SAR TEST REPORT

REPORT NO.: SA990514C07

MODEL NO.: 4M-CPE-USB250-2.5
(refer to item 3.1 for more details)

RECEIVED: May 14, 2010

TESTED: Jun. 11 ~ Jun. 15, 2010

ISSUED: Jun. 28, 2010

APPLICANT: Gemtek Technology Co., Ltd.

ADDRESS: No. 15-1, Zhonghua Rd, Hsinchu Industrial Park, Hsinchu County, Taiwan, R.O.C. 303

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

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

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1. CERTIFICATION

PRODUCT:	WiMAX USB250, 802.16e wave2 2.5GHz USB Dongle
MODEL NO.:	4M-CPE-USB250-2.5 (refer to item 2.1 for more details)
BRAND:	Alvarion (refer to item 2.1 for more details)
APPLICANT:	Gemtek Technology Co., Ltd.
TESTED:	Jun. 11 ~ Jun. 15, 2010
TEST SAMPLE:	Engineering Sample
STANDARDS:	**FCC Part 2 (Section 2.1093)**
	FCC OET Bulletin 65, Supplement C (01-01)
	RSS-102

The above equipment (model: 4M-CPE-USB250-2.5) 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 : _____ , **DATE :** Jun. 28, 2010
Pettie Chen / Specialist

TECHNICAL ACCEPTANCE : _____ , **DATE :** Jun. 28, 2010
Responsible for RF
Mason Chang / Engineer

APPROVED BY : _____ , **DATE :** Jun. 28, 2010
Gary Chang / Assistant Manager

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

EUT	WiMAX USB250, 802.16e wave2 2.5GHz USB Dongle	
MODEL NO.	4M-CPE-USB250-2.5 (refer to Note for more details)	
FCC ID	MXF-WIXUBB-110	
POWER SUPPLY	5Vdc	
CODED TYPE/MODULATION/ CODING RATE	**UL**	QPSK: 1/2, 3/4
		16QAM: 1/2, 3/4
		64QAM: 1/2, 2/3, 3/4, 5/6
	DL	QPSK: 1/2, 3/4
		16QAM: 1/2, 3/4
		64QAM: 1/2, 2/3, 3/4, 5/6
MULTIPLE ACCESS METHOD	TDMA	
MODULATION TECHNOLOGY	OFDMA	
DUPLEX METHOD	TDD	
TX / RX FUNCTION	1TX / 2RX , supports TX diversity	
MIMO FUNCTION	Not supported	
OPERATING FREQUENCY	2498.5MHz to 2687.5Mz	
CHANNEL BANDWIDTH	5MHz, 10MHz	
AVERAGE SAR (1g)	1.159W/kg	
ANTENNA TYPE	Printed antenna with -1dBi gain	
DATA CABLE	0.12m shielded USB cable without core	
I/O PORTS	Refer to user's manual	
ACCESSORY DEVICES	NA	
MAX DL :UL ratio	29:18	

NOTE:

1. The models as below are identical to each other except for their model designation and brand name due to marketing purpose.

BRAND	MODEL
Alvarion	4M-CPE-USB250-2.5
Gemtek	WIXUBB-110

2. The above EUT information was declared by the manufacturer and for more detailed features description, please refer 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

IEEE 1528-2003

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

2.3 GENERAL INOFRMATION OF THE SAR SYSTEM

DASY4 (software 4.7 Build 80) consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY4 software defined. The DASY4 software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.

EX3DV4 ISOTROPIC E-FIELD PROBE

CONSTRUCTION	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
FREQUENCY	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
DIRECTIVITY	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
DYNAMIC RANGE	10 μW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
DIMENSIONS	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
APPLICATION	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

NOTE

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

TWIN SAM V4.0

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

SYSTEM VALIDATION KITS:

CONSTRUCTION	Symmetrical dipole with l/4 balun enables measurement of feedpoint impedance with NWA matched for use near flat phantoms filled with brain simulating solutions. Includes distance holder and tripod adaptor
CALIBRATION	Calibrated SAR value for specified position and input power at the flat phantom in brain simulating solutions
FREQUENCY	2450MHz
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-1202	NA	NA
2	Signal Generator	Agilent	E8257C	MY43320668	Feb. 23, 2010	Feb. 22, 2011
3	E-Field Probe	S & P	EX3DV4	3590	Mar. 25, 2010	Mar. 24, 2011
4	DAE	S & P	DAE 4	861	Jan. 22, 2010	Jan. 21, 2011
5	Robot Positioner	Staubli Unimation	NA	NA	NA	NA
6	Validation Dipole	S & P	D2450V2	737	Feb. 19, 2010	Feb. 18, 2011
7			D2600V2	1020	Jan. 27, 2010	Jan. 26, 2011

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	E8358A	US41480538	Dec. 03, 2009	Dec. 02, 2010
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 DASY4 post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the micro-volt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

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

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

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

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

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

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

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

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

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

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

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

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

SAR	= local specific absorption rate in mW/g
E_{tot}	= total field strength in V/m
σ	= conductivity in [mho/m] or [Siemens/m]
ρ	= equivalent tissue density in g/cm3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid. The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 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. 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 DASY4 for the frequencies necessary for the measurements (‘Setup Config’, select medium (e.g. Brain 900MHz) and press ‘Option’-button.
14. Select the current medium for the frequency of the validation (e.g. Setup Medium Brain 900MHz).

FOR SIMULATING LIQUID

LIQUID TYPE		MSL-2450			
SIMULATING LIQUID TEMP.		22.7			
TEST DATE		Jun. 11, 2010			
TESTED BY		Aaron Liang			
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**	**LIMIT(%)**
2450.0	Permitivity (ε)	52.7	53.6	1.71	±5
2498.5		52.6	53.3	1.33	
2450.0	Conductivity (σ) S/m	1.95	2.04	4.62	
2498.5		2.02	2.07	2.48	

LIQUID TYPE		MSL-2600			
SIMULATING LIQUID TEMP.		22.7			
TEST DATE		Jun. 11, 2010			
TESTED BY		Aaron Liang			
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**	**LIMIT(%)**
2501.0	Permitivity (ε)	52.6	53.2	1.14	±5
2600.0		52.5	53.1	1.14	
2685.0		52.4	52.9	0.95	
2687.5		52.4	52.8	0.76	
2501.0	Conductivity (σ) S/m	2.02	2.08	2.97	
2600.0		2.16	2.21	2.31	
2685.0		2.28	2.26	-0.88	
2687.5		2.29	2.27	-0.87	

LIQUID TYPE		MSL-2450			
SIMULATING LIQUID TEMP.		22.8			
TEST DATE		Jun. 12, 2010			
TESTED BY		Aaron Liang			
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**	**LIMIT(%)**
2450.0	Permitivity (ε)	52.7	53.5	1.52	±5
2498.5		52.6	53.2	1.14	
2450.0	Conductivity (σ) S/m	1.95	2.03	4.10	
2498.5		2.02	2.06	1.98	

LIQUID TYPE		MSL-2600			
SIMULATING LIQUID TEMP.		22.8			
TEST DATE		Jun. 12, 2010			
TESTED BY		Aaron Liang			
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**	**LIMIT(%)**
2501.0	Permitivity (ε)	52.6	53.1	0.95	±5
2600.0		52.5	53.0	0.95	
2685.0		52.4	52.8	0.76	
2687.5		52.4	52.7	0.57	
2501.0	Conductivity (σ) S/m	2.02	2.07	2.48	
2600.0		2.16	2.20	1.85	
2685.0		2.28	2.25	-1.32	
2687.5		2.29	2.26	-1.31	

LIQUID TYPE		MSL-2450			
SIMULATING LIQUID TEMP.		22.7			
TEST DATE		Jun. 13, 2010			
TESTED BY		Aaron Liang			
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
2450.0	Permitivity (ε)	52.7	53.8	2.09	±5
2498.5		52.6	53.5	1.71	
2450.0	Conductivity (σ) S/m	1.95	2.04	4.62	
2498.5		2.02	2.07	2.48	

LIQUID TYPE		MSL-2600			
SIMULATING LIQUID TEMP.		22.7			
TEST DATE		Jun. 13, 2010			
TESTED BY		Aaron Liang			
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
2501.0	Permitivity (ε)	52.6	53.5	1.71	±5
2600.0		52.5	53.3	1.52	
2685.0		52.4	53.1	1.34	
2687.5		52.4	53.0	1.15	
2501.0	Conductivity (σ) S/m	2.02	2.09	3.47	
2600.0		2.16	2.22	2.78	
2685.0		2.28	2.26	-0.88	
2687.5		2.29	2.27	-0.87	

LIQUID TYPE		MSL-2450			
SIMULATING LIQUID TEMP.		22.8			
TEST DATE		Jun. 14, 2010			
TESTED BY		Aaron Liang			
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**	**LIMIT(%)**
2450.0	Permitivity (ε)	52.7	53.4	1.33	±5
2498.5		52.6	53.3	1.33	
2450.0	Conductivity (σ) S/m	1.95	2.04	4.62	
2498.5		2.02	2.06	1.98	

LIQUID TYPE		MSL-2600			
SIMULATING LIQUID TEMP.		22.8			
TEST DATE		Jun. 14, 2010			
TESTED BY		Aaron Liang			
FREQ. (MHz)	**LIQUID PARAMETER**	**STANDARD VALUE**	**MEASUREMENT VALUE**	**ERROR PERCENTAGE (%)**	**LIMIT(%)**
2501.0	Permitivity (ε)	52.6	53.2	1.14	±5
2600.0		52.5	53.1	1.14	
2685.0		52.4	52.9	0.95	
2687.5		52.4	52.8	0.76	
2501.0	Conductivity (σ) S/m	2.02	2.08	2.97	
2600.0		2.16	2.21	2.31	
2685.0		2.28	2.25	-1.32	
2687.5		2.29	2.26	-1.31	

LIQUID TYPE		MSL-2450			
SIMULATING LIQUID TEMP.		22.7			
TEST DATE		Jun. 15, 2010			
TESTED BY		Aaron Liang			
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
2450.0	Permitivity (ε)	52.7	53.5	1.52	±5
2498.5		52.6	53.2	1.14	
2450.0	Conductivity (σ) S/m	1.95	2.03	4.10	
2498.5		2.02	2.06	1.98	

LIQUID TYPE		MSL-2600			
SIMULATING LIQUID TEMP.		22.7			
TEST DATE		Jun. 15, 2010			
TESTED BY		Aaron Liang			
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
2501.0	Permitivity (ε)	52.6	53.2	1.14	±5
2600.0		52.5	53.1	1.14	
2685.0		52.4	52.8	0.76	
2687.5		52.4	52.5	0.19	
2501.0	Conductivity (σ) S/m	2.02	2.07	2.48	
2600.0		2.16	2.20	1.85	
2685.0		2.28	2.24	-1.75	
2687.5		2.29	2.27	-0.87	

5. 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.

5.1 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 DASY4 system is less than ±0.1mm.

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

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

5.2 VALIDATION RESULTS

SYSTEM VALIDATION TEST OF SIMULATING LIQUID					
FREQUENCY (MHz)	REQUIRED SAR (mW/g)	MEASURED SAR (mW/g)	DEVIATION (%)	SEPARATION DISTANCE	TESTED DATE
MSL 2450	13.1 (1g)	13.0	-0.76	10mm	Jun. 11, 2010
MSL 2600	13.9 (1g)	14.3	2.88	10mm	Jun. 11, 2010
MSL 2450	13.1 (1g)	12.9	-1.53	10mm	Jun. 12, 2010
MSL 2600	13.9 (1g)	14.2	2.16	10mm	Jun. 12, 2010
MSL 2450	13.1 (1g)	13.3	1.53	10mm	Jun. 13, 2010
MSL 2600	13.9 (1g)	14.4	3.60	10mm	Jun. 13, 2010
MSL 2450	13.1 (1g)	12.8	-2.29	10mm	Jun. 14, 2010
MSL 2600	13.9 (1g)	14.5	4.32	10mm	Jun. 14, 2010
MSL 2450	13.1 (1g)	13.4	2.29	10mm	Jun. 15, 2010
MSL 2600	13.9 (1g)	14.4	3.60	10mm	Jun. 15, 2010

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

5.3 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 measrurement	4.62	Rectangular	√3	1	1	2.67	2.67	1
Dipole Related								
Dipole Axis to Liquid Distance	1.60	Rectangular	√3	1	1	0.92	0.92	4
Input Power Drift	0.67	Rectangular	√3	1	1	0.39	0.39	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)	4.62	Normal	1	0.64	0.43	2.96	1.99	9
Liquid Permittivity (target)	5.00	Rectangular	√3	0.6	0.49	1.73	1.41	∞
Liquid Permittivity (measurement)	2.09	Normal	1	0.6	0.49	1.25	1.02	9
Combined Standard Uncertainty						9.20	8.74	
Coverage Factor for 95%						**Kp=2**		
Expanded Uncertainty (K=2)						18.40	17.48	

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

6. 802.16e/WiMax DEVICE AND SYSTEM OPERATING PARAMETERS

Description	Parameter		Comment
FCC ID	MXF-WIXUBB-110		Identify all related FCC ID
Radio Service	Part 27 subpart M		Rule parts
Transmit Frequency Range (MHz)	2496MHz-2690MHz		System parameter
System/Channel Bandwidth (MHz)	5MHz	10MHz	System parameter
System Profile	Revision 1.7.0		Defined by WiMAX Forum
Modulation Schemes	QPSK,16QAM, 64QAM		Identify all applicable UL modulations
Sampling Factor	28/25		System parameter
Sampling Frequency (MHz)	5.6MHz	11.2MHz	(Fs)
Sample Time (ns)	178.581ns	89.3ns	(1/Fs)
FFT Size (NFFT)	512	1024	(NFFT)
Sub-Carrier Spacing (kHz)	10.9375kHz		(Δf)
Useful Symbol time (μs)	91.43μs		(Tb=1/Δf)
Guard Time (μs)	11.43μs		(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	29		Identify the allowed & maximum symbols, including both traffic & control symbols
Number of UL OFDMA Symbols per Frame	18		
DL:UL Symbol Ratio	29:18		For determining UL duty factor
Power Class (dBm)	Power Class 2, 23±1dBm		Identify power class and tolerance
Wave1 / Wave2	Wave2, 2 antenna with receive MRC diversity		Describe antenna diversity info and MIMO requirements separately
	DL MIMO matrix A and B.		
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	409	841	Identify the allowed and tested/to be tested parameters; include separate
UL Burst Maximum Average Power	23dBm		
Number and type of UL Control Symbols	3 PUSC symbols (used for ranging, CQICH and ACK/NACK)		
UL Control Symbol Maximum Average Power	73.88mW	35.88mW	
UL Burst Peak-to-Average Power Ratio (PAR)	6.14 ~ 8.11dB		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	Duty Cycle = 15/48=0.3125 (3 control symbols are not activated) Duty Factor = 1/Duty Cycle=3.2		Show calculation 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

7. WIMAX/802.16e DEVICE SPECIFICATION

7.1 WIMAX ZONE TYPES

The device transmits using PUSC zone type only. 5 and 10MHz bandwidth are supported for the EUT. For the 10 MHz bandwidth, it has 35 sub-channels structured from 1024 subcarriers; 184 are used as spare/safeguard subcarriers, leaving 840 available for transmission. From this, 560 subcarriers for data transmission with 280 subcarriers intended for pilot use. For the 5 MHz bandwidth, it contains 17 sub-channels using 512 subcarriers; 104 subcarriers as spare/safeguard subcarriers, 272 for data transmission, and 136 for pilot.

