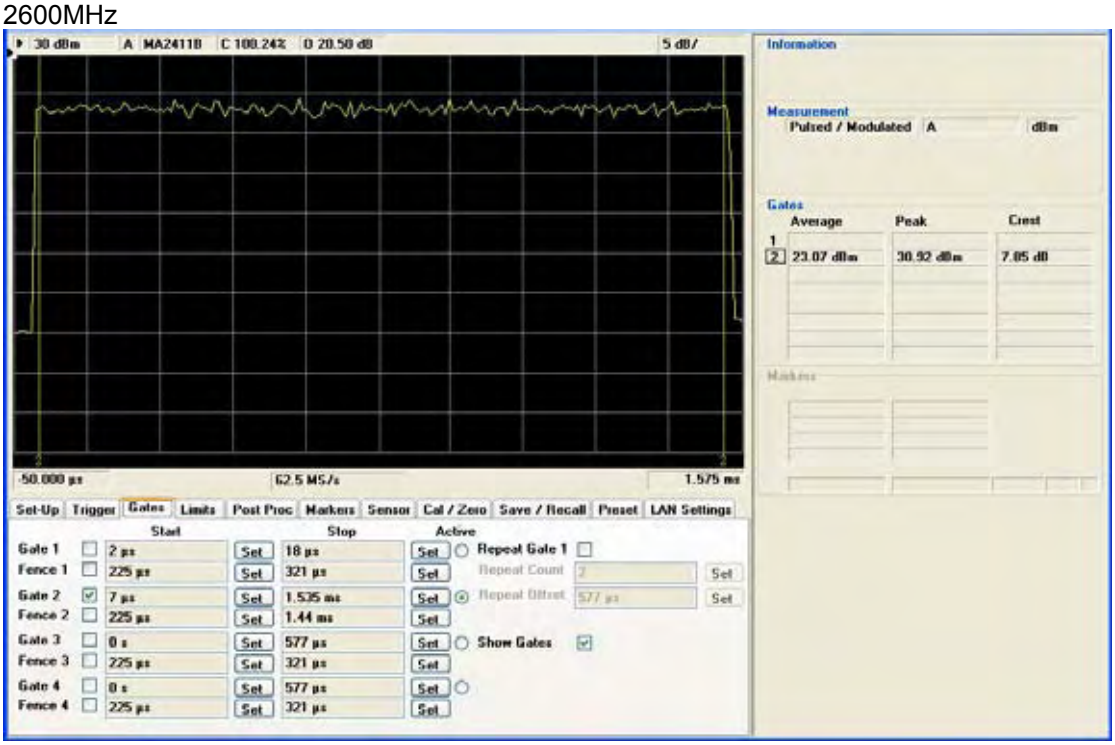
Bandwidth 10MHz / Modulation : QPSK

2600MHz



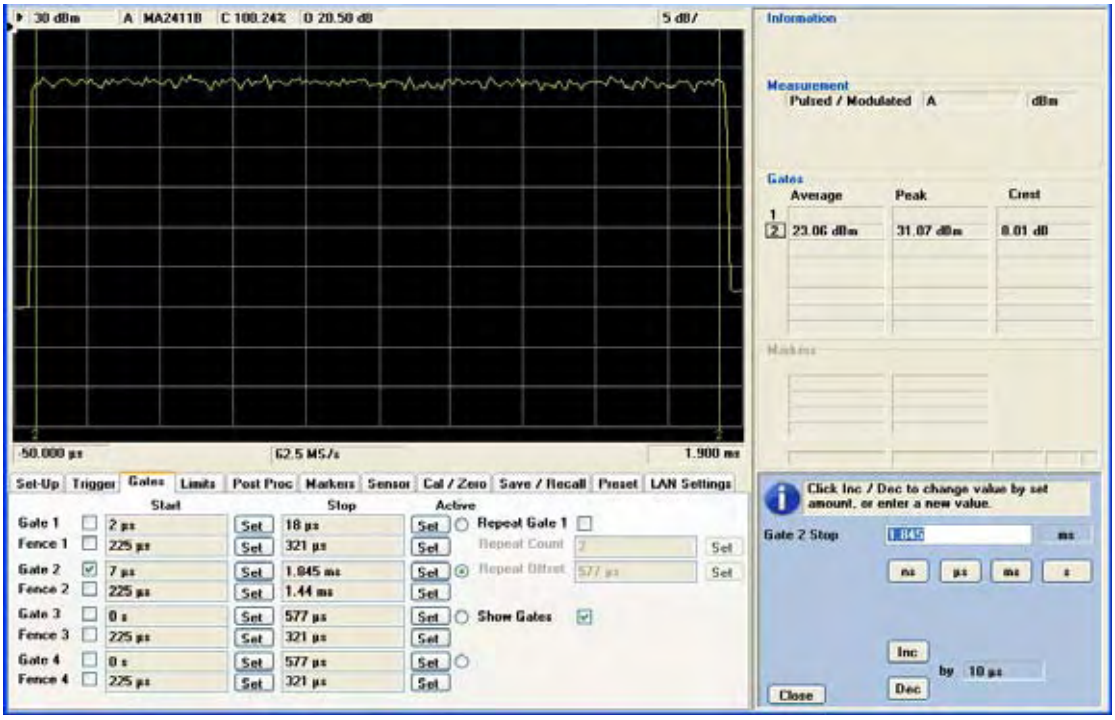
Bandwidth 10MHz / Modulation : 16QAM 1/2

2600MHz



Bandwidth 10MHz / Modulation : 64QAM

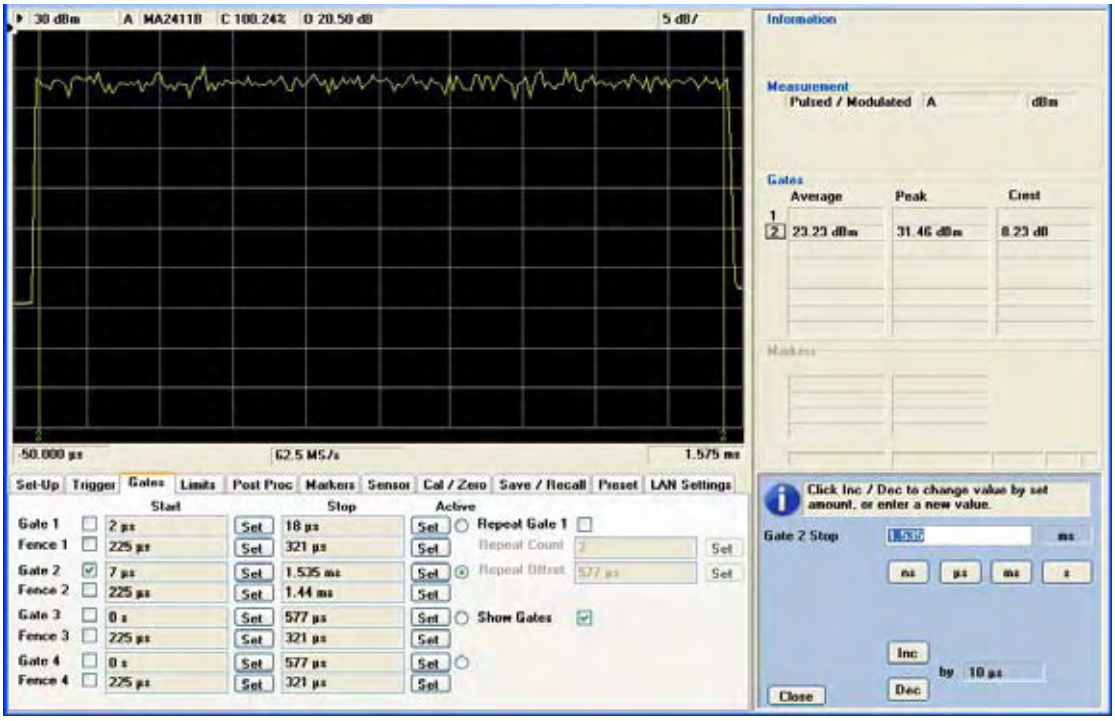
2600MHz



For Antenna 2

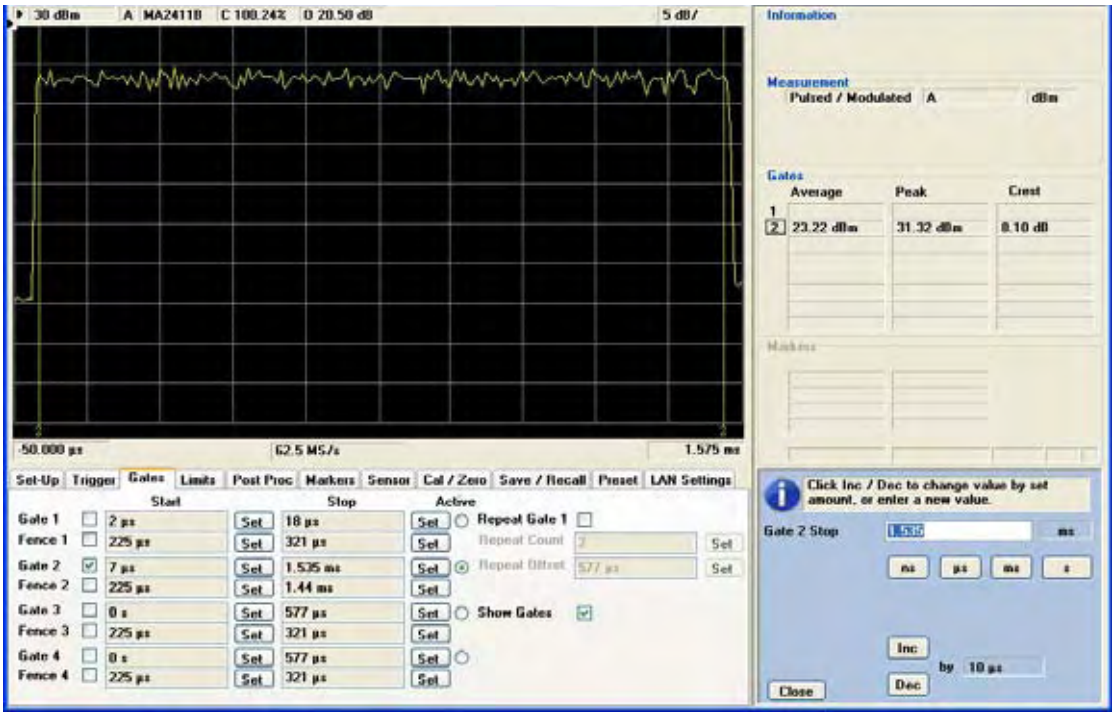
Bandwidth 5MHz / Modulation : QPSK

2600MHz



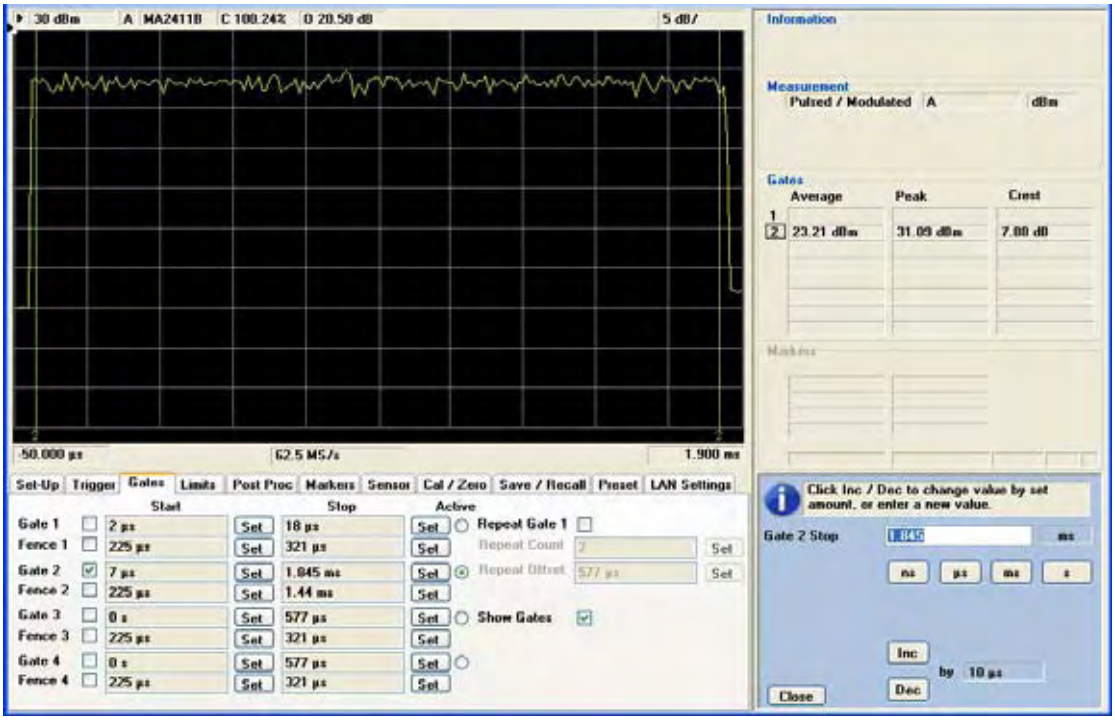
Bandwidth 5MHz / Modulation : 16QAM

2600MHz



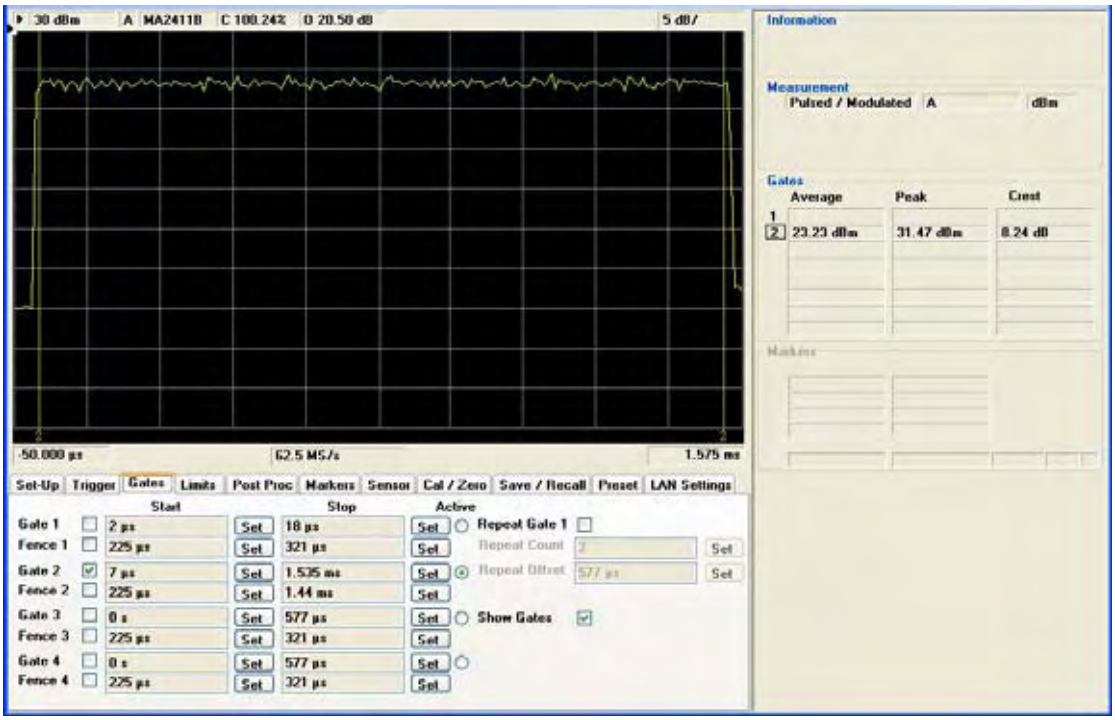
Bandwidth 5MHz / Modulation : 64QAM

2600MHz



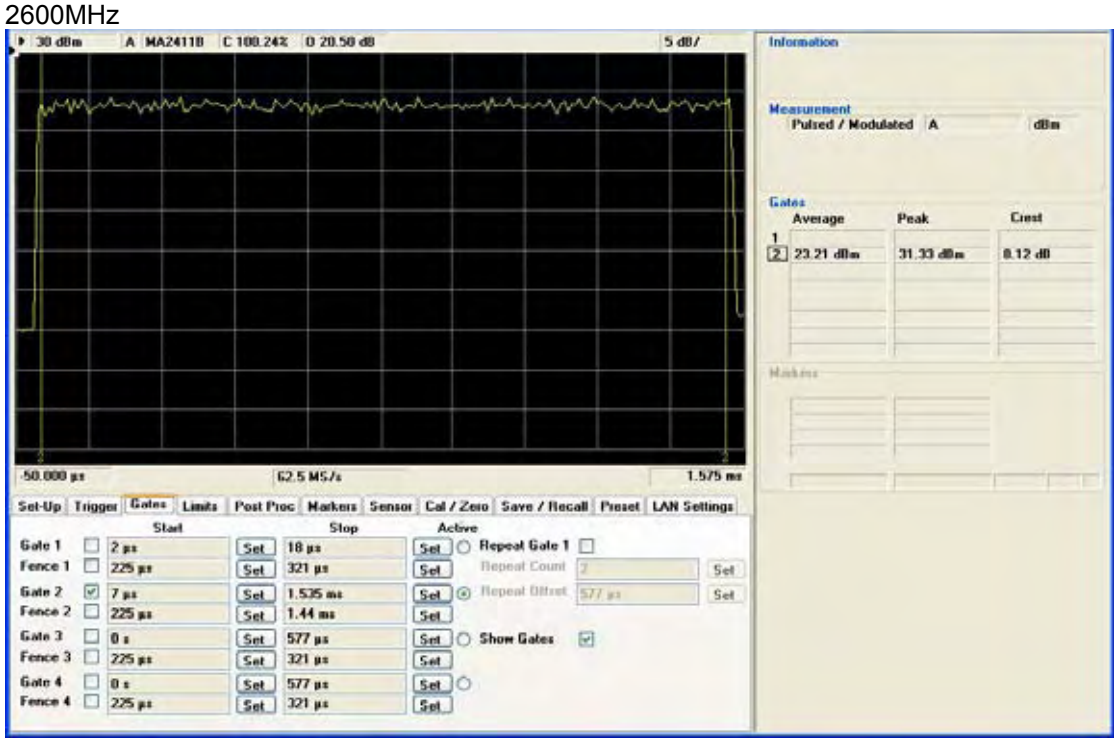
Bandwidth 10MHz / Modulation : QPSK

2600MHz



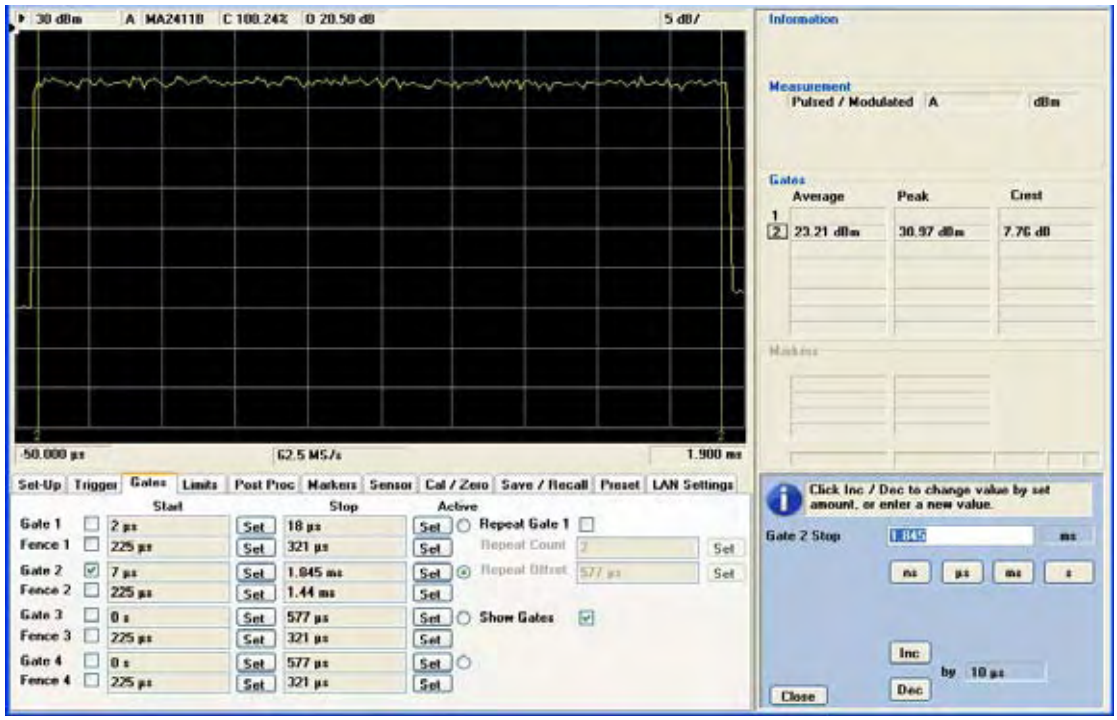
Bandwidth 10MHz / Modulation : 16QAM 1/2

2600MHz



Bandwidth 10MHz / Modulation : 64QAM

2600MHz



8.3 DUTY FACTOR

The transmitter maximum DL/UL symbol ratio is 29:18 with 15 traffic symbol transmitting at the max. power and three control symbols are not activate nor used in the SAR measurement, the duty cycle = 15/48 =0.3125.
Duty Factor = 1/(duty cycle)=3.2 for this periodic pulse signal device.

The SAR measurement is compensated using factors is as the below list:

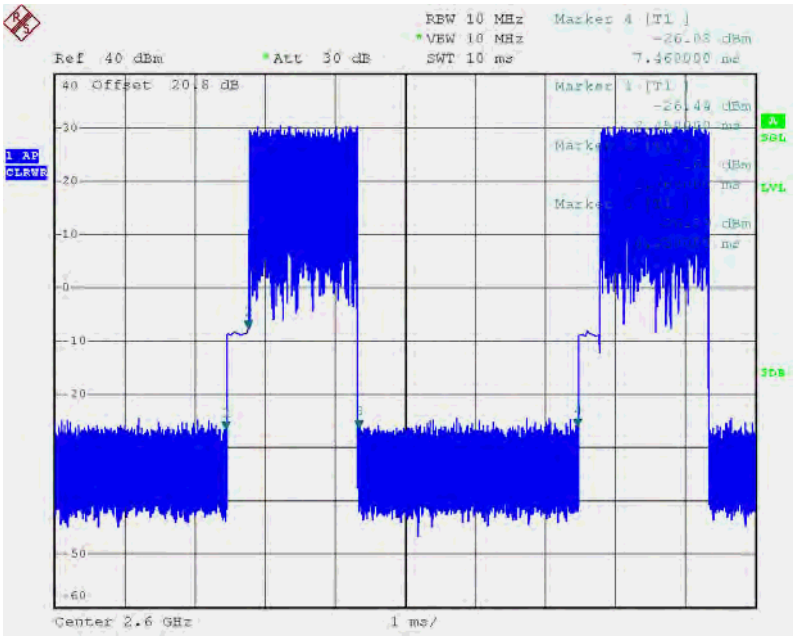
Channel BW	UL zone type	DL/UL Ratio	UL duty cycle	*cf factor*	UL modulation
5MHz	PUSC	29/18	32%	*3.2*	QPSK 16QAM 64QAM
10MHz	PUSC	29/18	32%	*3.2*	QPSK 16QAM 64QAM

For Antenna 1

Test plot of Duty cycle (Only show the plots of 5MHz / QPSK / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=7.46ms-2.45ms=5.01ms

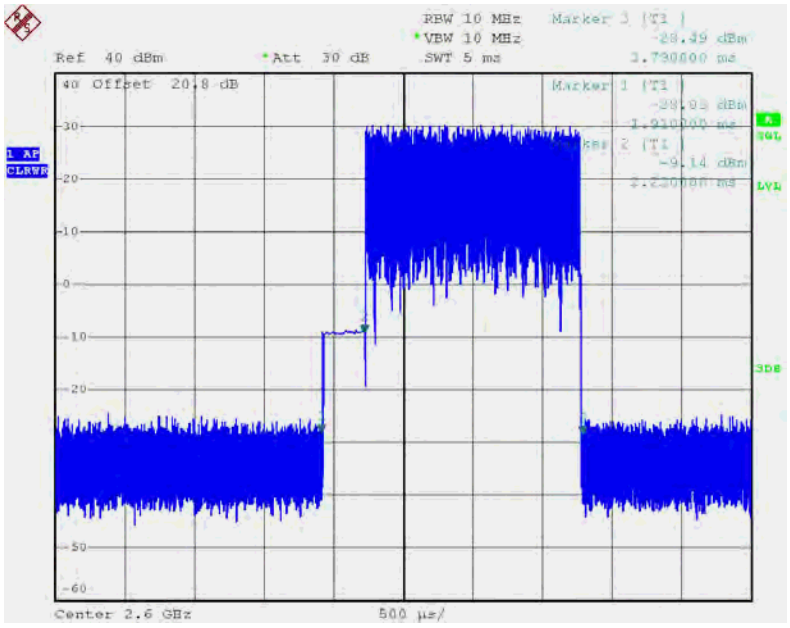
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =3.79ms-2.22ms=1.57ms

Plot 2

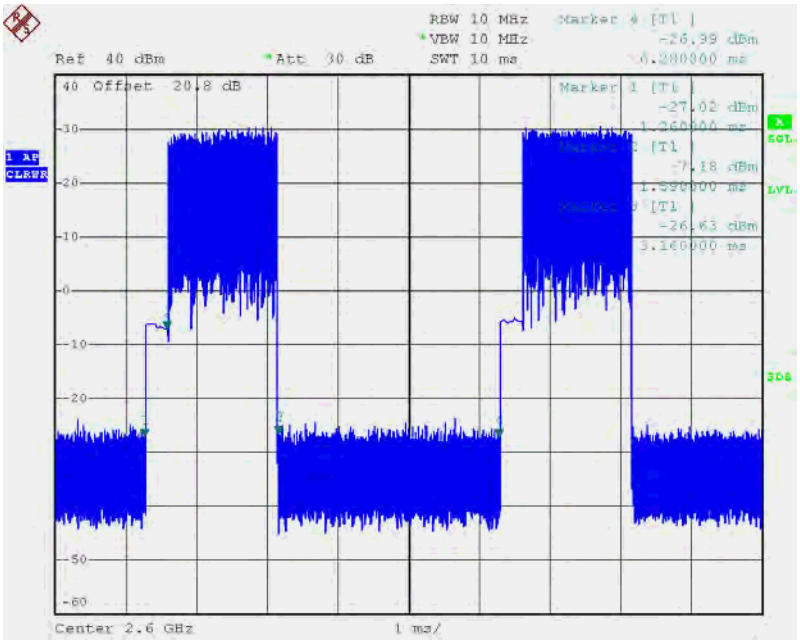


Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

Test plot of Duty cycle (Only show the plots of 5MHz / 16QAM / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=6.28ms-1.26ms=5.02ms

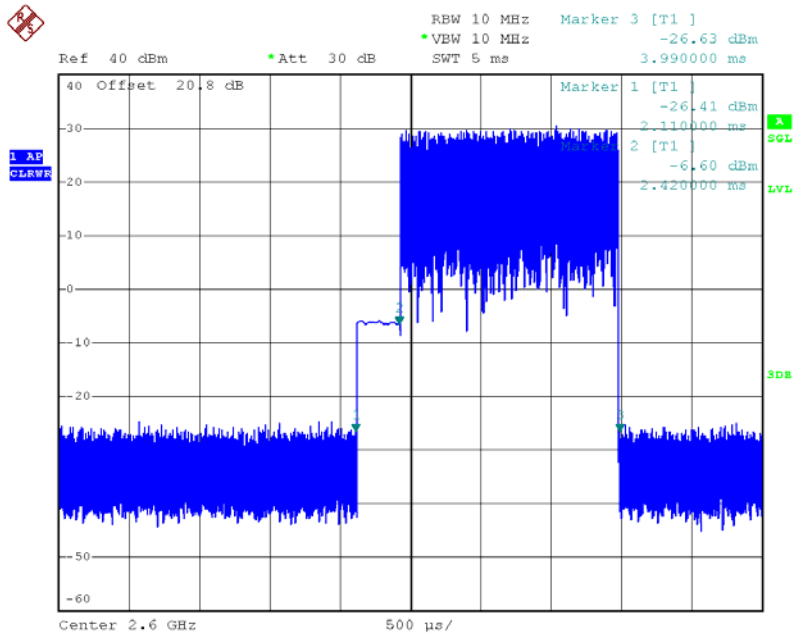
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =3.99ms-2.42ms=1.57ms

Plot 2

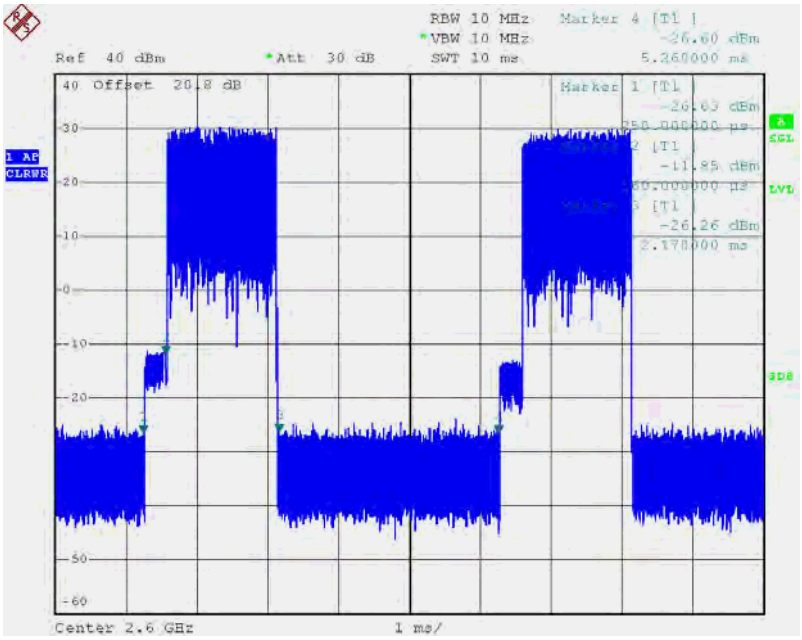


Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

Test plot of Duty cycle (Only show the plots of 5MHz / 64QAM / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=5.26ms-0.25ms=5.01ms

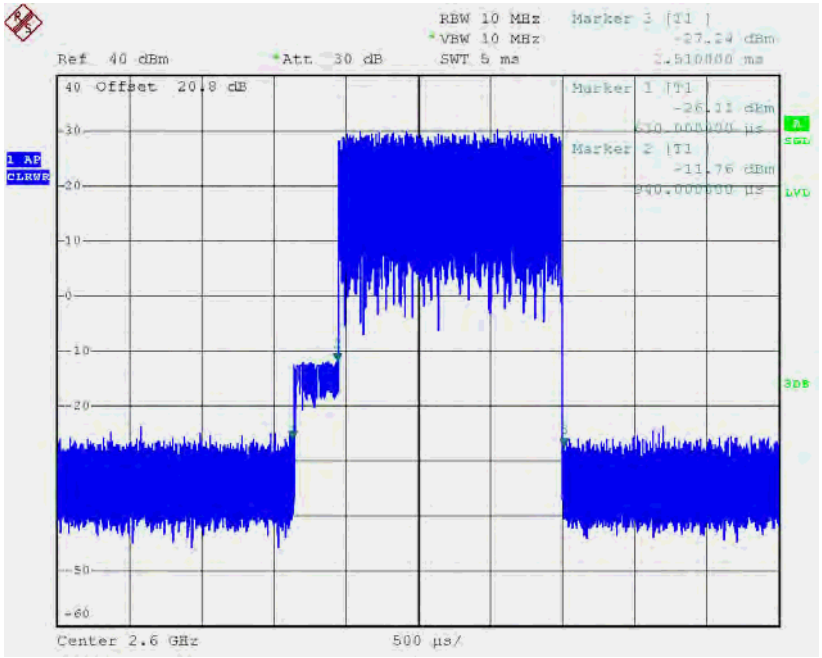
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =2.51ms-0.94ms=1.57ms

Plot 2

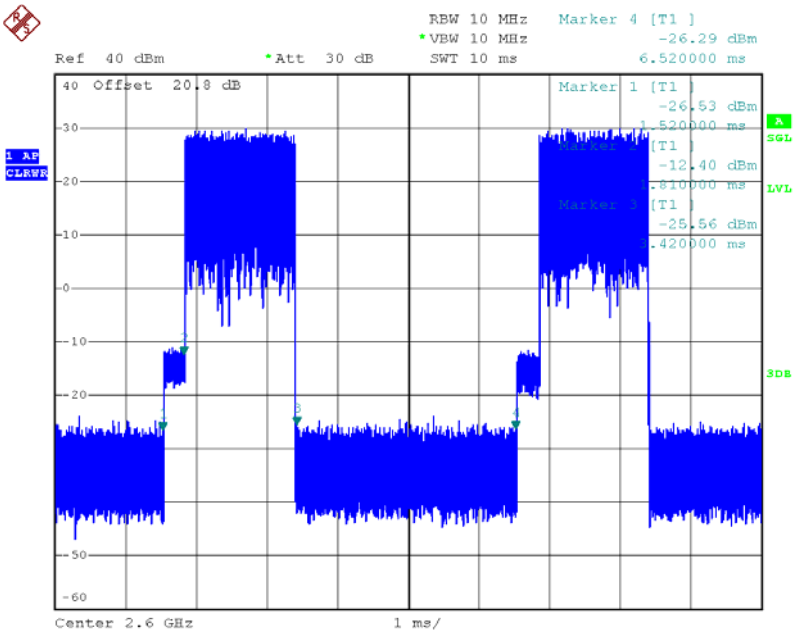


Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

Test plot of Duty cycle (Only show the plots of 10MHz / QPSK / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=6.52ms-1.52ms=5ms

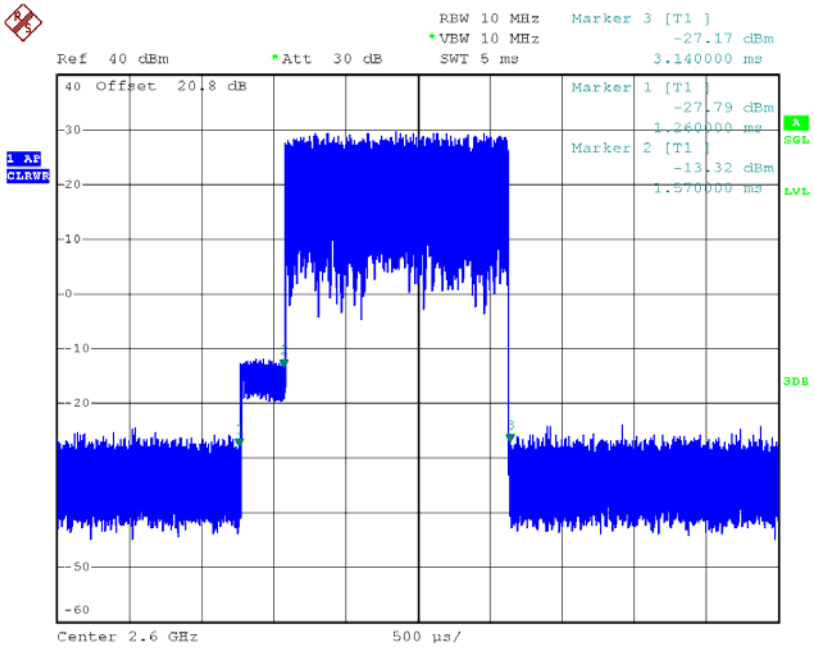
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =3.14ms-1.57ms=1.57ms

Plot 2

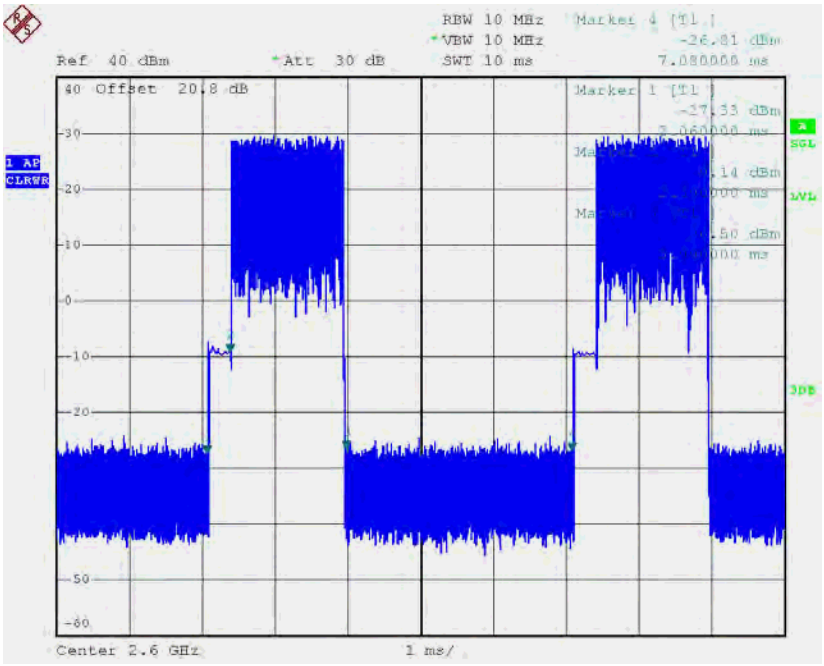


Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

Test plot of Duty cycle (Only show the plots of 10MHz / 16QAM / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=7.08ms-2.06ms=5.02ms

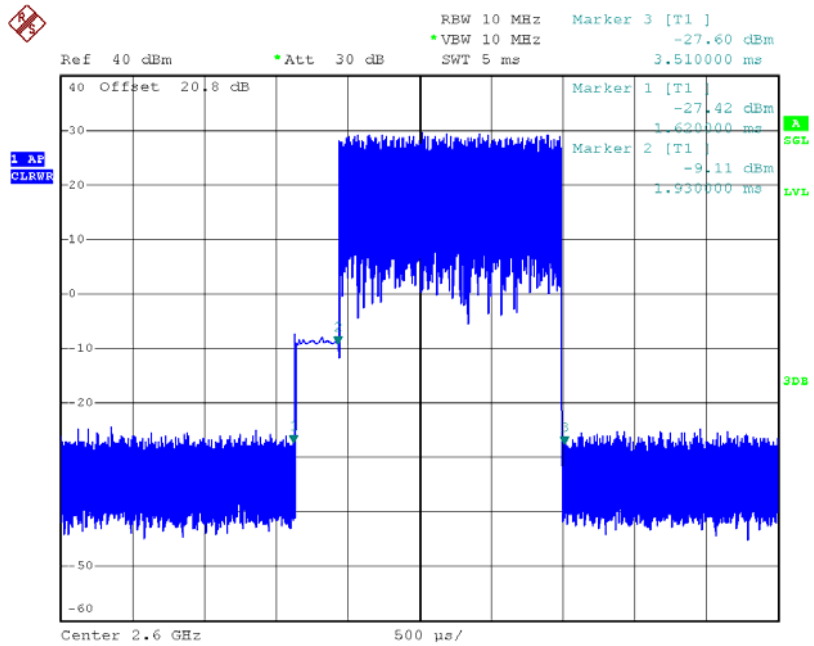
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =3.51ms-1.93ms=1.58ms

Plot 2

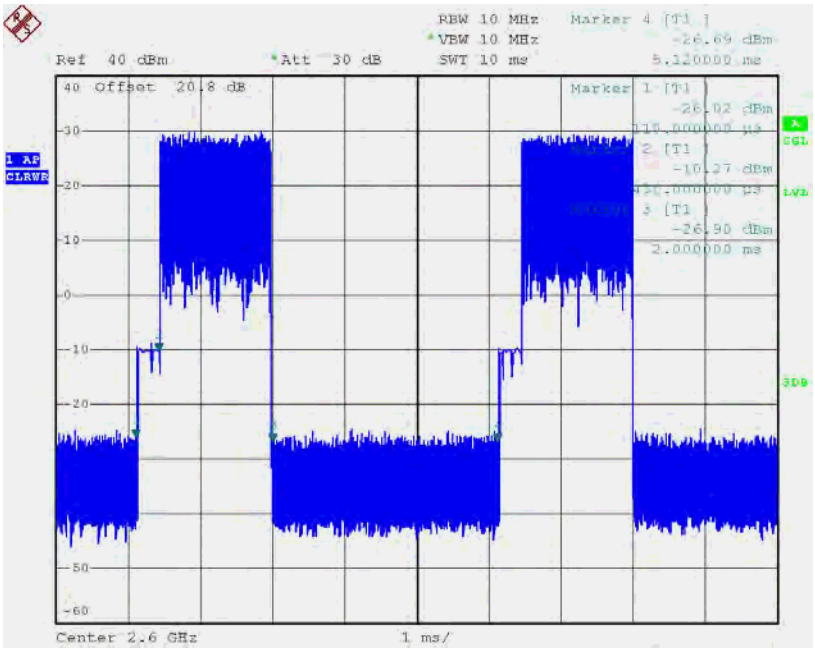


Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

Test plot of Duty cycle (Only show the plots of 10MHz / 64QAM / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=5.12ms-0.11ms=5.01ms