7.2 POWER MEASUREMENT

Set the transmitter under transmission condition continuously at specific mode with maximum output. 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.

An Anritus wideband power meter was used for measuring this item. The power was taken during the burst-on period (exclude 3 control symbols) by means of triggering and gating function.

The measured results are as below table:

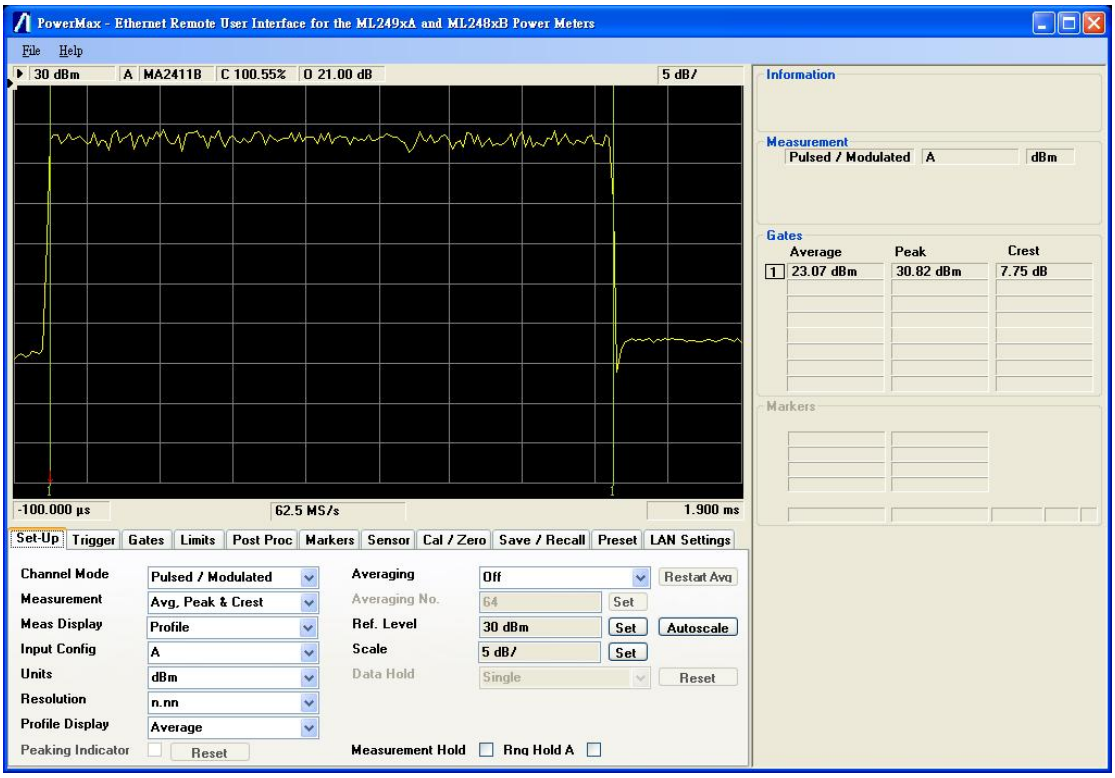
Output power table of Antenna 1

Channel BW	UL zone type / DL/UL Ratio	Channel Frequency (MHz)	Conducted Power (dBm)		Peak to Average ratio (dB)	UL modulation
			AV	PK		
5MHz	PUSC / 29:18	2498.5	23.05	29.92	6.87	QPSK
			23.09	30.14	7.05	16QAM
			23.11	30.15	7.04	64QAM
		2600	23.07	30.82	7.75	QPSK
			23.13	30.97	7.84	16QAM
			23.07	31.00	7.93	64QAM
		2687.5	23.10	30.78	7.68	QPSK
			23.07	30.76	7.69	16QAM
			23.06	30.94	7.88	64QAM
10MHz	PUSC / 29:18	2501	22.96	30.12	7.16	QPSK
			22.94	30.12	7.18	16QAM
			22.98	30.27	7.29	64QAM
		2600	23.03	30.91	7.88	QPSK
			22.96	30.86	7.9	16QAM
			22.98	31.09	8.11	64QAM
		2685	22.97	30.85	7.88	QPSK
			22.95	30.87	7.92	16QAM
			23.00	31.02	8.01	64QAM

Test plots of conducted power and PAR ratio for middle channel

Bandwidth 5MHz / Modulation : QPSK1/2

2600MHz



Bandwidth 5MHz / Modulation : 16QAM 1/2

2600MHz

Bandwidth 5MHz / Modulation : 64QAM 1/2

2600MHz

Bandwidth 10MHz / Modulation : QPSK1/2

2600MHz

Bandwidth 10MHz / Modulation : 16QAM 1/2

2600MHz

Bandwidth 10MHz / Modulation : 64QAM 1/2

2600MHz

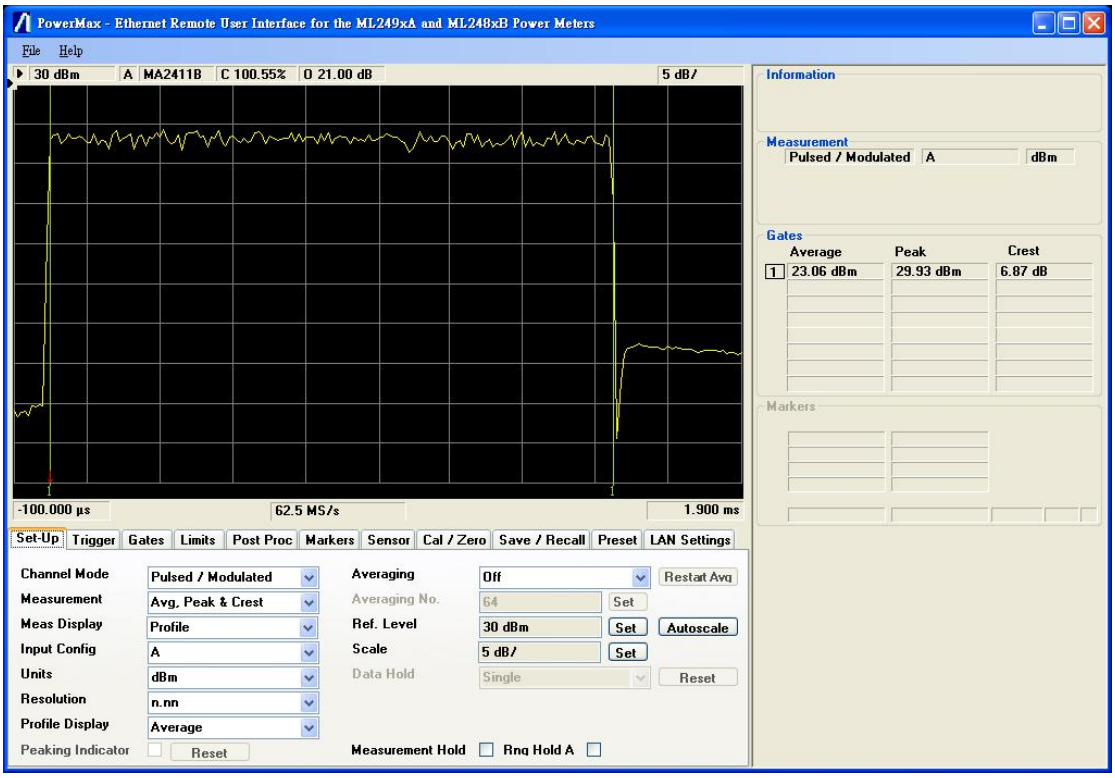
Output power table of Antenna 2

Channel BW	UL zone type / DL/UL Ratio	Channel Frequency (MHz)	Conducted Power (dBm)		Peak to Average ratio (dB)	UL modulation
			AV	PK		
5MHz	PUSC / 29:18	2498.5	23.12	29.32	6.20	QPSK
			23.09	29.30	6.21	16QAM
			23.11	29.25	6.14	64QAM
		2600	23.06	29.93	6.87	QPSK
			23.12	29.93	6.81	16QAM
			23.12	30.33	7.21	64QAM
		2687.5	23.03	30.46	7.43	QPSK
			23.05	30.44	7.39	16QAM
			23.13	30.45	7.32	64QAM
10MHz	PUSC / 29:18	2501	22.98	29.36	6.38	QPSK
			23.04	29.38	6.34	16QAM
			22.96	29.42	6.46	64QAM
		2600	23.04	30.11	7.07	QPSK
			23.01	30.16	7.15	16QAM
			22.93	30.43	7.50	64QAM
		2685	22.95	30.47	7.52	QPSK
			23.01	30.50	7.49	16QAM
			22.96	30.53	7.57	64QAM

Test plots of conducted power and PAR ratio for middle channel

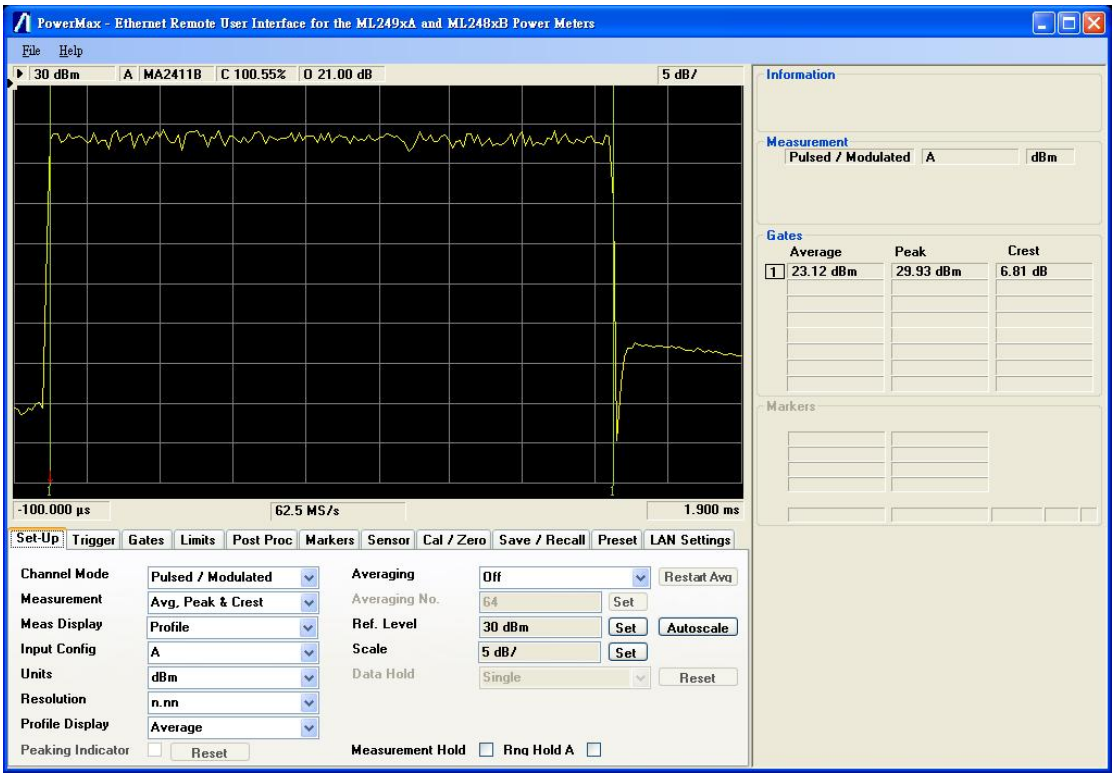
Bandwidth 5MHz / Modulation : QPSK1/2

2600MHz



Bandwidth 5MHz / Modulation : 16QAM 1/2

2600MHz



Bandwidth 5MHz / Modulation : 64QAM 1/2

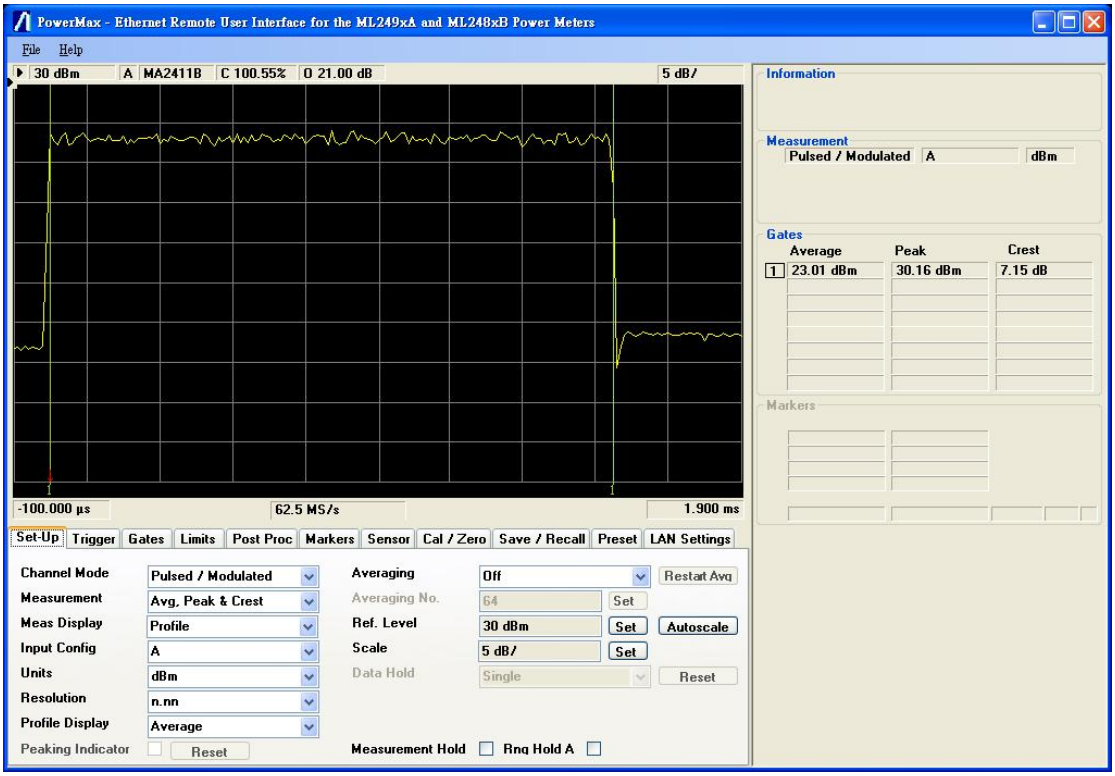
2600MHz

Bandwidth 10MHz / Modulation : QPSK1/2

2600MHz

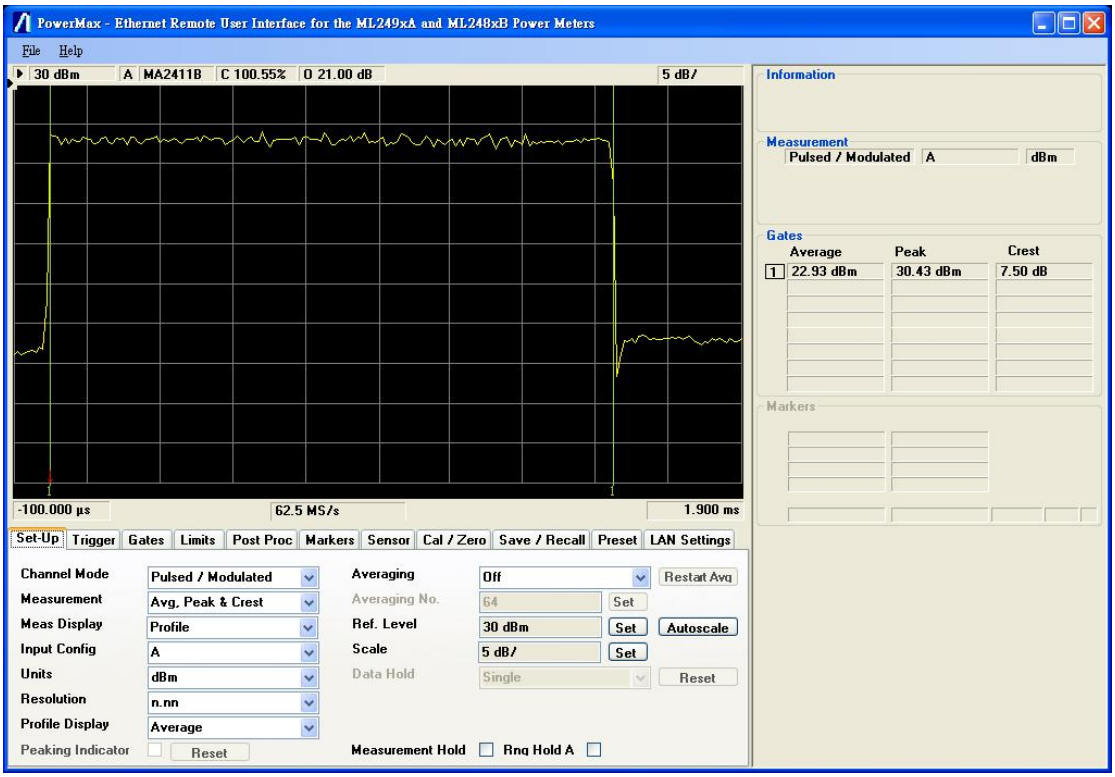
Bandwidth 10MHz / Modulation : 16QAM 1/2

2600MHz



Bandwidth 10MHz / Modulation : 64QAM 1/2

2600MHz



7.3 DUTY FACTOR

Maximum DL/UL symbol ratio for the EUT is 29:18.
The transmitter maximum DL/UL symbol ratio is 29:18 with 15 traffic symbols transmitting at the max. power and three control symbols are not activate in the SAR measurement,
The duty cycle = 15/48 =0.3125
Duty Factor = 1/(duty cycle)=3.2

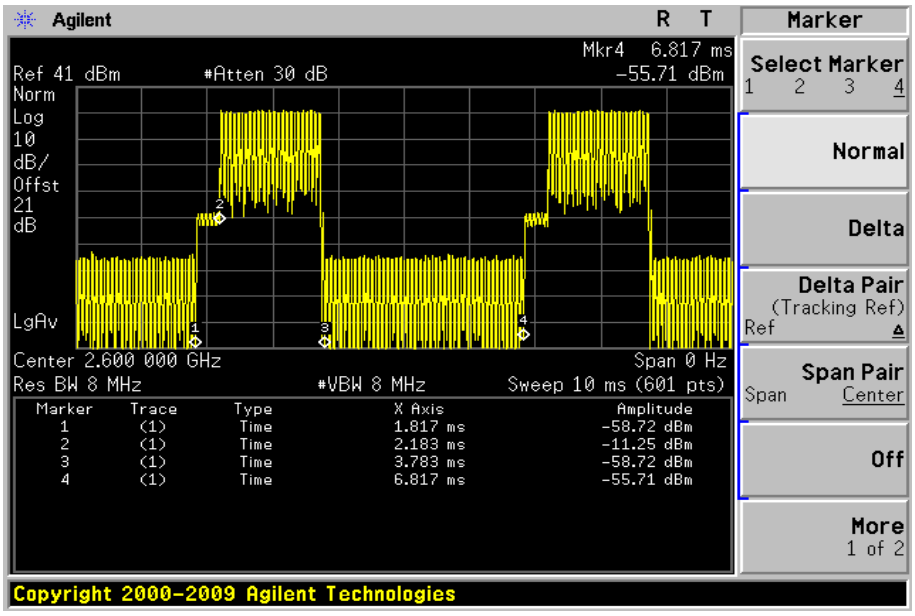
The SAR measurement is compensated using factors is as the below list:

Channel BW	UL zone type	DL/UL Ratio	UL duty cycle	*cf factor*	UL modulation
5MHz	PUSC	29/18	31.25%	*3.2*	QPSK 16QAM 64QAM
10MHz	PUSC	29/18	31.25%	*3.2*	QPSK 16QAM 64QAM

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=6.817ms-1.817ms=5ms

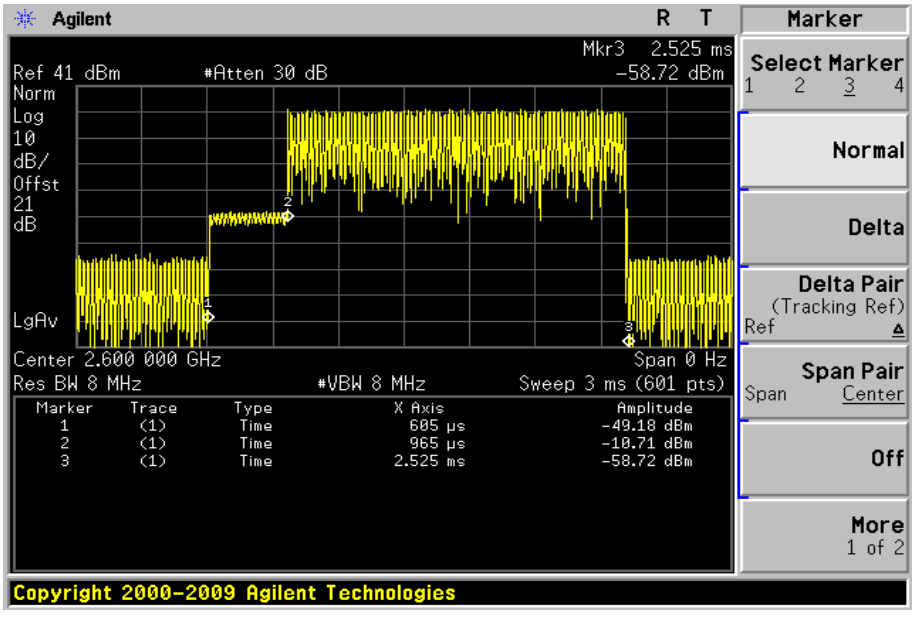
Plot 1



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

Mark 2 – Mark1 = First 3 symbols UL time=0.965ms-0.605ms=0.36ms
Mark 3 – Mark 2 =15 symbols UL time =2.525ms-0.965ms=1.56ms

Plot 2



Duty cycle = 15 UL symbols / burst length * 100 %
= 1.56 / 5 *100 %
= 31.2 %

7.4 SCALING FACTOR

For 5MHz bandwidth
The first 3 symbols have a total of 17 slots in a 5 MHz channel. The maximum number of slots that an active device can occupy in any frame is:

(a) 2 slots for CQICH report – maximum of 2 simultaneous CQICH reports are allowed by the Standard from any MS

(b) 3 slots for HARQ ACK/NAK (5 ACK/NAK bits corresponding to maximum of 5 DL HARQ bursts in previous DL frame allowed by the standard – each HARQ ACK/NAK bit is transmitted using 1/2 slot)
These 5 slots occupy 5/17 of the total number of available UL slots.

For 10MHz bandwidth

The first 3 symbols have a total of 35 slots in a 10 MHz channel bandwidth. The maximum number of slots that an active device can occupy in any frame is:

(a) 2 slots for CQICH report – maximum of 2 simultaneous CQICH reports are allowed by the Standard from any MS

(b) 3 slots for HARQ ACK/NAK (5 ACK/NAK bits corresponding to maximum of 5 DL HARQ bursts in previous DL frame allowed by the standard – each HARQ ACK/NAK bit is transmitted using 1/2 slot)

These 5 slots occupy 5/35 = 1/7 of the total number of available UL slots.

Per RF Exposure Procedures April 2010 and above description, the scaling factor can be calculated as below example

Power (mW)	QPSK	16QAM	64QAM	Rated max power
5MHz Mid ch	202.27	205.59	202.77	251.19
10MHz Mid ch.	200.91	197.7	198.61	251.19
Maximum DL:UL symbol ratio = 29:18				

For 5MHz
Scaling factor for QPSK = [(251.19 * 5 /17)* 3 + 251.19 *15] / [202.27 * 15] = 1.31
Scaling factor for 16QAM = [(251.19 * 5 /17)* 3 + 251.19 *15] / [205.59 * 15] = 1.29
Scaling factor for 64QAM = [(251.19 * 5 /17)* 3 + 251.19 *15] / [202.27 * 15] = 1.31

For 10MHz
Scaling factor for QPSK = [(251.19 * 5 /35)* 3 + 251.19 *15] / [200.91 * 15] = 1.29
Scaling factor for QPSK = [(251.19 * 5 /35)* 3 + 251.19 *15] / [197.7 * 15] = 1.31
Scaling factor for QPSK = [(251.19 * 5 /35)* 3 + 251.19 *15] / [198.61 * 15] = 1.30

Scaling factor for Antenna 1 and 2 are shown on below tables.

Scaling factor of Antenna 1

Channel BW	UL zone type / DL/UL Ratio	Channel Frequency (MHz)	Conducted Power (dBm)		Scaling factor	UL modulation
			Measured	Max rated power*		
5MHz	PUSC / 29:18	2498.5	23.05	24	1.32	QPSK
			23.09	24	1.31	16QAM
			23.11	24	1.30	64QAM
		2600	23.07	24	1.31	QPSK
			23.13	24	1.29	16QAM
			23.07	24	1.31	64QAM
		2687.5	23.1	24	1.30	QPSK
			23.07	24	1.31	16QAM
			23.06	24	1.31	64QAM
10MHz	PUSC / 29:18	2501	22.96	24	1.31	QPSK
			22.94	24	1.31	16QAM
			22.98	24	1.30	64QAM
		2600	23.03	24	1.29	QPSK
			22.96	24	1.31	16QAM
			22.98	24	1.30	64QAM
		2685	22.97	24	1.30	QPSK
			22.95	24	1.31	16QAM
			23	24	1.29	64QAM

*Max rated power is declared by manufacturer

Scaling factor of Antenna 2

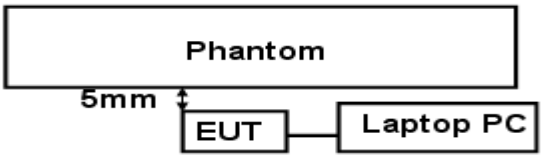
Channel BW	UL zone type / DL/UL Ratio	Channel Frequency (MHz)	Conducted Power (dBm)		Scaling factor	UL modulation
			Measured	Max rated power*		
5MHz	PUSC / 29:18	2498.5	23.12	24	1.30	QPSK
			23.09	24	1.31	16QAM
			23.11	24	1.30	64QAM
		2600	23.06	24	1.31	QPSK
			23.12	24	1.30	16QAM
			23.12	24	1.30	64QAM
		2687.5	23.03	24	1.32	QPSK
			23.05	24	1.32	16QAM
			23.13	24	1.29	64QAM
10MHz	PUSC / 29:18	2501	22.98	24	1.30	QPSK
			23.04	24	1.28	16QAM
			22.96	24	1.31	64QAM
		2600	23.04	24	1.28	QPSK
			23.01	24	1.29	16QAM
			22.93	24	1.32	64QAM
		2685	22.95	24	1.31	QPSK
			23.01	24	1.29	16QAM
			22.96	24	1.31	64QAM

*Max rated power is declared by manufacturer

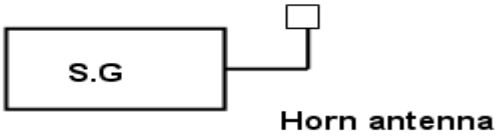
8. TEST SETUP

The test set-up is shown in the following picture. The EUT is plugged into the notebook computer and configured exactly as it would be in the field on a normal network.

The Beceem test tool is used on the laptop.
Beceem test tool is used to instruct the USB dongle to go to full power. Under normal operating conditions the BS would be responsible for controlling the MS Tx power. When working with a BS, the MS cannot Tx at a power greater than the max power requested by Beceem test tool.



Linking up through air interface



On the network side, there is a vector signal generator as below:

Agilent E4438C ESG with below options:
N7613A: Signal Studio for 802.16-2004 WiMAX
N7615B: Signal studio for 802.16 WiMAX

Software is loaded into the E4438C ESG that produces an output signal that looks like a 29:18 WiMAX frame, the EUT detects the “network” and begins to transmit based on the commands from the ESG signal and the measurements are then taken on the EUT.

The signal generator produces a downlink DL burst every 5 milliseconds which simulates the transmission of a base-station operating under normal mode. This DL burst instructs the mobile station MS to transmit for 15 symbols in the UL data zone. This UL transmission is repeated every 5 milliseconds. The TX power of the mobile station is set to maximum power.
The ESG and MS use same frequency. The ESG power is much less than the MS Tx power (Approximately 50dB less than the MS power) and so does not affect the SAR readings. Since both the signal generator (BS simulator) and MS are working in TDD mode, co-operation under same frequency is not an issue.

9. TEST RESULTS

9.1 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 DASY4 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 3mm and maintained at a constant distance of ±0.5mm during a zoom scan to determine peak SAR locations. The distance is 3mm 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 3mm 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%.