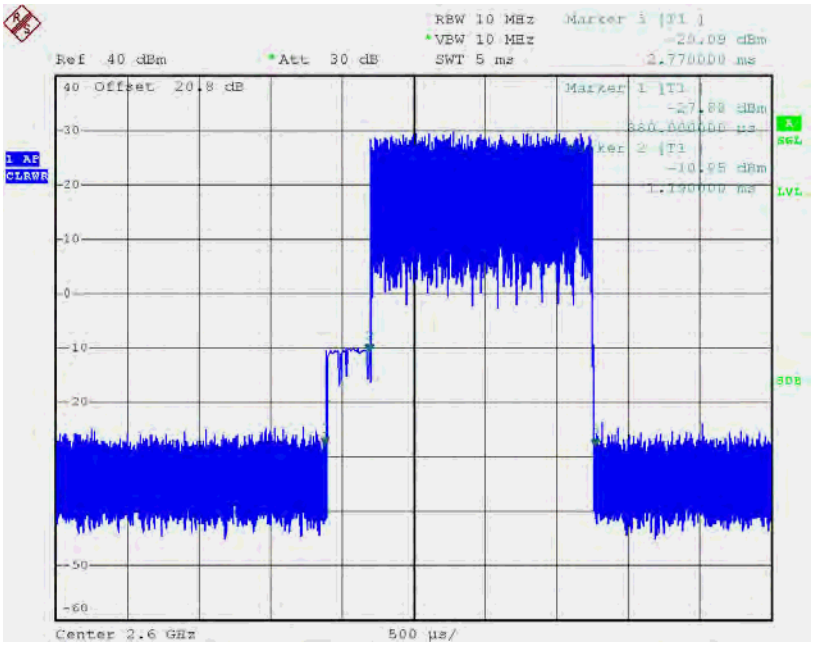
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =2.77ms-1.19ms=1.58ms

Plot 2



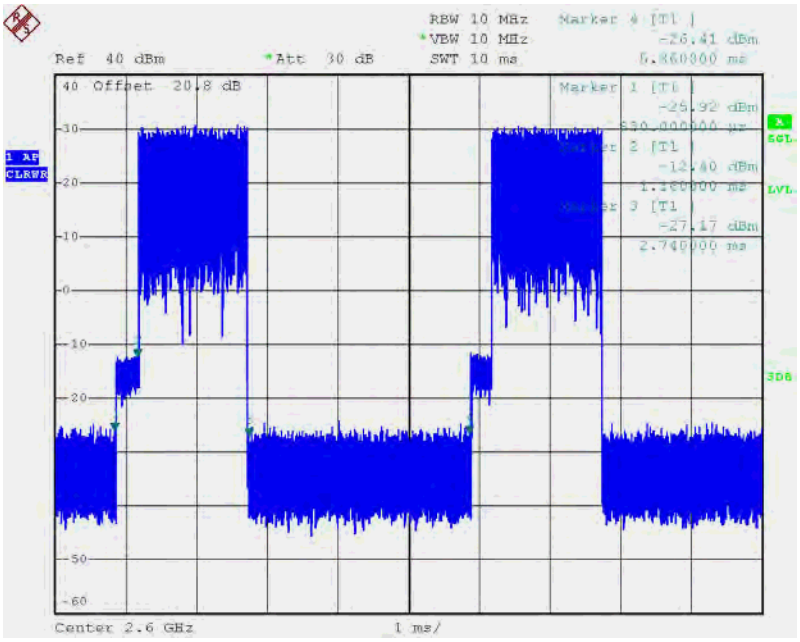
Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

For Antenna 2

Test plot of Duty cycle (Only show the plots of 5MHz / QPSK / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=5.86ms-0.83ms=5.03ms

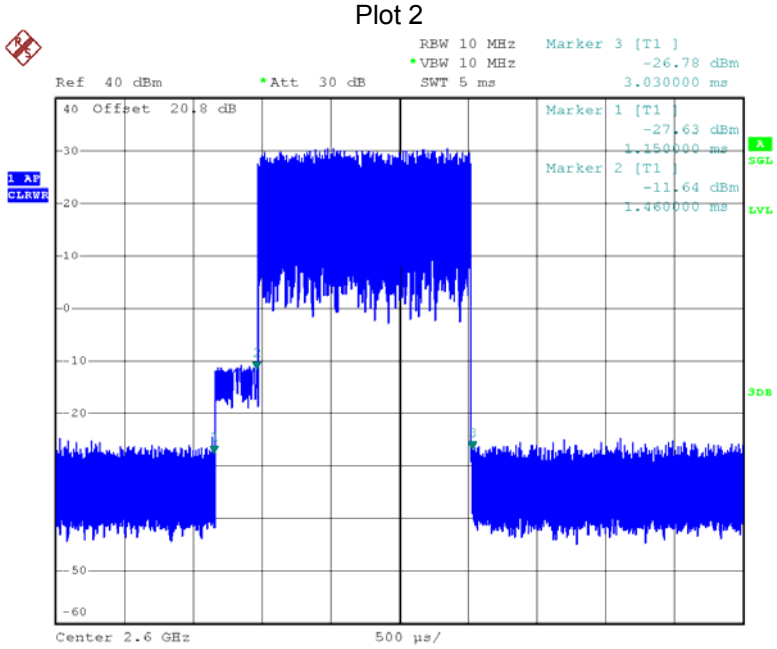
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =3.03ms-1.46ms=1.57ms

Plot 2

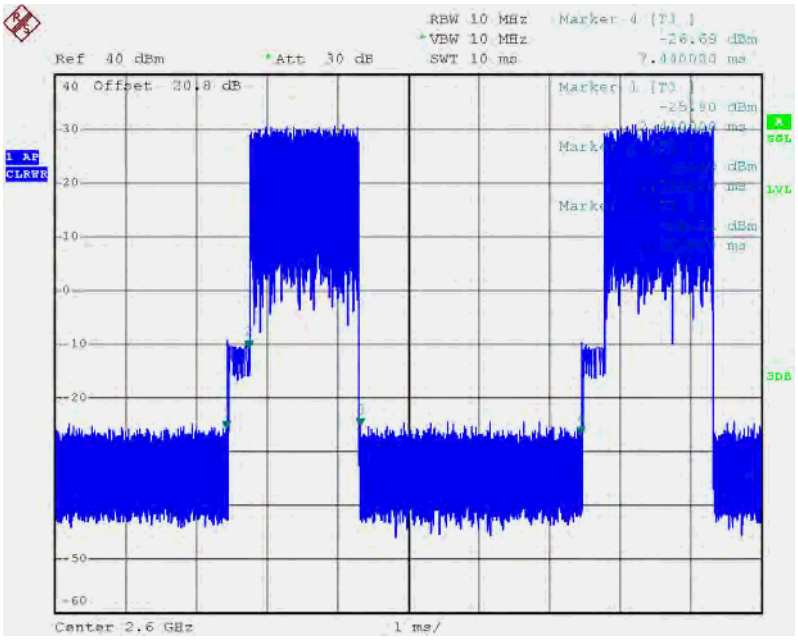


Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

Test plot of Duty cycle (Only show the plots of 5MHz / 16QAM / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=7.44ms-2.41ms=5.03ms

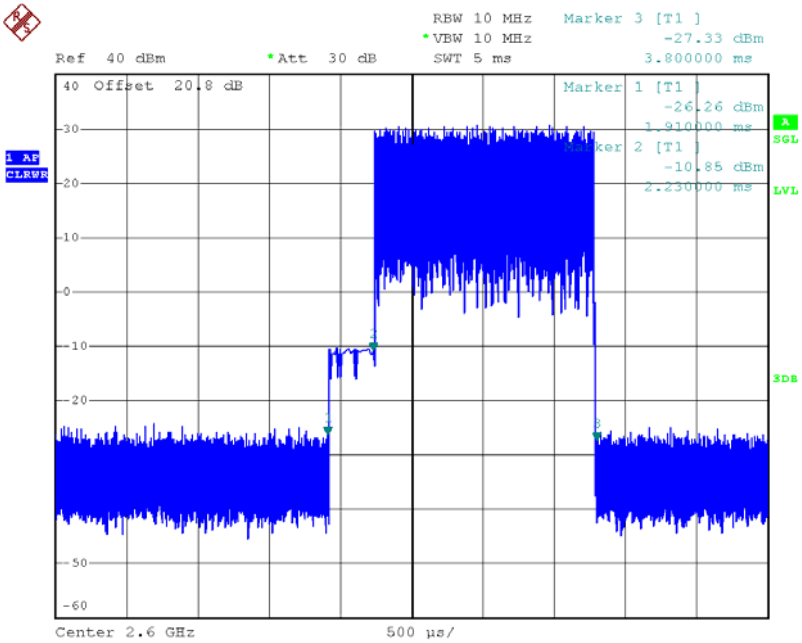
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =3.8ms-2.23ms=1.57ms

Plot 2

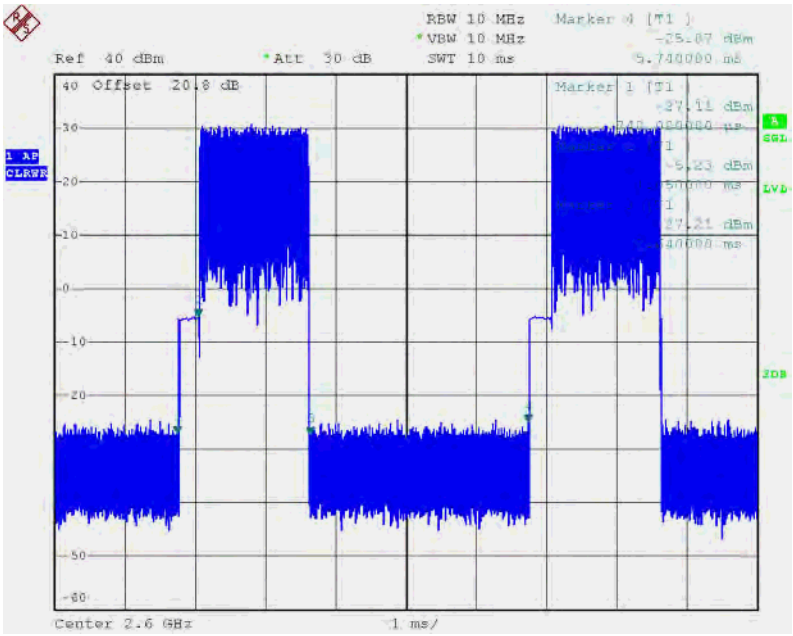


Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

Test plot of Duty cycle (Only show the plots of 5MHz / 64QAM / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=5.74ms-0.74ms=5ms

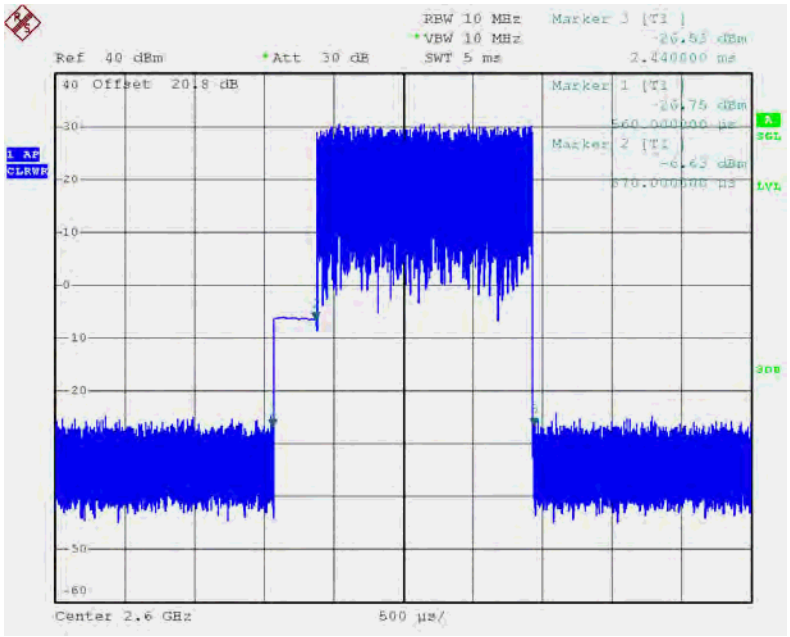
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =2.44ms-0.87ms=1.57ms

Plot 2

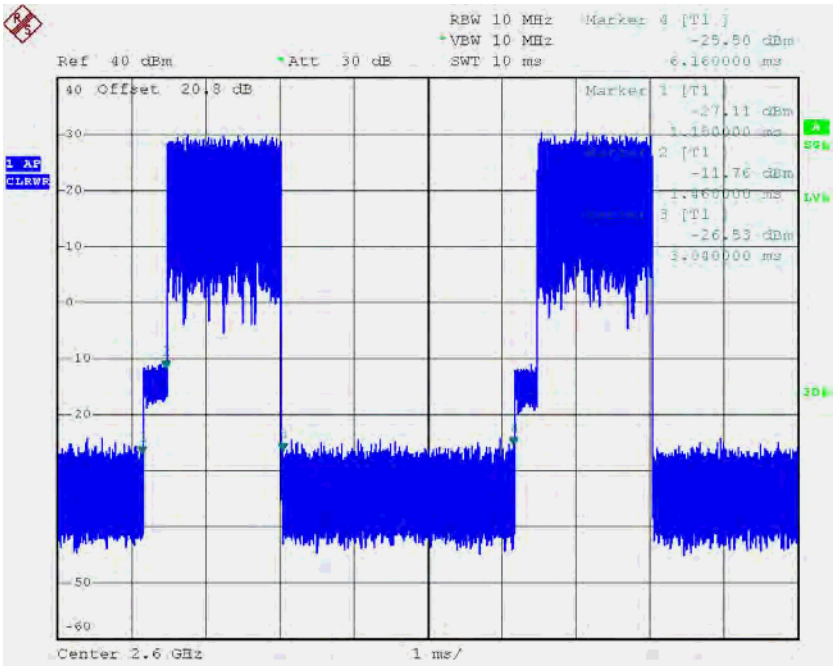


Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

Test plot of Duty cycle (Only show the plots of 10MHz / QPSK / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=6.16ms-1.15ms=5.01ms

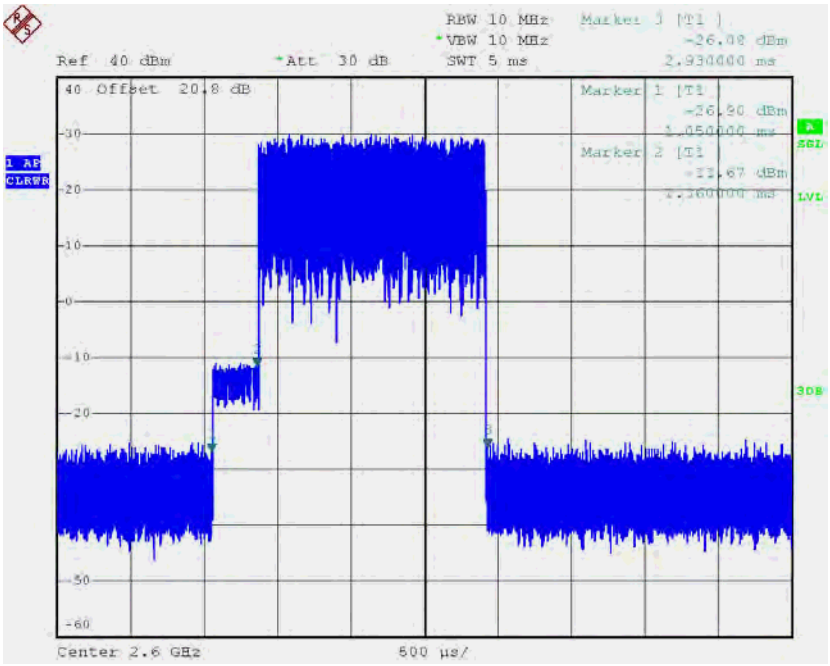
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =2.93ms-1.36ms=1.57ms

Plot 2

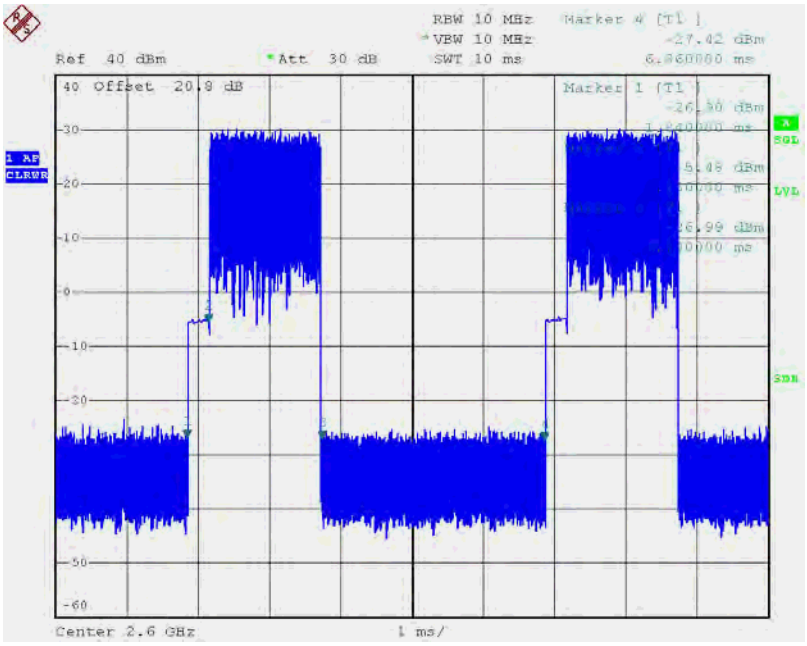


Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

Test plot of Duty cycle (Only show the plots of 10MHz / 16QAM / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=6.86ms-1.84ms=5.02ms

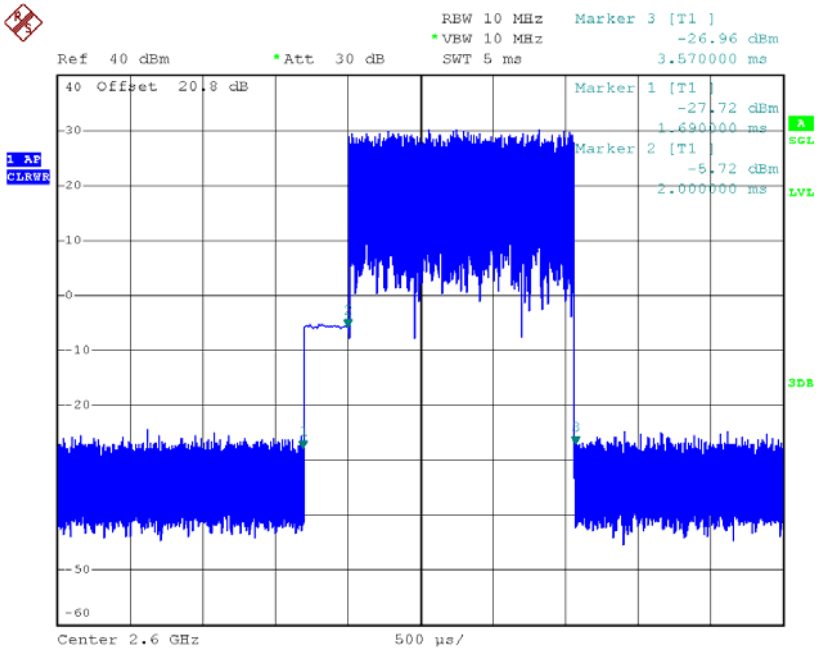
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =3.57ms-2ms=1.57ms

Plot 2

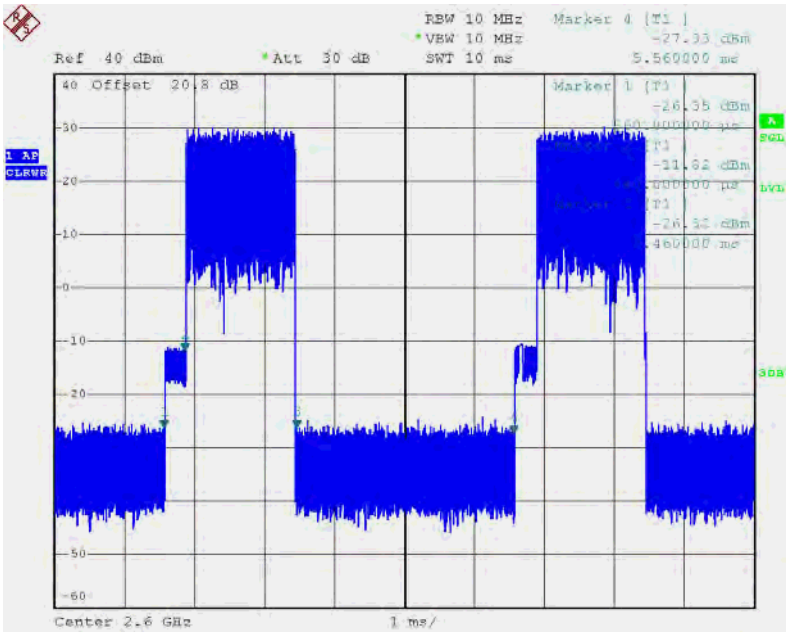


Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

Test plot of Duty cycle (Only show the plots of 10MHz / 64QAM / middle channel)

2 plots are measured for duty cycle to each condition shown on above summary table
Plot 1 is used to get the burst length of test signal.
Burst length = Mark 4 – Mark 1=5.56ms-0.56ms=5ms

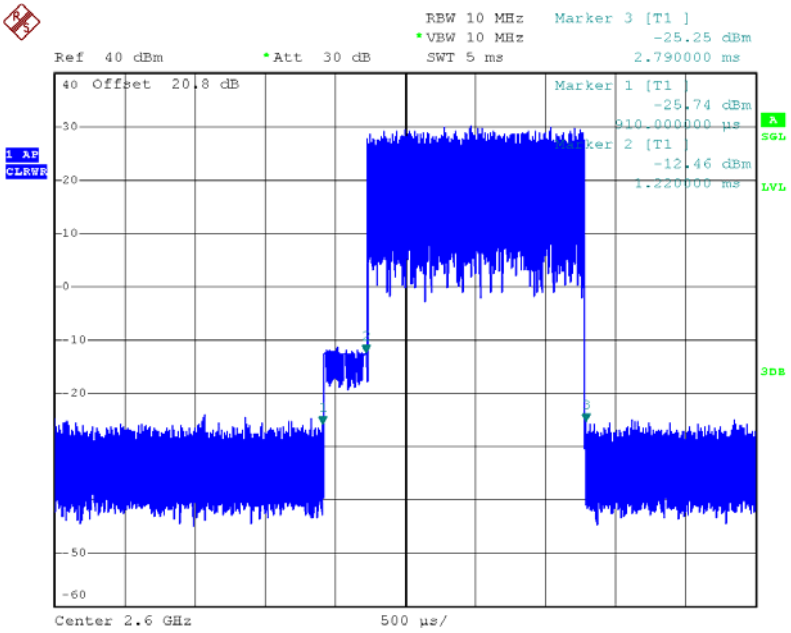
Plot 1



Plot 2 is used to get the UL time of test signal.

Mark 3 – Mark 2 =15 symbols UL time =2.79ms-1.22ms=1.57ms

Plot 2



Duty cycle = 15 symbols UL time / Burst length * 100 %
= 1.55 / 5 *100 %
= 31 %

8.4 SCALING FACTOR

Step-by-step control symbols Power and scaling parameters are as the following calculation:
a. Maximum Rated Output Power (MROP) is provided by applicant.

Maximum Rated Output Power (MROP) Used to Calculate the Scaling Factor		
Mode	**Antenna 1**	**Antenna 2**
5MHz/QPSK	24dBm / 251.19 mW	24dBm / 251.19 mW
5MHz/16QAM	24dBm / 251.19 mW	24dBm / 251.19 mW
5MHz/64QAM	24dBm / 251.19 mW	24dBm / 251.19 mW
10MHz/QPSK	24dBm / 251.19 mW	24dBm / 251.19 mW
10MHz/16QAM	24dBm / 251.19 mW	24dBm / 251.19 mW
10MHz/64QAM	24dBm / 251.19 mW	24dBm / 251.19 mW

b. For 5 MHz Channel BW: The control channels may occupy up to 5 slots during normal operation. A slot is a sub-channel with the duration of 3 symbols. There are a total of 17 slots in 5 MHz channel configuration. A maximum of two simultaneous CQICH reports are possible, which can occupy up to 2 slots. A maximum of three slots can be used for HARQ ACK/NAK by the five possible DL HARQ bursts in the previous DL frame. The 5 ACK/NAK bits each occupies ½ a slot. These 5 slots correspond to 5/17 of the total number of uplink slots.

Antenna 1	**Calculation**
73.88 mW for 5MHz / QPSK	251.19 mW x 5/17
73.88 mW for 5MHz / 16QAM	251.19 mW x 5/17
73.88 mW for 5MHz / 64QAM	251.19 mW x 5/17
Antenna 2	**Calculation**
73.88 mW for 5MHz / QPSK	251.19 mW x 5/17
73.88 mW for 5MHz / 16QAM	251.19 mW x 5/17
73.88 mW for 5MHz / 64QAM	251.19 mW x 5/17

c. For 10MHz Channel BW: The control channels may occupy up to 5 slots during normal operation. A slot is a sub-channel with the duration of 3 symbols. There are a total of 35 slots in the 10 MHz channel configuration. A maximum of two simultaneous CQICH reports are possible, which can occupy up to 2 slots. A maximum of three slots can be used for HARQ ACK/NAK by the five possible DL HARQ bursts in the previous DL frame. The 5 ACK/NAK bits each occupies ½ a slot. These 5 slots correspond to 5/35 of the total number of uplink slots.

Antenna 1	**Calculation**
35.88mW for 10MHz / QPSK	251.19mW x 5/35
35.88mW for 10MHz / 16QAM	251.19mW x 5/35
35.88mW for 10MHz / 64QAM	251.19mW x 5/35
Antenna 2	**Calculation**
35.88mW for 10MHz / QPSK	251.19mW x 5/35
35.88mW for 10MHz / 16QAM	251.19mW x 5/35
35.88mW for 10MHz / 64QAM	251.19mW x 5/35

d. The target output power for DL:UL ratio of 29:18 is calculated as the following:
Target output power = **(CCP x 3)+ (MROP x 15)**

Modulation	Channel Bandwidth	29:18 DL:UL Ratio Power /mW	TX antenna
QPSK	5 MHz	(73.88x 3)+(251.19 x 15)=3989.49	1
16QAM	5 MHz	(73.88x 3)+(251.19 x 15)=3989.49	
64QAM	5 MHz	(73.88x 3)+(251.19 x 15)=3989.49	
QPSK	10 MHz	(35.88 x 3)+(251.19 x 15)= 3875.49	
16QAM	10 MHz	(35.88 x 3)+(251.19 x 15)= 3875.49	
64QAM	10 MHz	(35.88 x 3)+(251.19 x 15)= 3875.49	
QPSK	5 MHz	(73.88x 3)+(251.19 x 15)=3989.49	2
16QAM	5 MHz	(73.88x 3)+(251.19 x 15)=3989.49	
64QAM	5 MHz	(73.88x 3)+(251.19 x 15)=3989.49	
QPSK	10 MHz	(35.88 x 3)+(251.19 x 15)= 3875.49	
16QAM	10 MHz	(35.88 x 3)+(251.19 x 15)= 3875.49	
64QAM	10 MHz	(35.88 x 3)+(251.19 x 15)= 3875.49	

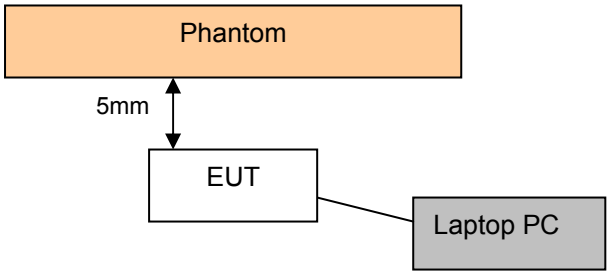
Scaling factor are shown on below table

Freq./MHz	Measured Power (mW)	Number of Traffic Symbols	29:18 Traffic Symbol Power (Actual OP x 15) (mW)	29:18 Rated Power ((CCP x 3)+ (MROP x 15)) (mW)	Scaling Factor (rated power/traffic power)
5MHz / QPSK / Antenna 1					
2502.5	210.86	15	3162.90	3989.49	1.26
2600	208.93	15	3133.95	3989.49	1.27
2687.5	207.97	15	3119.55	3989.49	1.28
5MHz / 16QAM / Antenna 1					
2502.5	209.89	15	3148.35	3989.49	1.27
2600	207.01	15	3105.15	3989.49	1.28
2687.5	208.93	15	3133.95	3989.49	1.27
5MHz / 64QAM / Antenna 1					
2502.5	207.01	15	3105.15	3989.49	1.28
2600	199.99	15	2999.85	3989.49	1.33
2687.5	199.99	15	2999.85	3989.49	1.33
10MHz / QPSK / Antenna 1					
2505	212.32	15	3184.80	3875.49	1.22
2600	205.12	15	3076.80	3875.49	1.26
2685	209.41	15	3141.15	3875.49	1.23
10MHz / 16QAM / Antenna 1					
2505	210.38	15	3155.70	3875.49	1.23
2600	202.77	15	3041.55	3875.49	1.27
2685	208.93	15	3133.95	3875.49	1.24
10MHz / 64QAM / Antenna 1					
2505	206.54	15	3098.10	3875.49	1.25
2600	202.3	15	3034.50	3875.49	1.28
2685	205.59	15	3083.85	3875.49	1.26

Freq./MHz	Measured Power (mW)	Number of Traffic Symbols	29:18 Traffic Symbol Power (Actual OP x 15) (mW)	29:18 Rated Power ((CCP x 3)+ (MROP x 15)) (mW)	Scaling Factor (rated power/traffic power)
5MHz / QPSK / Antenna 2					
2502.5	215.77	15	3236.55	3989.49	1.23
2600	210.38	15	3155.70	3989.49	1.26
2687.5	211.84	15	3177.60	3989.49	1.26
5MHz / 16QAM / Antenna 2					
2502.5	213.30	15	3199.50	3989.49	1.25
2600	209.89	15	3148.35	3989.49	1.27
2687.5	209.891	15	3148.37	3989.49	1.27
5MHz / 64QAM / Antenna 2					
2502.5	215.28	15	3229.20	3989.49	1.24
2600	209.41	15	3141.15	3989.49	1.27
2687.5	204.64	15	3069.60	3989.49	1.30
10MHz / QPSK / Antenna 2					
2505	214.29	15	3214.35	3875.49	1.21
2600	210.38	15	3155.70	3875.49	1.23
2685	212.32	15	3184.80	3875.49	1.22
10MHz / 16QAM / Antenna 2					
2505	212.32	15	3184.80	3875.49	1.22
2600	209.41	15	3141.15	3875.49	1.23
2685	211.35	15	3170.25	3875.49	1.22
10MHz / 64QAM / Antenna 2					
2505	212.32	15	3184.80	3875.49	1.22
2600	209.41	15	3141.15	3875.49	1.23
2685	204.64	15	3069.60	3875.49	1.26

9. TEST SETUP

The test setup is shown in the below picture. The USB Adapter (EUT) is plugged into the HOST (Laptop PC) as it would be in the field on a normal network.



Test Signal detail:
Test Signal generator:
Implement the **Sequans software tool** (Revsion 4.6.2.1-23712) into EUT. Use the Host (Laptop PC) to configure this tool to generate the UL test signal from EUT. The detail configuration procedures are as below step.

A.) Bootup DUT with specified the FFT profile, FFT512 or FFT1024, by startup script file,

mfg_SQN1130-RDX-rfcMAX2839-fft512.sh or mfg_SQN1130-RDX-rfcMAX2839-fft1024.sh.

EUT bootup script file	FFT#	Bandwidth
mfg_SQN1130-RDX-rfcMAX2839-fft512.sh	512	5MHz
mfg_SQN1130-RDX-rfcMAX2839-fft1024.sh	1024	10MHz

B.) Set the test signal pattern (UL subframe pattern) by

"setRfTxConfig frequency=2501000 tx-power=2100 ul-subframe-width=5"
It set the test signal center frequency at 2501000 KHz, output power 21dBm and 5 time slots (UL subframe). This 5 time slots is equal to 15 symbols which meet the DL/UL symbol 29/18 without 3 control symbols.

15 = 18 – 3 (symbol)

C.) Enable this test signal from EUT by

"starttxtest switch=1”

Based on the test requirement, configure the EUT by the process as above to generate the test signal continuously, DL/UL = 29/18 frame pattern without 3 control symbols. Then, follow the TCB workshop document (“SAR Measurement Procedure” in Oct., 2009) to come out the SAR test result by scaled the 3 control symbols signal effect.

10. TEST RESULTS

10.1 TEST PROCEDURES

The EUT plugged into the notebook. Use the software to control the EUT channel and transmission power. Then record the conducted power before the testing. Place the EUT to the specific test location. After the testing, must writing down the conducted power of the EUT into the report. The SAR value was calculated via the 3D spline interpolation algorithm that has been implemented in the software of DASY5 SAR measurement system manufactured and calibrated by SPEAG. According to the IEEE 1528 standards, 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 was performed for the highest spatial SAR location. 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 2mm and maintained at a constant distance of ±0.5mm during a zoom scan to determine peak SAR locations. The distance is 2mm 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 8mm separation distance. The cube size is 7 x 7 x 7 points consists of 343 points and the grid space is 5mm.

The measurement time is 0.5s 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 2mm 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%.

10.2 DESCRIPTION OF TEST CONDITION

TEST DATE	TEMPERATURE(°C)		HUMIDITY(%RH)	TESTED BY
	AIMBENT	LIQUID		
Feb. 09, 2011	22.5	21.7	58	Van Lin
Mar. 16, 2011	22.3	21.2	60	Van Lin

10.3 REDUCTION OF TEST CHANNEL

Per FCC WiMAX SAR general test reduction presented on April 2010

For each channel bandwidth and test position, QPSK will be tested for final test.

For 16QAM and 64QAM, test configuration will follow below conditions to define the final test modes.

1) If the 16/64QAM maximum output power is ≤ ¼ dB higher than QPSK and QPSK SAR is < 0.8 W/kg, 16/64QAM SAR is not needed

2) If QPSK SAR is between 0.8 and 1.2 W/kg, test 16/64QAM using the highest SAR channel in QPSK

3) If QPSK SAR is > 1.2 W/kg, test 16/64QAM using the highest SAR channel in QPSK; and if the 16/64QAM SAR is > 1.2, test all channels in 16/64QAM

10.4 MEASURED SAR RESULTS

For 5MHz

Bandwidth	5MHz		Modulation		QPSK 1/2		TX antenna		Antenna 1	
SAR (W/ kg)	Scaling Factor	Horizontal-down		Vertical-front		Horizontal-up		Vertical-back		Top edge	
Channel		Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	1.26	0.522	0.658	0.129	0.163	0.483	0.609	0.644	0.811	0.144	0.181
Middle	1.27	0.498	0.632			0.344	0.437	0.699	0.888		
High	1.28	0.611	0.782			0.586	0.750	0.727	0.931		

Bandwidth	5MHz	Modulation	16QAM 1/2	TX antenna	Antenna 1
SAR (W/ kg)	Scaling Factor	Vertical-back			
Channel		Meas.		Scaled	
Low	1.27	0.633		0.804	
Middle	1.28	0.683		0.874	
High	1.27	0.722		0.917	

Bandwidth	5MHz	Modulation	64QAM 1/2	TX antenna	Antenna 1
SAR (W/ kg)	Scaling Factor	Vertical-back			
Channel		Meas.		Scaled	
Low	1.28	0.628		0.804	
Middle	1.33	0.683		0.908	
High	1.33	0.718		0.955	

NOTE:

1. In this testing, the limit for General Population Spatial Peak averaged over 1g, **1.6 W/kg**, is applied.
2. Please see the Appendix A for the data.
3. The variation of the EUT conducted power measured before and after SAR testing should not over 5%.
4. When scaled SAR is less than 0.8W/kg, SAR of other channels under the same configuration will be reduced.

Bandwidth	5MHz		Modulation		QPSK 1/2		TX antenna		Antenna 2	
SAR (W/ kg)	Scaling Factor	Horizontal-down		Vertical-front		Horizontal-up		Vertical-back		Top edge	
Channel		Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	1.23	0.523	0.643	0.673	0.828	0.507	0.624	0.093	0.114	0.152	0.187
Middle	1.26	0.558	0.703	0.813	1.024	0.539	0.679				
High	1.26	0.627	0.790	0.807	1.017	0.458	0.577				

Bandwidth	5MHz	Modulation	16QAM 1/2	TX antenna	Antenna 2
SAR (W/ kg)	Scaling Factor	Vertical-front			
Channel		Meas.		Scaled	
Low	1.25	0.652		0.815	
Middle	1.27	0.804		1.021	
High	1.27	0.793		1.007	

Bandwidth	5MHz	Modulation	64QAM 1/2	TX antenna	Antenna 2
SAR (W/ kg)	Scaling Factor	Vertical-front			
Channel		Meas.		Scaled	
Low	1.24	0.637		0.790	
Middle	1.27	0.790		1.003	
High	1.30	0.779		1.013	

NOTE:

1. In this testing, the limit for General Population Spatial Peak averaged over 1g, **1.6 W/kg**, is applied.
2. Please see the Appendix A for the data.
3. The variation of the EUT conducted power measured before and after SAR testing should not over 5%.
4. When scaled SAR is less than 0.8W/kg, SAR of other channels under the same configuration will be reduced.

For 10MHz

Bandwidth	10MHz		Modulation		QPSK 1/2		TX antenna		Antenna 1	
SAR (W/ kg)	Scaling Factor	Horizontal-down		Vertical-front		Horizontal-up		Vertical-back		Top edge	
Channel		Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	1.22	0.545	0.665	0.137	0.167	0.511	0.623	0.681	0.831	0.144	0.176
Middle	1.26	0.496	0.625			0.478	0.602	0.702	0.885		
High	1.23	0.631	0.776			0.475	0.584	0.764	0.940		

Bandwidth	10MHz	Modulation	16QAM 1/2	TX antenna	Antenna 1
SAR (W/ kg)	Scaling Factor	Vertical-back			
Channel		Meas.		Scaled	
Low	1.23	0.686		0.844	
Middle	1.27	0.818		1.039	
High	1.24	0.796		0.987	

Bandwidth	10MHz	Modulation	64QAM 1/2	TX antenna	Antenna 1
SAR (W/ kg)	Scaling Factor	Vertical-back			
Channel		Meas.		Scaled	
Low	1.25	0.690		0.863	
Middle	1.28	0.704		0.901	
High	1.26	0.767		0.966	

NOTE:

1. In this testing, the limit for General Population Spatial Peak averaged over 1g, **1.6 W/kg**, is applied.
2. Please see the Appendix A for the data.
3. The variation of the EUT conducted power measured before and after SAR testing should not over 5%.
4. When scaled SAR is less than 0.8W/kg, SAR of other channels under the same configuration will be reduced.

Bandwidth	10MHz		Modulation		QPSK 1/2		TX antenna		Antenna 2	
SAR (W/ kg)	Scaling Factor	Horizontal-down		Vertical-front		Horizontal-up		Vertical-back		Top edge	
Channel		Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	1.21	0.542	0.656	0.696	0.842	0.555	0.672	0.083	0.100	0.151	0.183
Middle	1.23	0.557	0.685	0.828	1.018	0.536	0.659				
High	1.22	0.641	0.782	0.824	1.005	0.452	0.551				

Bandwidth	10MHz	Modulation	16QAM 1/2	TX antenna	Antenna 2
SAR (W/ kg)	Scaling Factor	Vertical-front			
Channel		Meas.		Scaled	
Low	1.22	0.673		0.821	
Middle	1.23	0.839		1.032	
High	1.22	0.819		0.999	

Bandwidth	10MHz	Modulation	64QAM 1/2	TX antenna	Antenna 2
SAR (W/ kg)	Scaling Factor	Vertical-front			
Channel		Meas.		Scaled	
Low	1.22	0.672		0.820	
Middle	1.23	0.837		1.030	
High	1.26	0.816		1.028	

NOTE:

1. In this testing, the limit for General Population Spatial Peak averaged over 1g, **1.6 W/kg**, is applied.
2. Please see the Appendix A for the data.
3. The variation of the EUT conducted power measured before and after SAR testing should not over 5%.
4. When scaled SAR is less than 0.8W/kg, SAR of other channels under the same configuration will be reduced.

11. 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

12. SAR ERROR CONSIDERATION

In order to estimate the measurement error due to PAR issues, the configuration with the highest SAR in each channel bandwidth and frequency band is measured at various power levels, from approximately 12.5 mW at approx. 3 dB steps, until the maximum power is reached. During the tests, the bottom of EUT is positioned at 5 mm separation distance to flat phantom.
Control EUT to transmit at various average power level and do single point peak SAR measurement at specified power level. The reported power is RMS average measured during burst-on period by trigger and gating.

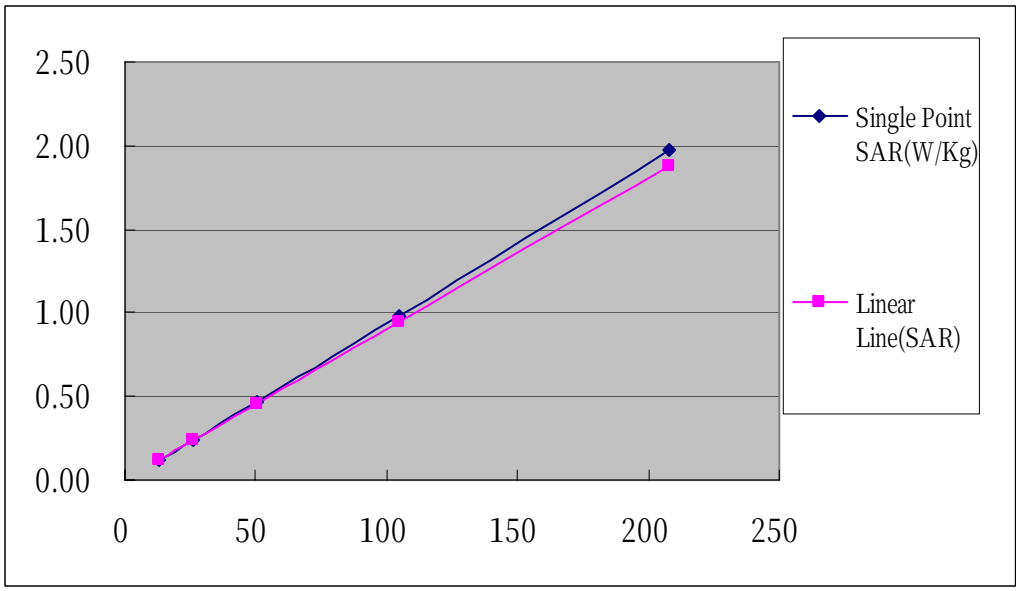
Test condition

Test position	Horizontal down
Test frequency	2600 MHz for 5MHz bandwidth 2600 MHz for 10MHz bandwidth
Modulation	QPSK 1/2 ,16QAM 1/2 , 64QAM 1/2
TX Antenna	2

By tuning different power on this EUT and measuring the relative “single point peak SAR” to verify the high PAR of OFDM/OFDMA is as below:

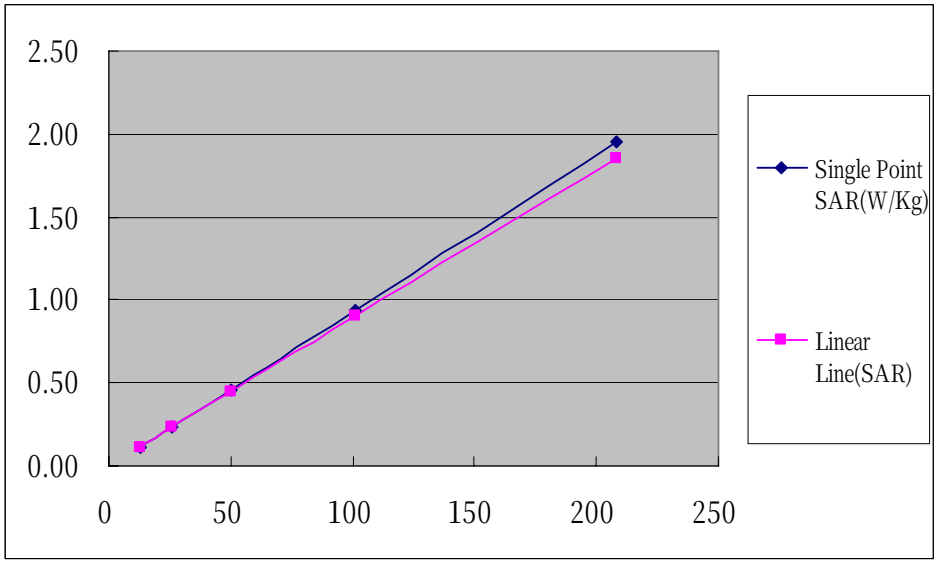
5MHz / QPSK

Average Power (mW):	12.63	26.30	50.33	104.71	207.80
Single Point SAR (W/kg):	0.114	0.241	0.462	0.983	1.972
Linear line (SAR):	0.114	0.237	0.454	0.945	1.876
Estimation (%):	0.00%	1.52%	1.70%	4.03%	5.14%



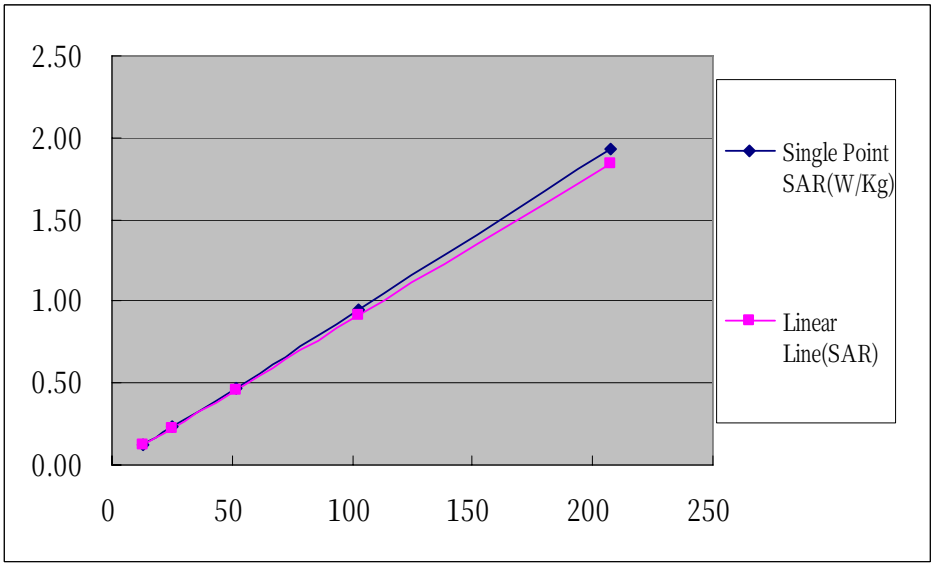
5MHz / 16QAM

Average Power (mW):	12.60	25.80	50.21	101.40	208.20
Single Point SAR (W/kg):	0.112	0.231	0.456	0.943	1.950
Linear line (SAR):	0.112	0.229	0.446	0.901	1.851
Estimation (%):	0.00%	0.73%	2.17%	4.62%	5.37%



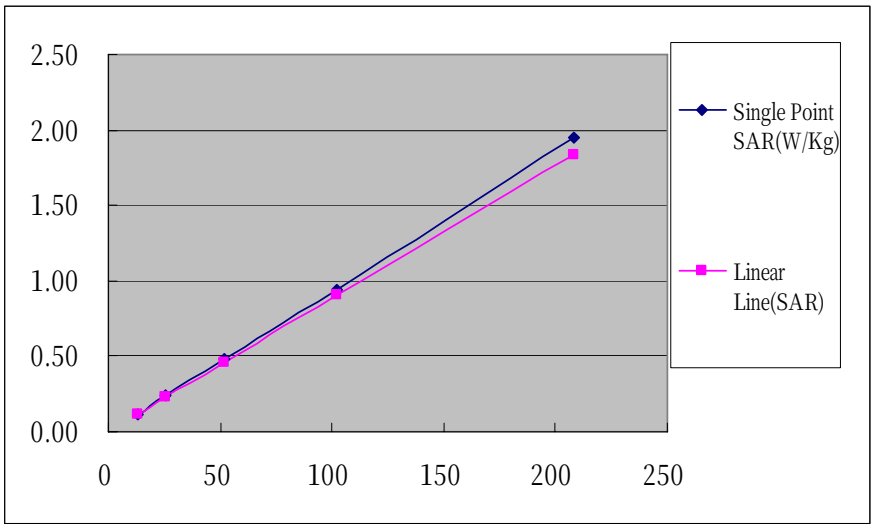
5MHz / 64QAM

Average Power (mW):	12.88	25.35	51.88	102.33	207.50
Single Point SAR (W/kg):	0.126	0.234	0.473	0.954	1.930
Linear line (SAR):	0.126	0.225	0.461	0.910	1.844
Estimation (%):	0.00%	3.85%	2.57%	4.88%	4.64%



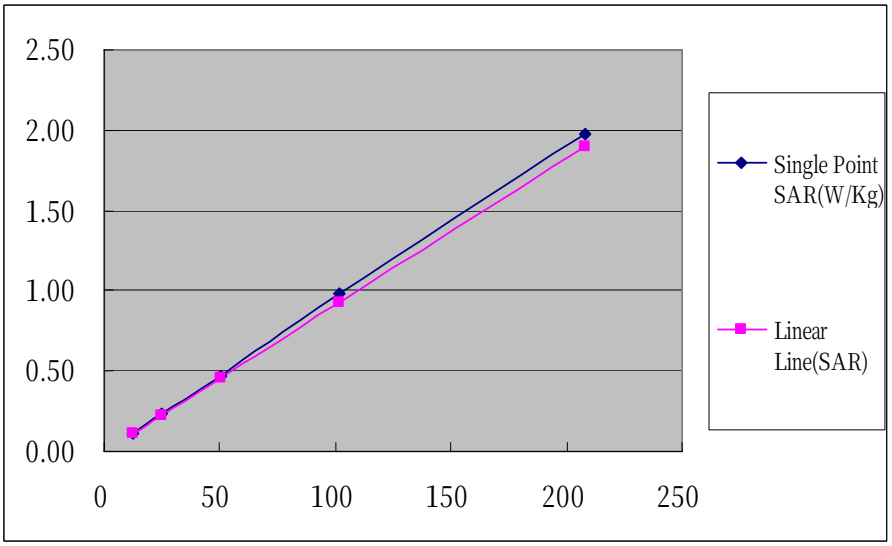
10MHz / QPSK

Average Power (mW):	12.89	25.84	51.48	102.40	207.90
Single Point SAR (W/kg):	0.114	0.236	0.480	0.942	1.950
Linear line (SAR):	0.114	0.229	0.455	0.906	1.839
Estimation (%):	0.00%	3.27%	5.43%	4.02%	6.05%



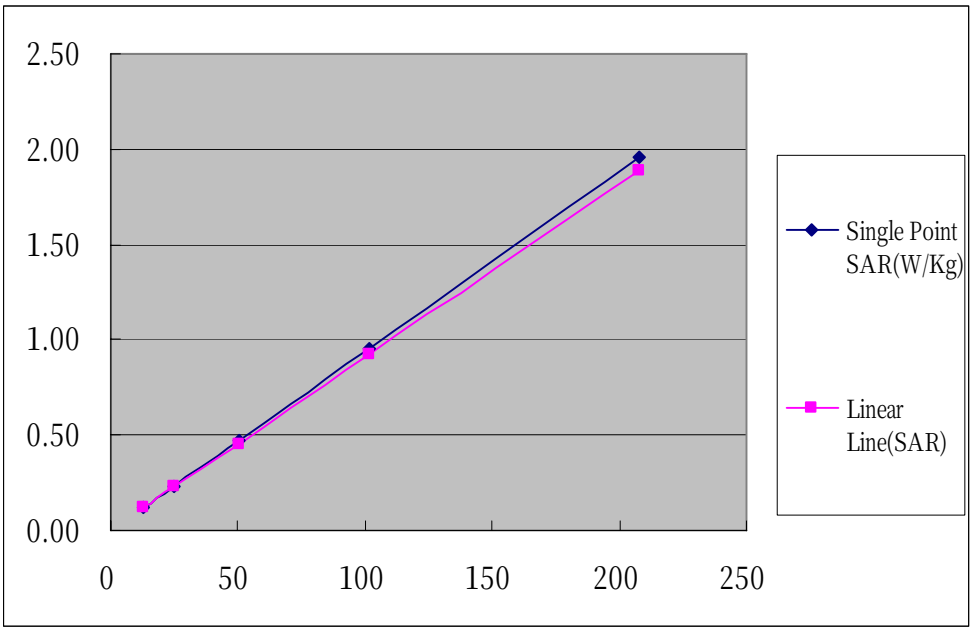
10MHz / 16QAM

Average Power (mW):	12.64	25.13	50.49	101.87	208.10
Single Point SAR (W/kg):	0.115	0.231	0.474	0.979	1.970
Linear line (SAR):	0.115	0.229	0.459	0.927	1.893
Estimation (%):	0.00%	1.03%	3.23%	5.62%	4.05%



10MHz / 64QAM

Average Power (mW):	12.87	25.20	50.08	101.63	207.60
Single Point SAR (W/kg):	0.119	0.230	0.468	0.949	1.954
Linear line (SAR):	0.119	0.229	0.456	0.925	1.889
Estimation (%):	0.00%	0.32%	2.69%	2.65%	3.45%



13. 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.

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APPENDIX A: TEST DATA

Product Name: WiMAX 802.16e USB Adapter ; Model Number: US300

Liquid Level Photo

Tissue 2600MHz D=150mm

Date/Time: 2011/2/9 01:22:57

M01-WiMax 5M-Ch16 / Ant 1

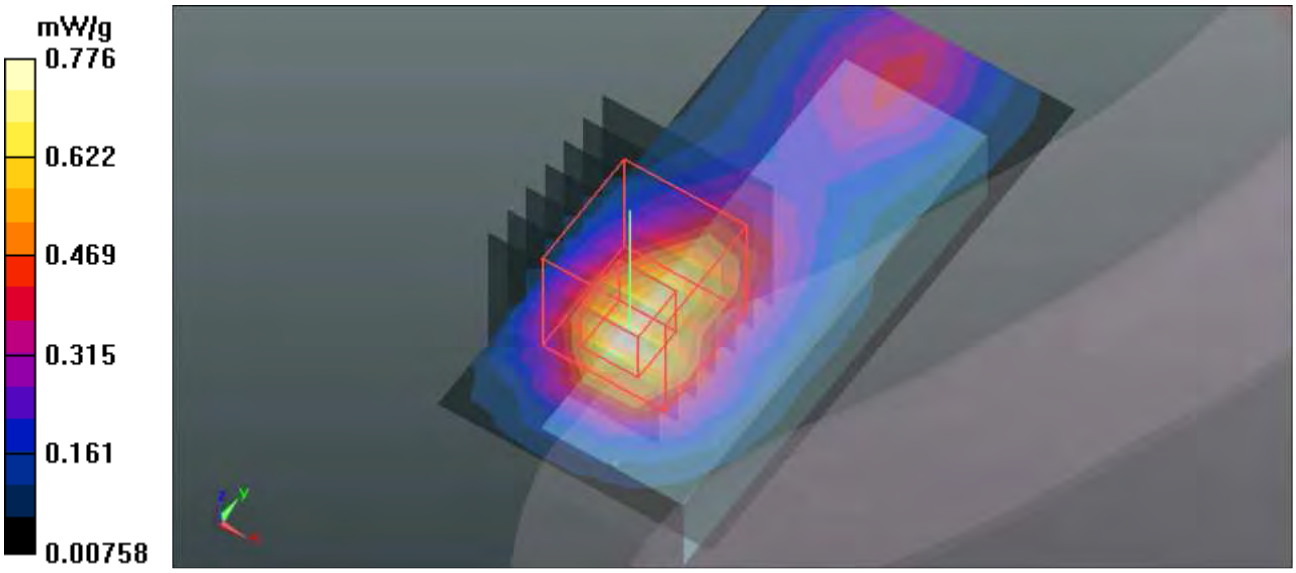
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The horizontal-down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.776 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.234 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.057 W/kg
SAR(1 g) = 0.522 mW/g; SAR(10 g) = 0.255 mW/g
Maximum value of SAR (measured) = 0.687 mW/g



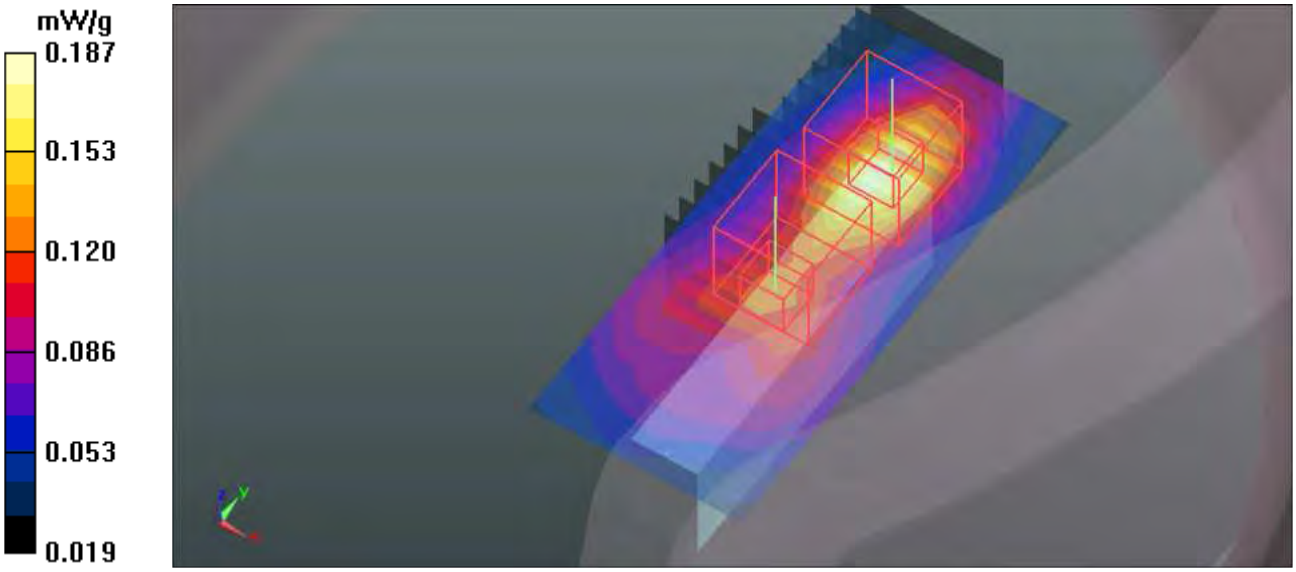
Date/Time: 2011/2/9 02:01:03

M02-WiMax 5M-Ch16 / Ant 1

Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)
DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat Section 5mm /Area Scan (7x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.187 mW/g
Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.049 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.259 W/kg
SAR(1 g) = 0.129 mW/g; SAR(10 g) = 0.065 mW/g
Maximum value of SAR (measured) = 0.190 mW/g
Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.049 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.186 W/kg
SAR(1 g) = 0.084 mW/g; SAR(10 g) = 0.047 mW/g
Maximum value of SAR (measured) = 0.132 mW/g



Date/Time: 2011/2/9 02:28:26

M03-WiMax 5M-Ch16 / Ant 1

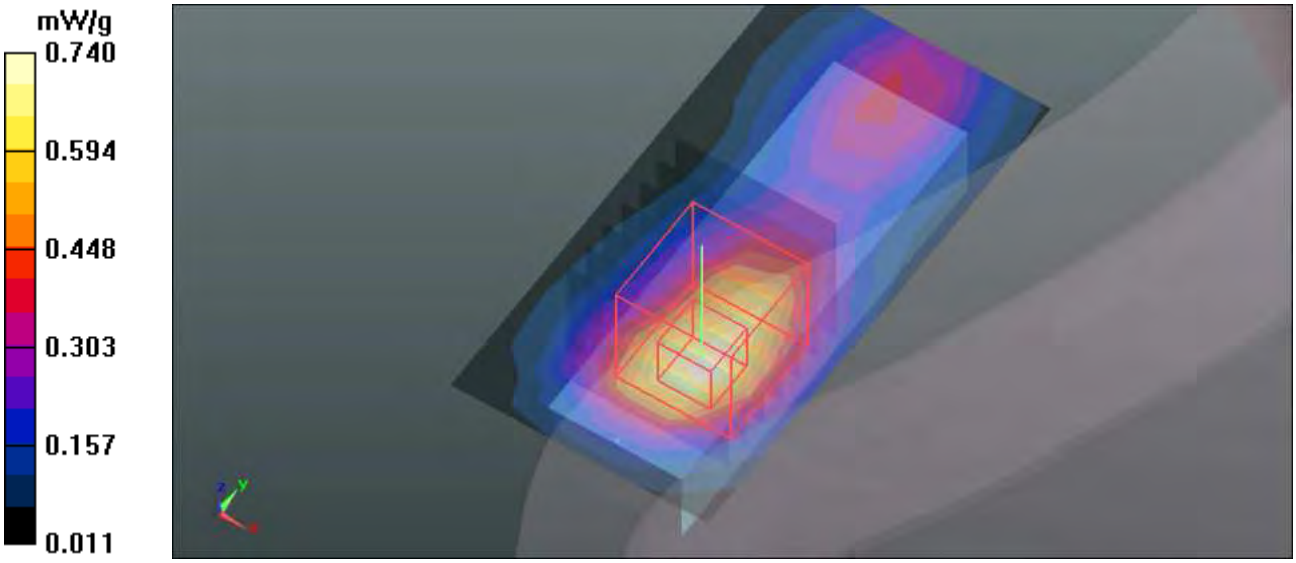
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The horizontal-up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.740 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.942 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.940 W/kg
SAR(1 g) = 0.483 mW/g; SAR(10 g) = 0.241 mW/g
Maximum value of SAR (measured) = 0.735 mW/g



Date/Time: 2011/2/9 02:55:38

M04-WiMax 5M-Ch16 / Ant 1

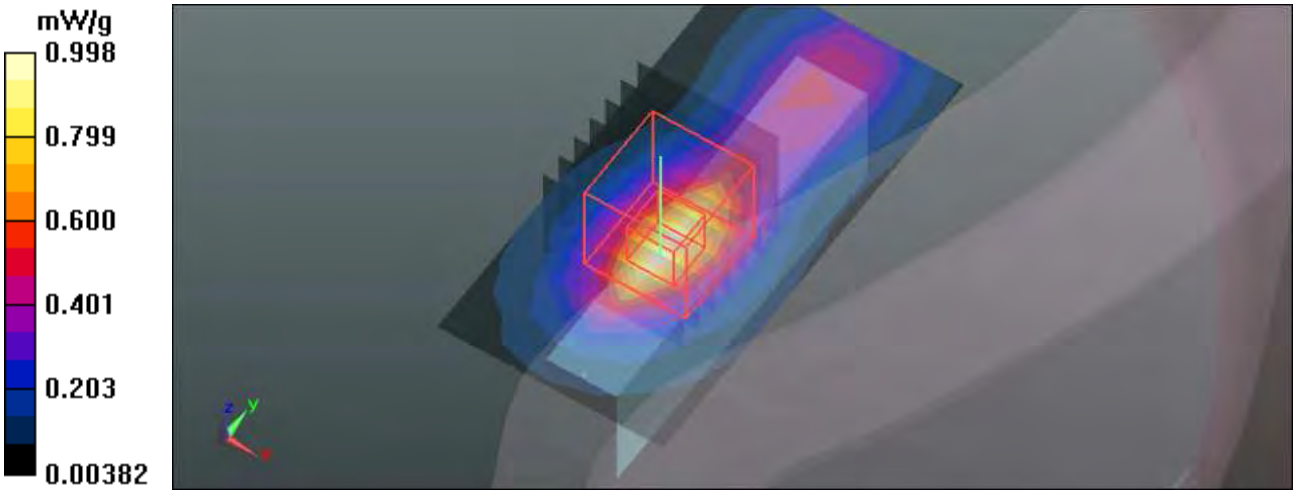
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.974 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.068 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.371 W/kg
SAR(1 g) = 0.644 mW/g; SAR(10 g) = 0.293 mW/g
Maximum value of SAR (measured) = 0.998 mW/g



Date/Time: 2011/2/9 03:20:19

M04-WiMax 5M-Ch406 / Ant 1

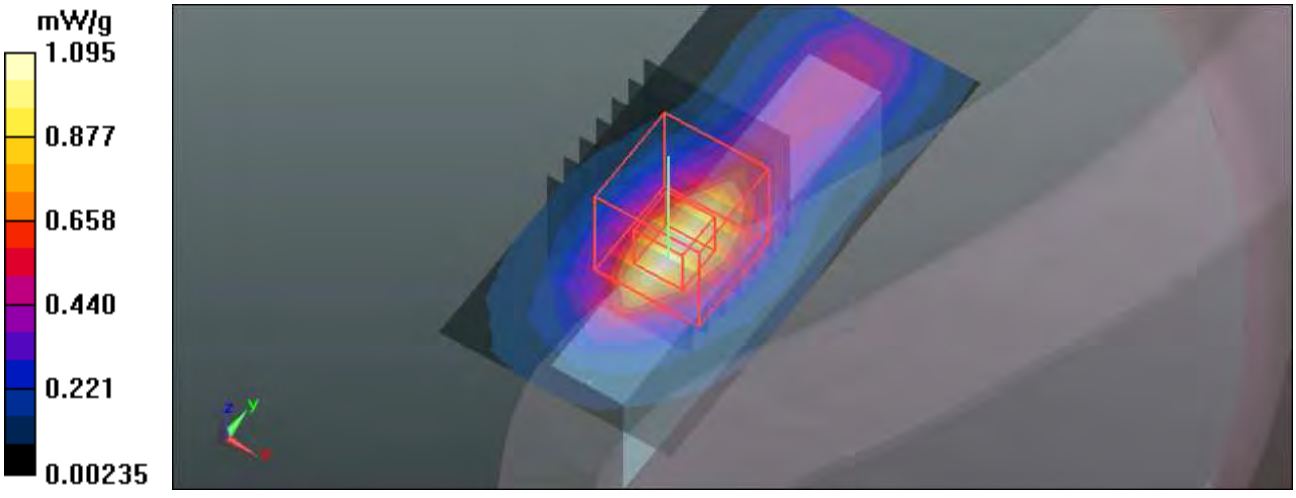
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.077 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.793 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.529 W/kg
SAR(1 g) = 0.699 mW/g; SAR(10 g) = 0.313 mW/g
Maximum value of SAR (measured) = 1.095 mW/g



Date/Time: 2011/2/9 03:47:06

M04-WiMax 5M-Ch756 / Ant 1

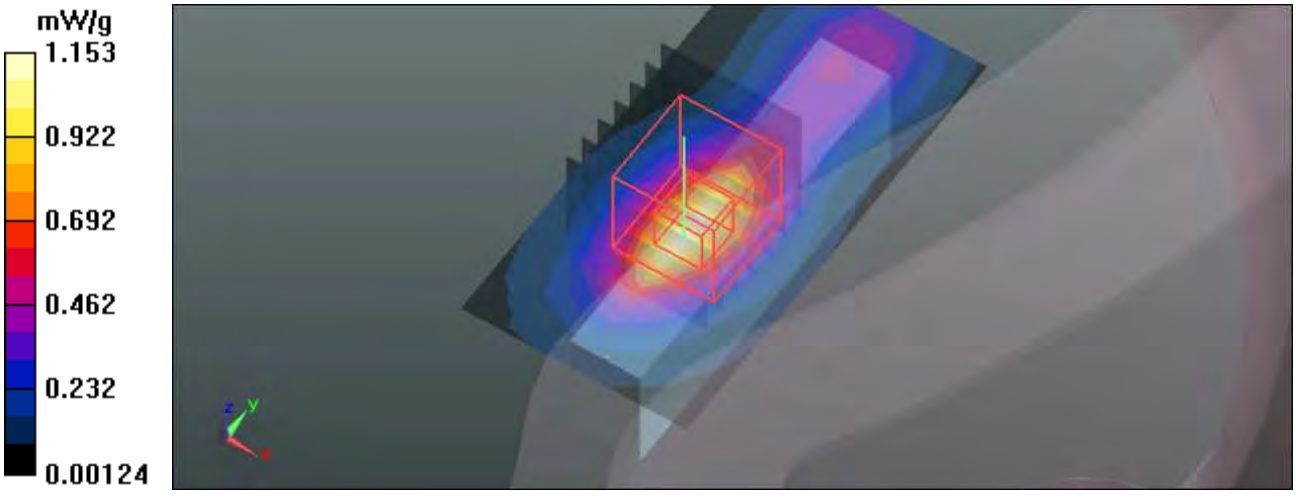
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.26 mho/m; εr = 53.02; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.131 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.244 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.634 W/kg
SAR(1 g) = 0.727 mW/g; SAR(10 g) = 0.321 mW/g
Maximum value of SAR (measured) = 1.153 mW/g



Date/Time: 2011/2/9 04:13:55

M05-WiMax 5M-Ch16 / Ant 1

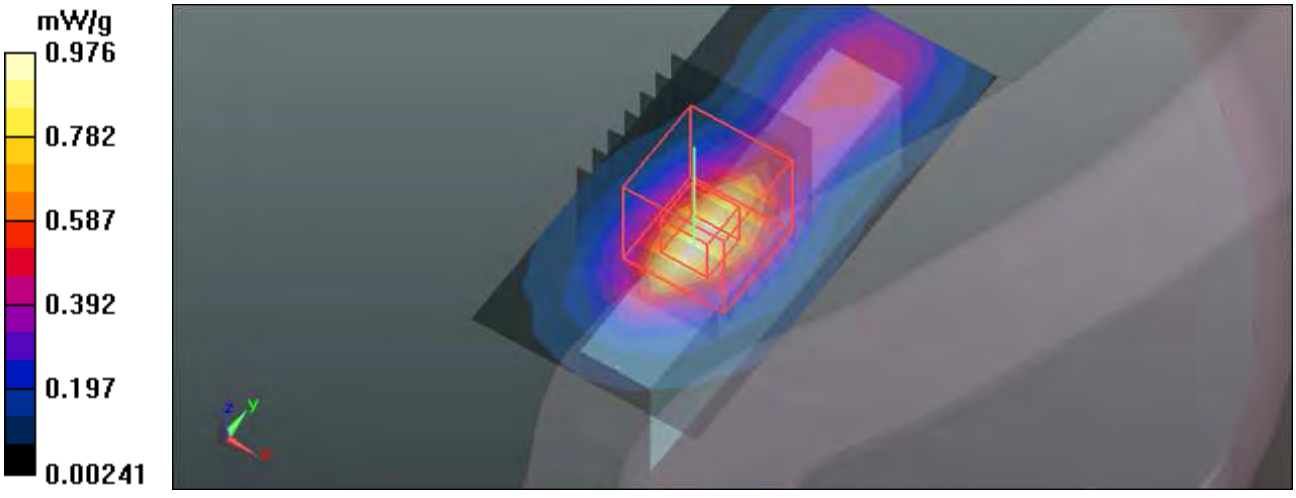
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.959 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.134 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.344 W/kg
SAR(1 g) = 0.633 mW/g; SAR(10 g) = 0.288 mW/g
Maximum value of SAR (measured) = 0.976 mW/g



Date/Time: 2011/2/9 04:41:49

M05-WiMax 5M-Ch406 / Ant 1

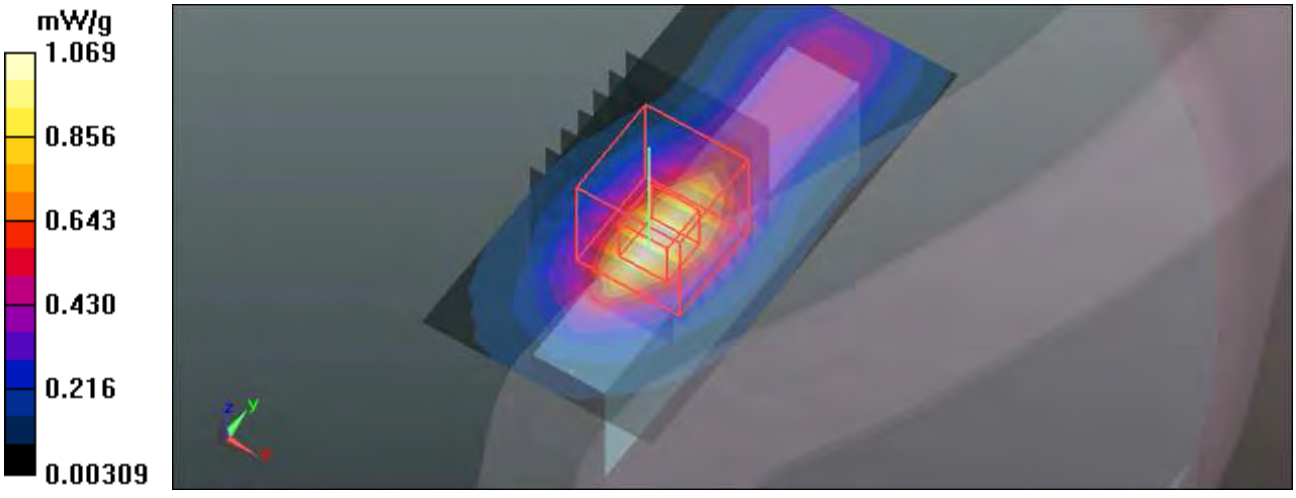
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.055 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.810 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.492 W/kg
SAR(1 g) = 0.683 mW/g; SAR(10 g) = 0.307 mW/g
Maximum value of SAR (measured) = 1.069 mW/g



Date/Time: 2011/2/9 05:09:31

M05-WiMax 5M-Ch756 / Ant 1

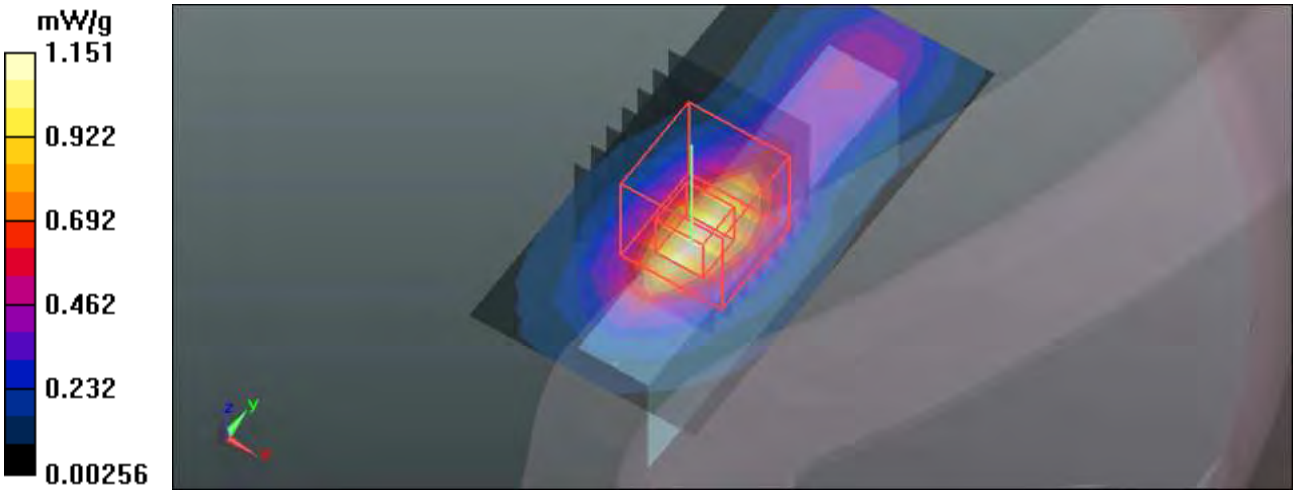
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.26 mho/m; εr = 53.02; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.119 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.332 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.629 W/kg
SAR(1 g) = 0.722 mW/g; SAR(10 g) = 0.318 mW/g
Maximum value of SAR (measured) = 1.151 mW/g



Date/Time: 2011/2/9 05:36:51

M06-WiMax 5M-Ch16 / Ant 1

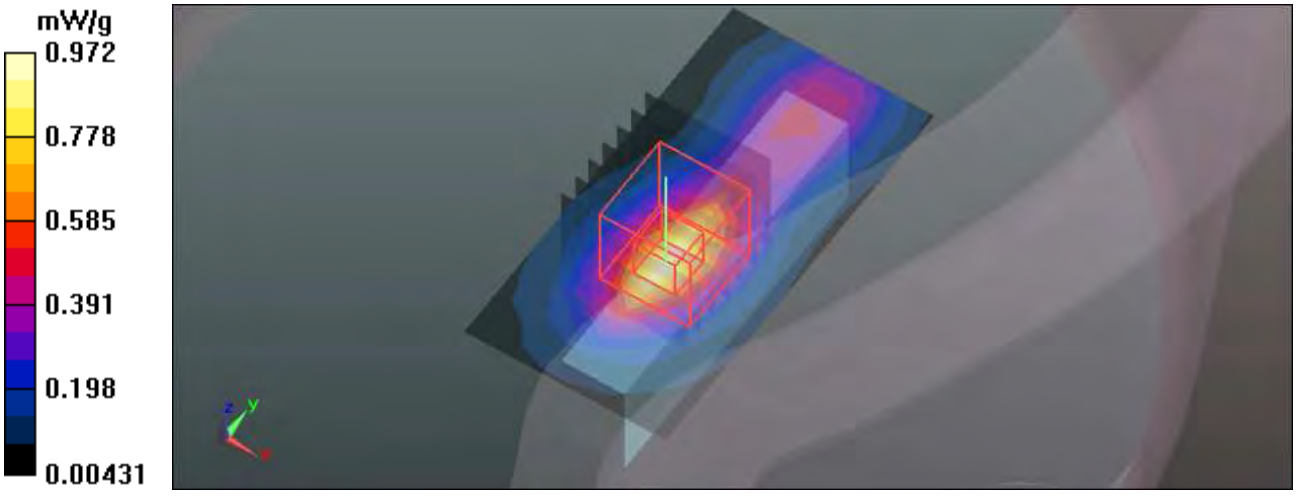
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.946 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.050 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.331 W/kg
SAR(1 g) = 0.628 mW/g; SAR(10 g) = 0.287 mW/g
Maximum value of SAR (measured) = 0.972 mW/g



Date/Time: 2011/2/9 06:02:58

M06-WiMax 5M-Ch406 / Ant 1

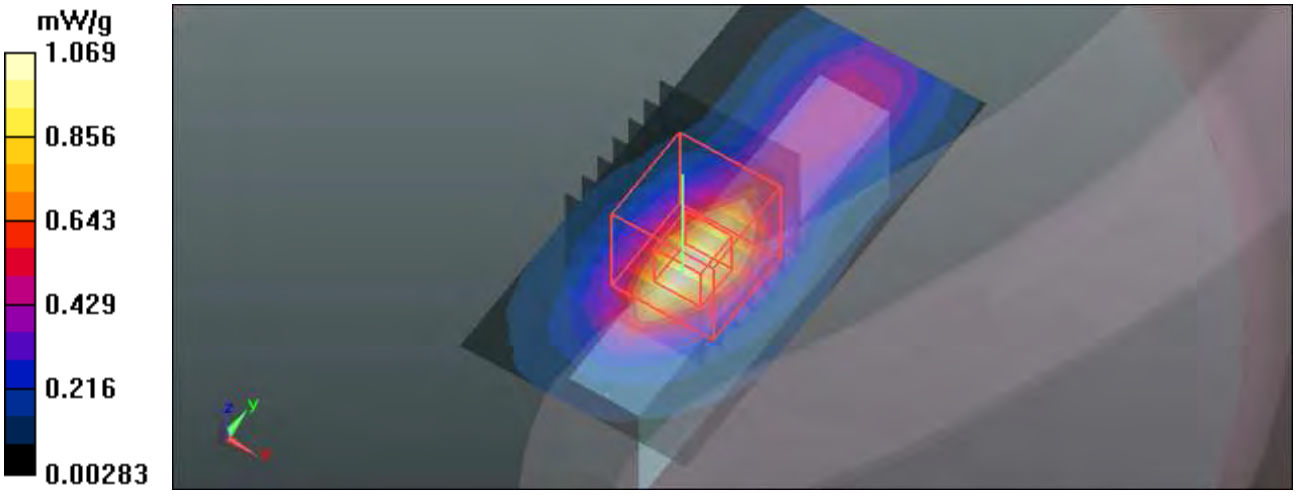
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.042 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.828 V/m; Power Drift = 0.0077 dB
Peak SAR (extrapolated) = 1.497 W/kg
SAR(1 g) = 0.683 mW/g; SAR(10 g) = 0.307 mW/g
Maximum value of SAR (measured) = 1.069 mW/g



Date/Time: 2011/2/9 06:28:25

M06-WiMax 5M-Ch756 / Ant 1

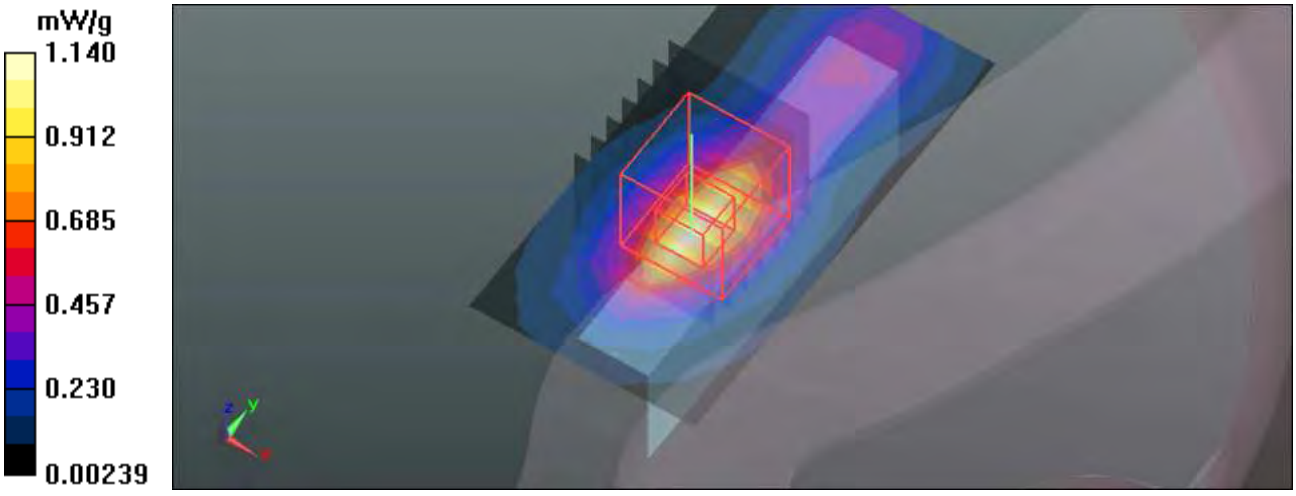
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.26 mho/m; εr = 53.02; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.113 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.338 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.612 W/kg
SAR(1 g) = 0.718 mW/g; SAR(10 g) = 0.318 mW/g
Maximum value of SAR (measured) = 1.140 mW/g