9.2 MEASURED SAR RESULTS

For 5MHz / TX Antenna 1

Modulation		64QAM									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2498.50	0.598	0.777	0.736	0.957	0.080	0.104	0.313	0.407	0.263	0.342
Middle	2600	0.448	0.587	0.612	0.802	Reduction					
High	2687.50	0.461	0.604	0.534	0.700						

Modulation		16QAM									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2498.50	0.578	0.757	0.766	1.003	Reduction					
Middle	2600	0.402	0.519	0.612	0.789	0.104	0.134	0.460	0.593	0.191	0.246
High	2687.50	0.403	0.528	0.657	0.861	Reduction					

Modulation		QPSK									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2498.50	0.622	0.821	0.796	1.051	Reduction					
Middle	2600	0.481	0.630	0.688	0.901						
High	2687.50	0.402	0.523	0.666	0.866	0.109	0.142	0.518	0.673	0.158	0.205

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. Temperature of Liquid is 22±1°C
5. When scaled SAR is less than 0.8W/kg, SAR of other channels under the same configuration will be reduced. FCC has accepted this reduce condition. (Tracking Number 554405)

For 5MHz / TX Antenna 2

Modulation		64QAM									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2498.50	0.706	0.918	0.778	1.011	Reduction					
Middle	2600	0.537	0.698	0.636	0.827						
High	2687.50	0.521	0.672	0.604	0.779	0.557	0.719	0.118	0.152	0.185	0.239

Modulation		16QAM									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2498.50	0.731	0.958	0.818	1.072	Reduction					
Middle	2600	0.555	0.722	0.612	0.796	0.469	0.610	0.126	0.164	0.207	0.269
High	2687.50	0.530	0.700	0.558	0.737	Reduction					

Modulation		QPSK									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2498.50	0.643	0.836	0.777	1.010	0.359	0.467	0.125	0.163	0.304	0.395
Middle	2600	0.548	0.718	0.610	0.799	Reduction					
High	2687.50	0.529	0.698	0.555	0.733						

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. Temperature of Liquid is 22±1°C
5. When scaled SAR is less than 0.8W/kg, SAR of other channels under the same configuration will be reduced. FCC has accepted this reduce condition. (Tracking Number 554405)

For 10MHz / TX Antenna 1

Modulation		64QAM									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2501	0.638	0.829	0.780	1.014	Reduction					
Middle	2600	0.623	0.810	0.695	0.904						
High	2685	0.631	0.814	0.684	0.882	0.125	0.161	0.566	0.730	0.164	0.212

Modulation		16QAM									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2501	0.599	0.785	0.792	1.038	Reduction					
Middle	2600	0.591	0.774	0.707	0.926	0.118	0.155	0.483	0.633	0.187	0.245
High	2685	0.573	0.751	0.661	0.866	Reduction					

Modulation		QPSK									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2501	0.680	0.891	0.794	1.040	Reduction					
Middle	2600	0.559	0.721	0.671	0.866	0.110	0.142	0.465	0.600	0.176	0.227
High	2685	0.616	0.801	0.699	0.909	Reduction					

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. Temperature of Liquid is 22±1°C
5. When scaled SAR is less than 0.8W/kg, SAR of other channels under the same configuration will be reduced. FCC has accepted this reduce condition. (Tracking Number 554405)

For 10MHz / TX Antenna 2

Modulation		64QAM									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2501	0.862	1.129	0.885	**1.159**	Reduction					
Middle	2600	0.678	0.895	0.686	0.906						
High	2685	0.657	0.861	0.653	0.855	0.564	0.739	0.122	0.160	0.178	0.233

Modulation		16QAM									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2501	0.822	1.052	0.888	1.137	0.344	0.440	0.101	0.129	0.286	0.366
Middle	2600	0.653	0.842	0.682	0.880	Reduction					
High	2685	0.624	0.805	0.653	0.842						

Modulation		QPSK									
SAR (W/ kg)		Horizontal-up		Horizontal-down		Vertical-front		Vertical-back		Tip	
Channel	Freq(MHz)	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled	Meas.	Scaled
Low	2501	0.837	1.088	0.884	1.149	Reduction					
Middle	2600	0.675	0.864	0.730	0.934	0.489	0.626	0.122	0.156	0.209	0.268
High	2685	0.660	0.865	0.696	0.912	Reduction					

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. Temperature of Liquid is 22±1°C
5. When scaled SAR is less than 0.8W/kg, SAR of other channels under the same configuration will be reduced. FCC has accepted this reduce condition. (Tracking Number 554405)

10. SAR LIMITS

HUMAN EXPOSURE	SAR (W/kg)	
	(GENERAL POPULATION / UNCONTROLLED EXPOSURE ENVIRONMENT)	(OCCUPATIONAL / CONTROLLED EXPOSURE ENVIRONMENT)
Spatial Average (whole body)	0.08	0.4
Spatial Peak (averaged over 1 g)	**1.6**	8.0
Spatial Peak (hands / wrists / feet / ankles averaged over 10 g)	4.0	20.0

NOTE:

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

11. SAR ERROR CONSIDERATION

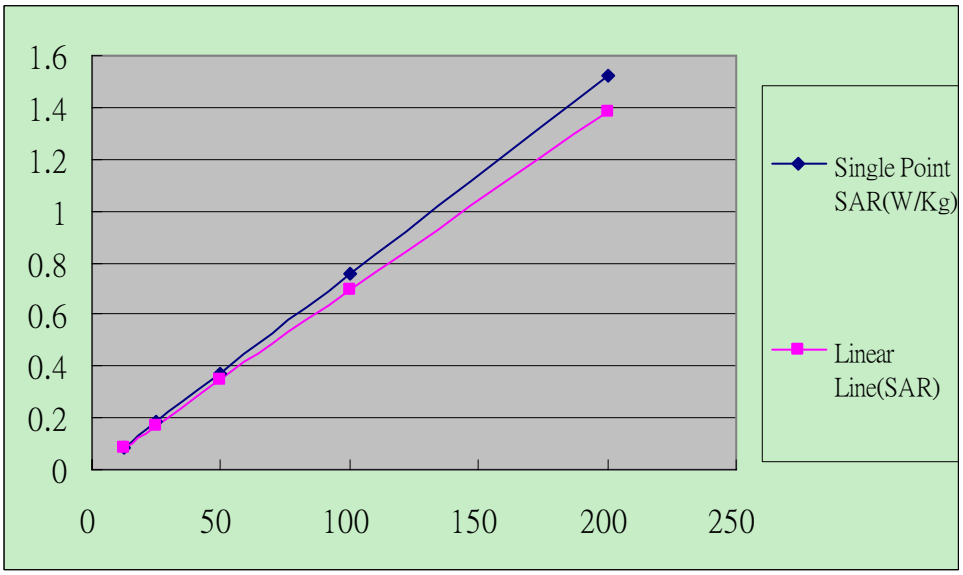
In order to estimate the measurement error due to PAR issues, the configuration with the highest SAR in each channel bandwidth and frequency band is measured at various power level. Test conditions are as below

Test position: Horizontal down
TX antenna: Antenna 2
Test frequency: 2498.5MHz for 5MHz bandwidth
2501MHz for 10MHz bandwidth
Modulation: QPSK 1/2,16QAM 1/2, 64QAM 1/2

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

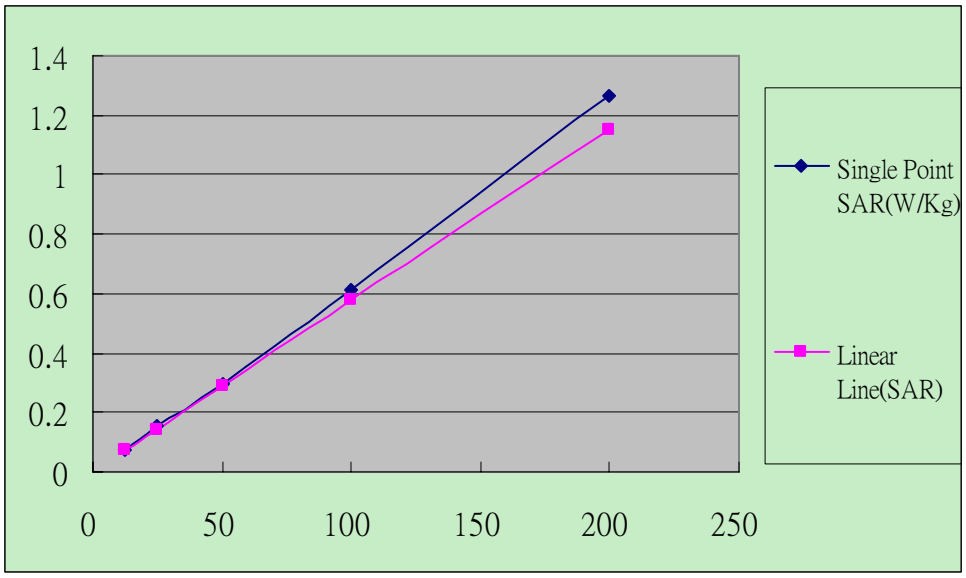
5MHz / QPSK 1/2

SAR (W/kg)	Power (mW)	12.5	25	50	100	200
5MHz	Point SAR	0.087	0.182	0.373	0.758	1.522
	Linear line	0.087	0.174	0.348	0.696	1.392
	Deviation(%)	0	4.60	7.18	8.91	9.34



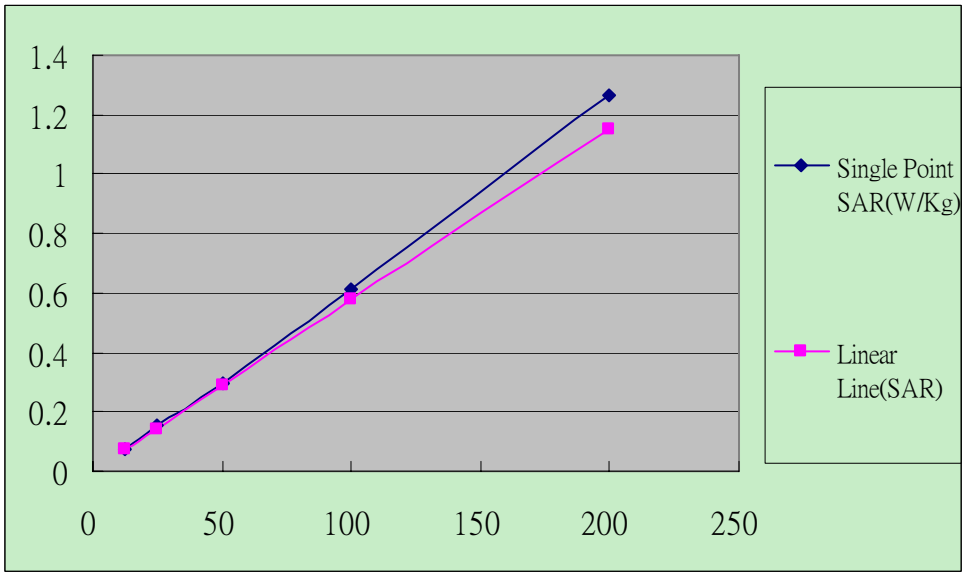
5MHz / 16QAM 1/2

SAR (W/kg)	Power (mW)	12.5	25	50	100	200
5MHz	Point SAR	0.072	0.155	0.312	0.621	1.265
	Linear line	0.072	0.144	0.288	0.576	1.152
	Deviation(%)	0	7.64	8.33	7.81	9.81



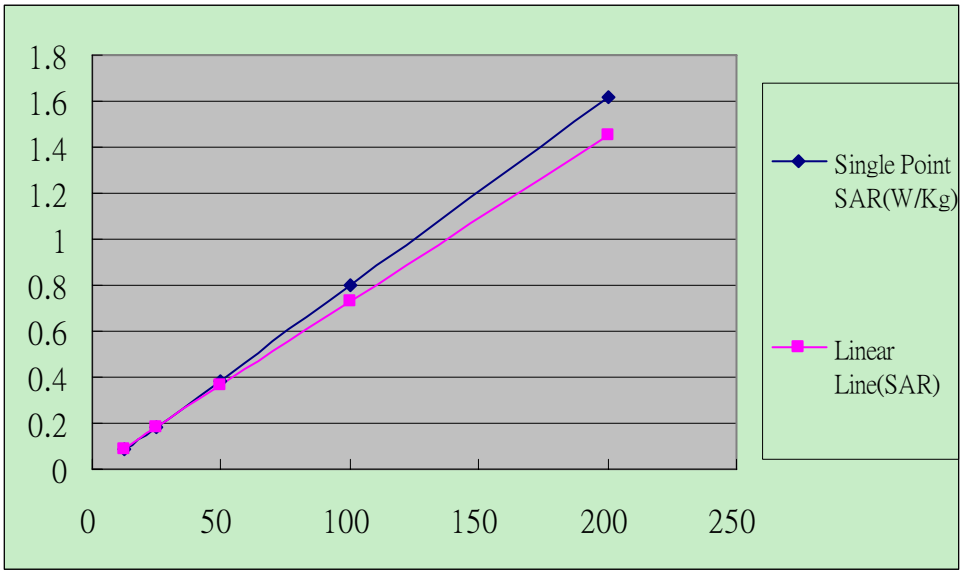
5MHz / 64QAM 1/2

SAR (W/kg)	Power (mW)	12.5	25	50	100	200
5MHz	Point SAR	0.080	0.163	0.345	0.692	1.433
	Linear line	0.080	0.160	0.320	0.640	1.280
	Deviation(%)	0	1.88	7.81	8.12	11.95



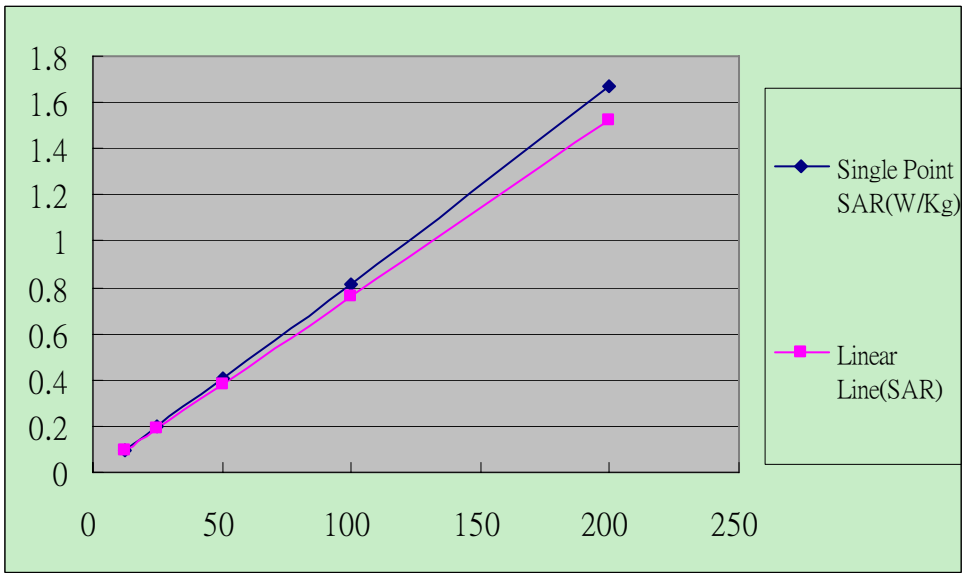
10MHz / QPSK 1/2

SAR (W/kg)	Power (mW)	12.5	25	50	100	200
10MHz	Point SAR	0.091	0.185	0.382	0.755	1.620
	Linear line	0.091	0.182	0.364	0.728	1.456
	Deviation(%)	0	1.65	4.95	3.71	11.26



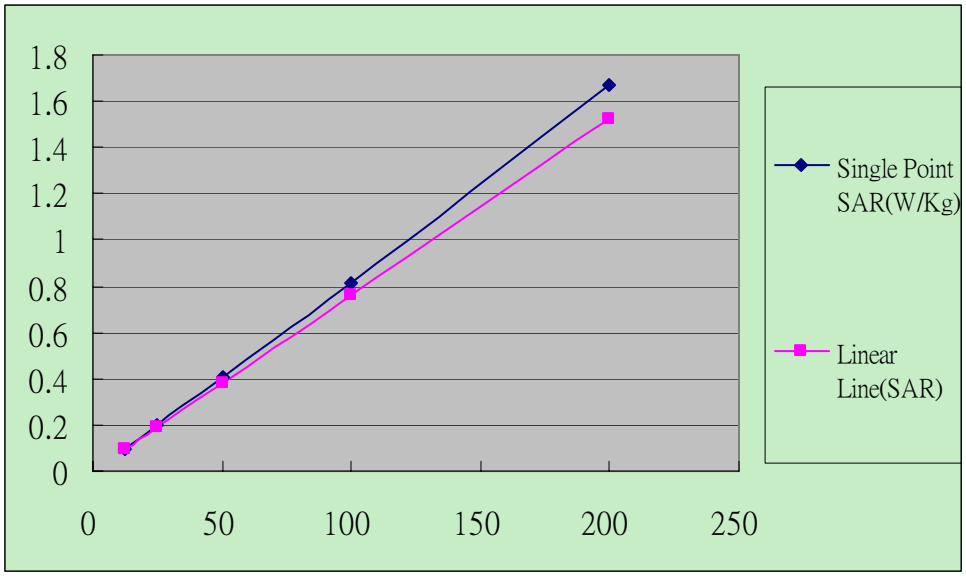
10MHz / 16QAM 1/2

SAR (W/kg)	Power (mW)	12.5	25	50	100	200
10MHz	Point SAR	0.095	0.199	0.405	0.815	1.669
	Linear line	0.095	0.190	0.380	0.760	1.520
	Deviation(%)	0	4.74	6.58	7.24	9.80