Date/Time: 2011/2/9 06:50:43

M07-WiMax 5M-Ch16 / Ant 1

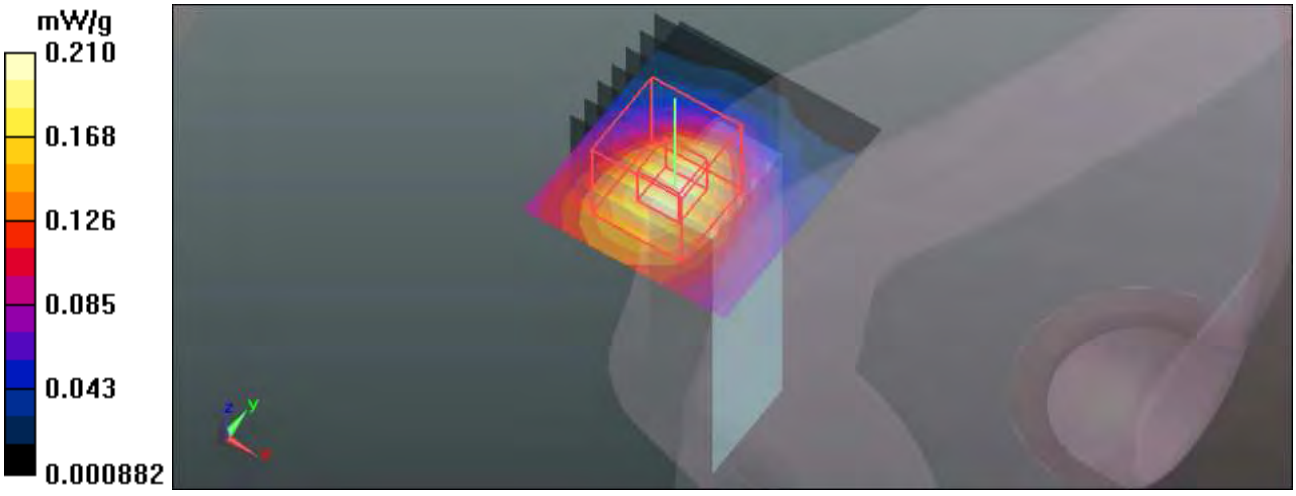
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The top edge side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x8x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.201 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.614 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.284 W/kg
SAR(1 g) = 0.144 mW/g; SAR(10 g) = 0.074 mW/g
Maximum value of SAR (measured) = 0.210 mW/g



Date/Time: 2011/2/9 07:20:22

M08-WiMax 5M-Ch16 / Ant 2

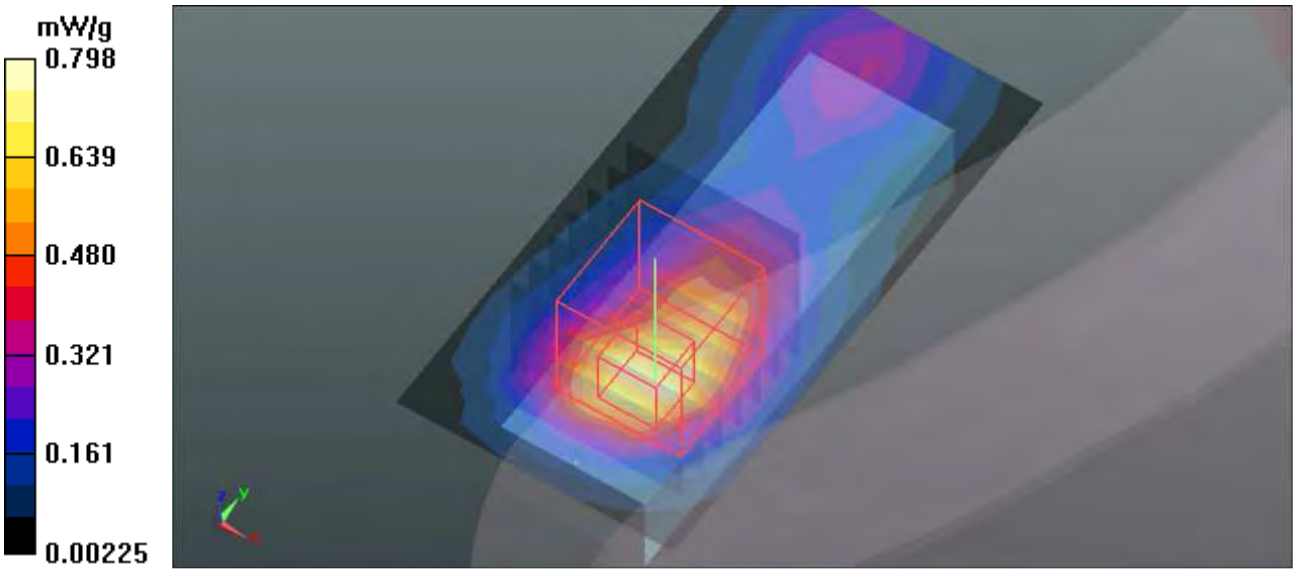
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The horizontal-down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.751 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.340 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.102 W/kg
SAR(1 g) = 0.523 mW/g; SAR(10 g) = 0.247 mW/g
Maximum value of SAR (measured) = 0.798 mW/g



Date/Time: 2011/2/9 07:47:11

M09-WiMax 5M-Ch16 / Ant 2

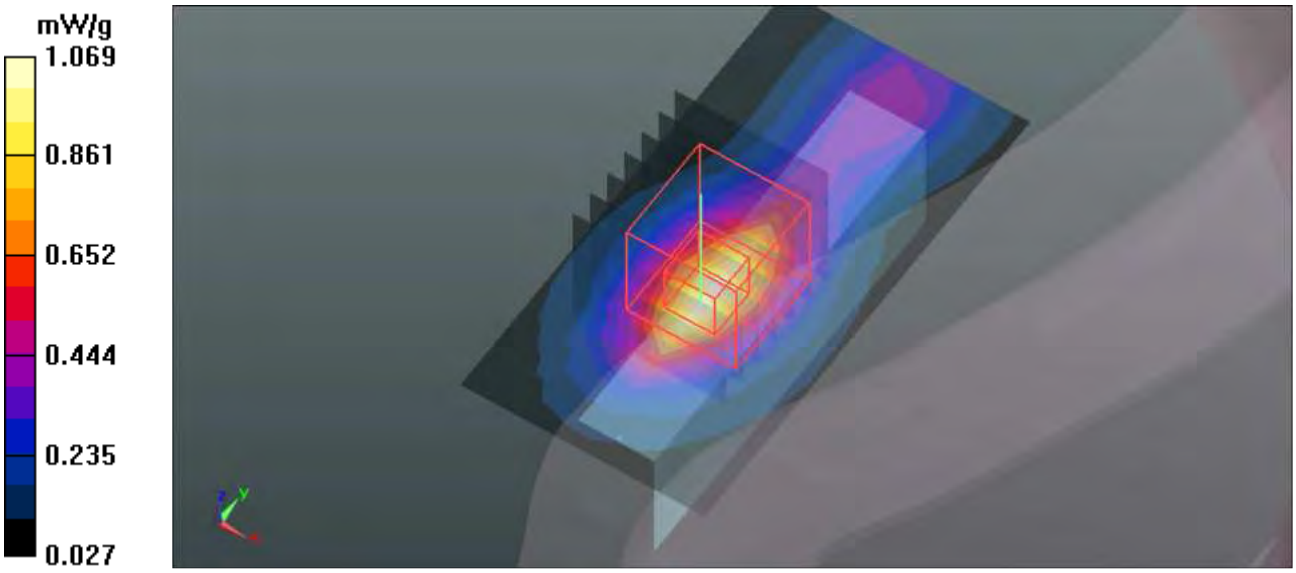
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.069 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.718 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 1.449 W/kg
SAR(1 g) = 0.673 mW/g; SAR(10 g) = 0.307 mW/g
Maximum value of SAR (measured) = 1.045 mW/g



Date/Time: 2011/2/9 08:04:06

M09-WiMax 5M-Ch406 / Ant 2

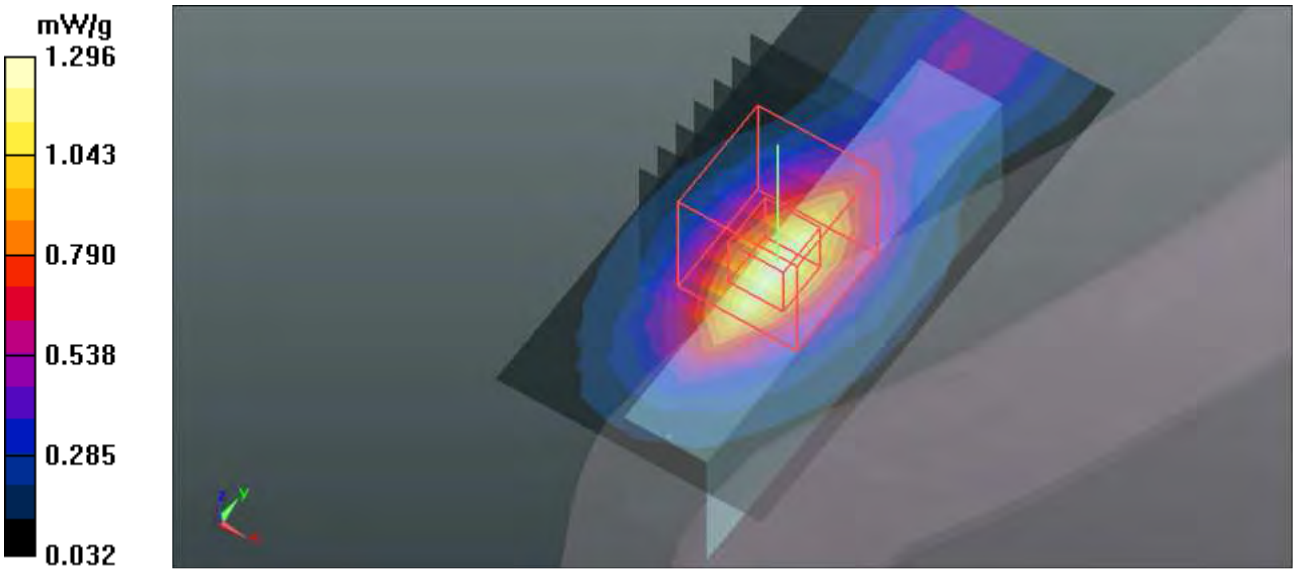
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.296 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.250 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.829 W/kg
SAR(1 g) = 0.813 mW/g; SAR(10 g) = 0.365 mW/g
Maximum value of SAR (measured) = 1.279 mW/g



Date/Time: 2011/2/9 08:31:37

M09-WiMax 5M-Ch756 / Ant 2

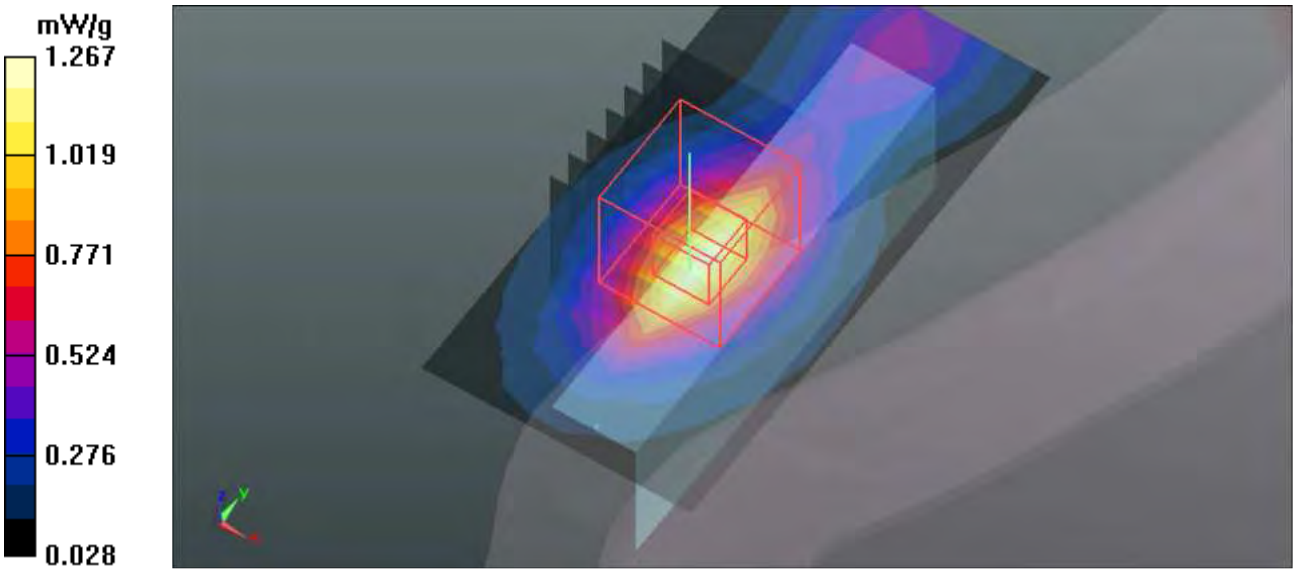
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.26 mho/m; εr = 53.02; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.267 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.399 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.773 W/kg
SAR(1 g) = 0.807 mW/g; SAR(10 g) = 0.365 mW/g
Maximum value of SAR (measured) = 1.259 mW/g



Date/Time: 2011/2/9 08:57:09

M10-WiMax 5M-Ch16 / Ant 2

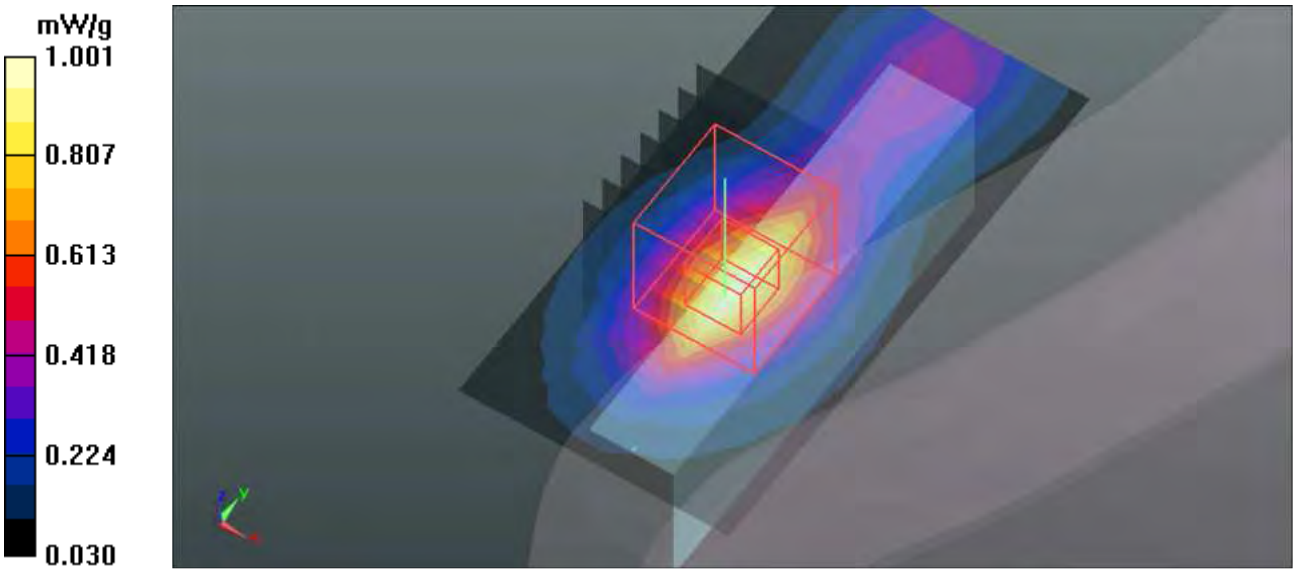
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.001 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.429 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.390 W/kg
SAR(1 g) = 0.652 mW/g; SAR(10 g) = 0.298 mW/g
Maximum value of SAR (measured) = 1.008 mW/g



Date/Time: 2011/2/9 09:22:35

M10-WiMax 5M-Ch406 / Ant 2

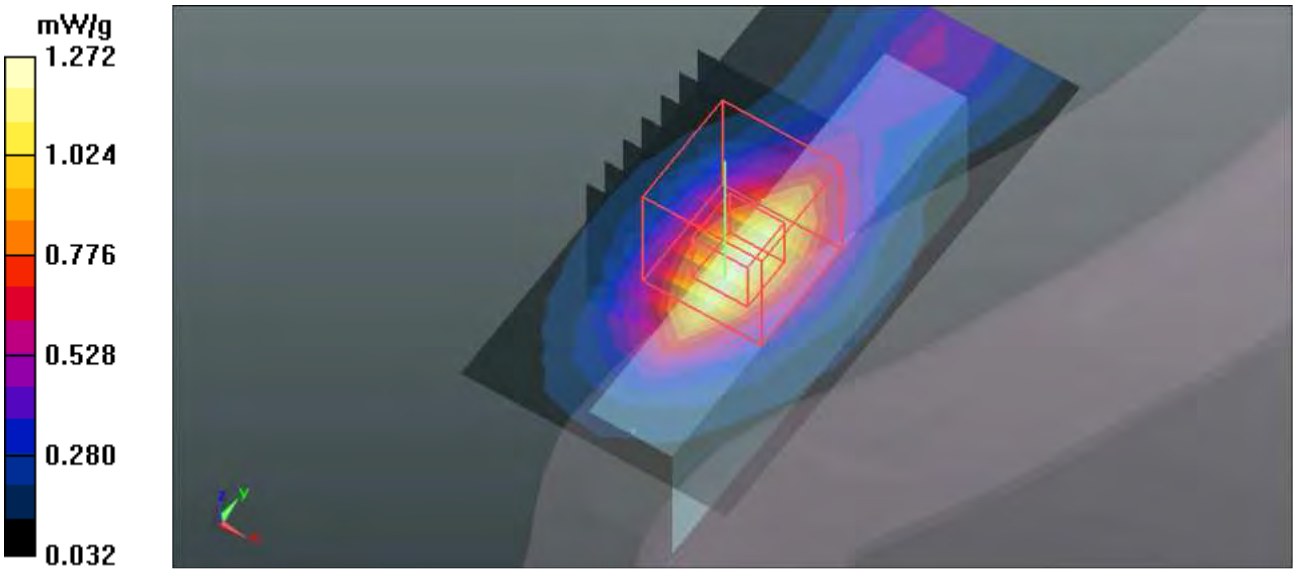
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.272 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.193 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.797 W/kg
SAR(1 g) = 0.804 mW/g; SAR(10 g) = 0.363 mW/g
Maximum value of SAR (measured) = 1.256 mW/g



Date/Time: 2011/2/9 09:48:16

M10-WiMax 5M-Ch756 / Ant 2

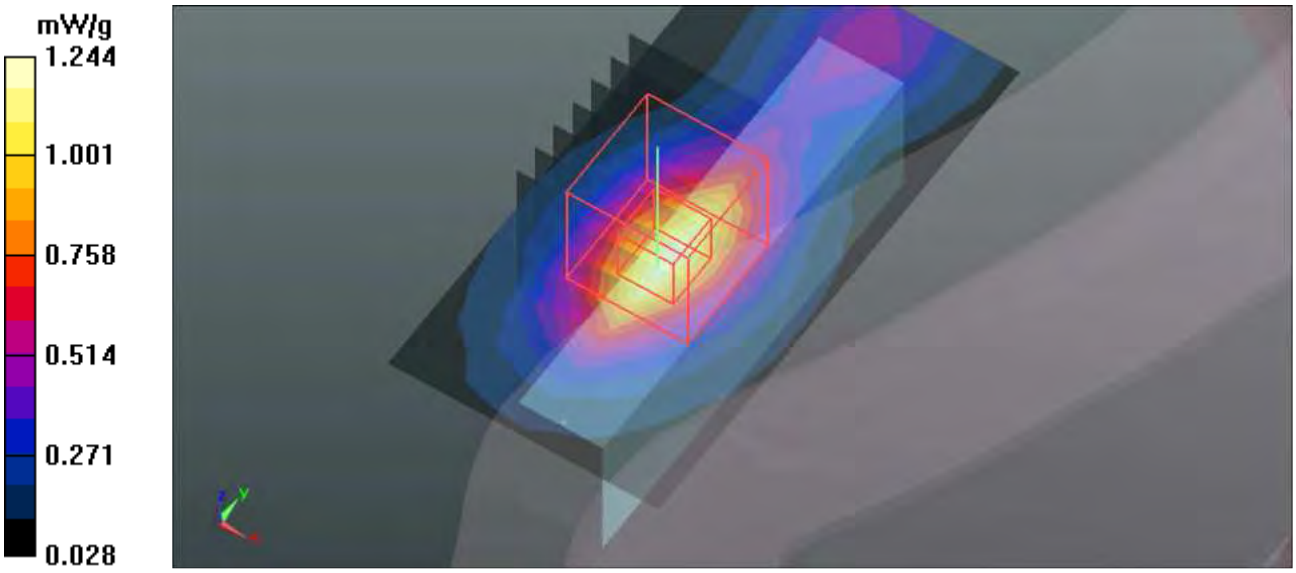
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.26 mho/m; εr = 53.02; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.244 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.385 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.735 W/kg
SAR(1 g) = 0.793 mW/g; SAR(10 g) = 0.360 mW/g
Maximum value of SAR (measured) = 1.235 mW/g



Date/Time: 2011/2/9 10:15:16

M11-WiMax 5M-Ch16 / Ant 2

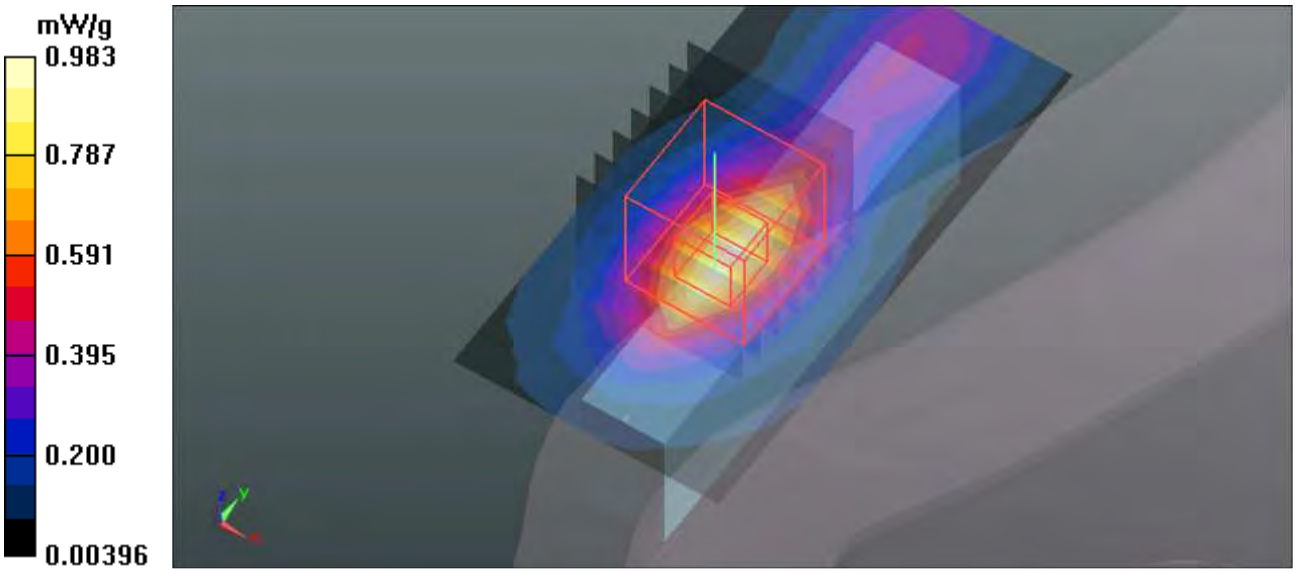
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.970 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.380 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.356 W/kg
SAR(1 g) = 0.637 mW/g; SAR(10 g) = 0.292 mW/g
Maximum value of SAR (measured) = 0.983 mW/g



Date/Time: 2011/2/9 10:43:39

M11-WiMax 5M-Ch406 / Ant 2

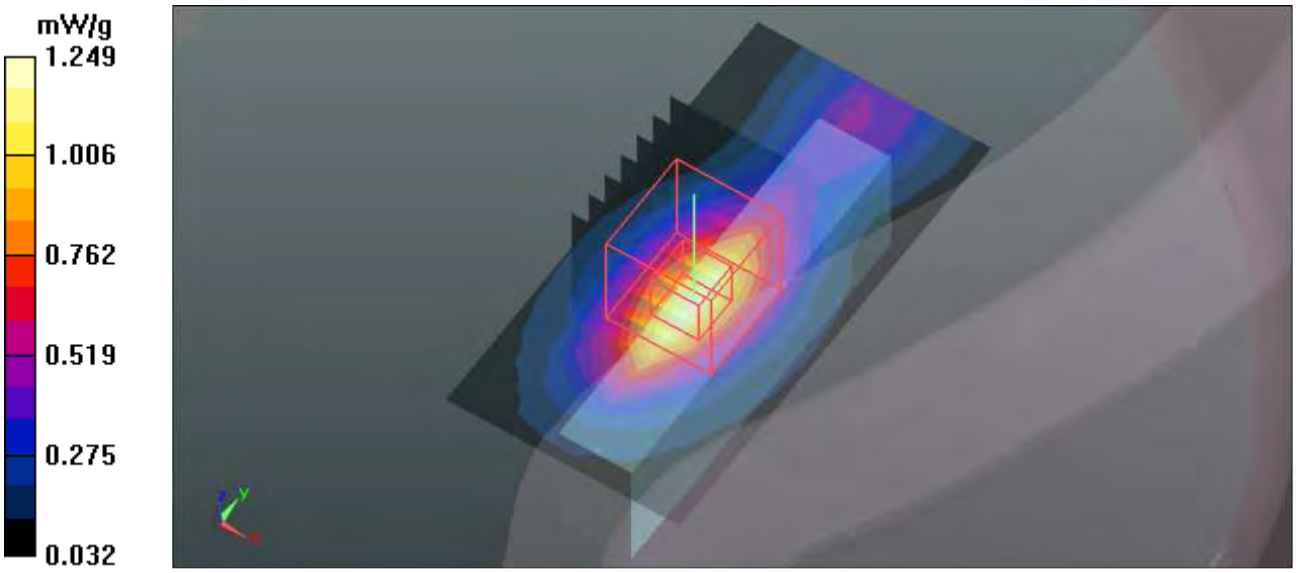
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.249 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.102 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.776 W/kg
SAR(1 g) = 0.790 mW/g; SAR(10 g) = 0.356 mW/g
Maximum value of SAR (measured) = 1.237 mW/g



Date/Time: 2011/2/9 11:09:17

M11-WiMax 5M-Ch756 / Ant 1

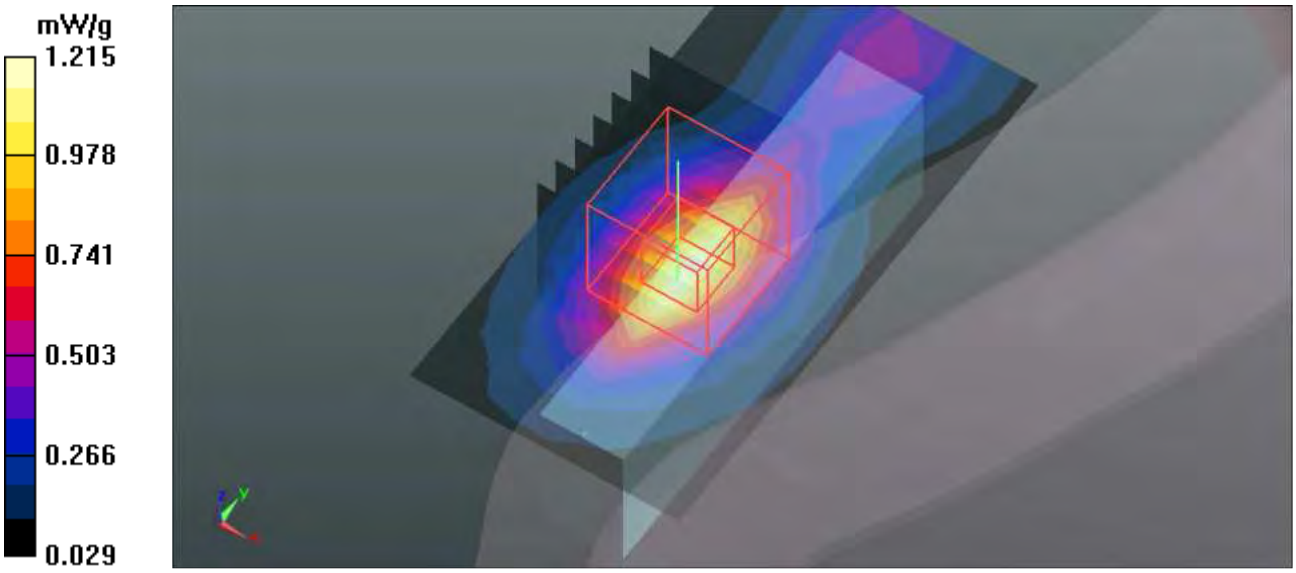
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.26 mho/m; εr = 53.02; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.215 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.197 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.706 W/kg
SAR(1 g) = 0.779 mW/g; SAR(10 g) = 0.354 mW/g
Maximum value of SAR (measured) = 1.214 mW/g



Date/Time: 2011/2/9 11:38:31

M12-WiMax 5M-Ch16 / Ant 2

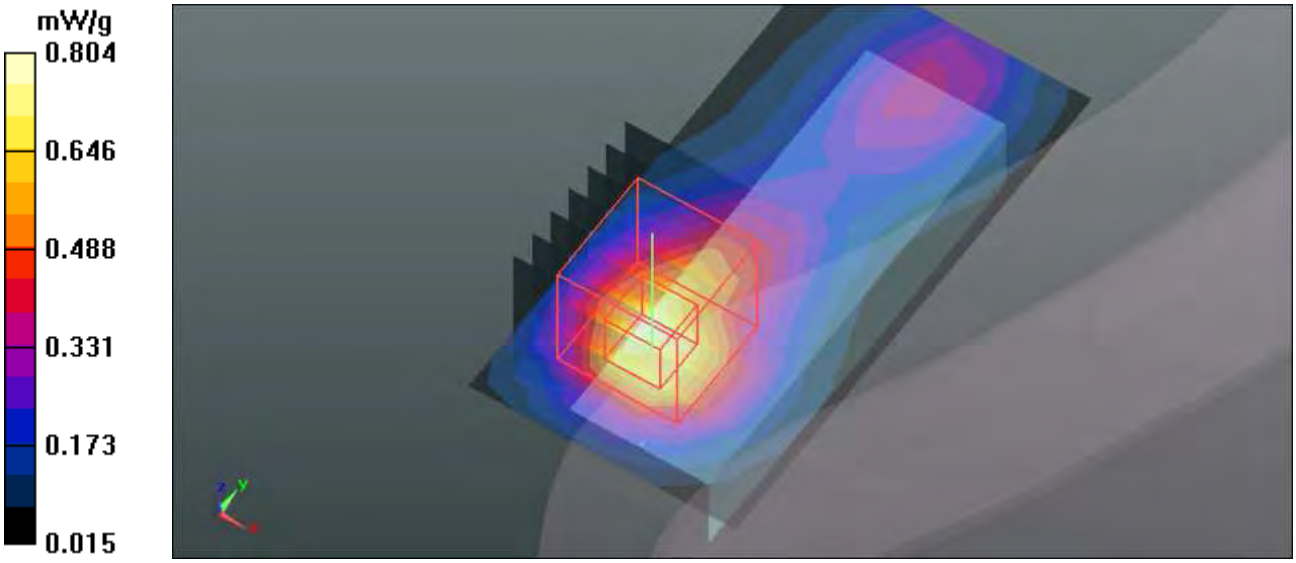
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; ε_r = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The horizontal-up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.804 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.412 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.013 W/kg
SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.248 mW/g
Maximum value of SAR (measured) = 0.754 mW/g



Date/Time: 2011/2/9 12:15:32

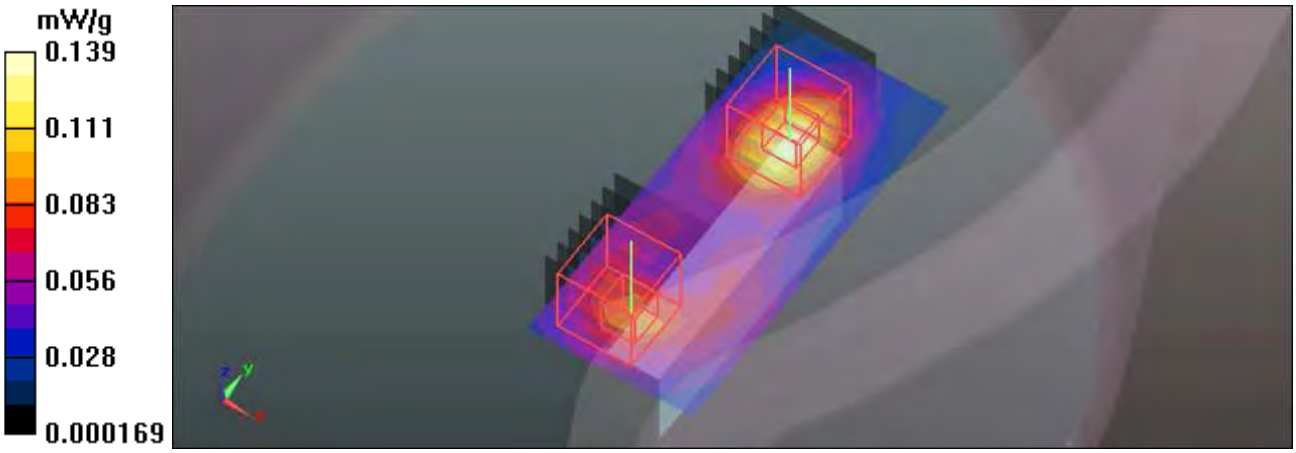
M13-WiMax 5M-Ch16 / Ant 2

Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.138 mW/g
Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.228 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.191 W/kg
SAR(1 g) = 0.093 mW/g; SAR(10 g) = 0.046 mW/g
Maximum value of SAR (measured) = 0.139 mW/g
Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.228 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.148 W/kg
SAR(1 g) = 0.062 mW/g; SAR(10 g) = 0.031 mW/g
Maximum value of SAR (measured) = 0.099 mW/g



Date/Time: 2011/2/9 12:37:49

M14-WiMax 5M-Ch16 / Ant 2

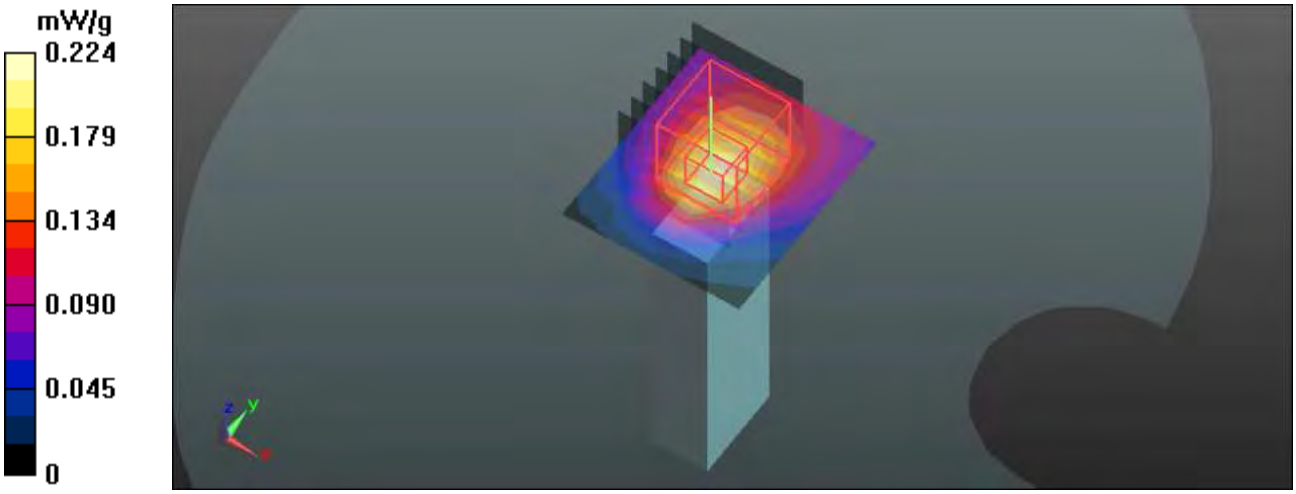
Communication System: Wimax_2.6GHz 5M ; Frequency: 2502.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2502.5 MHz; σ = 2.06 mho/m; εr = 53.68; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The top edge side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x8x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.216 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.259 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.304 W/kg
SAR(1 g) = 0.152 mW/g; SAR(10 g) = 0.077 mW/g
Maximum value of SAR (measured) = 0.224 mW/g



Date/Time: 2011/2/9 13:09:15

M15-WiMax 10M-Ch16 / Ant 1

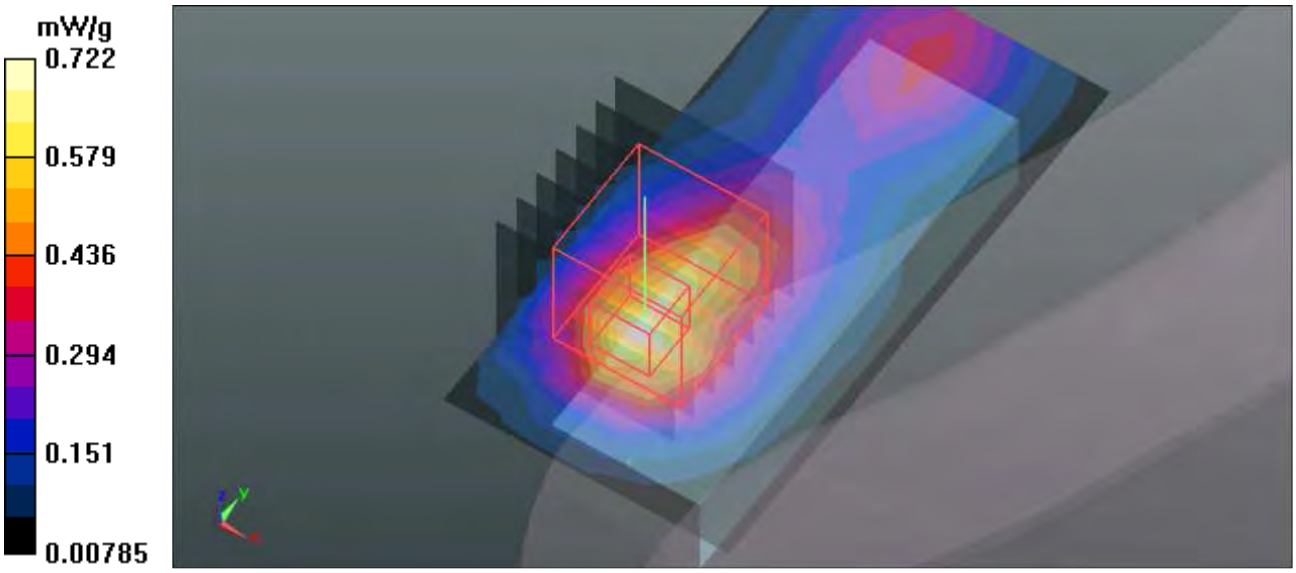
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The horizontal-down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.722 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.240 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.104 W/kg
SAR(1 g) = 0.545 mW/g; SAR(10 g) = 0.264 mW/g
Maximum value of SAR (measured) = 0.619 mW/g



Date/Time: 2011/2/9 13:46:25

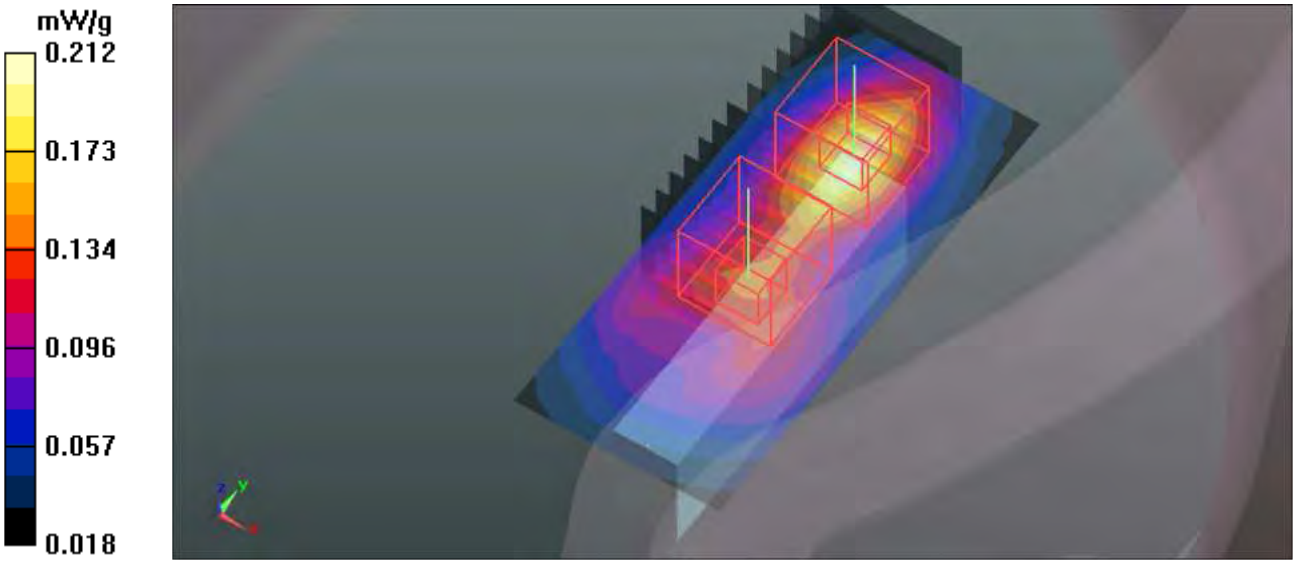
M16-WiMax 10M-Ch16 / Ant 1

Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat Section 5mm /Area Scan (7x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.212 mW/g
Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.705 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.277 W/kg
SAR(1 g) = 0.137 mW/g; SAR(10 g) = 0.069 mW/g
Maximum value of SAR (measured) = 0.205 mW/g
Flat Section 5mm /Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.705 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.184 W/kg
SAR(1 g) = 0.091 mW/g; SAR(10 g) = 0.050 mW/g
Maximum value of SAR (measured) = 0.135 mW/g



Date/Time: 2011/2/9 14:13:45

M17-WiMax 10M-Ch16 / Ant 1

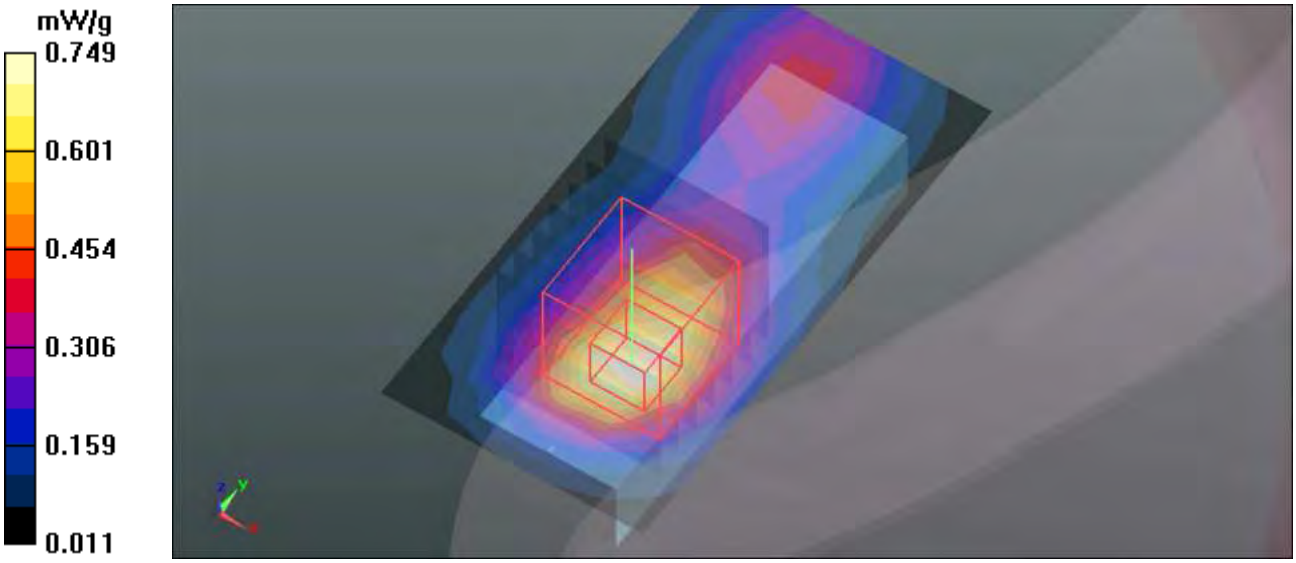
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The horizontal-up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.749 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.366 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 1.015 W/kg
SAR(1 g) = 0.511 mW/g; SAR(10 g) = 0.254 mW/g
Maximum value of SAR (measured) = 0.736 mW/g



Date/Time: 2011/2/9 14:40:47

M18-WiMax 10M-Ch16 / Ant 1

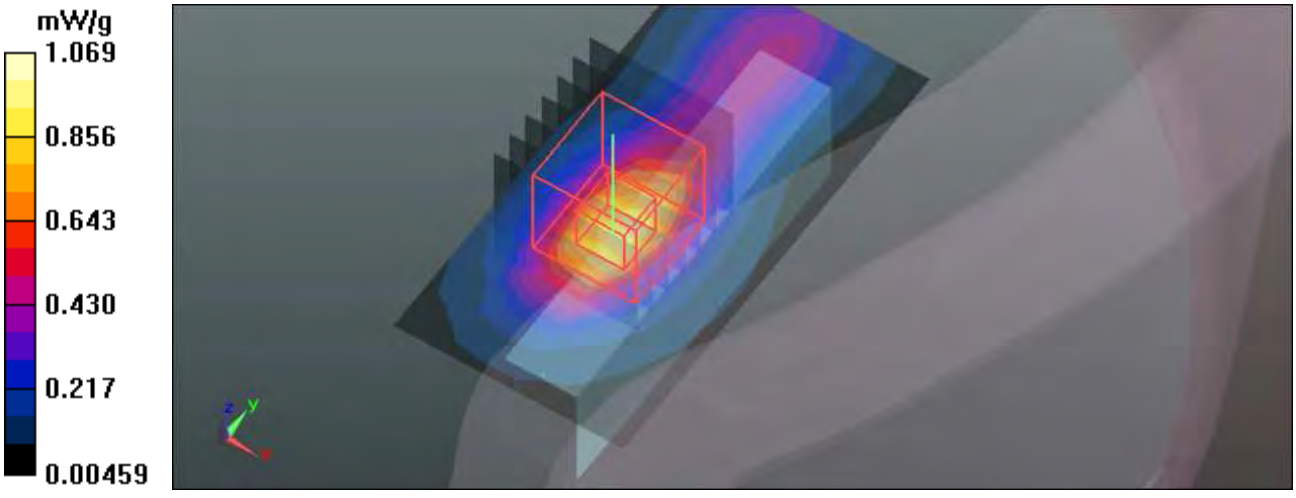
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.968 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.555 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 1.484 W/kg
SAR(1 g) = 0.681 mW/g; SAR(10 g) = 0.308 mW/g
Maximum value of SAR (measured) = 1.069 mW/g



Date/Time: 2011/2/9 15:07:07

M18-WiMax 10M-Ch396 / Ant 1

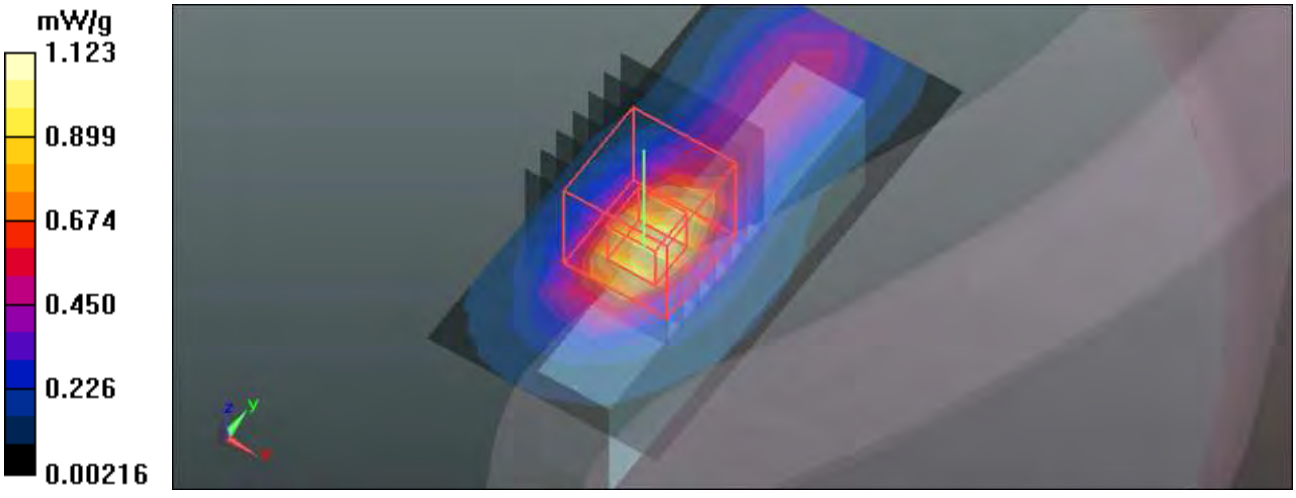
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.014 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.181 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.590 W/kg
SAR(1 g) = 0.702 mW/g; SAR(10 g) = 0.310 mW/g
Maximum value of SAR (measured) = 1.123 mW/g



Date/Time: 2011/2/9 15:33:19

M18-WiMax 10M-Ch736 / Ant 1

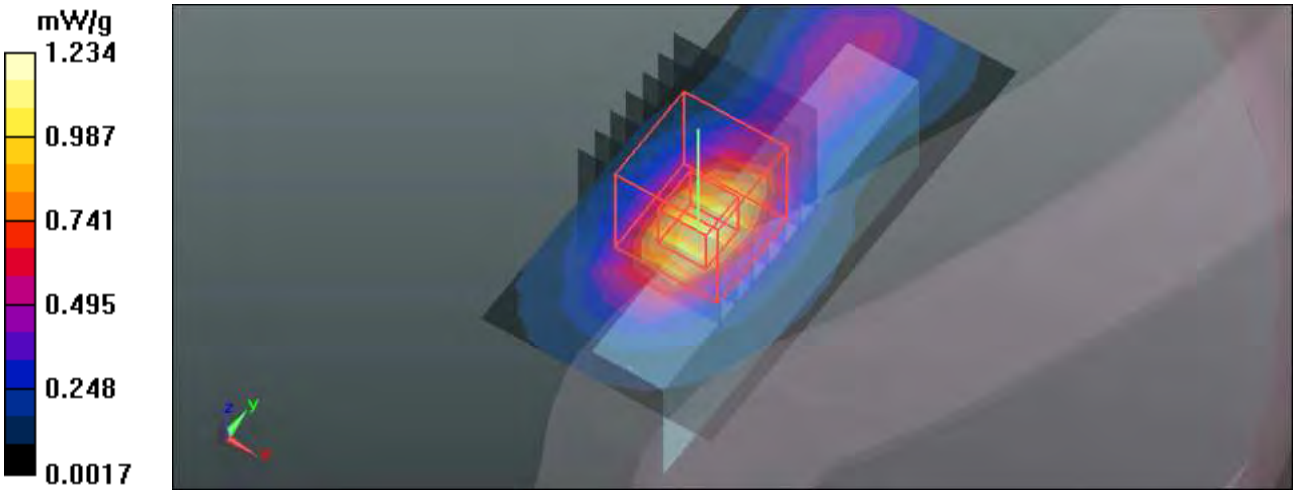
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.25 mho/m; εr = 53.08; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.120 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.898 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.772 W/kg
SAR(1 g) = 0.764 mW/g; SAR(10 g) = 0.332 mW/g
Maximum value of SAR (measured) = 1.234 mW/g



Date/Time: 2011/2/9 16:02:31

M19-WiMax 10M-Ch16 / Ant 1

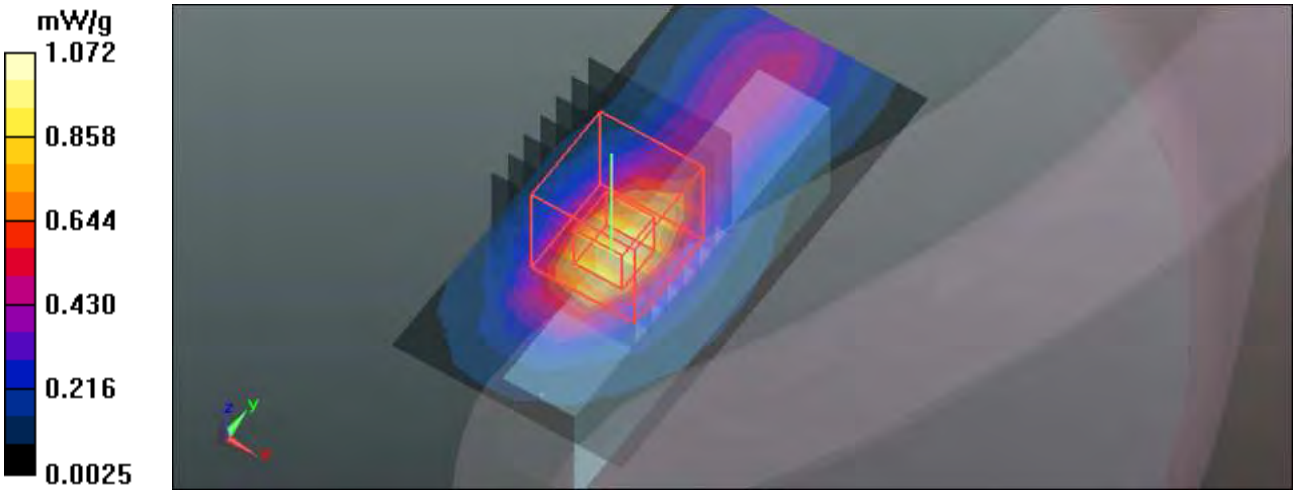
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.990 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.833 V/m; Power Drift = -0.00048 dB
Peak SAR (extrapolated) = 1.489 W/kg
SAR(1 g) = 0.686 mW/g; SAR(10 g) = 0.310 mW/g
Maximum value of SAR (measured) = 1.072 mW/g



Date/Time: 2011/2/9 16:28:11

M19-WiMax 10M-Ch396 / Ant 1

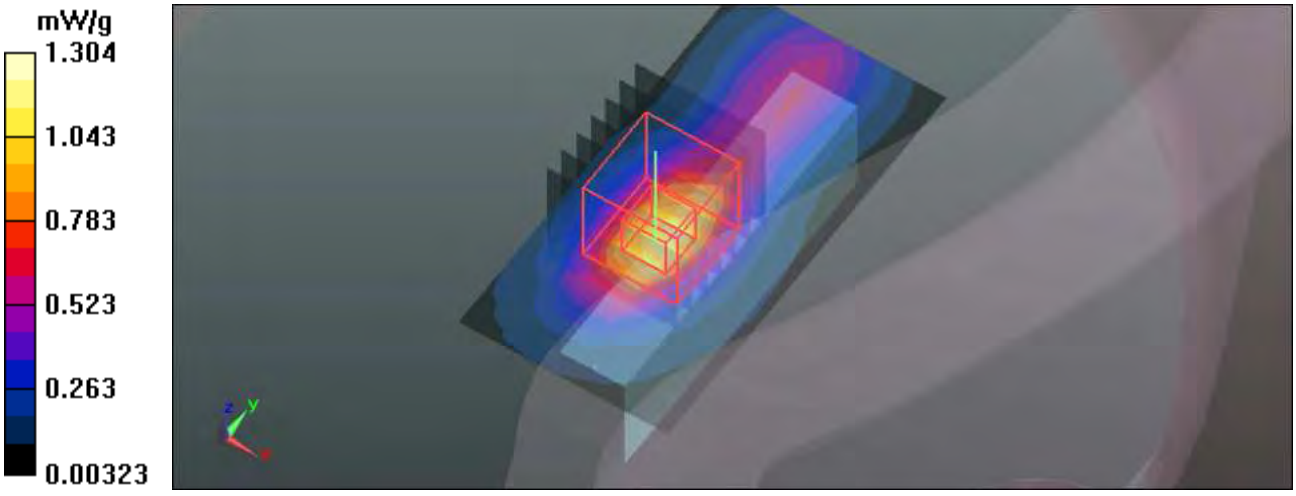
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.193 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.052 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.848 W/kg
SAR(1 g) = 0.818 mW/g; SAR(10 g) = 0.362 mW/g
Maximum value of SAR (measured) = 1.304 mW/g



Date/Time: 2011/2/9 16:55:58

M19-WiMax 10M-Ch736 / Ant 1

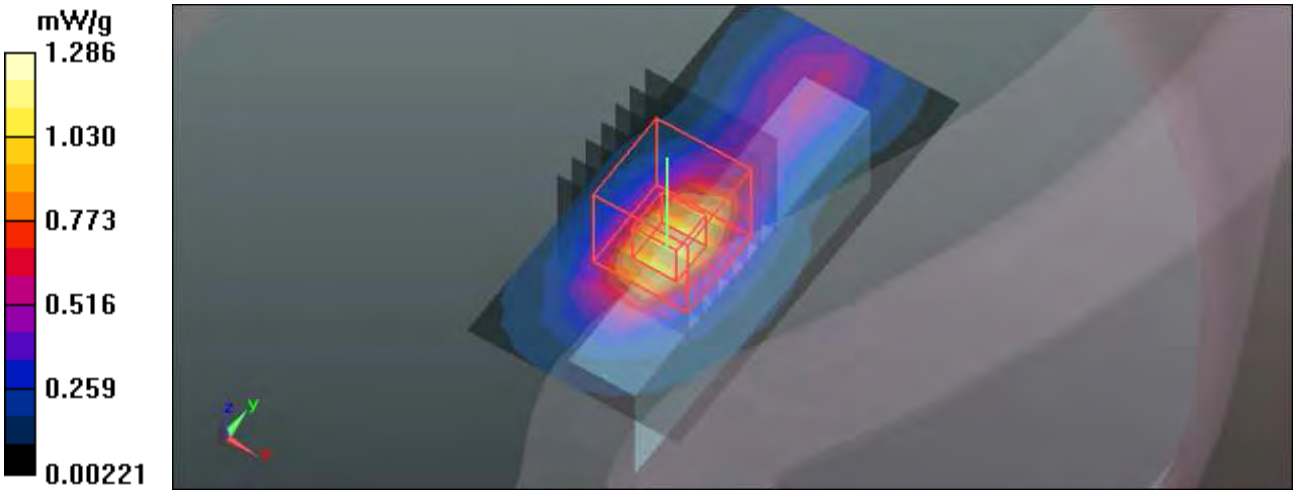
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.25 mho/m; εr = 53.08; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.164 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.147 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.844 W/kg
SAR(1 g) = 0.796 mW/g; SAR(10 g) = 0.346 mW/g
Maximum value of SAR (measured) = 1.286 mW/g



Date/Time: 2011/2/9 17:27:43

M20-WiMax 10M-Ch16 / Ant 1

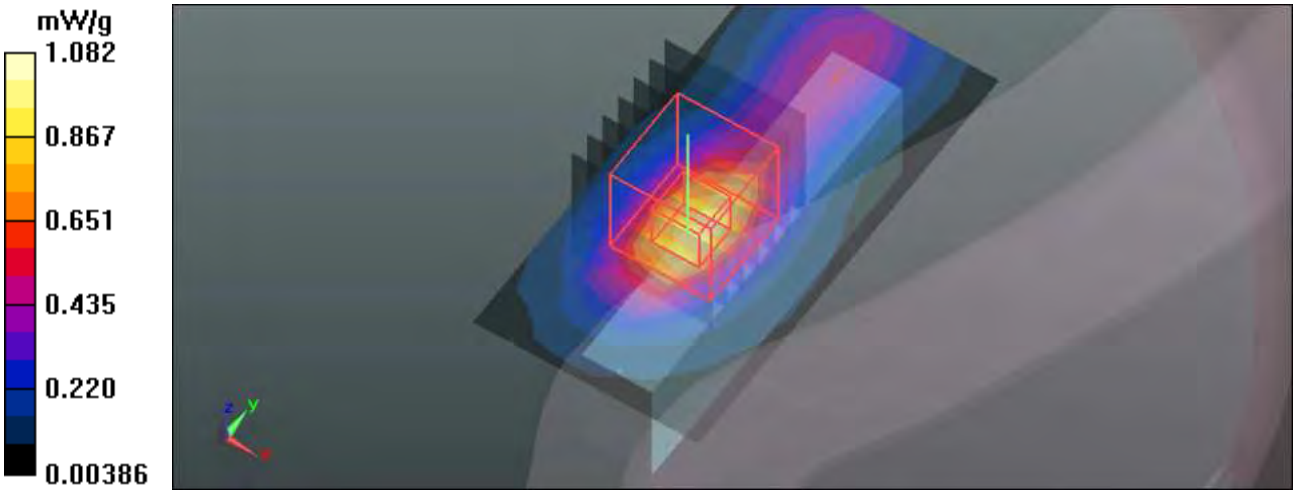
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.987 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.735 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.503 W/kg
SAR(1 g) = 0.690 mW/g; SAR(10 g) = 0.311 mW/g
Maximum value of SAR (measured) = 1.082 mW/g



Date/Time: 2011/2/9 17:57:09

M20-WiMax 10M-Ch396 / Ant 1

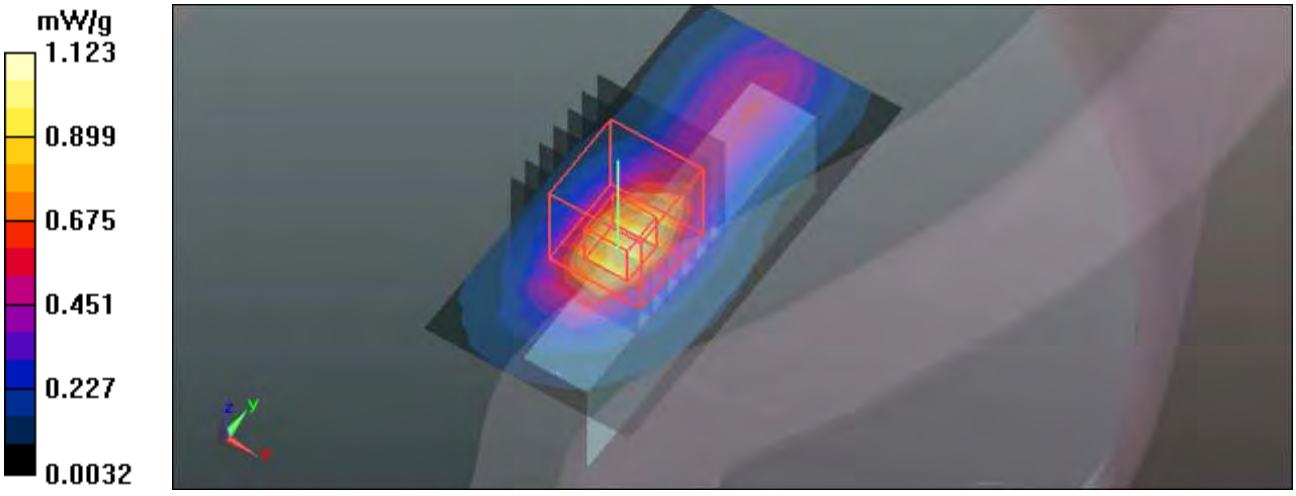
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.023 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.271 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.593 W/kg
SAR(1 g) = 0.704 mW/g; SAR(10 g) = 0.311 mW/g
Maximum value of SAR (measured) = 1.123 mW/g



Date/Time: 2011/2/9 18:22:51

M20-WiMax 10M-Ch736 / Ant 1

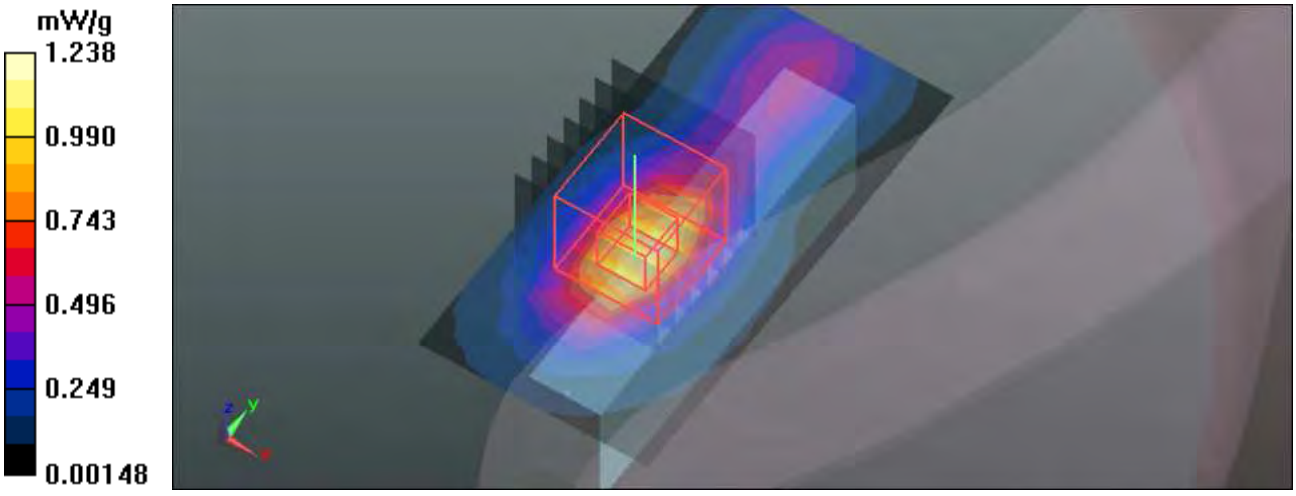
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.25 mho/m; εr = 53.08; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.130 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.012 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.776 W/kg
SAR(1 g) = 0.767 mW/g; SAR(10 g) = 0.334 mW/g
Maximum value of SAR (measured) = 1.238 mW/g



Date/Time: 2011/2/9 18:42:48

M21-WiMax 10M-Ch16 / Ant 1

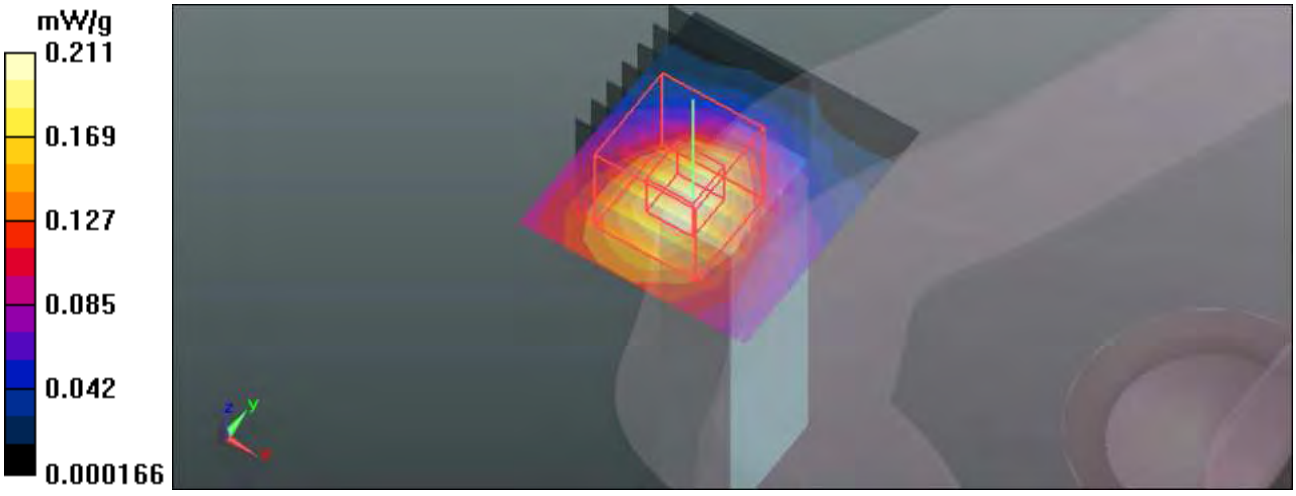
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The top edge side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x8x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.204 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.882 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.287 W/kg
SAR(1 g) = 0.144 mW/g; SAR(10 g) = 0.074 mW/g
Maximum value of SAR (measured) = 0.211 mW/g



Date/Time: 2011/2/9 19:09:53

M22-WiMax 10M-Ch16 / Ant 2

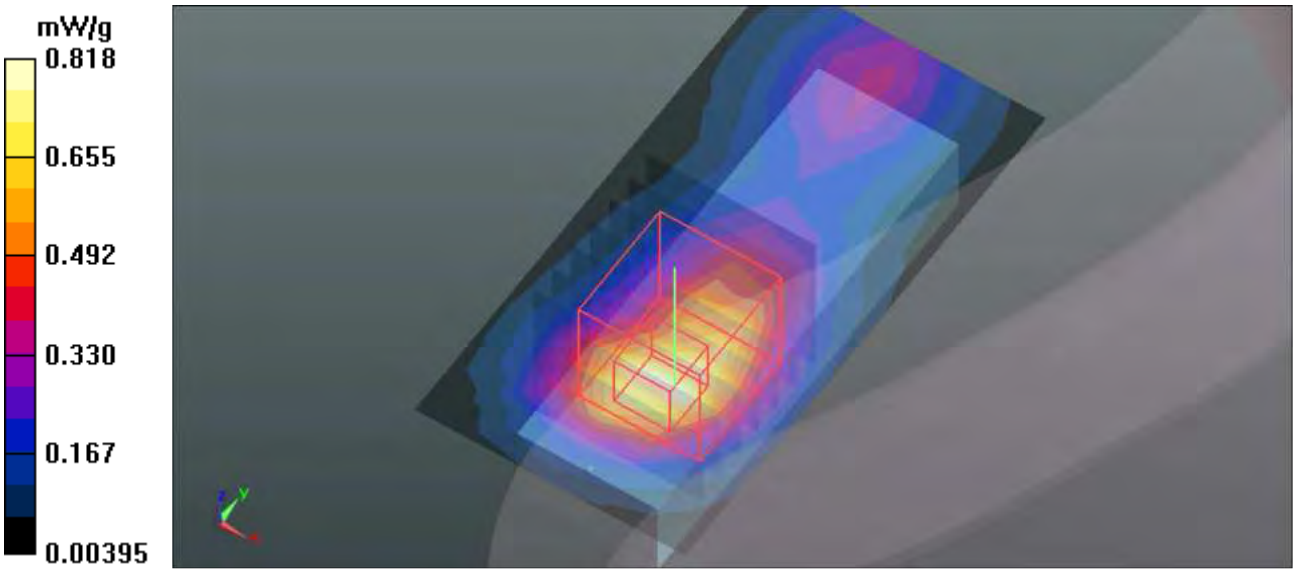
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The horizontal-down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.781 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.671 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.137 W/kg
SAR(1 g) = 0.542 mW/g; SAR(10 g) = 0.260 mW/g
Maximum value of SAR (measured) = 0.818 mW/g



Date/Time: 2011/2/9 19:35:40

M23-WiMax 10M-Ch16 / Ant 2

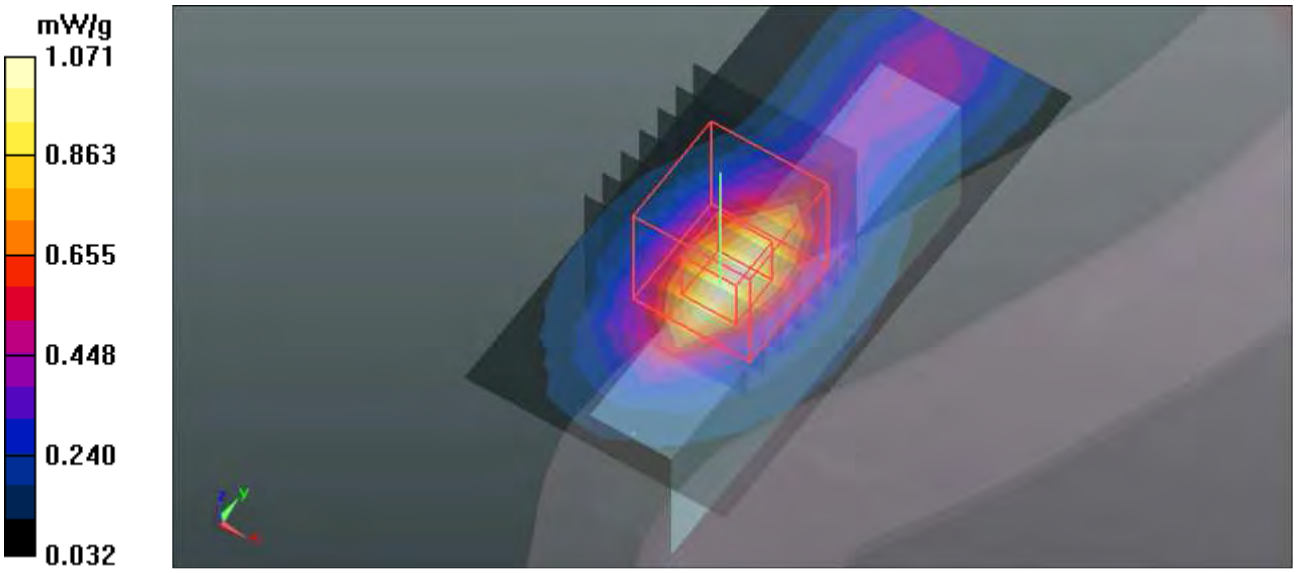
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; ε_r = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.071 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.920 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.481 W/kg
SAR(1 g) = 0.696 mW/g; SAR(10 g) = 0.320 mW/g
Maximum value of SAR (measured) = 1.073 mW/g



Date/Time: 2011/2/9 20:00:54

M23-WiMax 10M-Ch396 / Ant 2

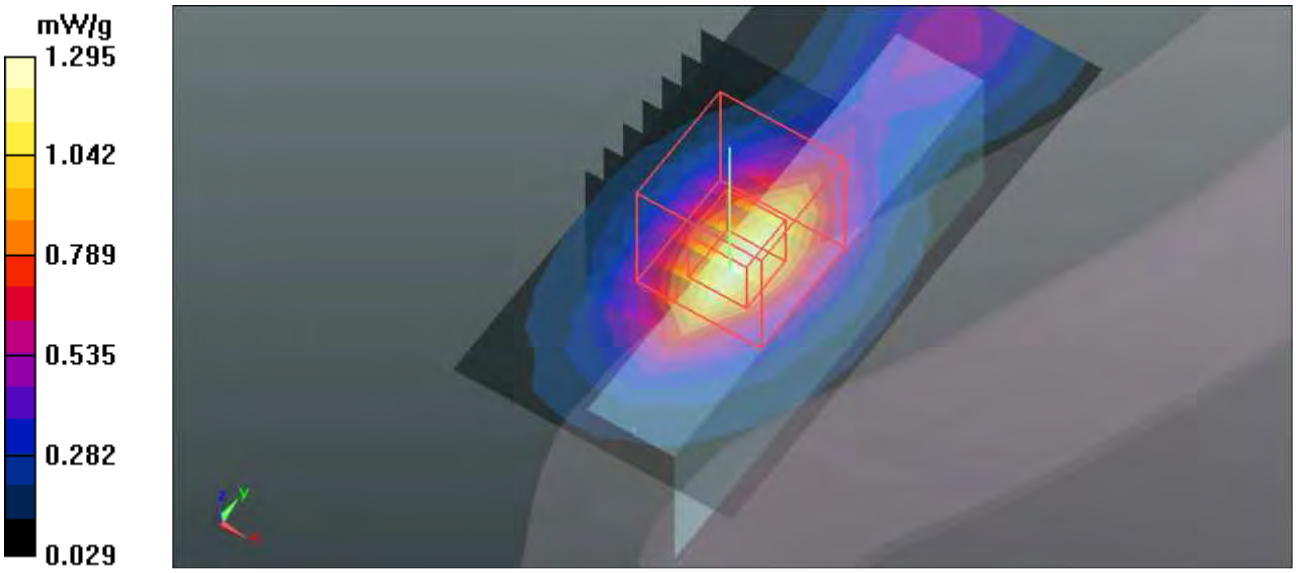
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.295 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.634 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.807 W/kg
SAR(1 g) = 0.828 mW/g; SAR(10 g) = 0.377 mW/g
Maximum value of SAR (measured) = 1.289 mW/g



Date/Time: 2011/2/9 20:25:30

M23-WiMax 10M-Ch736 / Ant 2

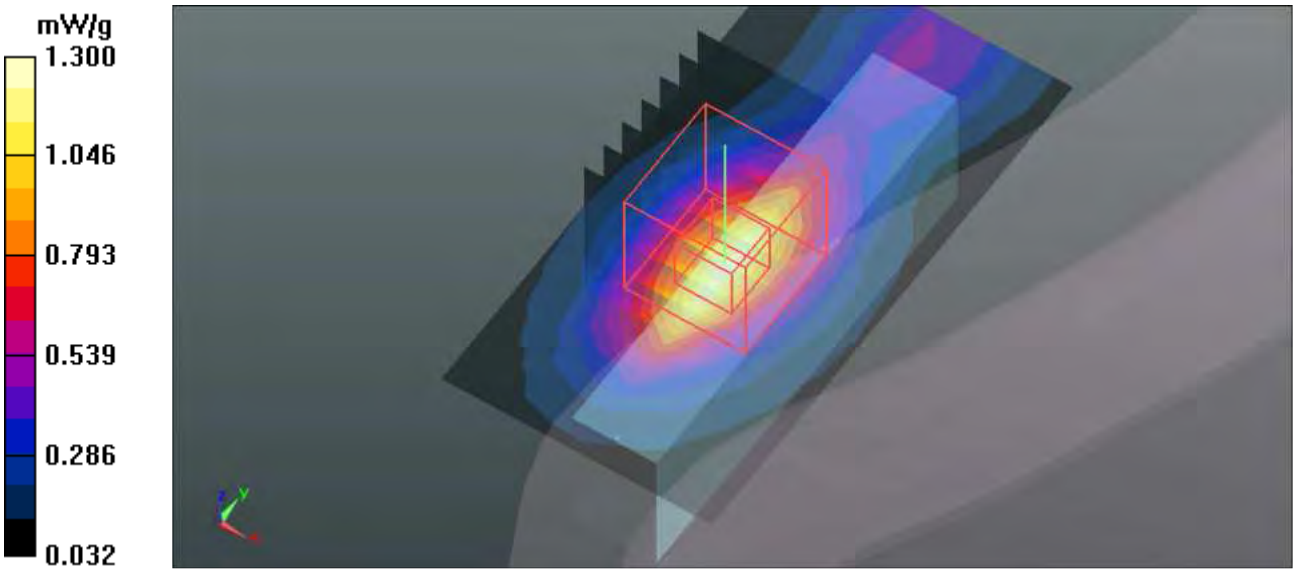
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.25 mho/m; εr = 53.08; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.300 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.317 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.840 W/kg
SAR(1 g) = 0.824 mW/g; SAR(10 g) = 0.372 mW/g
Maximum value of SAR (measured) = 1.296 mW/g



Date/Time: 2011/2/9 20:50:10

M24-WiMax 10M-Ch16 / Ant 2

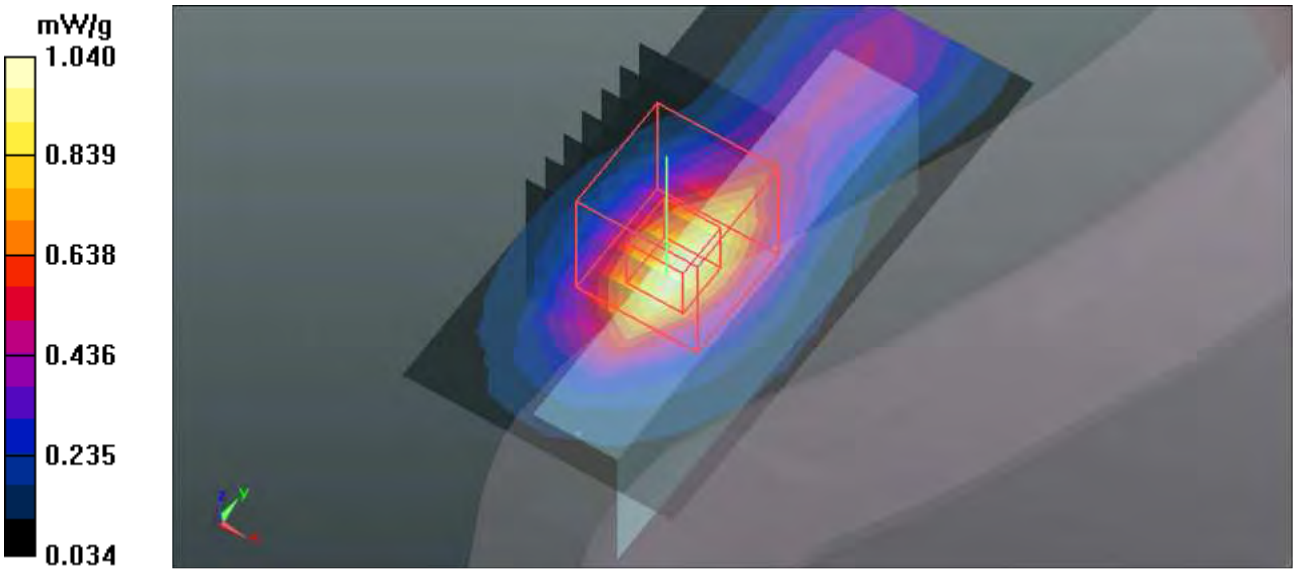
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.040 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.969 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.434 W/kg
SAR(1 g) = 0.673 mW/g; SAR(10 g) = 0.310 mW/g
Maximum value of SAR (measured) = 1.043 mW/g



Date/Time: 2011/2/9 21:16:29

M24-WiMax 10M-Ch396 / Ant 2

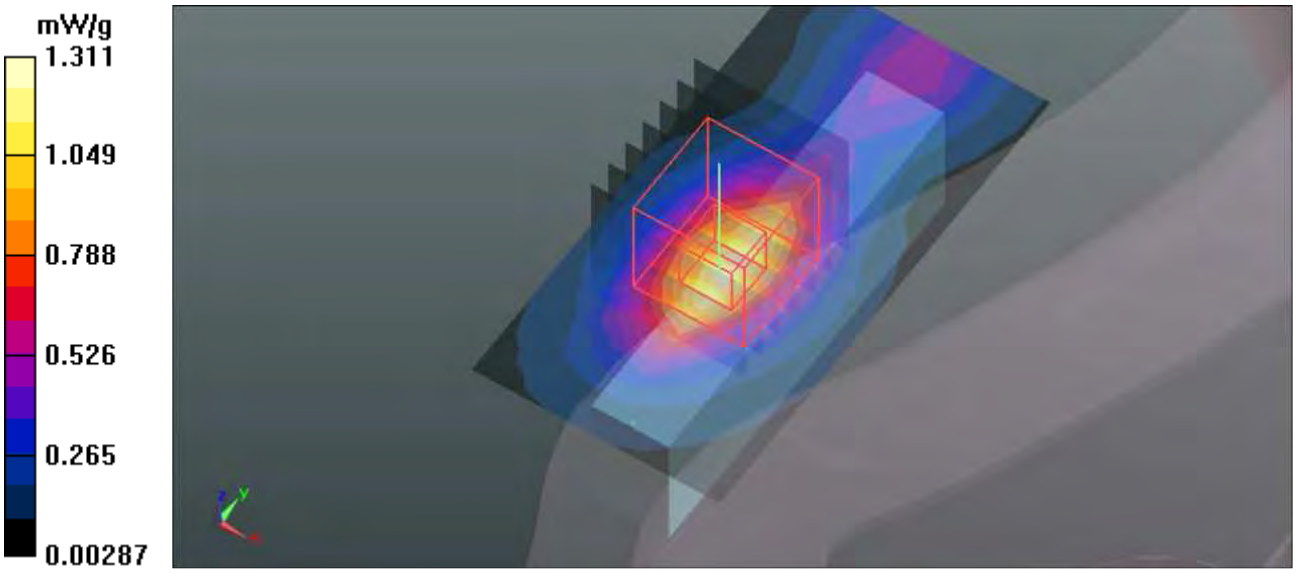
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