10MHz / 64QAM 1/2

SAR (W/kg)	Power (mW)	12.5	25	50	100	200
10MHz	Point SAR	0.093	0.190	0.395	0.799	1.627
	Linear line	0.093	0.186	0.372	0.744	1.488
	Deviation(%)	0	2.15	6.18	7.39	9.34



12. INFORMATION ON THE TESTING LABORATORIES

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

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

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

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

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

Web Site: www.adt.com.tw

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

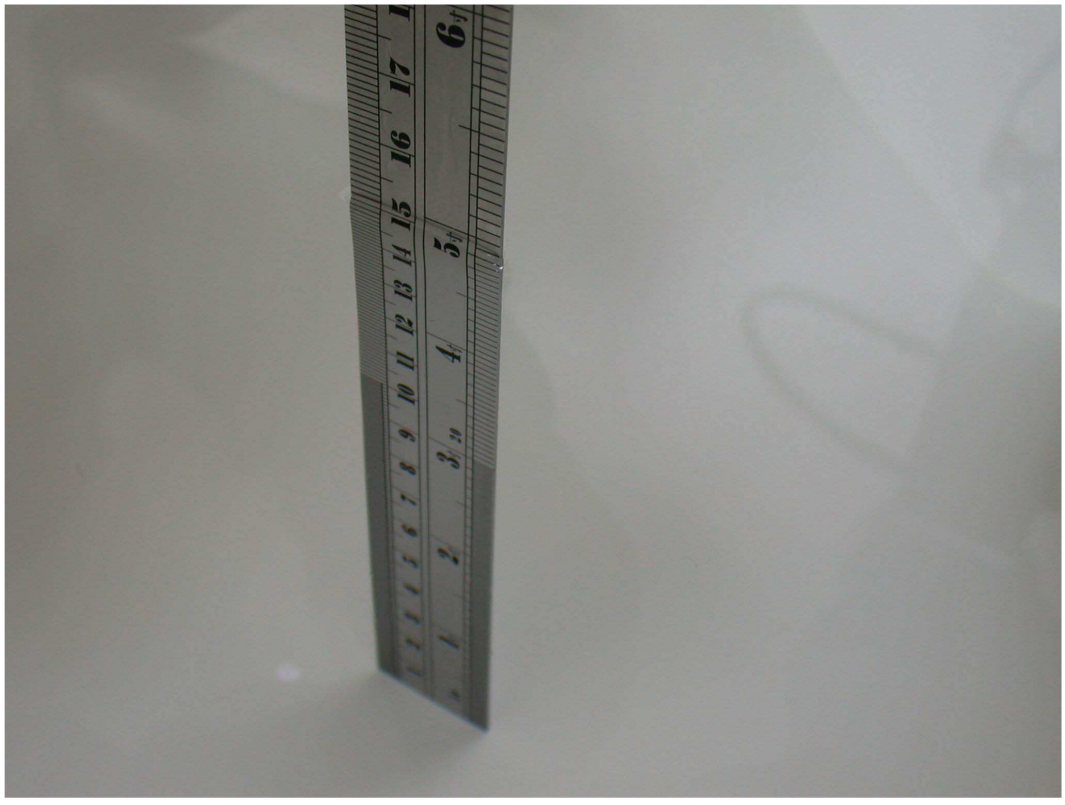
---END---

APPENDIX A: TEST DATA

Liquid Level Photo

Tissue MSL2450MHz D=151mm

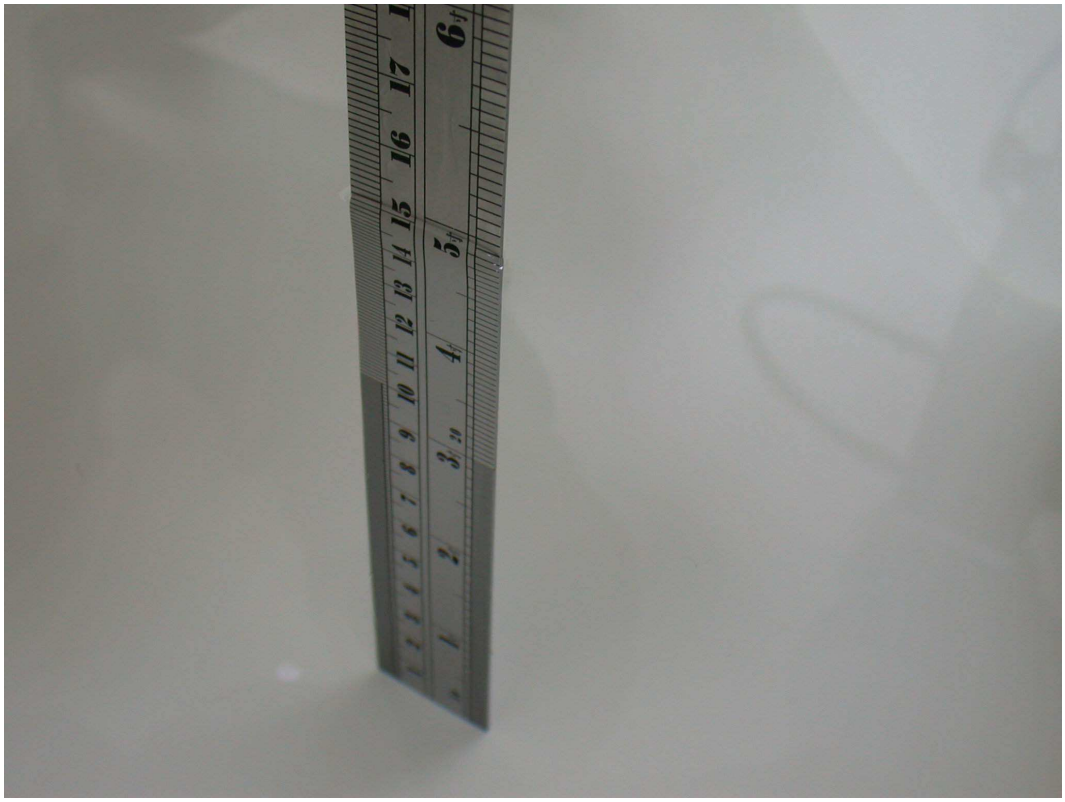
Tissue MSL2600MHz D=151mm



Tissue MSL2450MHz D=150mm

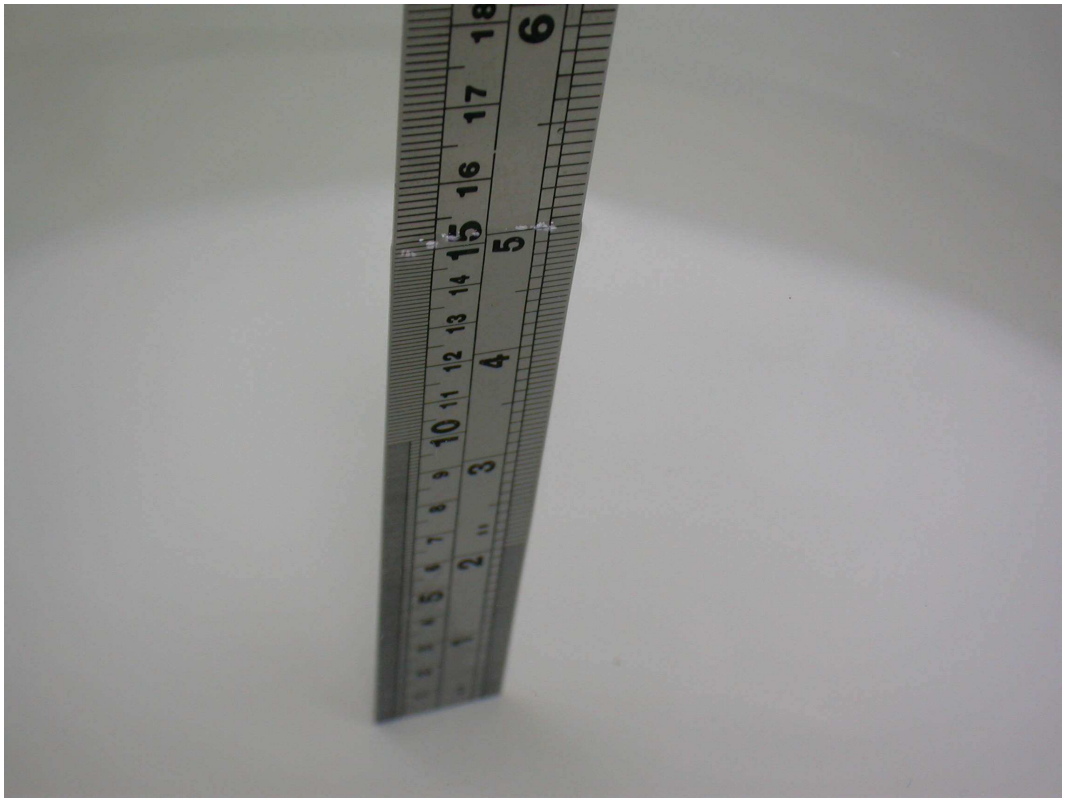
Tissue MSL2600MHz D=150mm

Tissue MSL2450MHz D=151mm

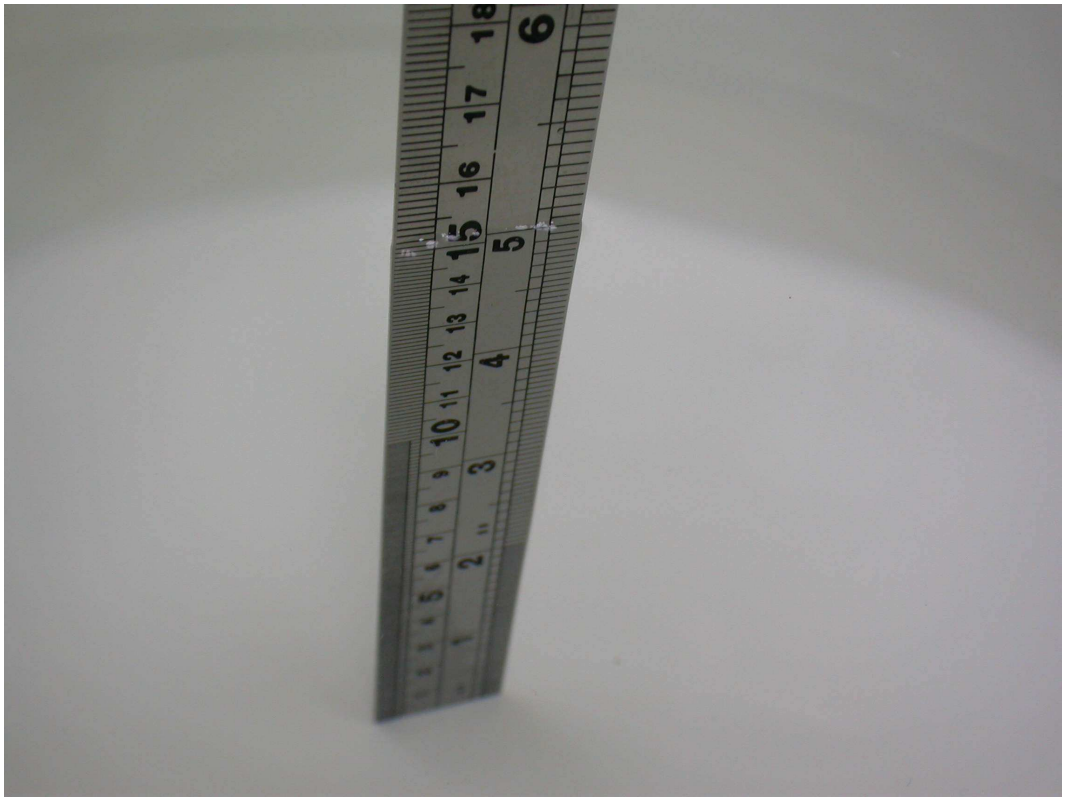


Tissue MSL2600MHz D=151mm

Tissue MSL2450MHz D=152mm



Tissue MSL2600MHz D=152mm



Tissue MSL2450MHz D=150mm

Tissue MSL2600MHz D=150mm

Date/Time: 2010/6/11 02:02:23

Test Laboratory: Bureau Veritas ADT

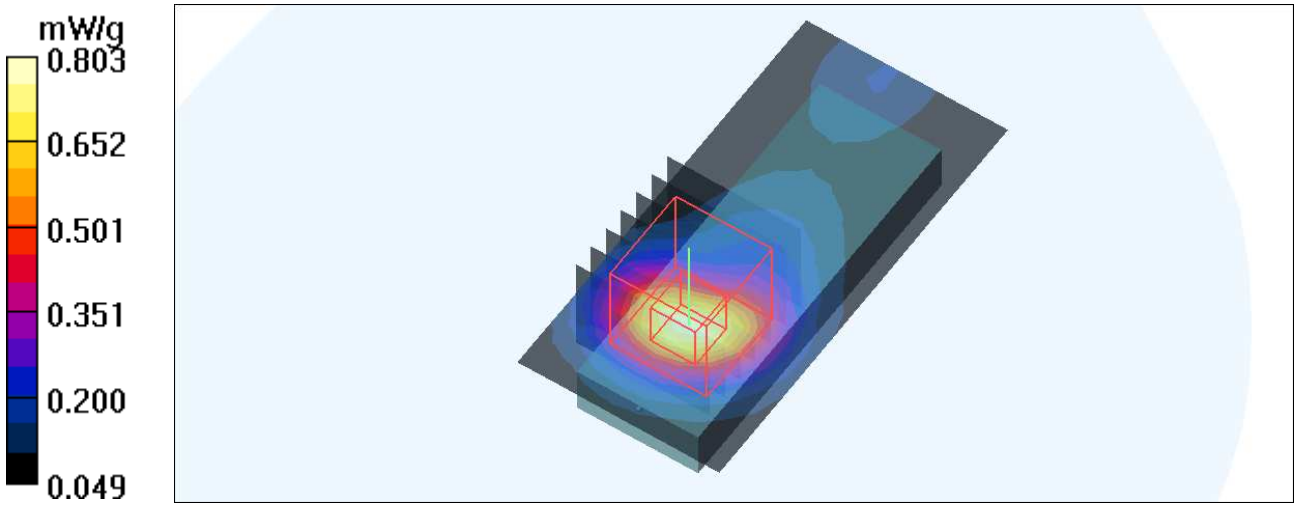
M01-Horizontal Up-5M-64QAM 1/2-Low Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2498.5 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2450 Medium parameters used: f = 2498.5 MHz; σ = 2.07 mho/m; ε_r = 53.3; 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(8.2, 8.2, 8.2) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.803 mW/g

Low Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 12.3 V/m; Power Drift = -0.102 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.598 mW/g; SAR(10 g) = 0.299 mW/g
Maximum value of SAR (measured) = 0.781 mW/g