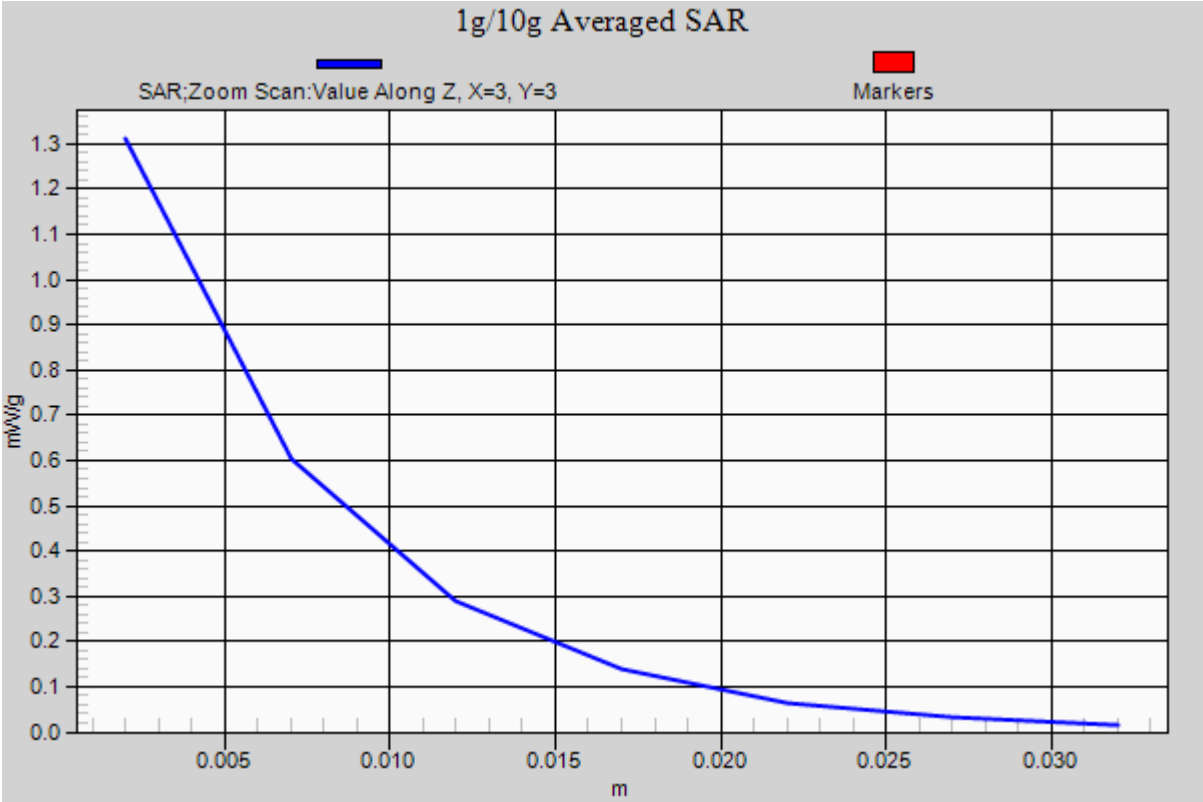
DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.287 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.447 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.827 W/kg
SAR(1 g) = 0.839 mW/g; SAR(10 g) = 0.383 mW/g
Maximum value of SAR (measured) = 1.311 mW/g




1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=3, Y=3
Markers
mW/g
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
m

Date/Time: 2011/2/9 21:42:05

M24-WiMax 10M-Ch736 / Ant 2

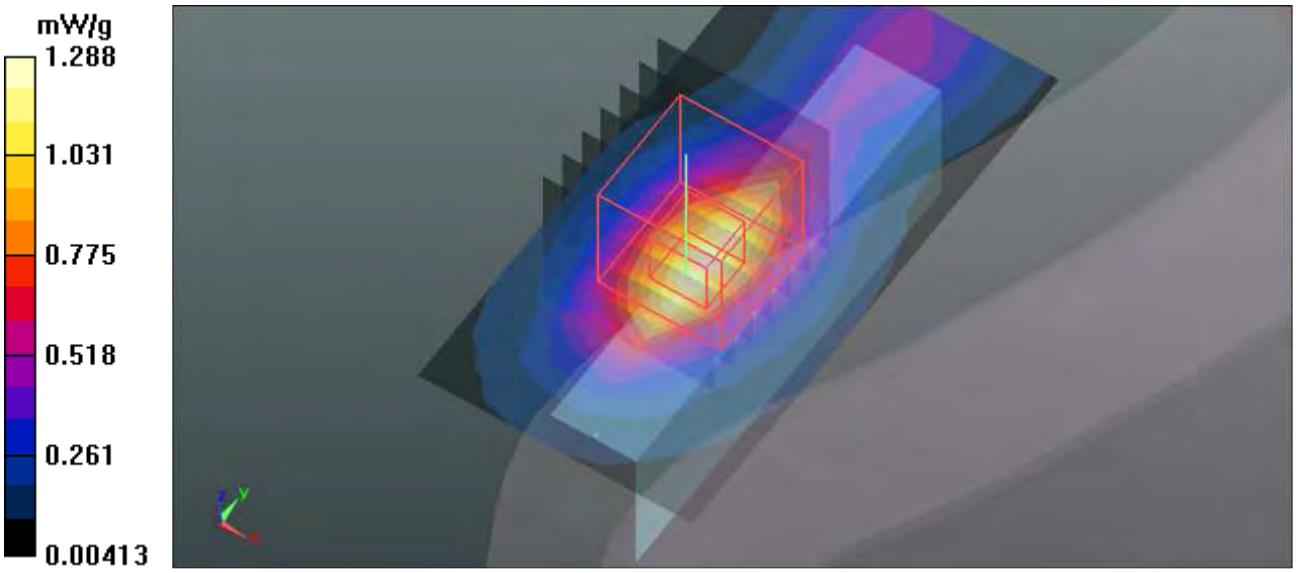
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.25 mho/m; εr = 53.08; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.273 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.280 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.835 W/kg
SAR(1 g) = 0.819 mW/g; SAR(10 g) = 0.368 mW/g
Maximum value of SAR (measured) = 1.288 mW/g



Date/Time: 2011/2/9 22:08:12

M25-WiMax 10M-Ch16 / Ant 2

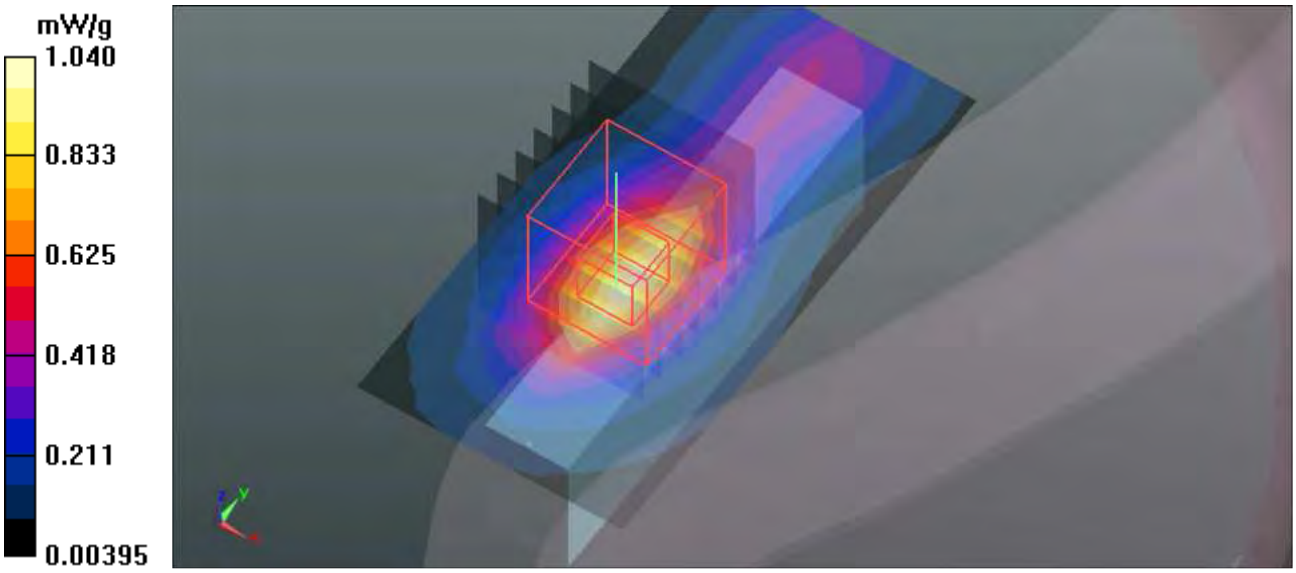
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.011 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.628 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.429 W/kg
SAR(1 g) = 0.672 mW/g; SAR(10 g) = 0.310 mW/g
Maximum value of SAR (measured) = 1.040 mW/g



Date/Time: 2011/2/9 22:34:35

M25-WiMax 10M-Ch396 / Ant 2

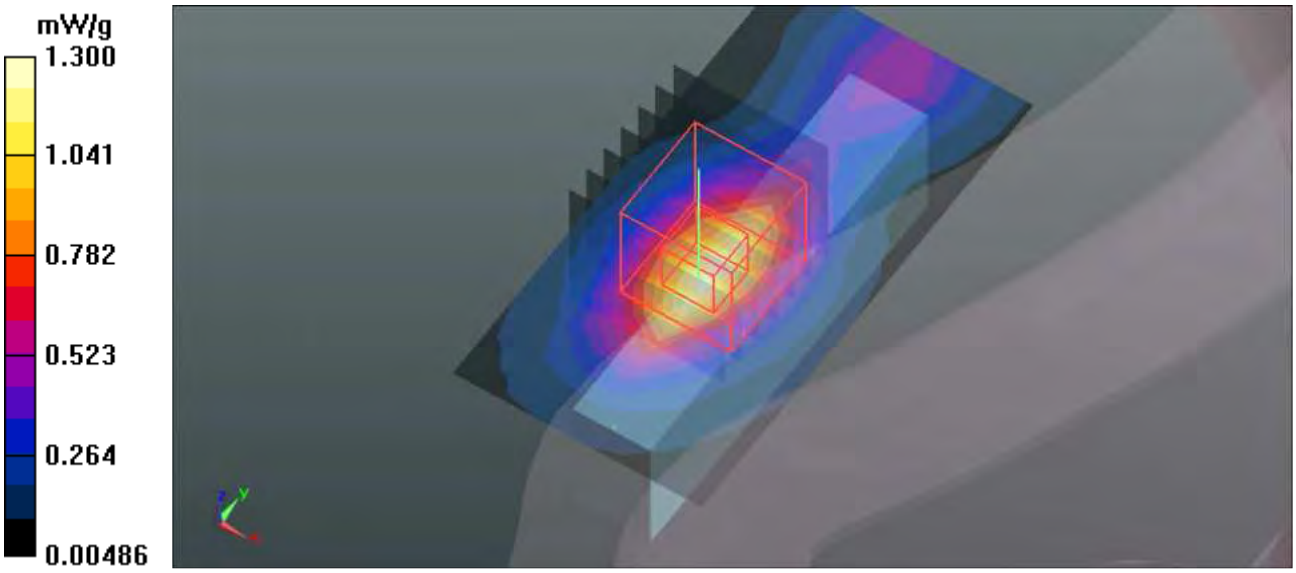
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; εr = 53.24; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.295 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.607 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.817 W/kg
SAR(1 g) = 0.837 mW/g; SAR(10 g) = 0.383 mW/g
Maximum value of SAR (measured) = 1.300 mW/g



Date/Time: 2011/2/9 23:01:57

M25-WiMax 10M-Ch736 / Ant 2

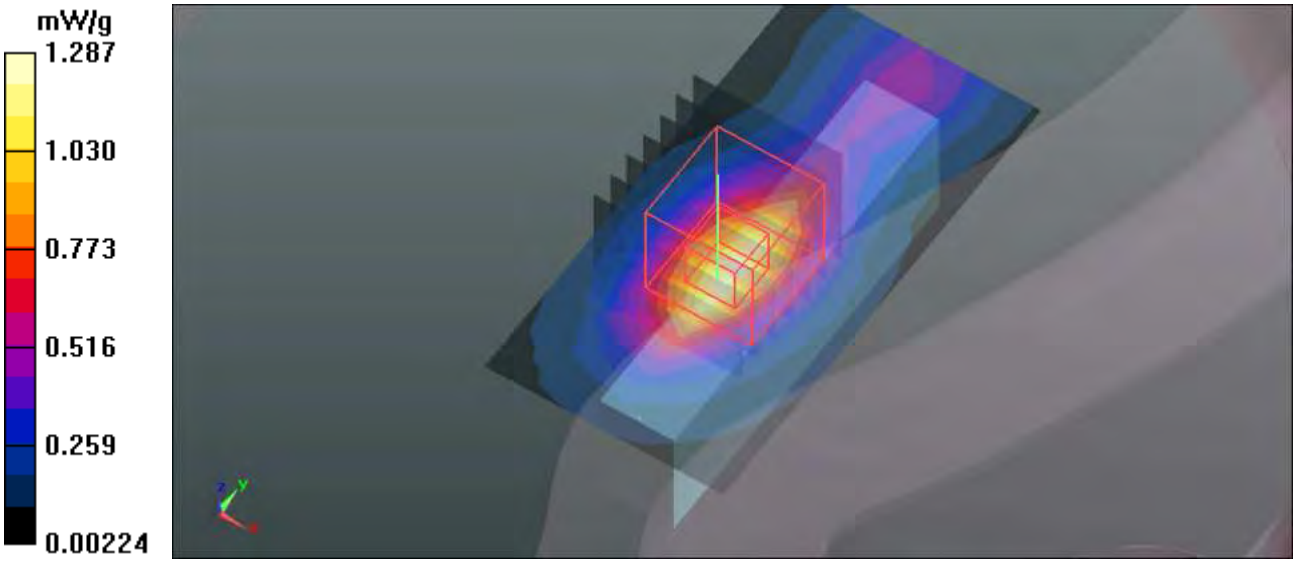
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.24 ; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.25 mho/m; εr = 53.08; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.275 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.369 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.833 W/kg
SAR(1 g) = 0.816 mW/g; SAR(10 g) = 0.368 mW/g
Maximum value of SAR (measured) = 1.287 mW/g



Date/Time: 2011/2/9 23:28:01

M26-WiMax 10M-Ch16 / Ant 2

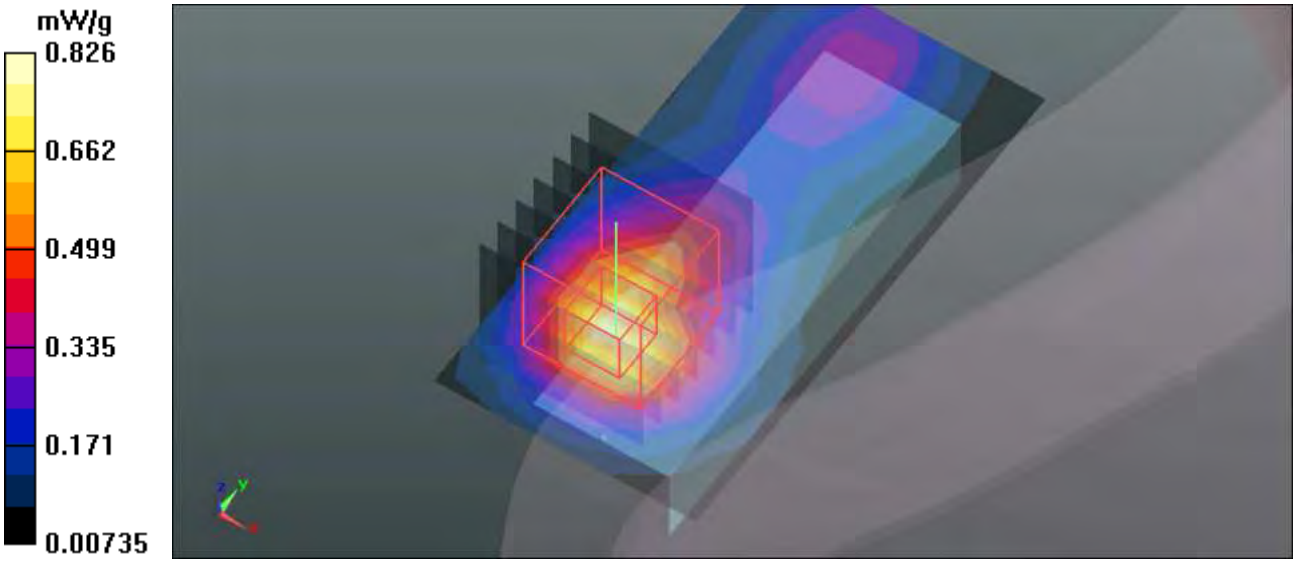
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; ε_r = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The horizontal-up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x13x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.826 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.492 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.125 W/kg
SAR(1 g) = 0.555 mW/g; SAR(10 g) = 0.268 mW/g
Maximum value of SAR (measured) = 0.835 mW/g



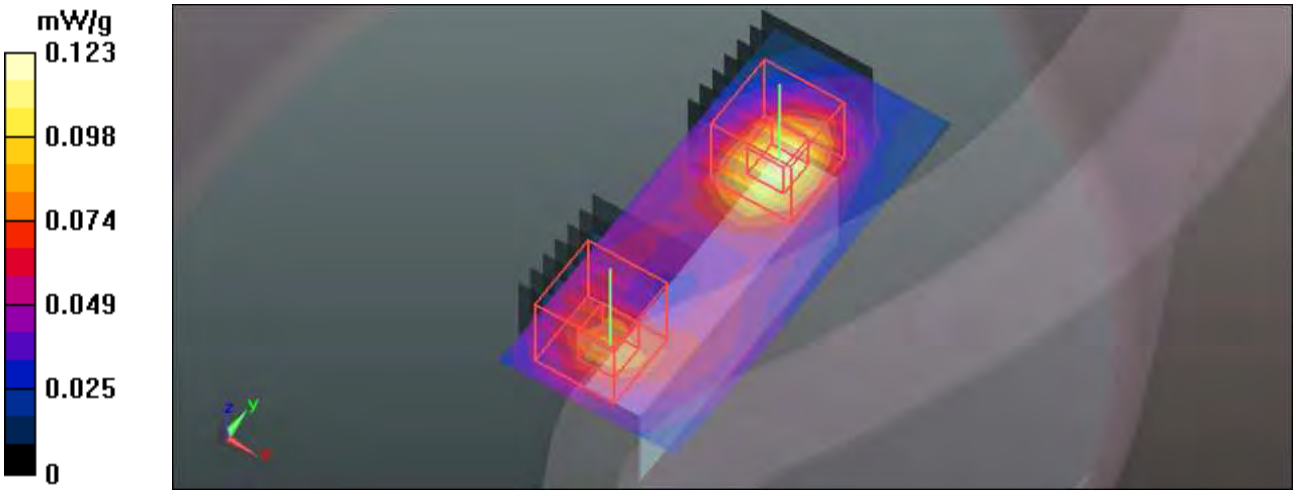
Date/Time: 2011/2/10 00:03:38

M27-WiMax 10M-Ch16 / Ant 2

Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; ε_r = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The vertical-back side of the EUT to the Phantom)
DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.119 mW/g
Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.780 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.169 W/kg
SAR(1 g) = 0.083 mW/g; SAR(10 g) = 0.041 mW/g
Maximum value of SAR (measured) = 0.123 mW/g
Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.780 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.134 W/kg
SAR(1 g) = 0.057 mW/g; SAR(10 g) = 0.028 mW/g
Maximum value of SAR (measured) = 0.090 mW/g



Date/Time: 2011/2/10 00:25:49

M28-WiMax 10M-Ch16 / Ant 2

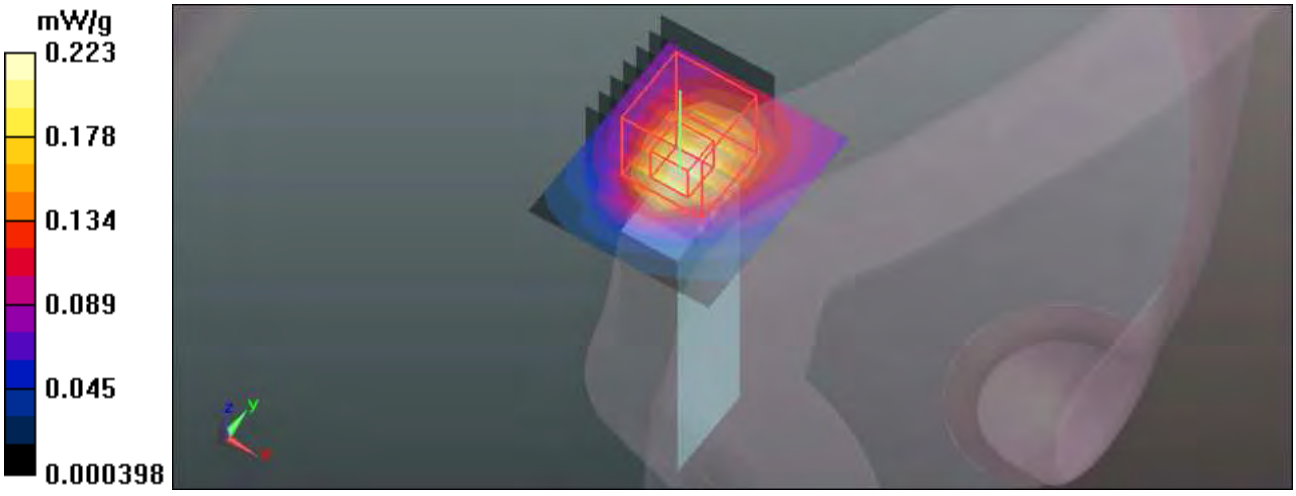
Communication System: Wimax_2.6GHz 10M ; Frequency: 2505 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2505 MHz; σ = 2.07 mho/m; εr = 53.64; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The top edge side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

Flat-Section MSL/Flat Section 5mm /Area Scan (7x8x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.215 mW/g

Flat-Section MSL/Flat Section 5mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.132 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.302 W/kg
SAR(1 g) = 0.151 mW/g; SAR(10 g) = 0.077 mW/g
Maximum value of SAR (measured) = 0.223 mW/g



Date/Time: 2011/2/9 00:41:43

SystemPerformanceCheck-D2600V2-MSL2600 MHz

DUT: Dipole 2600 MHz ; Type: D2600V2 ; Serial: D2600V2 - SN:1003 ; Test Frequency: 2600 MHz

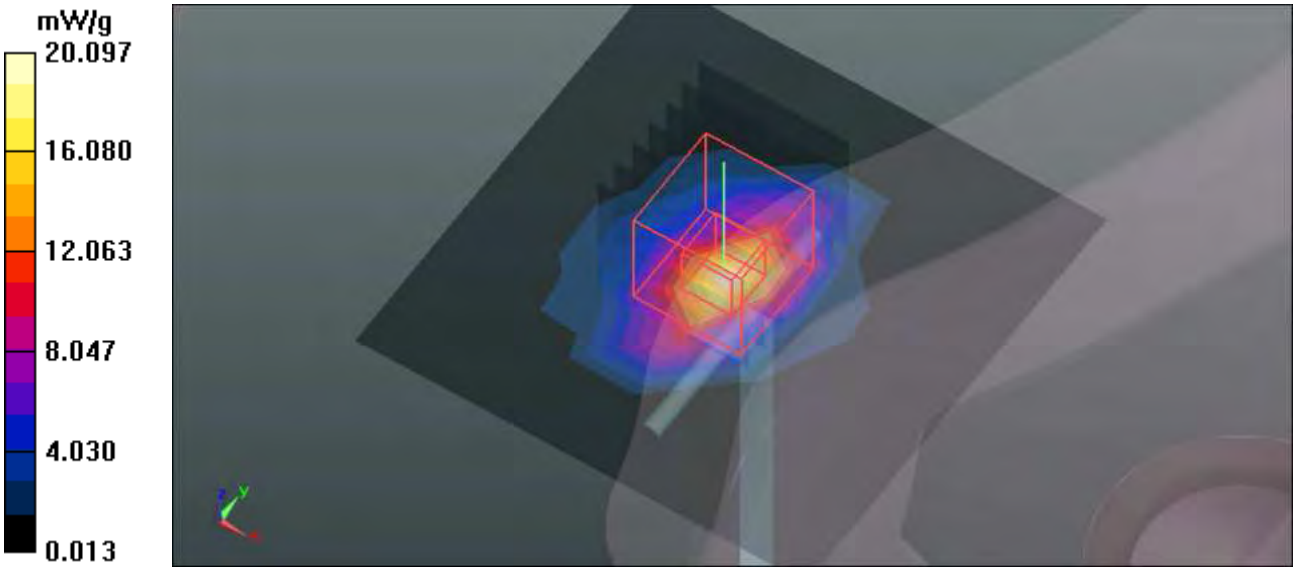
Communication System: CW ; Frequency: 2600 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL2600;Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; ε_r = 53.24; ρ = 1000 kg/m^3 ; Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feet point of the dipole to the Phantom)Air temp. : 22.5 degrees ; Liquid temp. : 21.7 degrees

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(6.92, 6.92, 6.92); Calibrated: 2011/1/24
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2010/10/4
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 C; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (1); SEMCAD X Version 14.4.2 (2595)

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 20.097 mW/g

System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.445 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 29.379 W/kg
SAR(1 g) = 13 mW/g; SAR(10 g) = 5.78 mW/g
Maximum value of SAR (measured) = 14.934 mW/g



Date/Time: 2011/3/16 10:01:52

M01-Wimax 5M-Ch406 / Ant 1

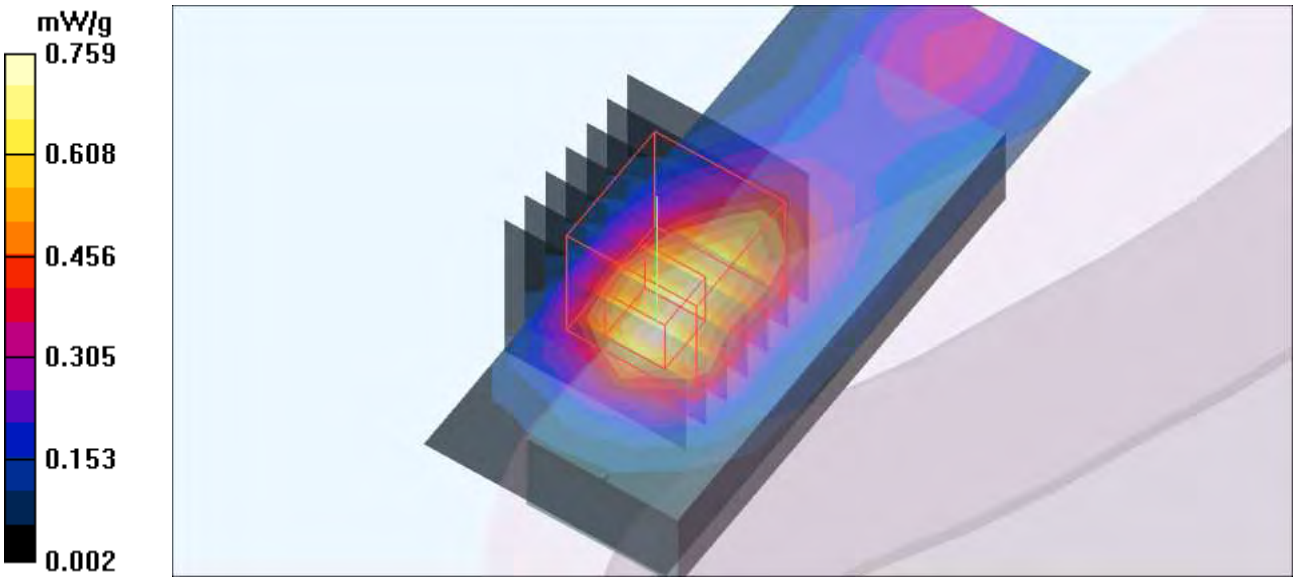
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.15 mho/m; εr = 53.58; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Mid Channel 406/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.735 mW/g

Body Position - Mid Channel 406/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.42 V/m; Power Drift = 0.056 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.498 mW/g; SAR(10 g) = 0.238 mW/g
Maximum value of SAR (measured) = 0.759 mW/g



Date/Time: 2011/3/16 12:33:19

M01-Wimax 5M-Ch756 / Ant 1

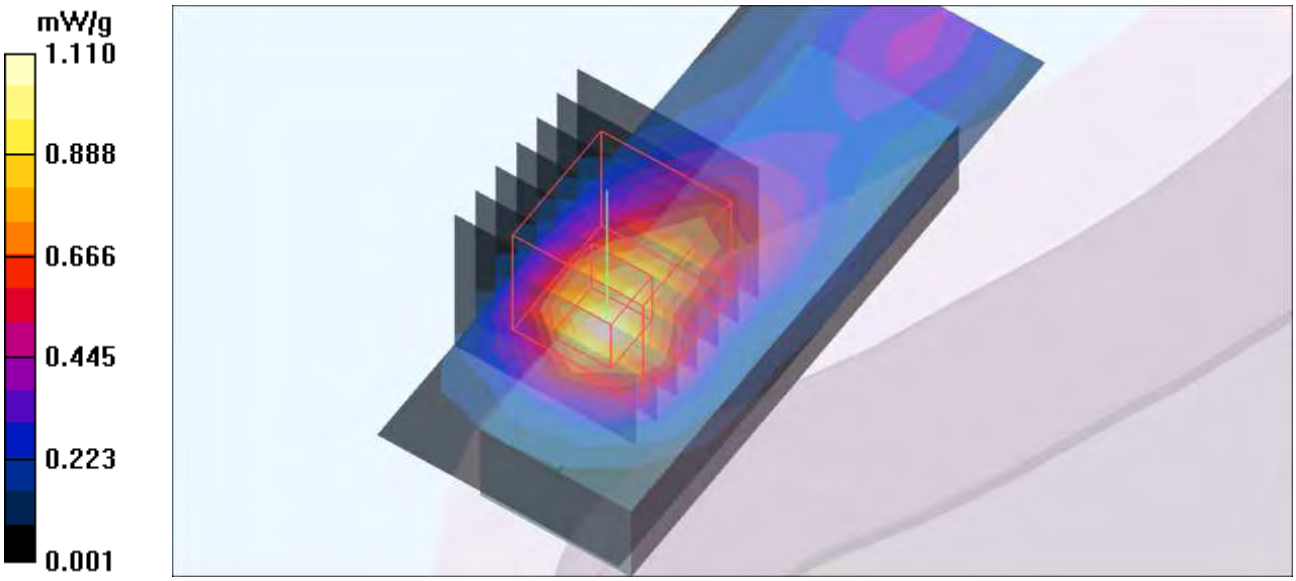
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.24 mho/m; εr = 53.36; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High Channel 756/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.96 mW/g

Body Position - High Channel 756/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.01 V/m; Power Drift = 0.071 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.611 mW/g; SAR(10 g) = 0.278 mW/g
Maximum value of SAR (measured) = 0.981 mW/g



Date/Time: 2011/3/16 11:06:10

M08-Wimax 5M-Ch406 / Ant 2

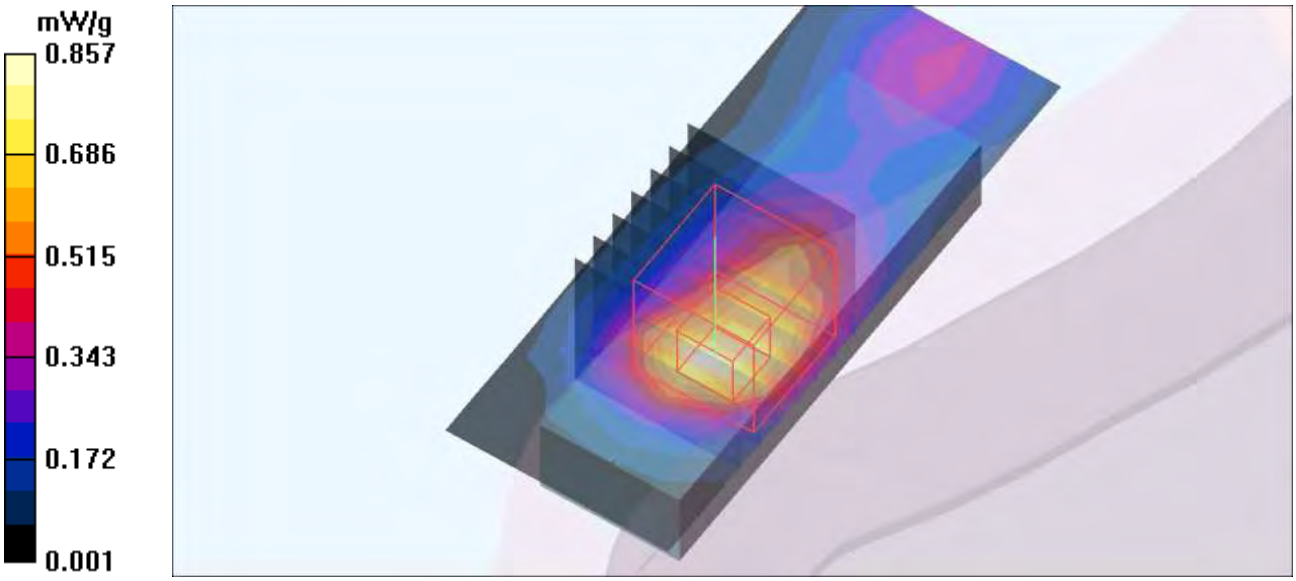
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.15 mho/m; εr = 53.58; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Mid Channel 406/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.840 mW/g

Body Position - Mid Channel 406/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.14 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.558 mW/g; SAR(10 g) = 0.266 mW/g
Maximum value of SAR (measured) = 0.857 mW/g



Date/Time: 2011/3/16 13:13:55

M08-Wimax 5M-Ch756 / Ant 2

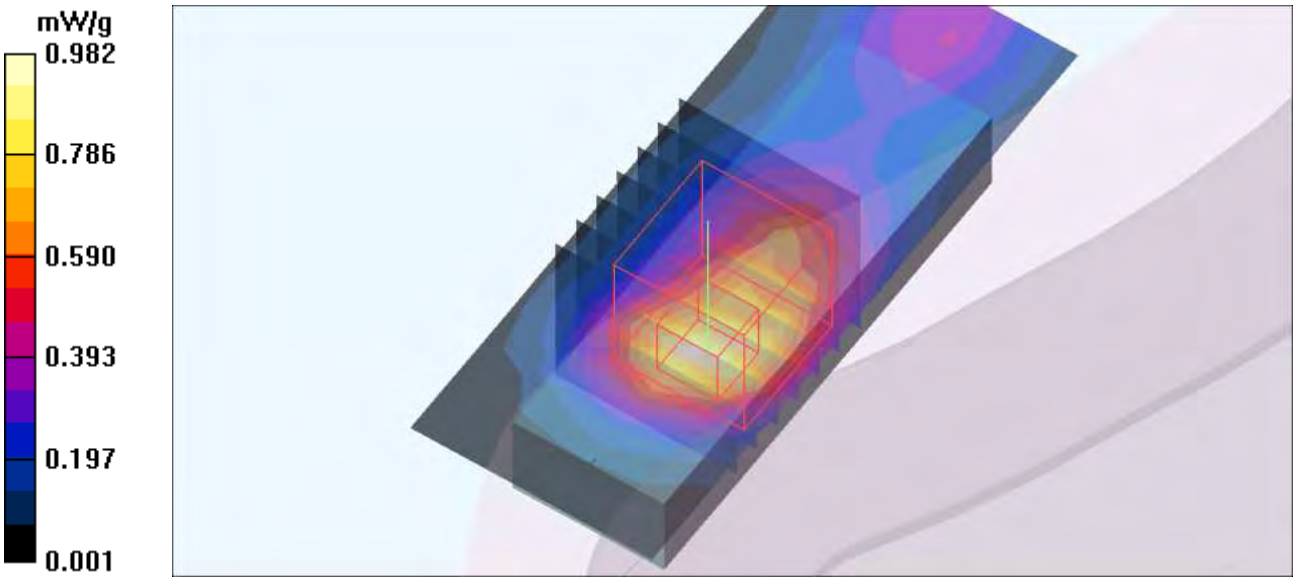
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.24 mho/m; εr = 53.36; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High Channel 756/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.948 mW/g

Body Position - High Channel 756/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.64 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.627 mW/g; SAR(10 g) = 0.291 mW/g
Maximum value of SAR (measured) = 0.982 mW/g



Date/Time: 2011/3/16 12:11:59

M15-Wimax 10M-Ch396 / Ant 1

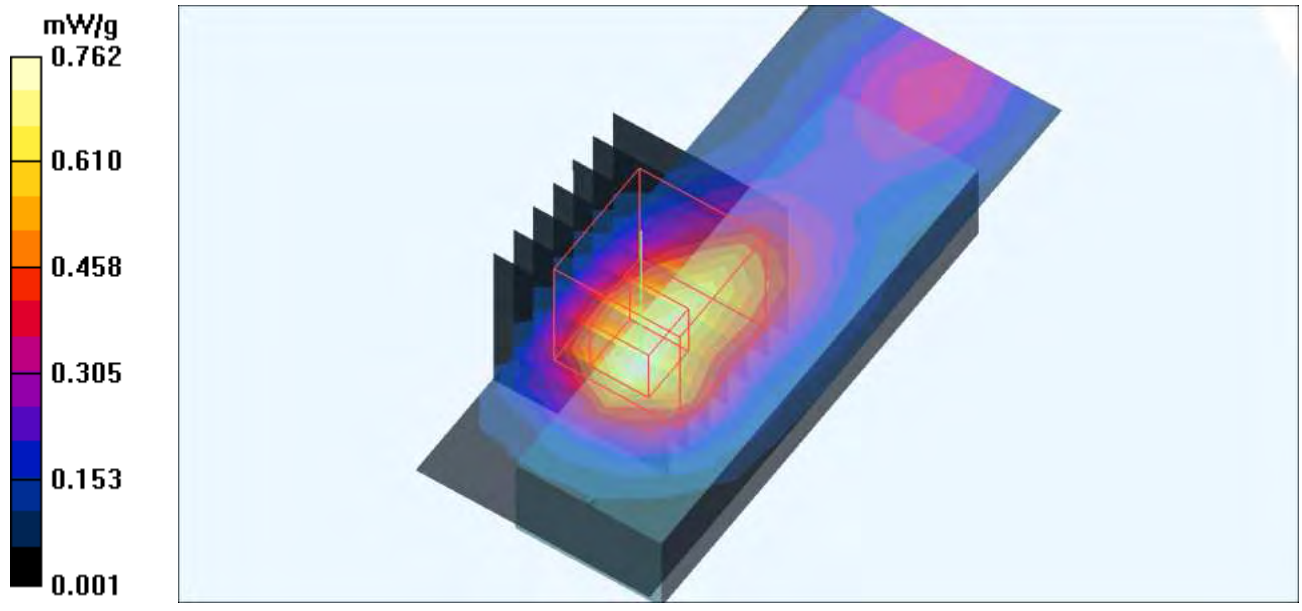
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.15 mho/m; εr = 53.58; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Mid Channel 396/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.762 mW/g

Body Position - Mid Channel 396/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.46 V/m; Power Drift = 0.057 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.496 mW/g; SAR(10 g) = 0.238 mW/g



Date/Time: 2011/3/16 12:53:23

M15-Wimax 10M-Ch736 / Ant 1

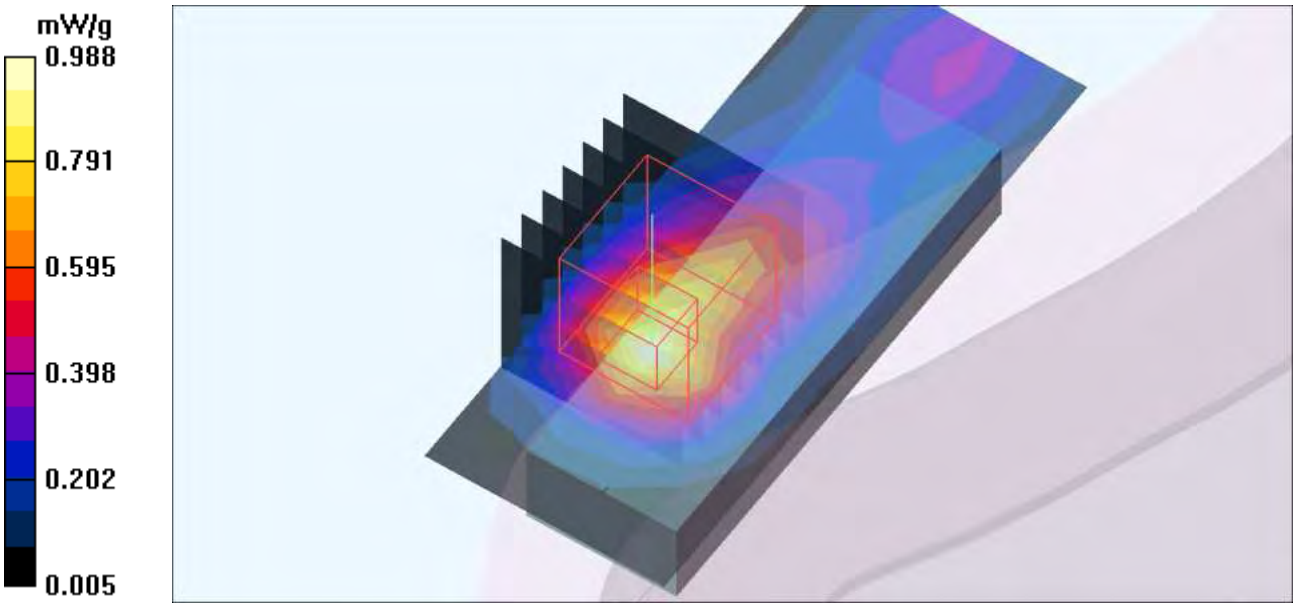
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.23 mho/m; εr = 53.42; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High Channel 736/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.988 mW/g