Date/Time: 2010/6/11 05:32:30

Test Laboratory: Bureau Veritas ADT

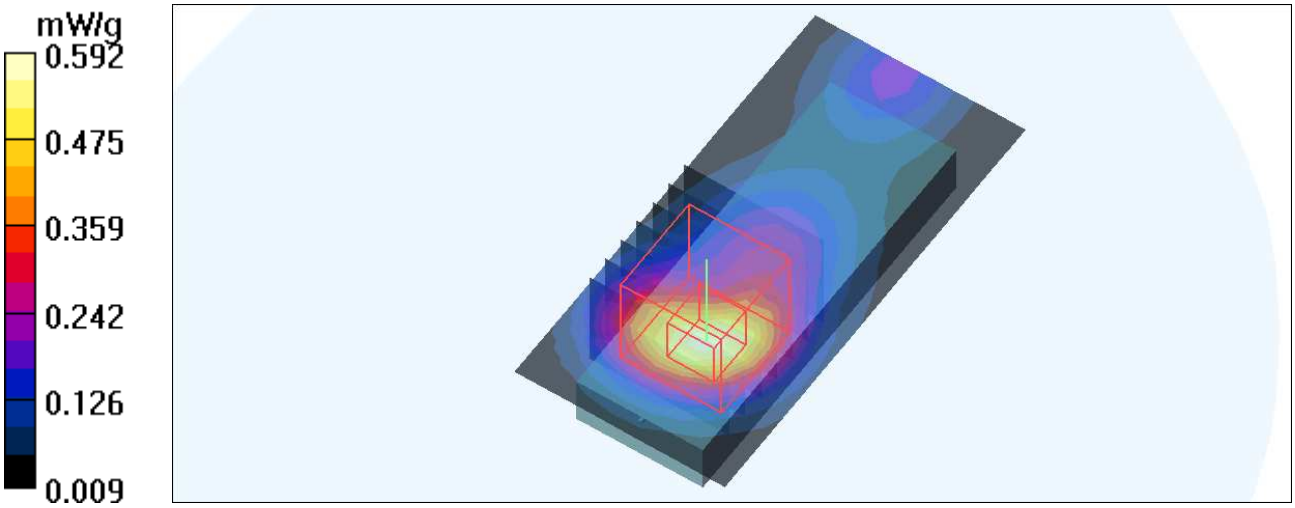
M01-Horizontal Up-5M-64QAM 1/2-Mid Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2600MHz; σ = 2.21 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal Up of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel /Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.592 mW/g

Mid Channel /Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.15 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 0.858 W/kg
SAR(1 g) = 0.448 mW/g; SAR(10 g) = 0.212 mW/g
Maximum value of SAR (measured) = 0.544 mW/g



Date/Time: 2010/6/11 06:02:25

Test Laboratory: Bureau Veritas ADT

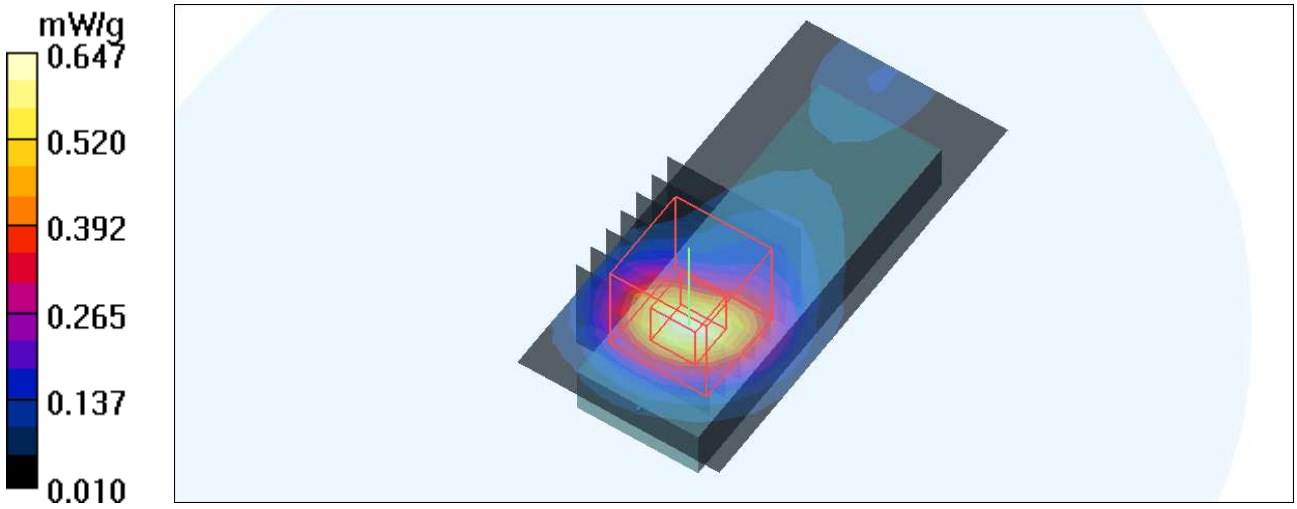
M01-Horizontal Up-5M-64QAM1/2-High Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.27 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal Up of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel /Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.647 mW/g

High Channel /Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 8.41 V/m; Power Drift = -0.116 dB
Peak SAR (extrapolated) = 0.970 W/kg
SAR(1 g) = 0.461 mW/g; SAR(10 g) = 0.214 mW/g
Maximum value of SAR (measured) = 0.607 mW/g



Date/Time: 2010/6/11 02:35:03

Test Laboratory: Bureau Veritas ADT

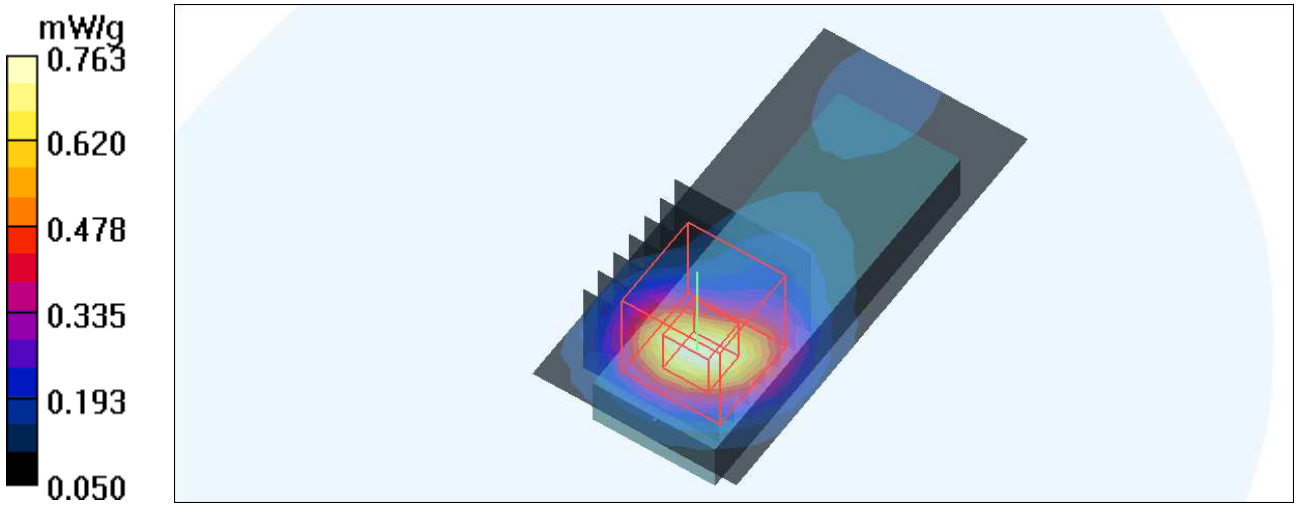
M02-Horizontal Up-5M-16QAM1/2-Low Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2498.5 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2450 Medium parameters used: f = 2498.5 MHz; σ = 2.07 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal Up of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(8.2, 8.2, 8.2) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel 0 2/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.763 mW/g

Low Channel 0 2/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 12.6 V/m; Power Drift = -0.163 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.578 mW/g; SAR(10 g) = 0.294 mW/g
Maximum value of SAR (measured) = 0.735 mW/g



Date/Time: 2010/6/11 06:33:52

Test Laboratory: Bureau Veritas ADT

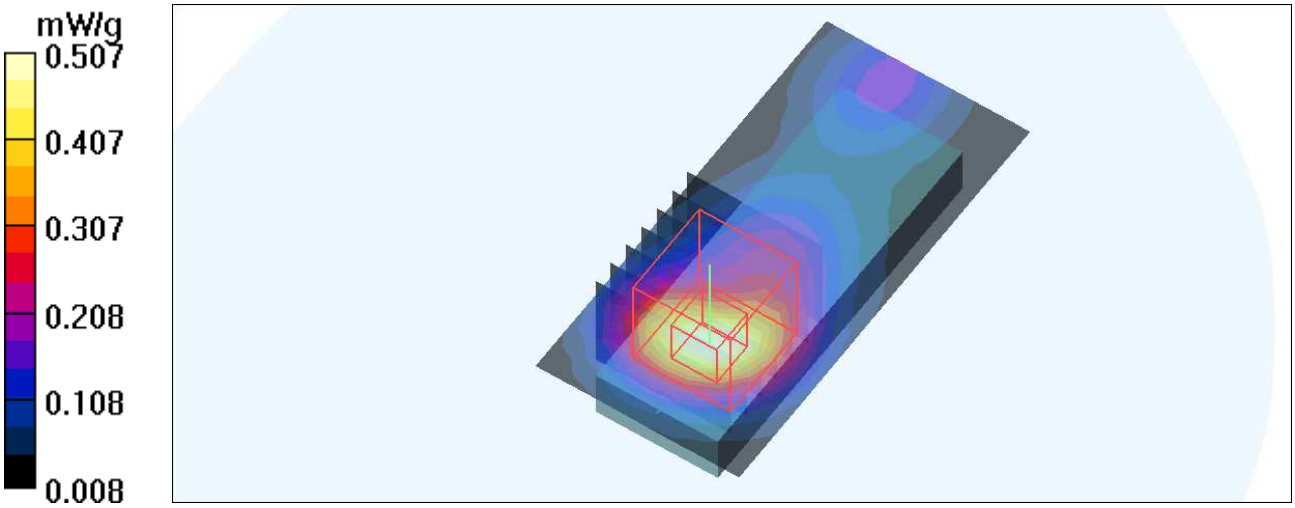
M02-Horizontal Up-5M-16QAM 1/2-Mid Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2600MHz; σ = 2.21 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal Up of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel /Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.507 mW/g

Mid Channel /Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.3 V/m; Power Drift = -0.091 dB
Peak SAR (extrapolated) = 0.767 W/kg
SAR(1 g) = 0.402 mW/g; SAR(10 g) = 0.193 mW/g
Maximum value of SAR (measured) = 0.490 mW/g



Date/Time: 2010/6/11 07:02:19

Test Laboratory: Bureau Veritas ADT

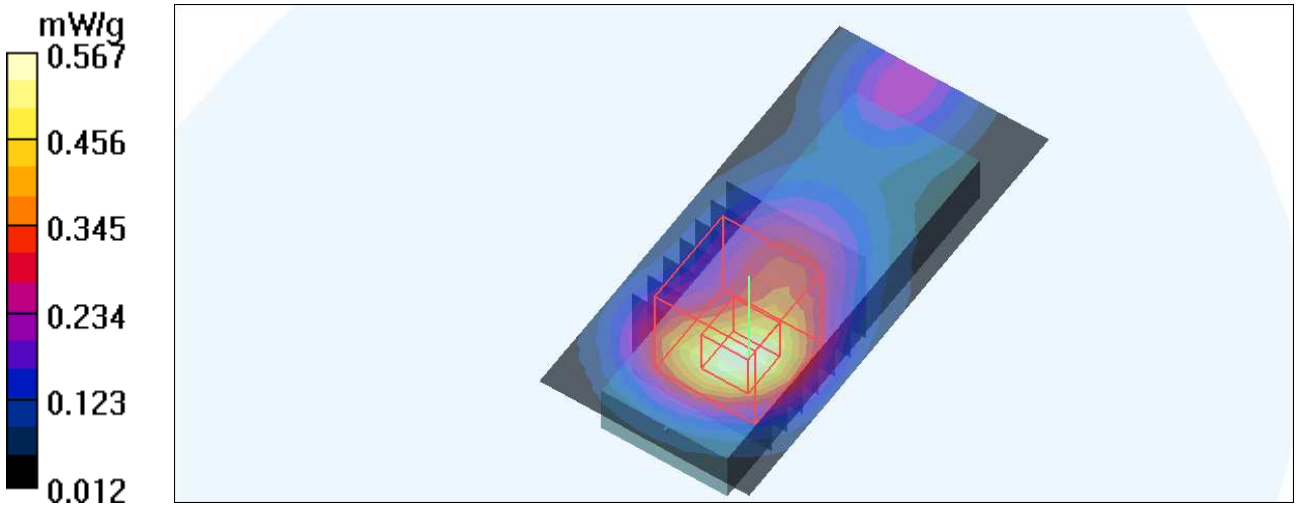
M02-Horizontal Up-5M-16QAM 1/2-High Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.27 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal Up of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel /Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.567 mW/g

High Channel /Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.37 V/m; Power Drift = -0.121 dB
Peak SAR (extrapolated) = 0.832 W/kg
SAR(1 g) = 0.403 mW/g; SAR(10 g) = 0.192 mW/g
Maximum value of SAR (measured) = 0.519 mW/g



Date/Time: 2010/6/11 03:03:15

Test Laboratory: Bureau Veritas ADT

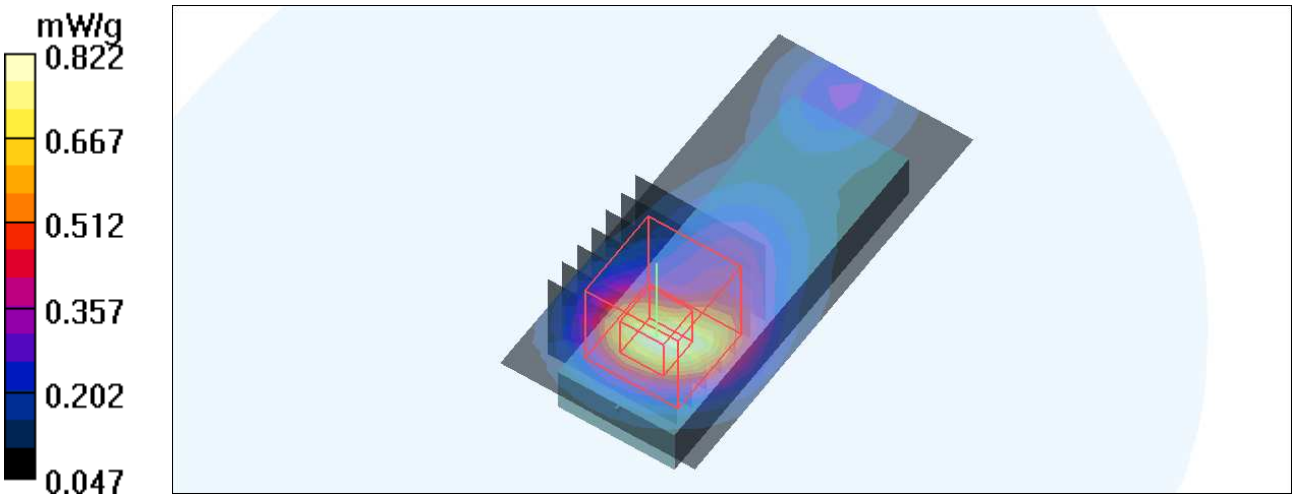
M03-Horizontal Up-5M-QPSK 1/2- Low Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2498.5 MHzFrequency: 2687.5 MHz ; Duty Cycle: 1:3.2; Modulation type: QPSK
Medium: MSL2450 Medium parameters used: f = 2498.5 MHz; σ = 2.07 mho/m; ε_r = 53.3; 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(8.2, 8.2, 8.2); Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.822 mW/g

Low Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 13.2 V/m; Power Drift = -0.181 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.622 mW/g; SAR(10 g) = 0.314 mW/g
Maximum value of SAR (measured) = 0.799 mW/g



Date/Time: 2010/6/11 07:35:15

Test Laboratory: Bureau Veritas ADT

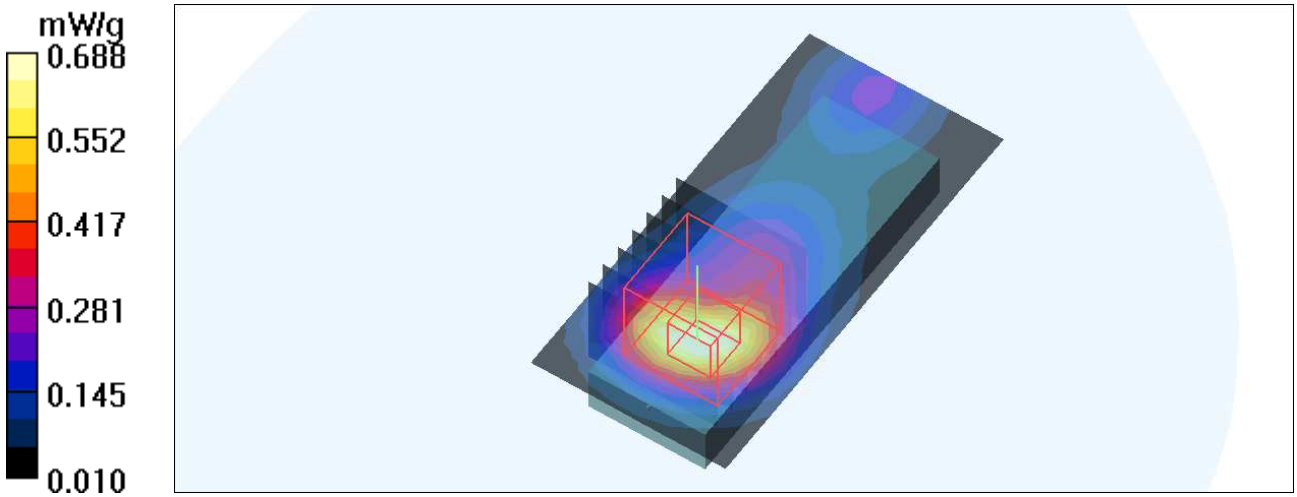
M03-Horizontal Up--5M-QPSK 1/2-Mid Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600MHz; σ = 2.21 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal Up of the EUT to the Phantom)

DASY4 Configuration:
- Probe: EX3DV4 - SN3590 ; ConvF(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel /Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.688 mW/g

Mid Channel /Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.6 V/m; Power Drift = 0.120 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.481 mW/g; SAR(10 g) = 0.227 mW/g
Maximum value of SAR (measured) = 0.665 mW/g



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Test Laboratory: Bureau Veritas ADT

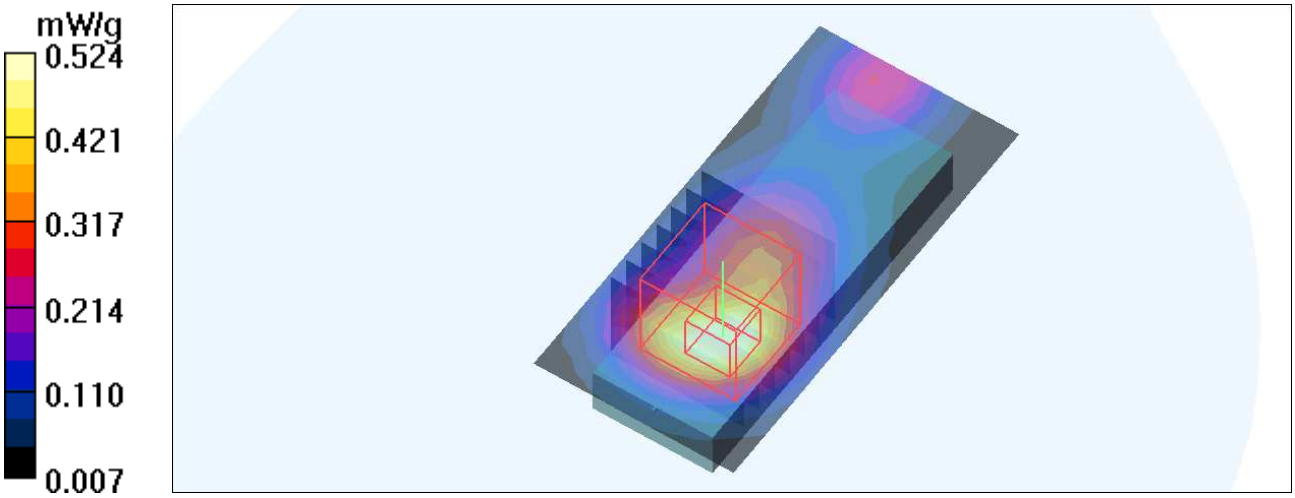
M03-Horizontal Up-5M-QPSK 1/2 -High Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.2; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.27 mho/m; ε_r = 52.8; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.560 mW/g

High Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.55 V/m; Power Drift = -0.145 dB
Peak SAR (extrapolated) = 0.824 W/kg
SAR(1 g) = 0.402 mW/g; SAR(10 g) = 0.192 mW/g
Maximum value of SAR (measured) = 0.524 mW/g



Date/Time: 2010/6/11 03:35:31

Test Laboratory: Bureau Veritas ADT

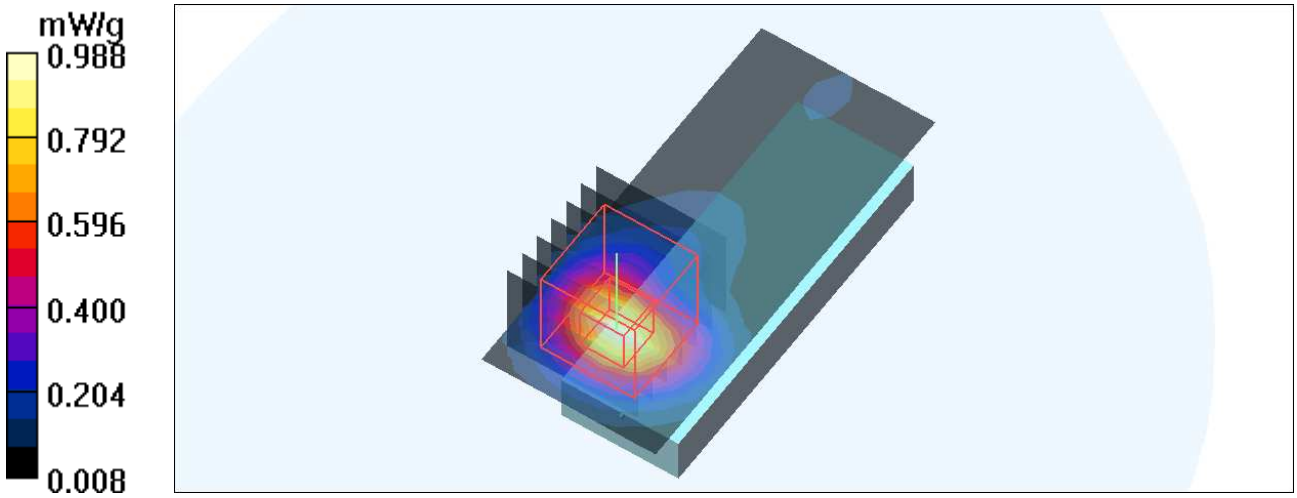
M04-Horizontal Up-5M-64QAM 1/2 -Low Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2498.5 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2450 Medium parameters used: f = 2498.5 MHz; σ = 2.07 mho/m; ε_r = 53.3; 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(8.2, 8.2, 8.2) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.988 mW/g

Low Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 13.9 V/m; Power Drift = -0.164 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.706 mW/g; SAR(10 g) = 0.319 mW/g
Maximum value of SAR (measured) = 0.935 mW/g



Date/Time: 2010/6/11 08:35:16

Test Laboratory: Bureau Veritas ADT

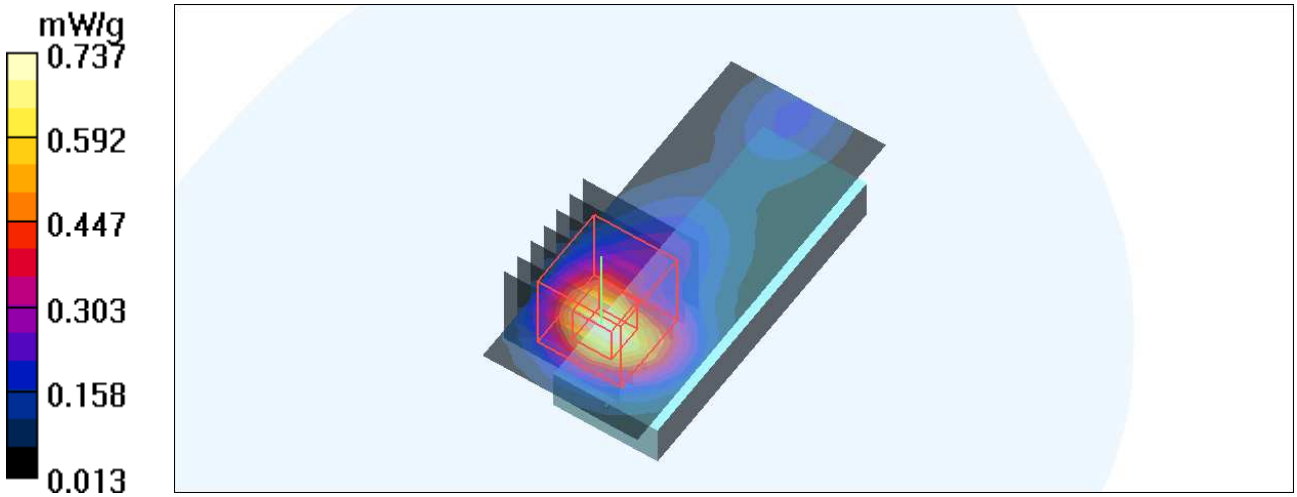
M04-Horizontal Up-5M-64QAM 1/2 -Mid Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.21 mho/m; ε_r = 53.1; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.737 mW/g

Mid Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 11.7 V/m; Power Drift = -0.132 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.537 mW/g; SAR(10 g) = 0.251 mW/g
Maximum value of SAR (measured) = 0.705 mW/g



Date/Time: 2010/6/11 09:03:06

Test Laboratory: Bureau Veritas ADT

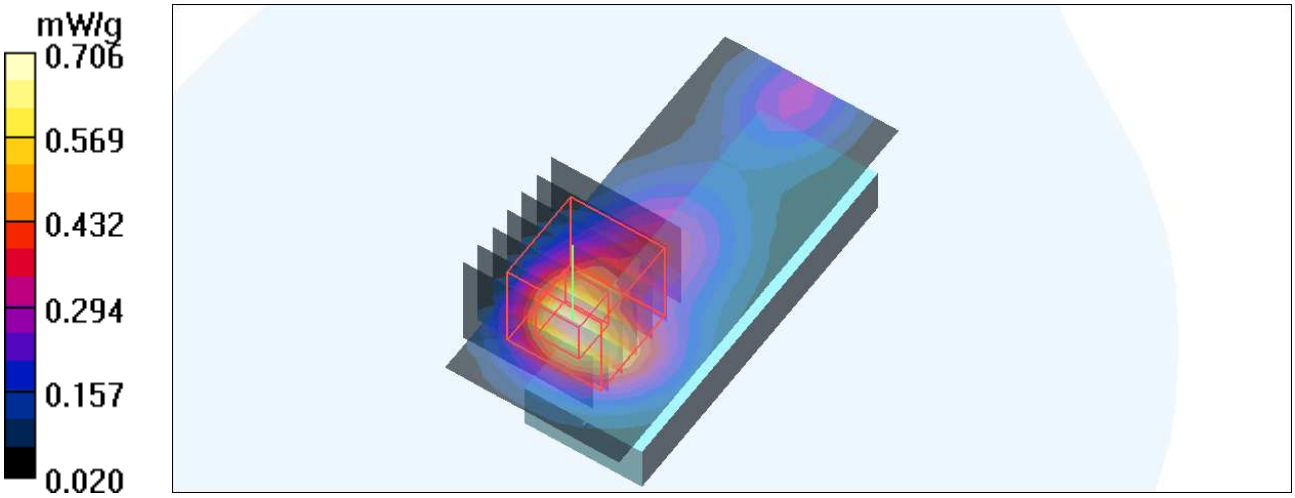
M04-Horizontal Up-5M-64QAM 1/2 -High Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.27 mho/m; ε_r = 52.8; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.706 mW/g

High Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.5 V/m; Power Drift = -0.160 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.521 mW/g; SAR(10 g) = 0.245 mW/g
Maximum value of SAR (measured) = 0.689 mW/g



Date/Time: 2010/6/11 04:05:14

Test Laboratory: Bureau Veritas ADT

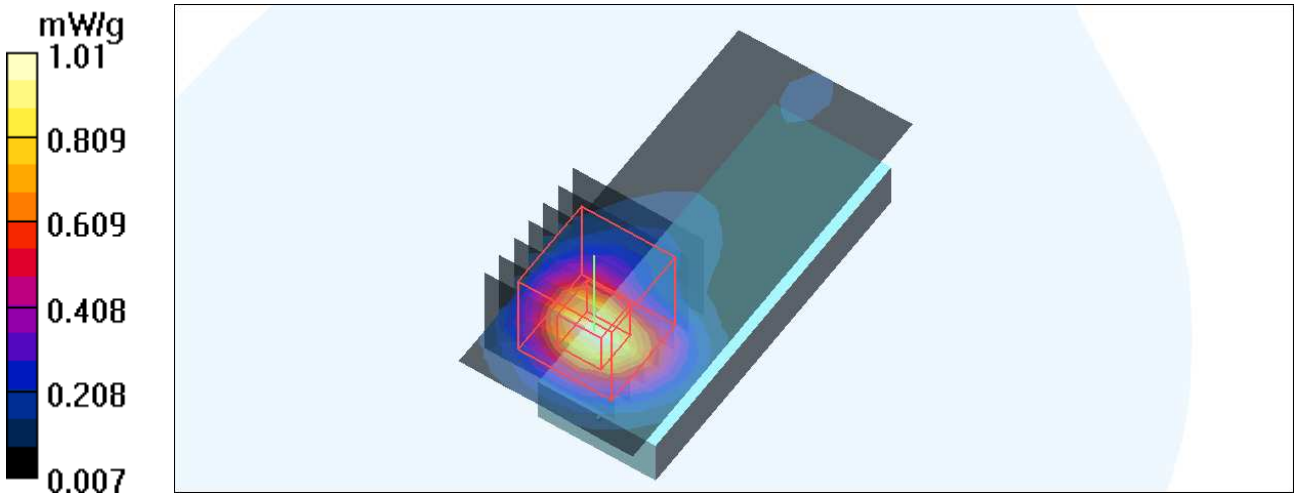
M05-Horizontal Up-5M-16QAM 1/2 -Low Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2498.5 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2450 Medium parameters used: f = 2498.5 MHz; σ = 2.07 mho/m; ε_r = 53.3; 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(8.2, 8.2, 8.2) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 1.01 mW/g