Body Position - High Channel 736/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.09 V/m; Power Drift = 0.047 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.631 mW/g; SAR(10 g) = 0.287 mW/g



Date/Time: 2011/3/16 11:26:51

M22-Wimax 10M-Ch396 / Ant 2

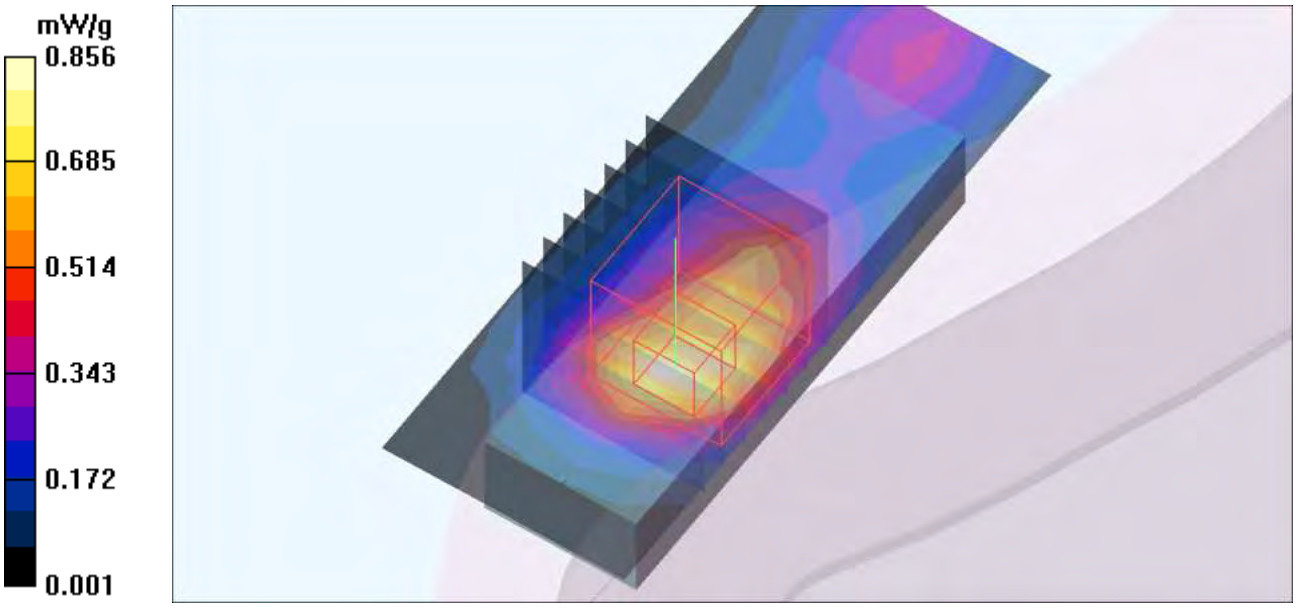
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.15 mho/m; εr = 53.58; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Mid Channel 396/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.844 mW/g

Body Position - Mid Channel 396/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.29 V/m; Power Drift = -0.051 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.557 mW/g; SAR(10 g) = 0.265 mW/g
Maximum value of SAR (measured) = 0.856 mW/g



Date/Time: 2011/3/16 13:33:07

M22-Wimax 10M-Ch736 / Ant 2

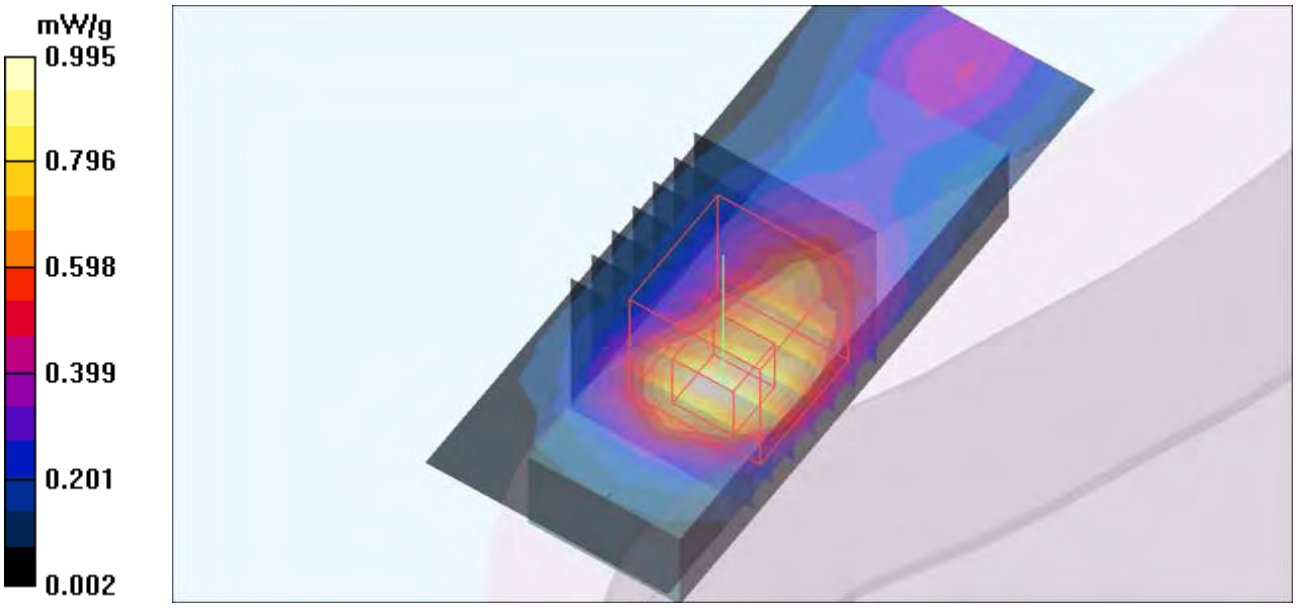
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.23 mho/m; εr = 53.42; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High Channel 736/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.995 mW/g

Body Position - High Channel 736/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.66 V/m; Power Drift = -0.115 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.641 mW/g; SAR(10 g) = 0.298 mW/g



Date/Time: 2011/3/16 15:57:00

M03-Wimax 5M-Ch406 / Ant 1

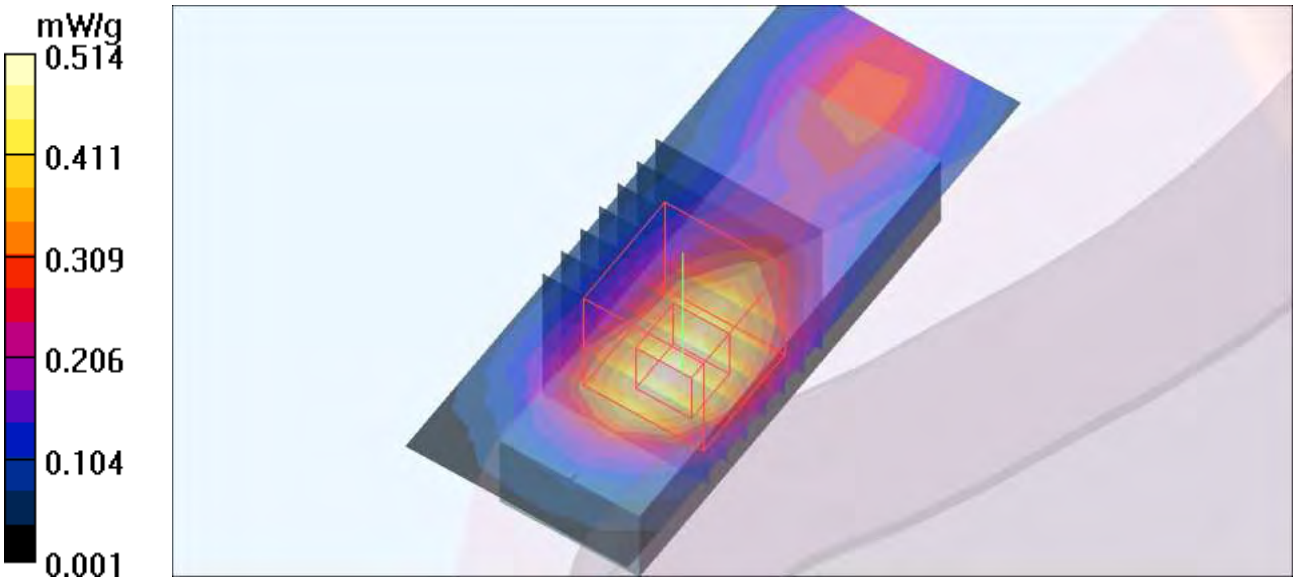
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.15 mho/m; εr = 53.58; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Mid Channel 406/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.504 mW/g

Body Position - Mid Channel 406/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.87 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 0.703 W/kg
SAR(1 g) = 0.344 mW/g; SAR(10 g) = 0.169 mW/g
Maximum value of SAR (measured) = 0.514 mW/g



Date/Time: 2011/3/16 14:01:36

M03-Wimax 5M-Ch756 / Ant 1

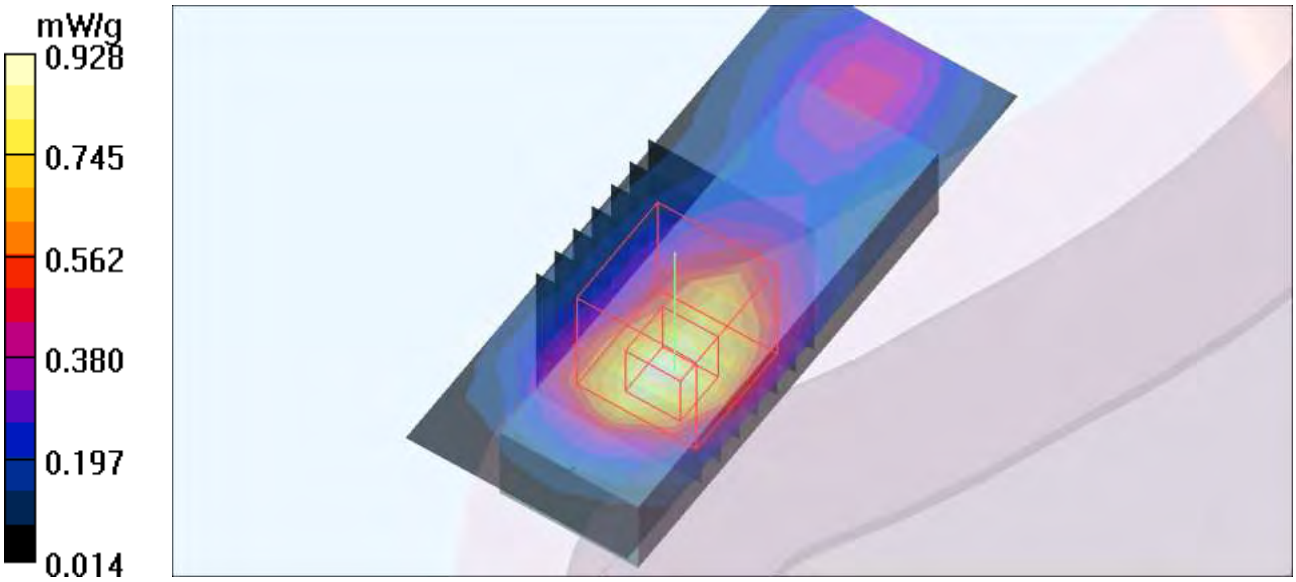
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.24 mho/m; εr = 53.36; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High Channel 756/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.928 mW/g

Body Position - High Channel 756/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.2 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.586 mW/g; SAR(10 g) = 0.276 mW/g
Maximum value of SAR (measured) = 0.902 mW/g



Date/Time: 2011/3/16 16:09:06

M12-Wimax 5M-Ch406 / Ant 2

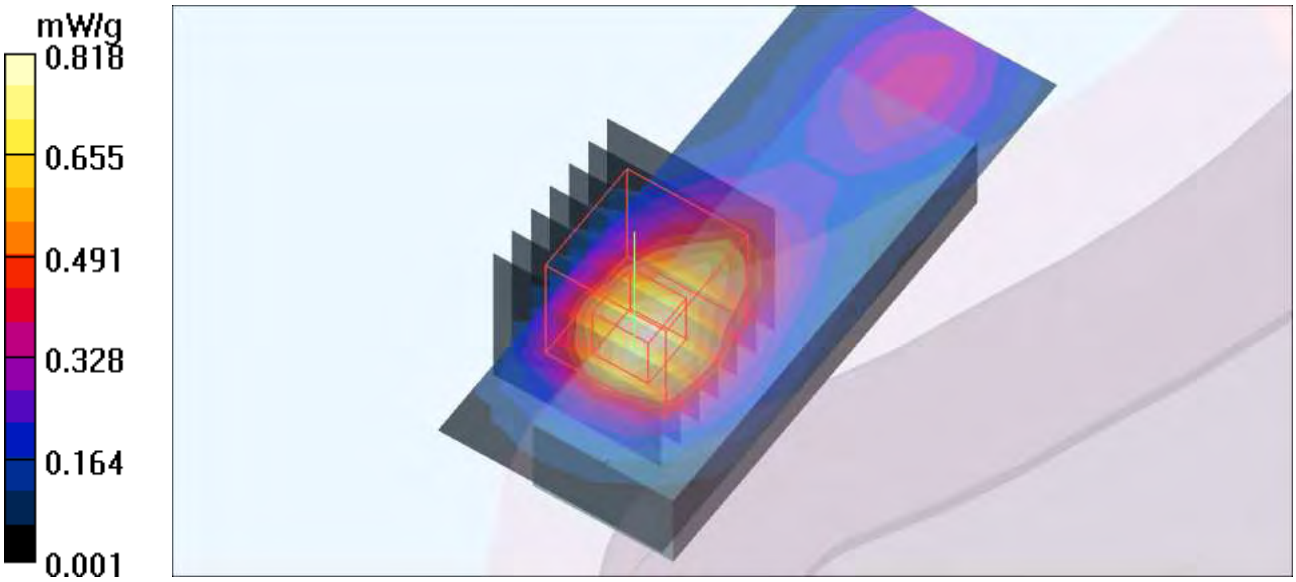
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.15 mho/m; εr = 53.58; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Mid Channel 406/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.795 mW/g

Body Position - Mid Channel 406/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = 0.178 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.539 mW/g; SAR(10 g) = 0.258 mW/g
Maximum value of SAR (measured) = 0.818 mW/g



Date/Time: 2011/3/16 15:13:18

M12-Wimax 5M-Ch756 /Ant 2

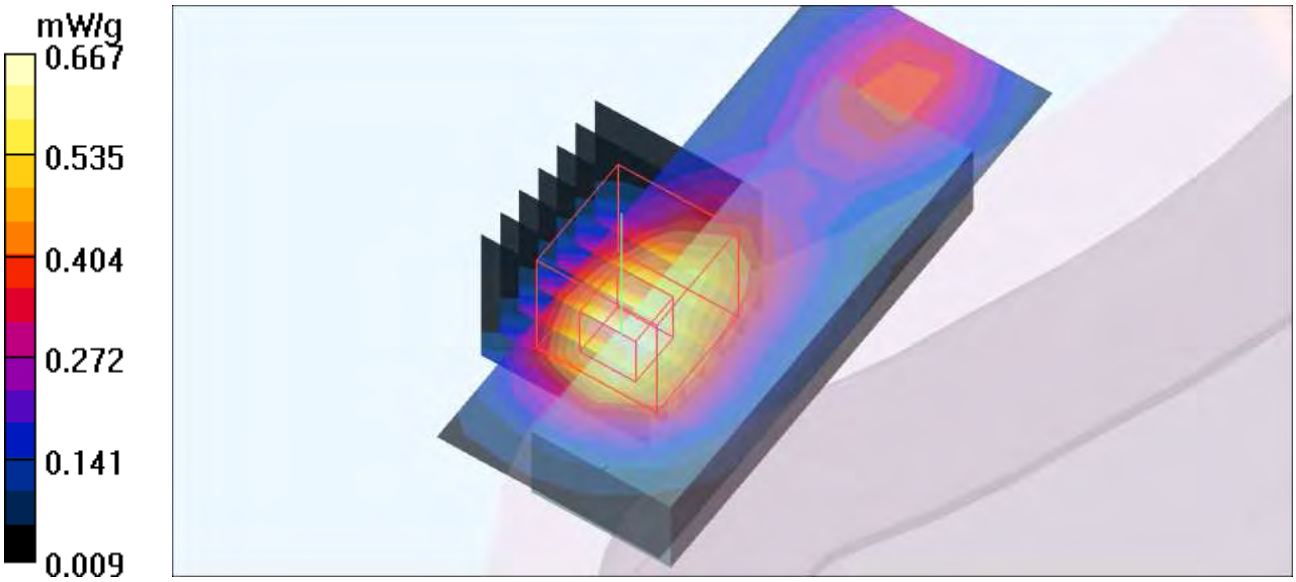
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.24 mho/m; εr = 53.36; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High Channel 756/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.667 mW/g

Body Position - High Channel 756/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = -0.027 dB
Peak SAR (extrapolated) = 0.967 W/kg
SAR(1 g) = 0.458 mW/g; SAR(10 g) = 0.225 mW/g
Maximum value of SAR (measured) = 0.693 mW/g



Date/Time: 2011/3/16 16:48:10

M17-Wimax 10M-Ch396 / Ant 1

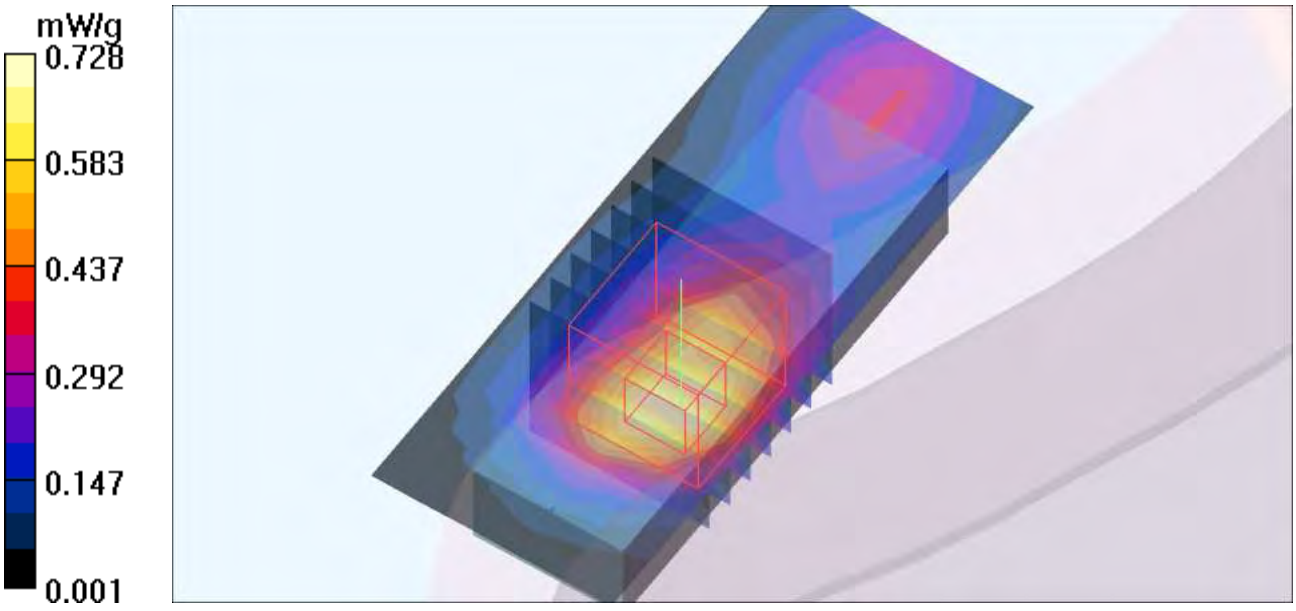
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.15 mho/m; εr = 53.58; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Mid Channel 396/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.684 mW/g

Body Position - Mid Channel 396 /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.00 V/m; Power Drift = -0.076 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.478 mW/g; SAR(10 g) = 0.230 mW/g
Maximum value of SAR (measured) = 0.728 mW/g



Date/Time: 2011/3/16 14:27:30

M17-Wimax 10M-Ch736 / Ant 1

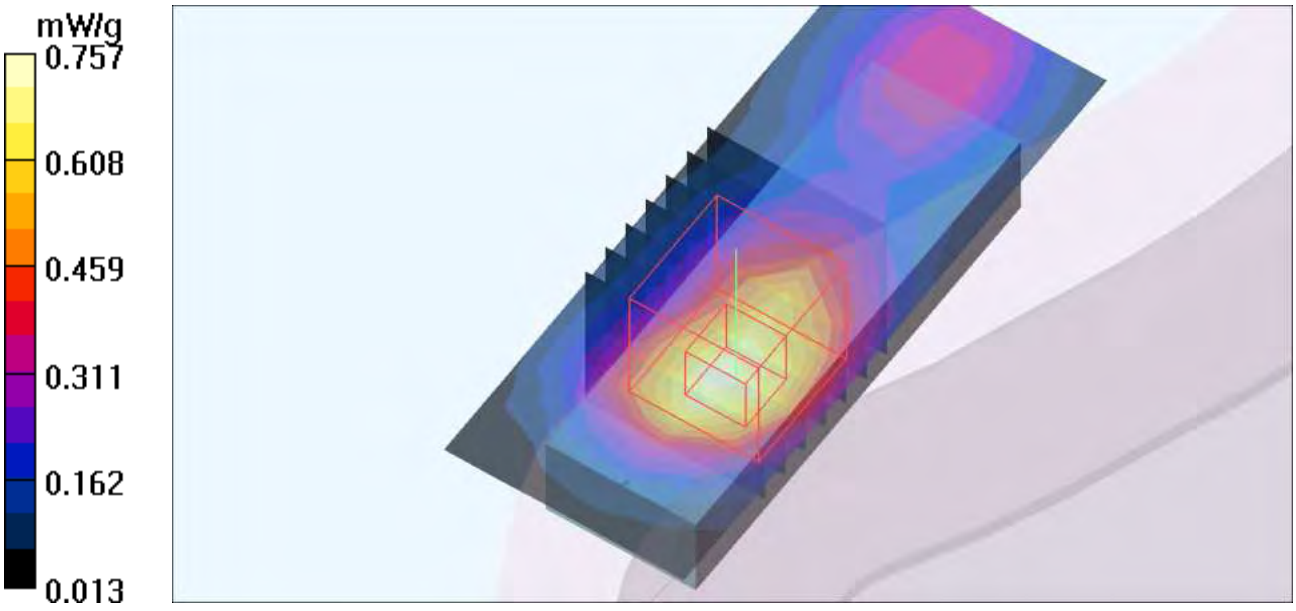
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.23 mho/m; ε_r = 53.42; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High Channel 736/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.757 mW/g

Body Position - High Channel 736/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.7 V/m; Power Drift = -0.102 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.475 mW/g; SAR(10 g) = 0.226 mW/g
Maximum value of SAR (measured) = 0.727 mW/g



Date/Time: 2011/3/16 16:28:54

M26-Wimax 10M-Ch396 / Ant 2

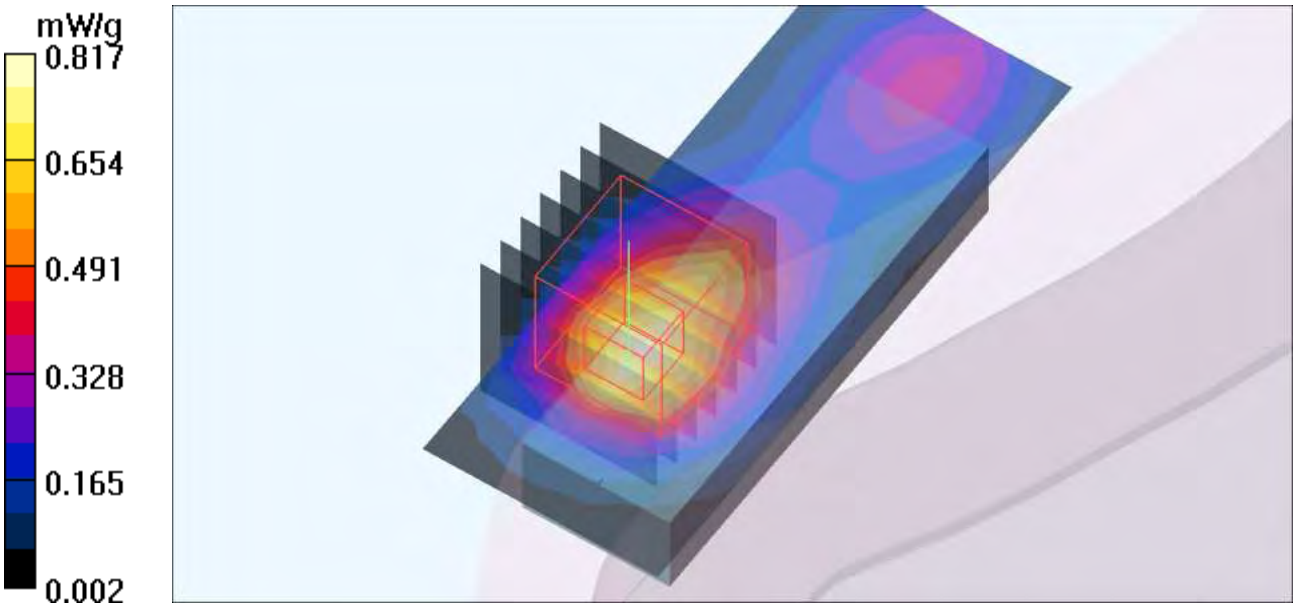
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.15 mho/m; ε_r = 53.58; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Mid Channel 396/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.798 mW/g

Body Position - Mid Channel 396/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = 0.039 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.536 mW/g; SAR(10 g) = 0.257 mW/g
Maximum value of SAR (measured) = 0.817 mW/g



Date/Time: 2011/3/16 15:33:07

M26-Wimax 10M-Ch736 / Ant 2

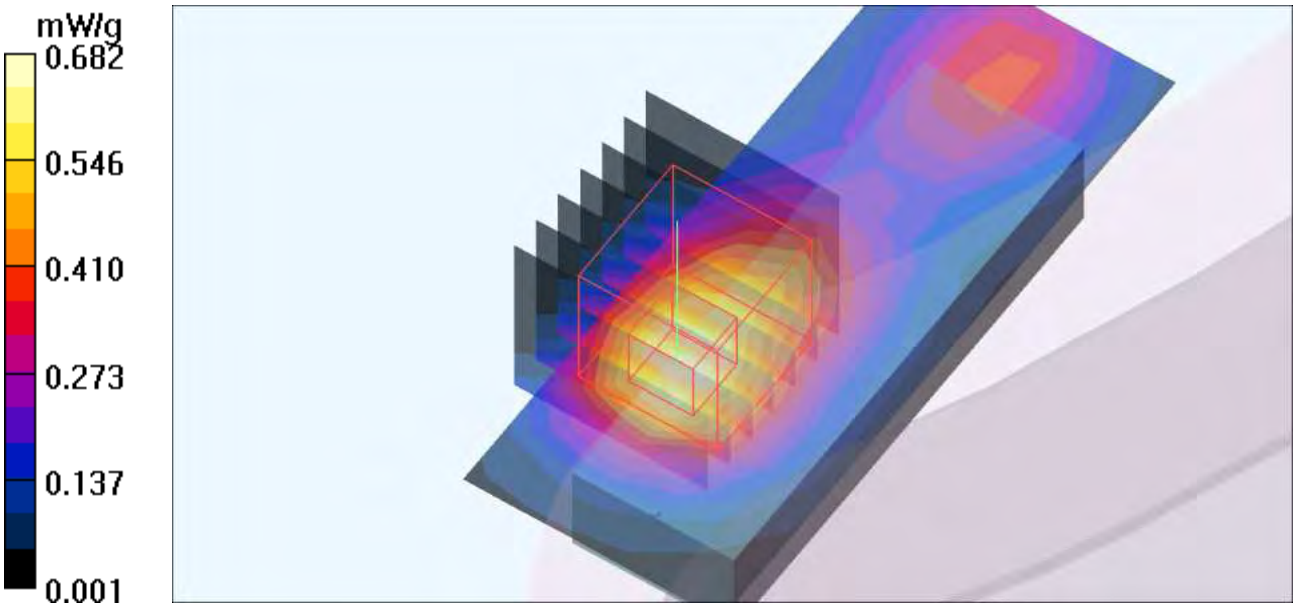
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.24 ; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.23 mho/m; εr = 53.42; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High Channel 736/Area Scan (6x14x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.655 mW/g

Body Position - High Channel 736/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 0.953 W/kg
SAR(1 g) = 0.452 mW/g; SAR(10 g) = 0.222 mW/g
Maximum value of SAR (measured) = 0.682 mW/g



Date/Time: 2011/3/16 08:33:46

SystemPerformanceCheck-D2600V2-MSL2600 MHz

DUT: Dipole 2600 MHz D2600V2 ; Type: D2600V2 ; SN:1003 ; Test Frequency: 2600 MHz

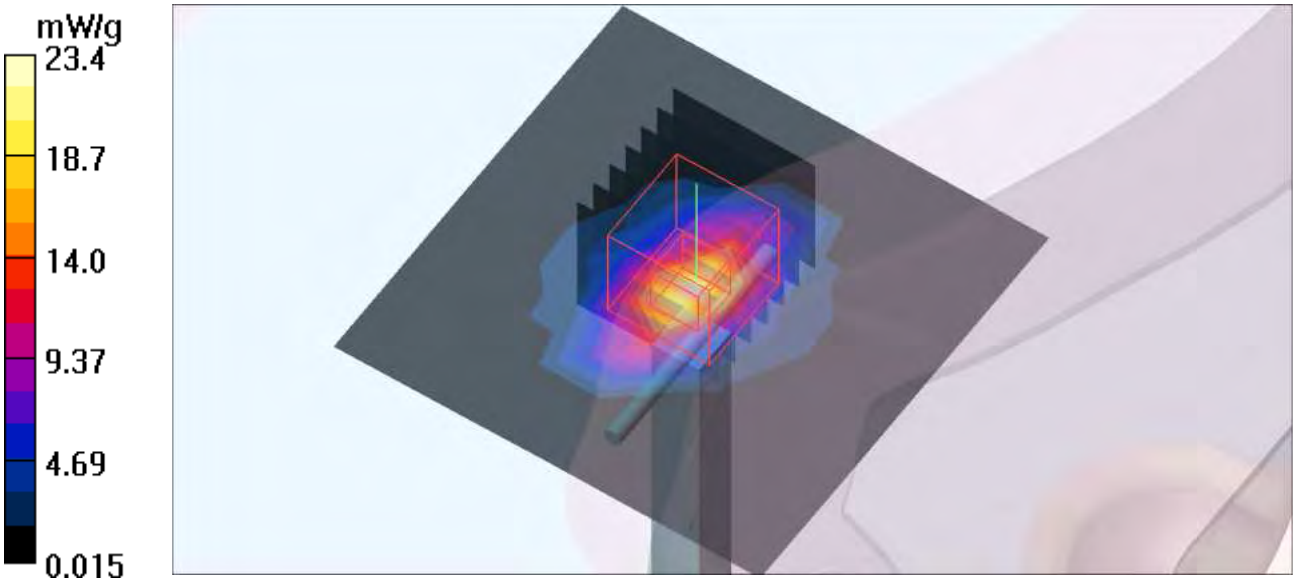
Communication System: CW ; Frequency: 2600 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL2600;Medium parameters used: f = 2600 MHz; σ = 2.15 mho/m; εr = 53.58; ρ = 1000 kg/m^3 ; Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feet point of the dipole to the Phantom)Air temp. : 22.3 degrees ; Liquid temp. : 21.2 degrees

DASY4 Configuration:

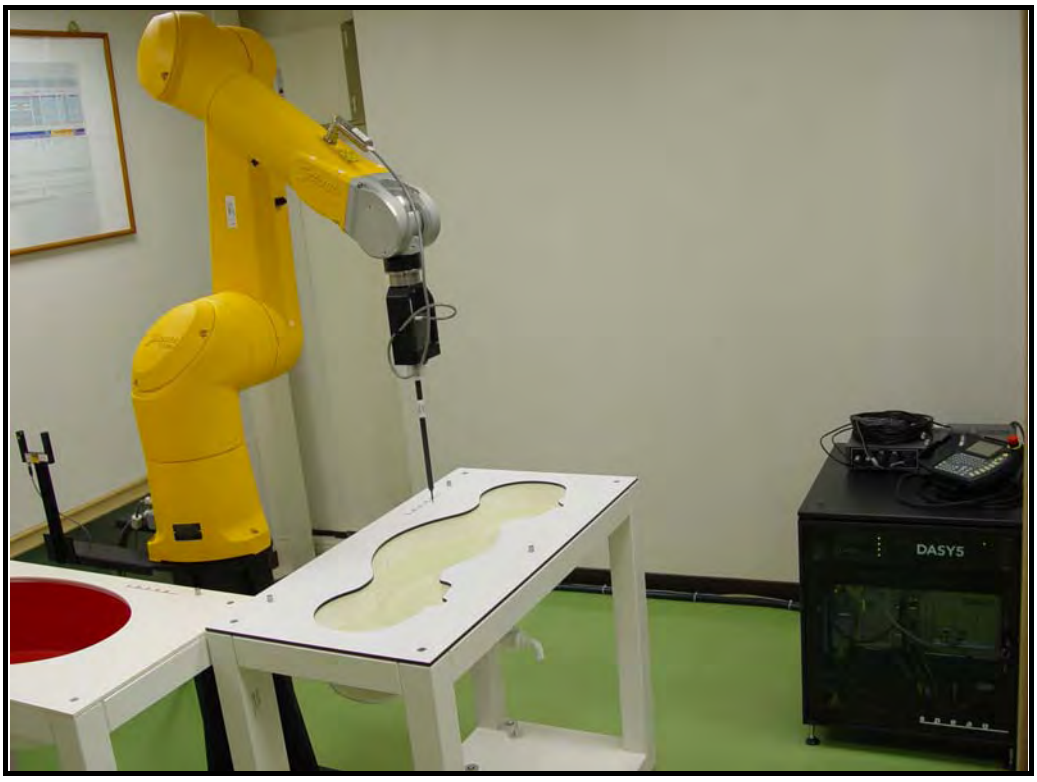
- Probe: EX3DV4 - SN3590; ConvF(7.78, 7.78, 7.78); Calibrated: 2011/2/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 23.4 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, 4dz=5mm
Reference Value = 106.2 V/m; Power Drift = -0.049 dB
Peak SAR (extrapolated) = 32.2 W/kg
SAR(1 g) = 14.5 mW/g; SAR(10 g) = 6.23 mW/g
Maximum value of SAR (measured) = 23.0 mW/g



APPENDIX B: BV ADT SAR MEASUREMENT SYSTEM



APPENDIX C: PHOTOGRAPHS OF SYSTEM VALIDATION

APPENDIX D: SYSTEM CERTIFICATE & CALIBRATION

D1: PHANTOM

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Certificate of Conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 C
Series No	TP-1150 and higher
Manufacturer	SPEAG Zeughausstrasse 43 CH-8004 Zürich Switzerland

Tests

The series production process used allows the limitation to test of first articles.
Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series items (called samples) or are tested at each item.

Test	Requirement	Details	Units tested
Dimensions	Compliant with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness of shell	Compliant with the requirements according to the standards	2mm +/- 0.2mm in flat and specific areas of head section	First article, Samples, TP-1314 ff.
Material thickness at ERP	Compliant with the requirements according to the standards	6mm +/- 0.2mm at ERP	First article, All items
Material parameters	Dielectric parameters for required frequencies	300 MHz – 6 GHz: Relative permittivity < 5, Loss tangent < 0.05	Material samples
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility.	DEGMBE based simulating liquids	Pre-series, First article, Material samples
Sagging	Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid.	< 1% typical < 0.8% if filled with 155mm of HSL900 and without DUT below	Prototypes, Sample testing

Standards

[1] CENELEC EN 50361
[2] IEEE Std 1528-2003
[3] IEC 62209 Part I
[4] FCC OET Bulletin 65, Supplement C, Edition 01-01
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4].

Date 07.07.2005

Signature / Stamp

D2: DOSIMETRIC E-FIELD PROBE

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

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

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

Accreditation No.: **SCS 108**

Client **B.V. ADT (Auden)**

Certificate No: **EX3-3650_Jan11**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3650
Calibration procedure(s)	QA CAL-01.v7, QA CAL-14.v3, QA CAL-23.v4 and QA CAL-25.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	January 24, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Fin Bomholt	R&D Director	

Issued: January 25, 2011

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

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

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

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe EX3DV4

SN:3650

Manufactured:	March 18, 2008
Last calibrated:	July 5, 2008
Recalibrated:	January 24, 2011

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 SN:3650

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.45	0.40	0.49	± 10.1%
DCP (mV)[B]	93.4	96.5	95.5	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	137.0	± 3.4 %
			Y	0.00	0.00	1.00	141.2	
			Z	0.00	0.00	1.00	144.7	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3650

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
750	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	9.46	9.46	9.46	0.43	0.72	± 11.0%
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	8.95	8.95	8.95	0.55	0.67	± 11.0%
1450	± 50 / ± 100	40.5 ± 5%	1.20 ± 5%	8.86	8.86	8.86	0.78	0.64	± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	8.17	8.17	8.17	0.75	0.60	± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.57	7.57	7.57	0.57	0.66	± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	7.10	7.10	7.10	0.36	0.88	± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	6.93	6.93	6.93	0.38	0.88	± 11.0%
5200	± 50 / ± 100	36.0 ± 5%	4.66 ± 5%	4.69	4.69	4.69	0.40	1.80	± 13.1%
5300	± 50 / ± 100	35.9 ± 5%	4.76 ± 5%	4.33	4.33	4.33	0.45	1.80	± 13.1%
5500	± 50 / ± 100	35.6 ± 5%	4.96 ± 5%	4.42	4.42	4.42	0.45	1.80	± 13.1%
5600	± 50 / ± 100	35.5 ± 5%	5.07 ± 5%	3.96	3.96	3.96	0.60	1.80	± 13.1%
5800	± 50 / ± 100	35.3 ± 5%	5.27 ± 5%	4.27	4.27	4.27	0.45	1.80	± 13.1%

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3650

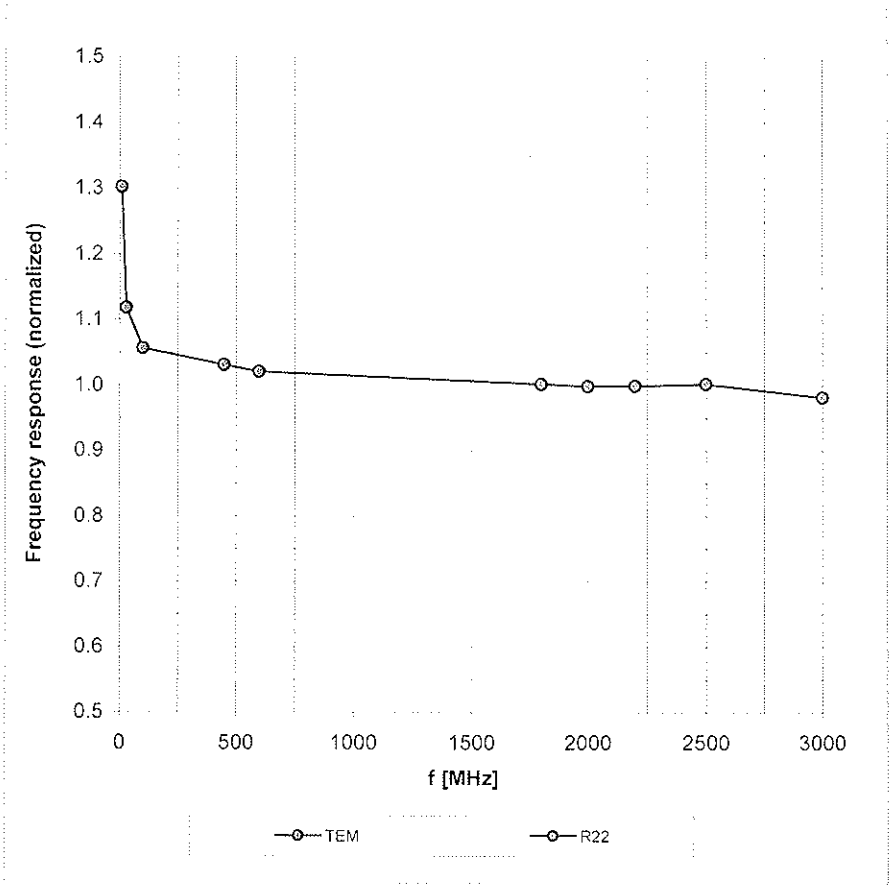
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	9.25	9.25	9.25	0.53	0.71	± 11.0%
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	9.12	9.12	9.12	0.36	0.88	± 11.0%
1450	± 50 / ± 100	54.0 ± 5%	1.30 ± 5%	7.97	7.97	7.97	0.71	0.63	± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	7.46	7.46	7.46	0.78	0.61	± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.52	7.52	7.52	0.79	0.59	± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	7.05	7.05	7.05	0.54	0.74	± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	6.92	6.92	6.92	0.45	0.80	± 11.0%
5200	± 50 / ± 100	49.0 ± 5%	5.30 ± 5%	4.25	4.25	4.25	0.50	1.90	± 13.1%
5300	± 50 / ± 100	48.9 ± 5%	5.42 ± 5%	3.96	3.96	3.96	0.50	1.90	± 13.1%
5500	± 50 / ± 100	48.6 ± 5%	5.65 ± 5%	3.76	3.76	3.76	0.55	1.90	± 13.1%
5600	± 50 / ± 100	48.5 ± 5%	5.77 ± 5%	3.55	3.55	3.55	0.58	1.90	± 13.1%
5800	± 50 / ± 100	48.2 ± 5%	6.00 ± 5%	3.86	3.86	3.86	0.60	1.90	± 13.1%

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Frequency Response of E-Field

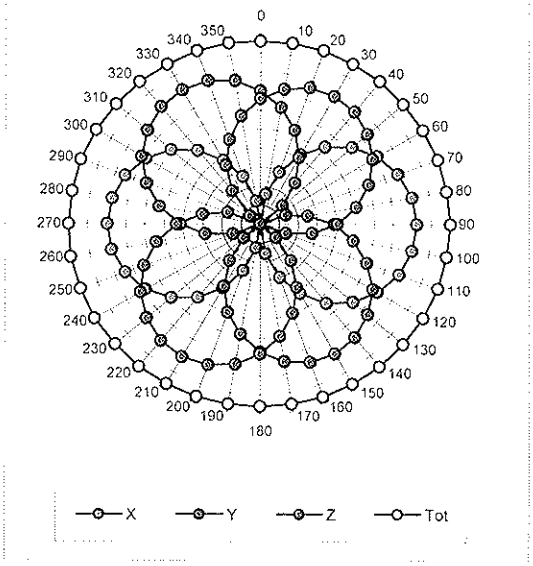
(TEM-Cell:ifi110 EXX, Waveguide: R22)



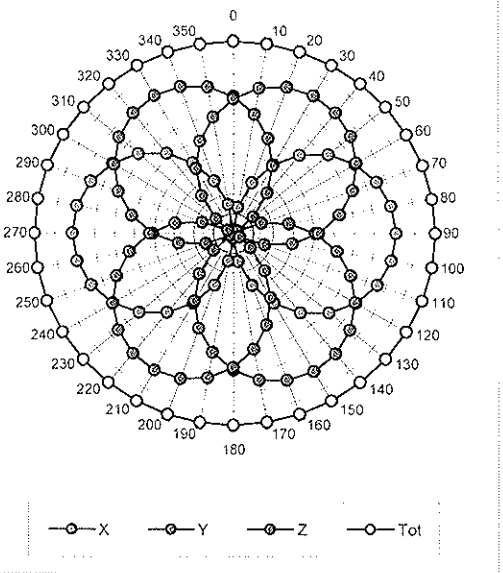
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

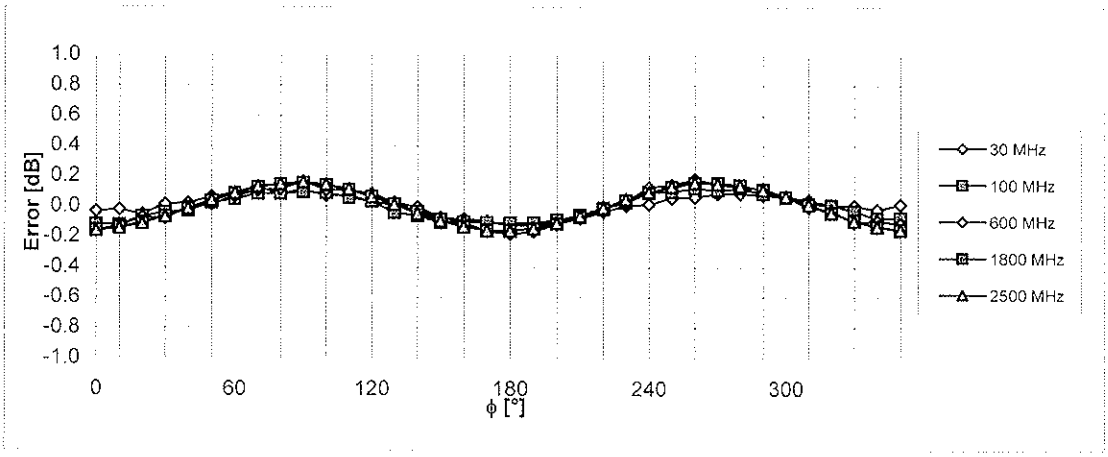
Receiving Pattern (ϕ), ϑ = 0°

f = 600 MHz, TEM ifi110EXX



f = 1800 MHz, WG R22

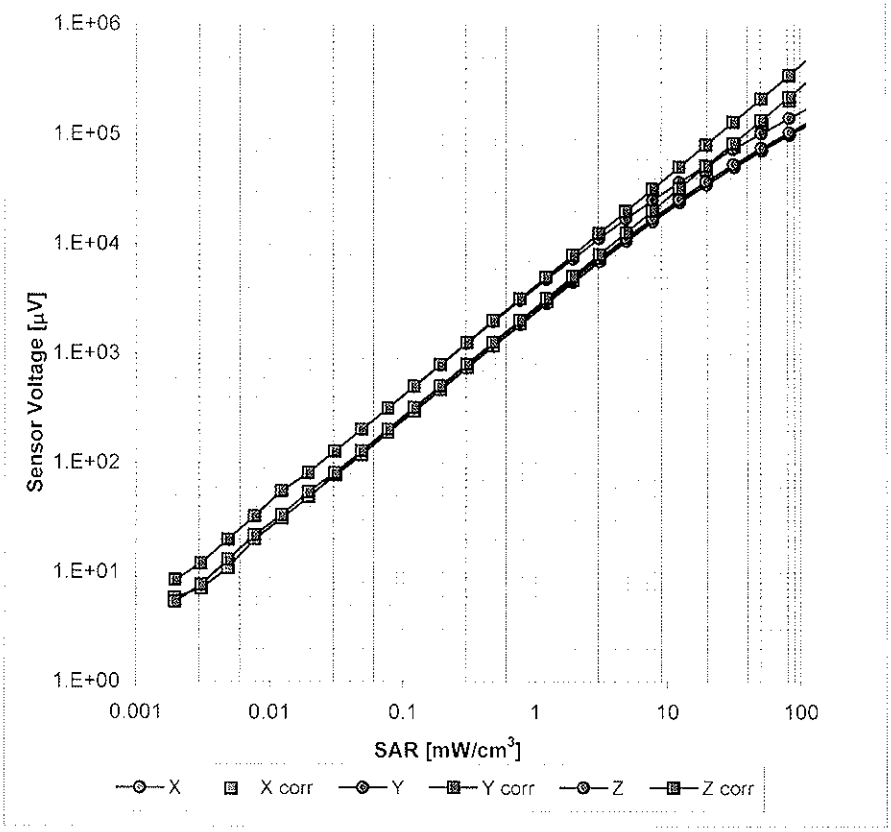


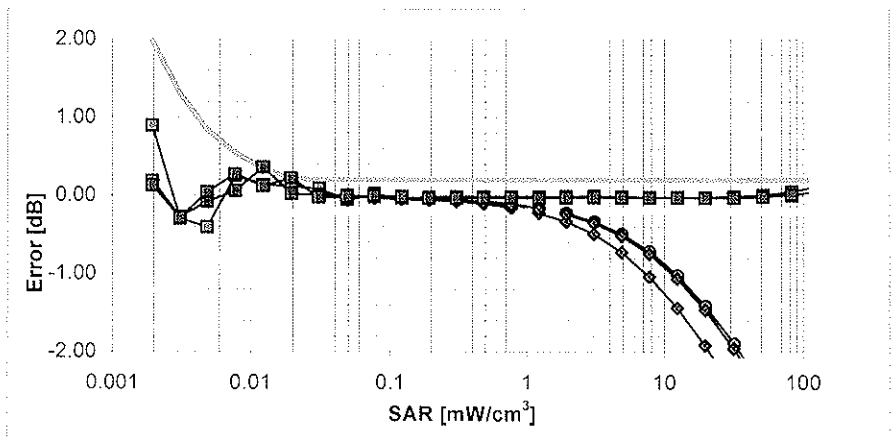


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

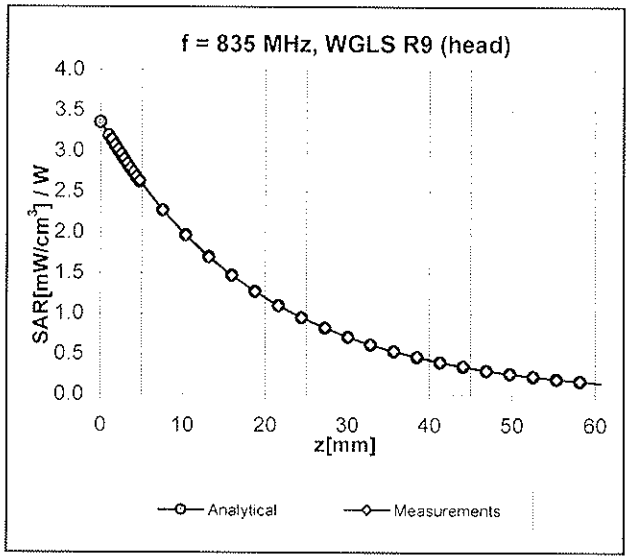
(TEM cell, f = 900 MHz)

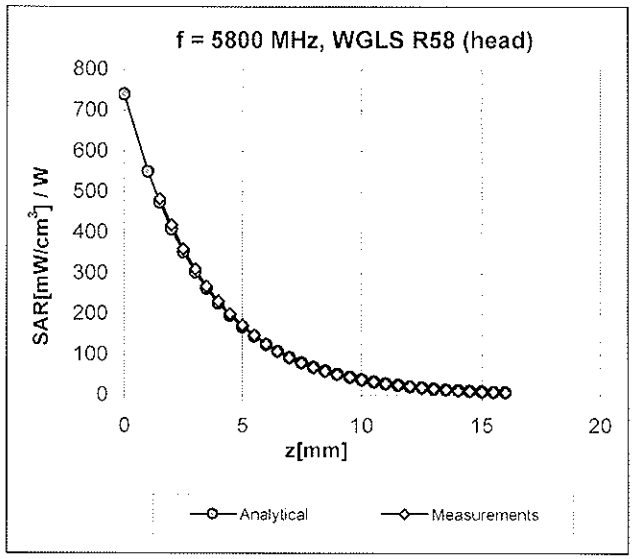




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

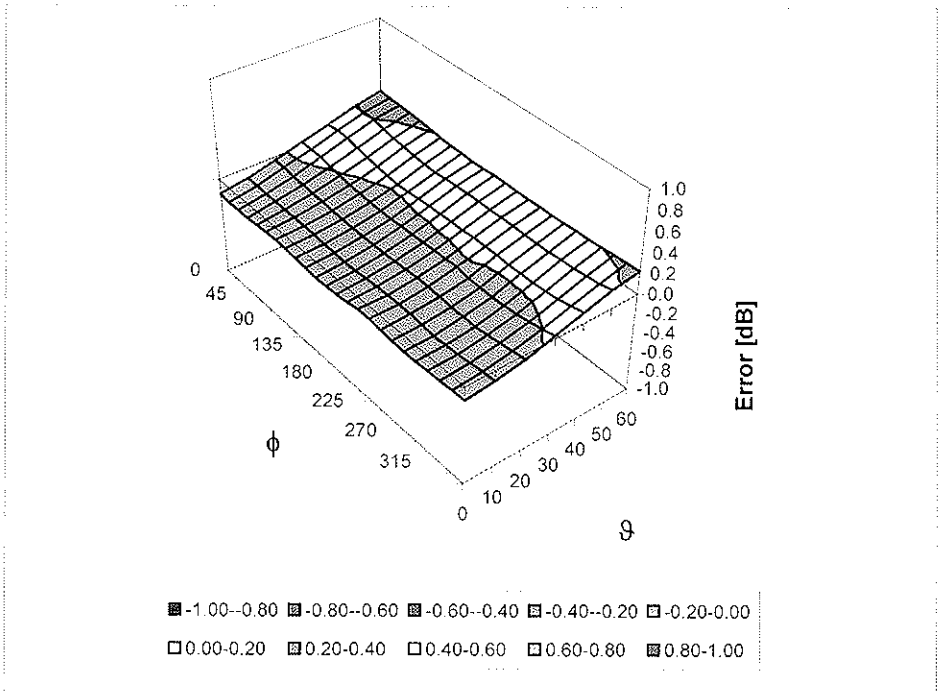
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

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Accreditation No.: SCS 108

Client **BV-ADT (Auden)**

Certificate No: EX3-3590_Mar10

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3590

Calibration procedure(s): QA CAL-01.v6, QA CAL-14.v3, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes

Calibration date: March 25, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10
Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	29-Sep-09 (No. DAE4-660_Sep09)	Sep-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: March 25, 2010

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

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z*: *A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe EX3DV4

SN:3590

Manufactured:	March 23, 2009
Last calibrated:	April 28, 2009
Recalibrated:	March 25, 2010

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: EX3DV4 SN:3590

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.49	0.49	0.50	± 10.1%
DCP (mV)[B]	88.1	87.5	87.6	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300	± 1.5%
			Y	0.00	0.00	1.00	300	
			Z	0.00	0.00	1.00	300	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

DASY - Parameters of Probe: EX3DV4 SN:3590

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	10.25	10.25	10.25	0.74	0.61	± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	8.89	8.89	8.89	0.76	0.58	± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	8.33	8.33	8.33	0.62	0.64	± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	7.90	7.90	7.90	0.36	0.84	± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	7.79	7.79	7.79	0.19	1.32	± 11.0%
5200	± 50 / ± 100	36.0 ± 5%	4.66 ± 5%	5.30	5.30	5.30	0.40	1.90	± 13.1%
5300	± 50 / ± 100	35.9 ± 5%	4.76 ± 5%	4.92	4.92	4.92	0.45	1.90	± 13.1%
5500	± 50 / ± 100	35.6 ± 5%	4.96 ± 5%	4.93	4.93	4.93	0.45	1.90	± 13.1%
5600	± 50 / ± 100	35.5 ± 5%	5.07 ± 5%	4.63	4.63	4.63	0.50	1.90	± 13.1%
5800	± 50 / ± 100	35.3 ± 5%	5.27 ± 5%	4.54	4.54	4.54	0.50	1.90	± 13.1%

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

DASY - Parameters of Probe: EX3DV4 SN:3590

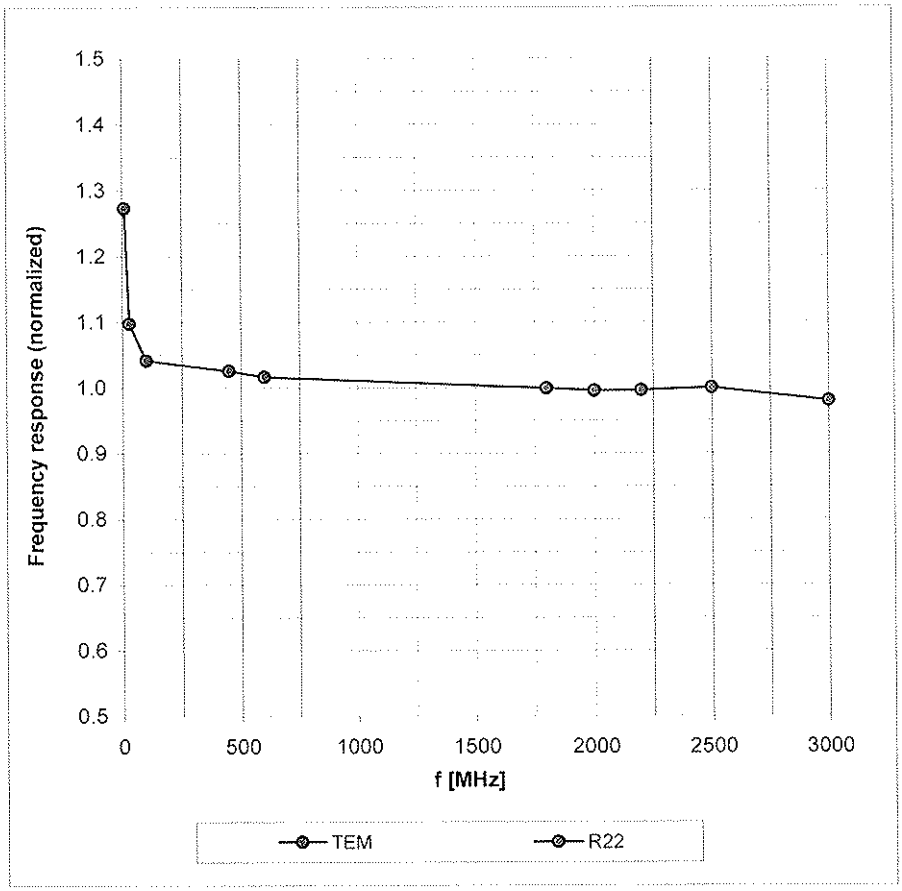
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	10.20	10.20	10.20	0.60	0.71 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	8.69	8.69	8.69	0.79	0.58 ± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	8.61	8.61	8.61	0.40	0.80 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	8.20	8.20	8.20	0.28	1.02 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	8.04	8.04	8.04	0.21	1.25 ± 11.0%
5200	± 50 / ± 100	49.0 ± 5%	5.30 ± 5%	4.80	4.80	4.80	0.53	1.95 ± 13.1%
5300	± 50 / ± 100	48.5 ± 5%	5.42 ± 5%	4.50	4.50	4.50	0.53	1.95 ± 13.1%
5500	± 50 / ± 100	48.6 ± 5%	5.65 ± 5%	4.32	4.32	4.32	0.55	1.95 ± 13.1%
5600	± 50 / ± 100	48.5 ± 5%	5.77 ± 5%	4.16	4.16	4.16	0.50	1.95 ± 13.1%
5800	± 50 / ± 100	48.2 ± 5%	6.00 ± 5%	4.41	4.41	4.41	0.60	1.95 ± 13.1%

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

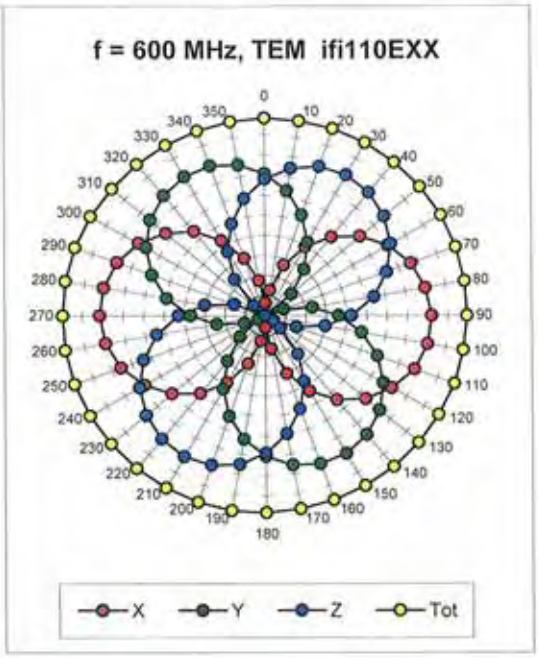
Frequency Response of E-Field

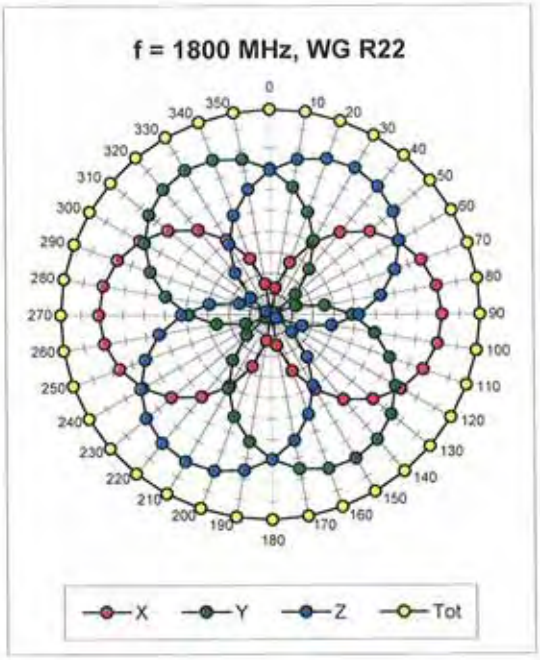
(TEM-Cell:ifi110 EXX, Waveguide: R22)

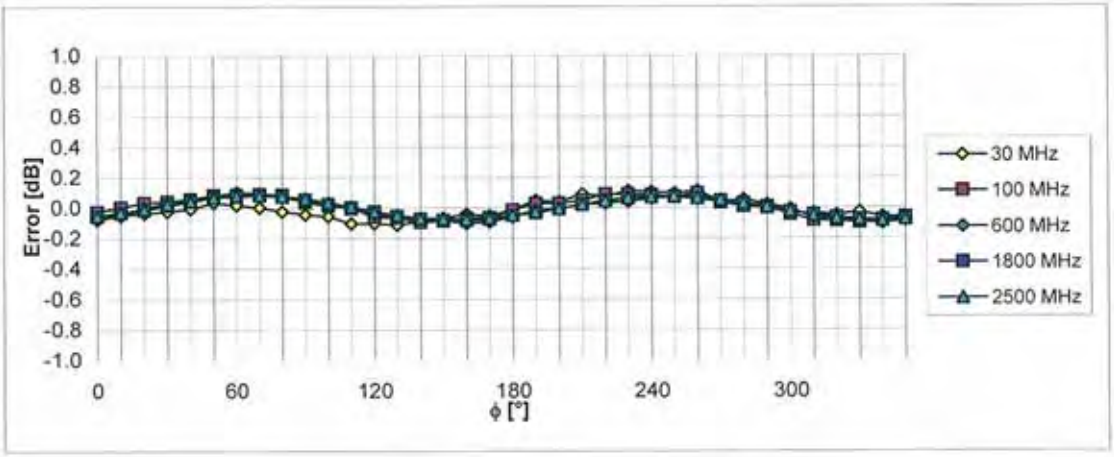


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



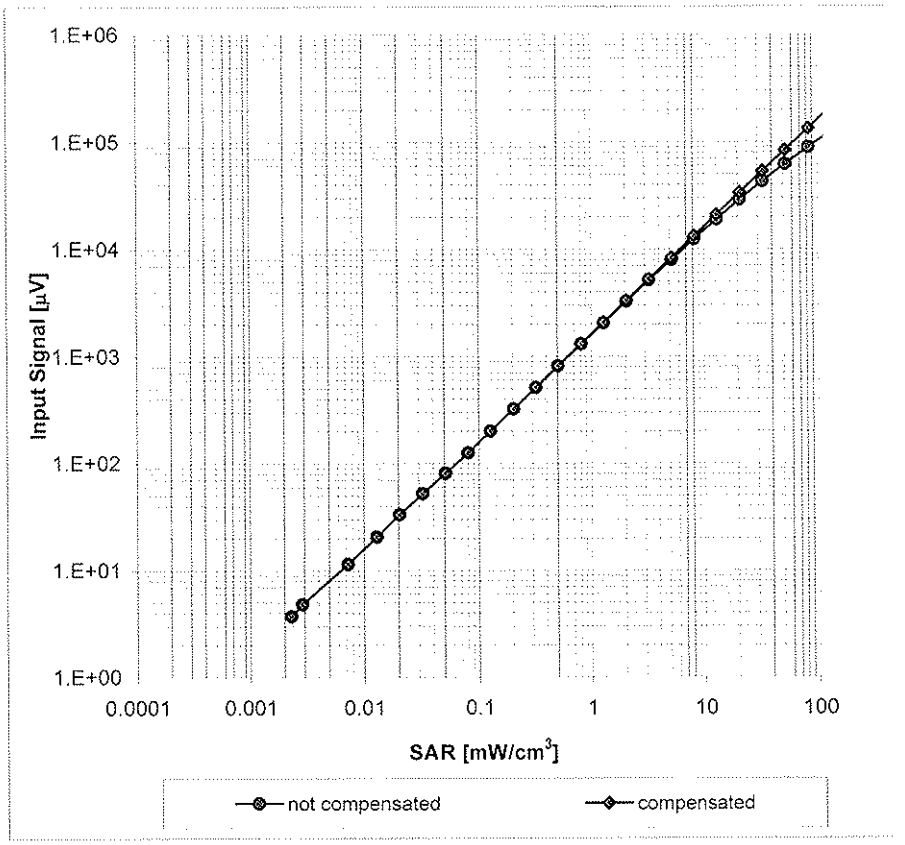


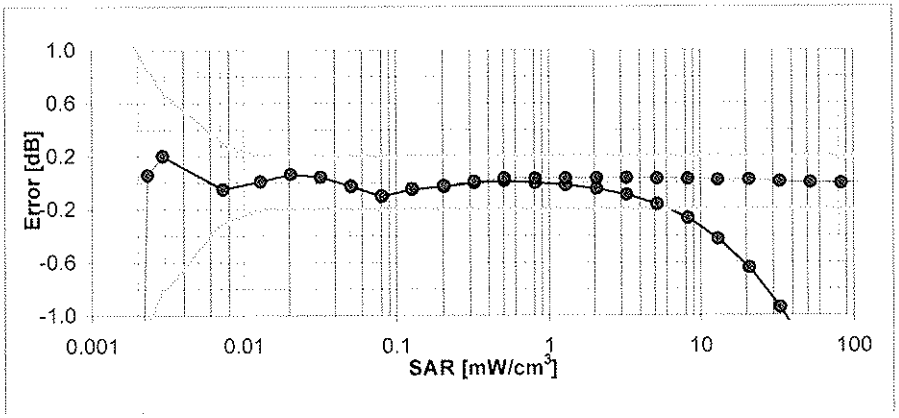


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

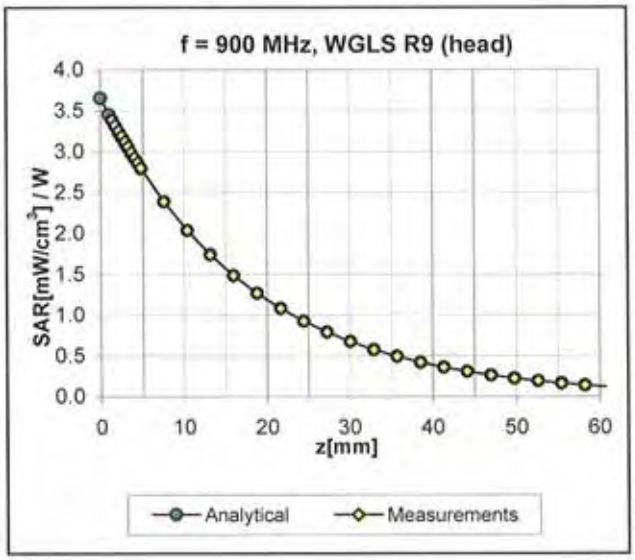
(Waveguide R22, f = 1800 MHz)

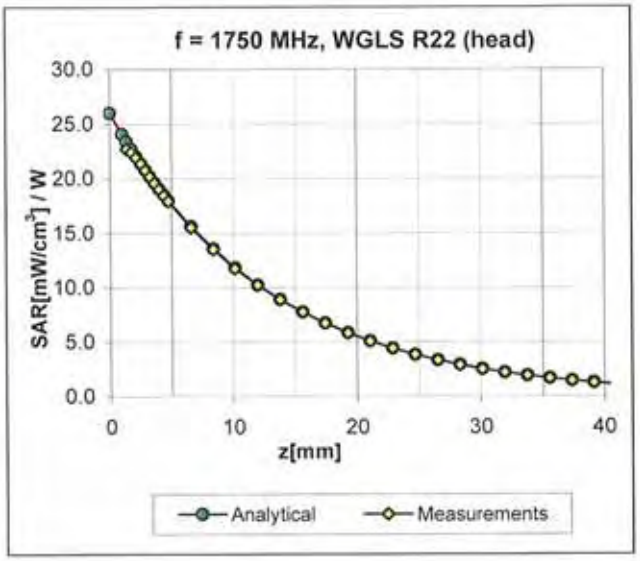




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

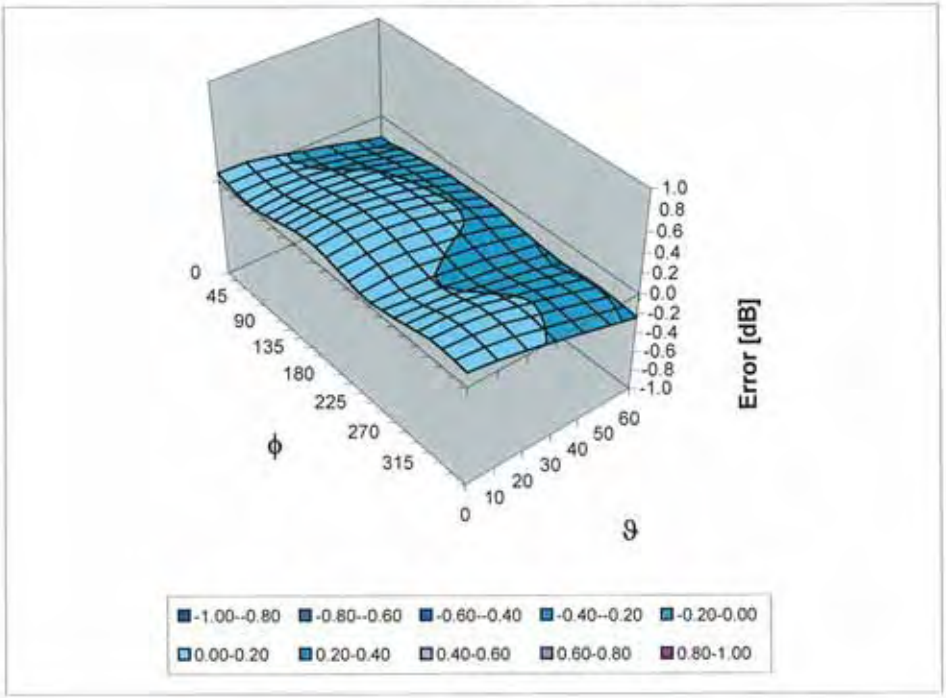
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

D3: DAE

Schmid & Partner Engineering AG

s p e a g

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info@speag.com, http://www.speag.com

IMPORTANT NOTICE

USAGE OF THE DAE 3

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

Battery Exchange: The battery cover of the DAE3 unit is connected to a fragile 3-pin battery connector. Customer is responsible to apply outmost caution not to bend or damage the connector when changing batteries.

Shipping of the DAE: Before shipping the DAE to SPEAG for calibration the customer shall remove the batteries and pack the DAE in an antistatic bag. This antistatic bag shall then be packed into a larger box or container which protects the DAE from impacts transportation. The package shall be marked to indicate that a fragile instrument is inside.

E-Stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, Customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

DASY Configuration Files: Since the exact values of the DAE input resistances, as measured during the calibration procedure of a DAE unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file.

Important Note:
Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.

Important Note:
Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.

Important Note:
To prevent damage of the DAE probe connector pins, use great care when installing the probe to the DAE. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE.

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The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **ADT (Auden)**

Certificate No: DAE3-510_Oct10

CALIBRATION CERTIFICATE

Object	DAE3 - SD 000 D03 AA - SN: 510
Calibration procedure(s)	QA CAL-06.v22 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	October 4, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: October 4, 2010

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.204 ± 0.1% (k=2)	404.261 ± 0.1% (k=2)	404.619 ± 0.1% (k=2)
Low Range	3.97841 ± 0.7% (k=2)	3.96431 ± 0.7% (k=2)	3.98318 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	280.0 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200002.6	1.33	0.00
Channel X	+ Input	20001.52	1.72	0.01
Channel X	- Input	-19997.99	1.81	-0.01
Channel Y	+ Input	200010.4	0.89	0.00
Channel Y	+ Input	20000.89	1.39	0.01
Channel Y	- Input	-19998.10	1.60	-0.01
Channel Z	+ Input	200007.2	-1.37	-0.00
Channel Z	+ Input	19998.21	-1.29	-0.01
Channel Z	- Input	-20001.73	-2.13	0.01

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.1	0.23	0.01
Channel X	+ Input	200.27	0.27	0.13
Channel X	- Input	-199.76	0.04	-0.02
Channel Y	+ Input	2000.8	0.66	0.03
Channel Y	+ Input	199.56	-0.44	-0.22
Channel Y	- Input	-200.06	-0.16	0.08
Channel Z	+ Input	1999.4	-0.75	-0.04
Channel Z	+ Input	199.53	-0.57	-0.28
Channel Z	- Input	-201.06	-1.16	0.58

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	17.87	16.44
	- 200	-15.36	-17.11
Channel Y	200	14.99	14.97
	- 200	-16.63	-16.47
Channel Z	200	-8.65	-8.74
	- 200	7.23	7.63

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	4.37	-3.14
Channel Y	200	6.07	-	3.36
Channel Z	200	3.03	-0.24	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15917	15639
Channel Y	16112	16210
Channel Z	16121	16322

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.61	0.06	2.59	0.30
Channel Y	1.72	-0.56	3.01	0.39
Channel Z	-1.94	-2.73	-0.59	0.30

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	–0.01	-8	-9

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IMPORTANT NOTICE

USAGE OF THE DAE 3

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

Battery Exchange: The battery cover of the DAE3 unit is connected to a fragile 3-pin battery connector. Customer is responsible to apply outmost caution not to bend or damage the connector when changing batteries.

Shipping of the DAE: Before shipping the DAE to SPEAG for calibration the customer shall remove the batteries and pack the DAE in an antistatic bag. This antistatic bag shall then be packed into a larger box or container which protects the DAE from impacts transportation. The package shall be marked to indicate that a fragile instrument is inside.

E-Stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, Customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

DASY Configuration Files: Since the exact values of the DAE input resistances, as measured during the calibration procedure of a DAE unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file.

Important Note:
Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.

Important Note:
Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.

Important Note:
To prevent damage of the DAE probe connector pins, use great care when installing the probe to the DAE. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE.

Schmid & Partner Engineering

Calibration Laboratory of
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Engineering AG
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Accreditation No.: SCS 108

Client BV-ADT (Auden)

Certificate No: DAE3-579_Sep10

CALIBRATION CERTIFICATE

Object: DAE3 - SD 000 D03 AA - SN: 579

Calibration procedure(s): QA CAL-06.v22
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: September 20, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	1-Oct-09 (No: 9055)	Oct-10
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: September 20, 2010

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.327 ± 0.1% (k=2)	404.379 ± 0.1% (k=2)	404.160 ± 0.1% (k=2)
Low Range	3.98675 ± 0.7% (k=2)	3.99301 ± 0.7% (k=2)	3.94834 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	358.0 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200003.9	0.96	0.00
Channel X	+ Input	20003.19	3.09	0.02
Channel X	- Input	-19994.55	4.75	-0.02
Channel Y	+ Input	199992.4	-0.09	-0.00
Channel Y	+ Input	19999.51	0.41	0.00
Channel Y	- Input	-19997.22	3.18	-0.02
Channel Z	+ Input	200002.0	0.91	0.00
Channel Z	+ Input	20001.93	2.03	0.01
Channel Z	- Input	-19997.58	2.82	-0.01

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.0	0.02	0.00
Channel X	+ Input	199.82	0.12	0.06
Channel X	- Input	-200.46	-0.56	0.28
Channel Y	+ Input	2000.3	0.47	0.02
Channel Y	+ Input	199.12	-0.78	-0.39
Channel Y	- Input	-201.36	-1.16	0.58
Channel Z	+ Input	1999.9	-0.07	-0.00
Channel Z	+ Input	199.18	-0.72	-0.36
Channel Z	- Input	-201.47	-1.47	0.73

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	7.07	5.75
	- 200	-4.60	-6.25
Channel Y	200	9.48	9.62
	- 200	-10.39	-10.96
Channel Z	200	8.79	8.42
	- 200	-9.64	-9.80

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	0.03	0.35
Channel Y	200	1.14	-	2.31
Channel Z	200	2.01	0.80	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16343	16314
Channel Y	16194	16427
Channel Z	15816	16265

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	-0.70	-1.94	0.80	0.49
Channel Y	-1.55	-2.12	-0.66	0.27
Channel Z	0.57	-0.11	5.61	0.62

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	–0.01	-8	-9

D4: SYSTEM VALIDATION DIPOLE

Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Swiss Calibration Service

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The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **B.V. ADT (Auden)**

Certificate No: D2600V2_1003_Jan11

CALIBRATION CERTIFICATE

Object: D2600V2 - SN: 1003

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

Calibration date: January 27, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 27, 2011

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.9 ± 6 %	2.03 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 0.2) °C	-------	-------

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	15.0 mW / g
SAR normalized	normalized to 1W	60.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**58.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.57 mW / g
SAR normalized	normalized to 1W	26.3 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**26.1 mW / g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.3 ± 6 %	2.10 mho/m ± 6 %
Body TSL temperature during test	(20.8 ± 0.2) °C	-------	------

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	condition	
SAR measured	250 mW input power	14.4 mW / g
SAR normalized	normalized to 1W	57.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**58.1 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.41 mW / g
SAR normalized	normalized to 1W	25.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**25.7 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.5 Ω - 0.4 jΩ
Return Loss	- 44.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.2 Ω + 0.0 jΩ
Return Loss	- 28.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.147 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 23, 2006

DASY5 Validation Report for Head TSL

Date/Time: 27.01.2011 15:40:46

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1003

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: HSL BB1.9
Medium parameters used: f = 2600 MHz; σ = 2.04 mho/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

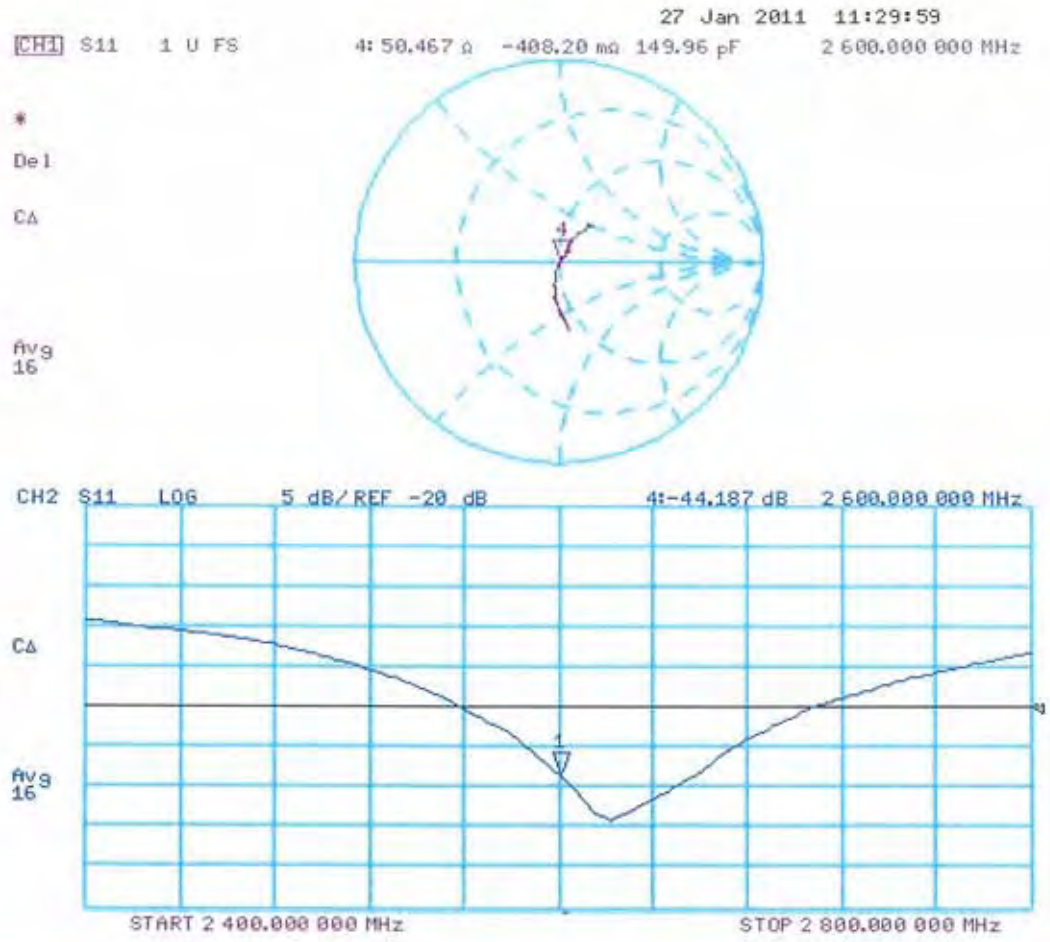
DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.47, 4.47, 4.47); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW/d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.3 V/m; Power Drift = 0.00081 dB
Peak SAR (extrapolated) = 32.976 W/kg
SAR(1 g) = 15 mW/g; SAR(10 g) = 6.57 mW/g
Maximum value of SAR (measured) = 19.719 mW/g

0 dB = 19.720mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 05.01.2011 14:25:38

Test Laboratory: SPEAG, Zurich, Switzerland

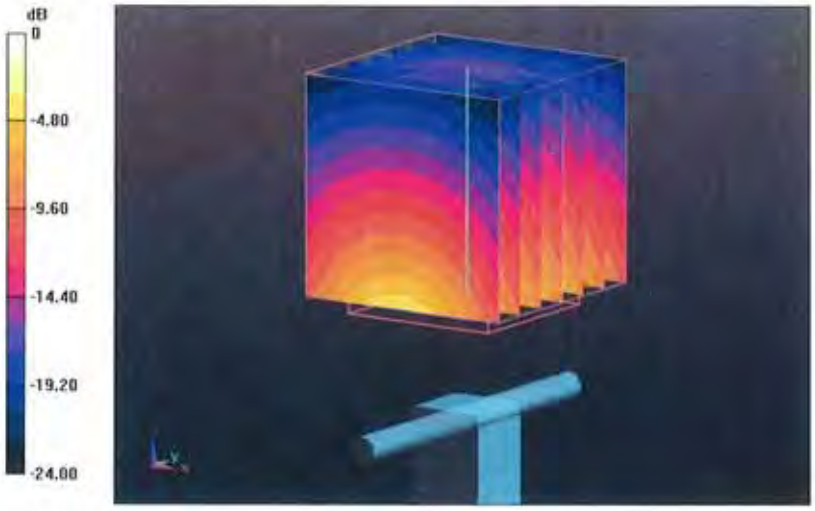
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1003

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: MSL U12 BB
Medium parameters used: f = 2600 MHz; σ = 2.12 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.18, 4.18, 4.18); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW/d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.717 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 31.466 W/kg
SAR(1 g) = 14.4 mW/g; SAR(10 g) = 6.41 mW/g
Maximum value of SAR (measured) = 19.133 mW/g



0 dB = 19.130mW/g

Impedance Measurement Plot for Body TSL