Low Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 13.7 V/m; Power Drift = 0.106 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.731 mW/g; SAR(10 g) = 0.330 mW/g
Maximum value of SAR (measured) = 0.968 mW/g



Date/Time: 2010/6/11 09:35:53

Test Laboratory: Bureau Veritas ADT

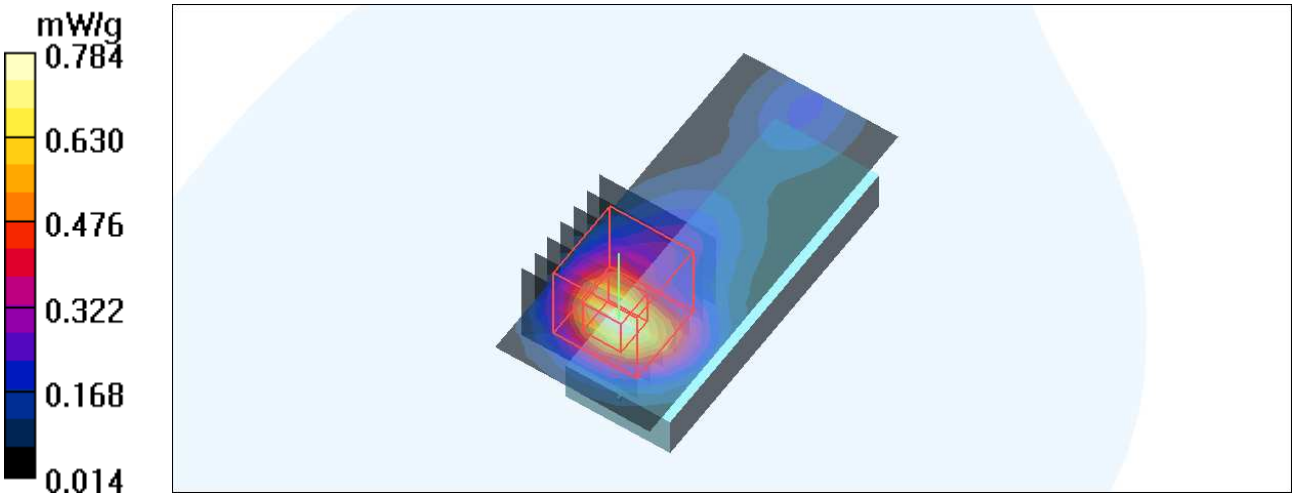
M05-Horizontal Up-5M-16QAM 1/2 -Mid Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.21 mho/m; ε_r = 53.1; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.784 mW/g

Mid Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 11.9 V/m; Power Drift = -0.169 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.555 mW/g; SAR(10 g) = 0.260 mW/g
Maximum value of SAR (measured) = 0.724 mW/g



Date/Time: 2010/6/11 10:05:53

Test Laboratory: Bureau Veritas ADT

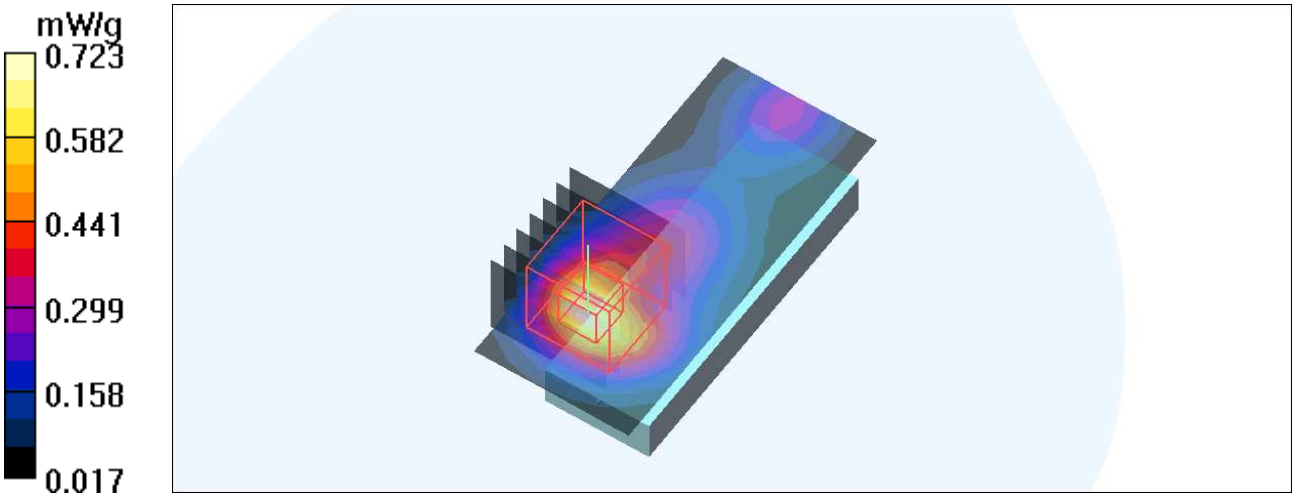
M05-Horizontal Up-5M-16QAM 1/2 -High Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.27 mho/m; ε_r = 52.8; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.723 mW/g

High Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.6 V/m; Power Drift = -0.094 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.530 mW/g; SAR(10 g) = 0.249 mW/g
Maximum value of SAR (measured) = 0.699 mW/g



Date/Time: 2010/6/11 04:34:32

Test Laboratory: Bureau Veritas ADT

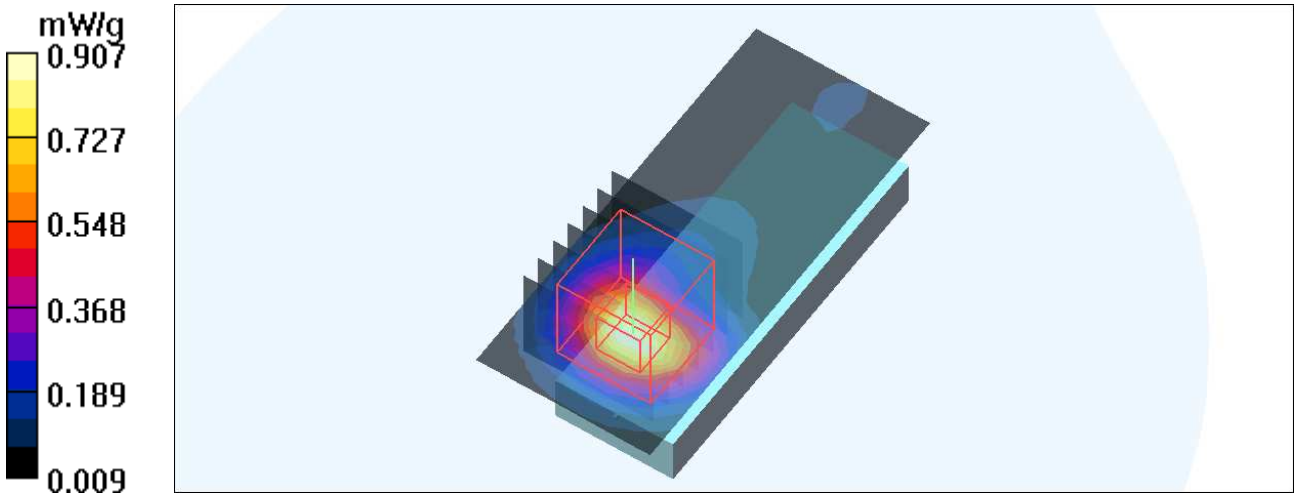
M06-Horizontal Up-5M-QPSK 1/2 -Low Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2498.5 MHz ; Duty Cycle: 1:3.2; Modulation type: QPSK
Medium: MSL2450 Medium parameters used: f = 2498.5 MHz; σ = 2.07 mho/m; ε_r = 53.3; 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(8.2, 8.2, 8.2) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.907 mW/g

Low Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 12.5 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.643 mW/g; SAR(10 g) = 0.291 mW/g
Maximum value of SAR (measured) = 0.853 mW/g



Date/Time: 2010/6/11 10:36:55

Test Laboratory: Bureau Veritas ADT

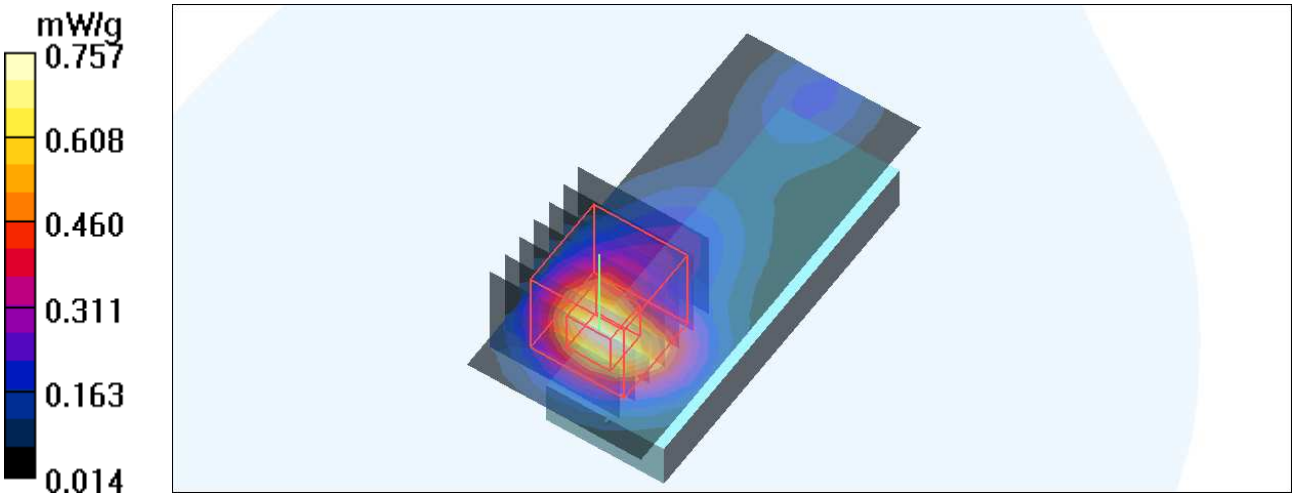
M06-Horizontal Up-5M-QPSK 1/2 -Mid Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.21 mho/m; ε_r = 53.1; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.757 mW/g

Mid Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 11.6 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.548 mW/g; SAR(10 g) = 0.257 mW/g
Maximum value of SAR (measured) = 0.718 mW/g



Date/Time: 2010/6/11 11:05:48

Test Laboratory: Bureau Veritas ADT

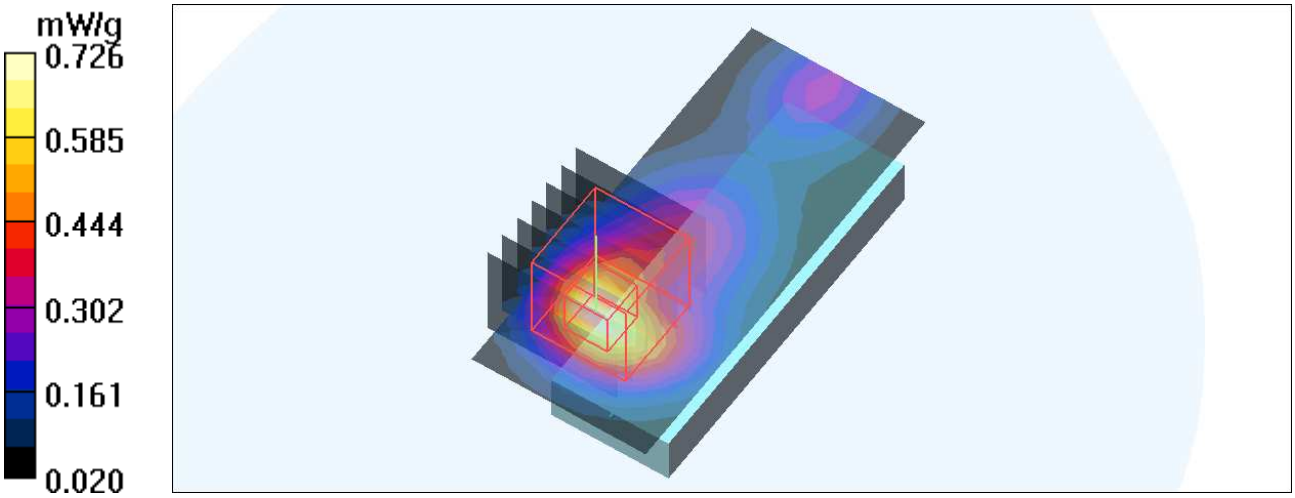
M06-Horizontal Up-5M-QPSK 1/2 -High Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 5M ; Frequency: 2687.5 MHz ; Duty Cycle: 1:3.2; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2687.5 MHz; σ = 2.27 mho/m; ε_r = 52.8; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.726 mW/g

High Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.6 V/m; Power Drift = -0.156 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.529 mW/g; SAR(10 g) = 0.249 mW/g
Maximum value of SAR (measured) = 0.695 mW/g



Date/Time: 2010/6/11 11:36:49

Test Laboratory: Bureau Veritas ADT

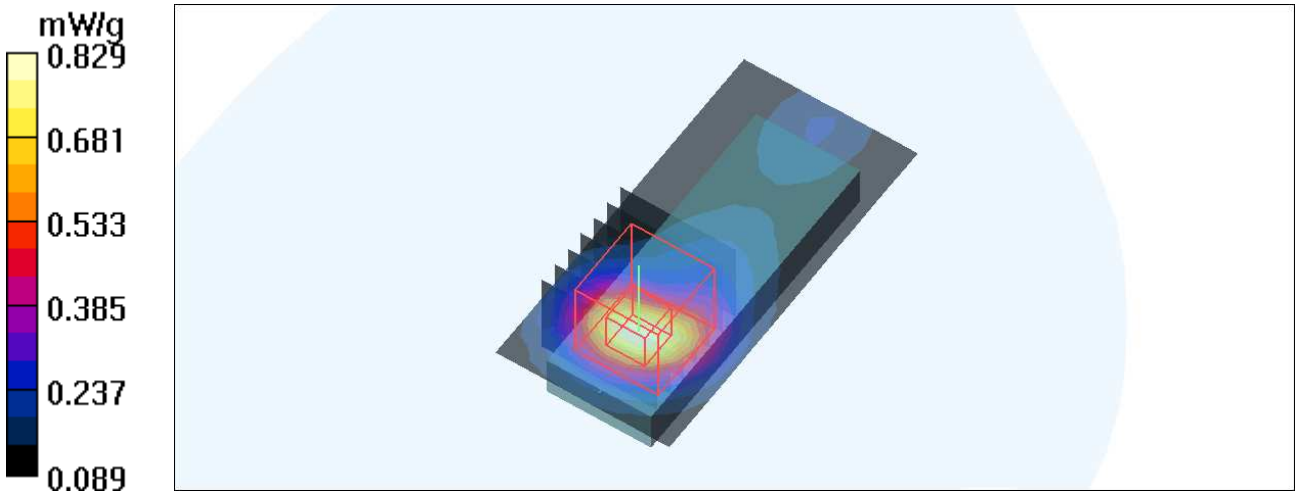
M07- Horizontal Up -10M-64QAM1_2 -Low Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2501 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2501 MHz; σ = 2.08 mho/m; ε_r = 53.2; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel /Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.829 mW/g

Low Channel /Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 13.4 V/m; Power Drift = 0.107 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.638 mW/g; SAR(10 g) = 0.345 mW/g
Maximum value of SAR (measured) = 0.804 mW/g



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Test Laboratory: Bureau Veritas ADT

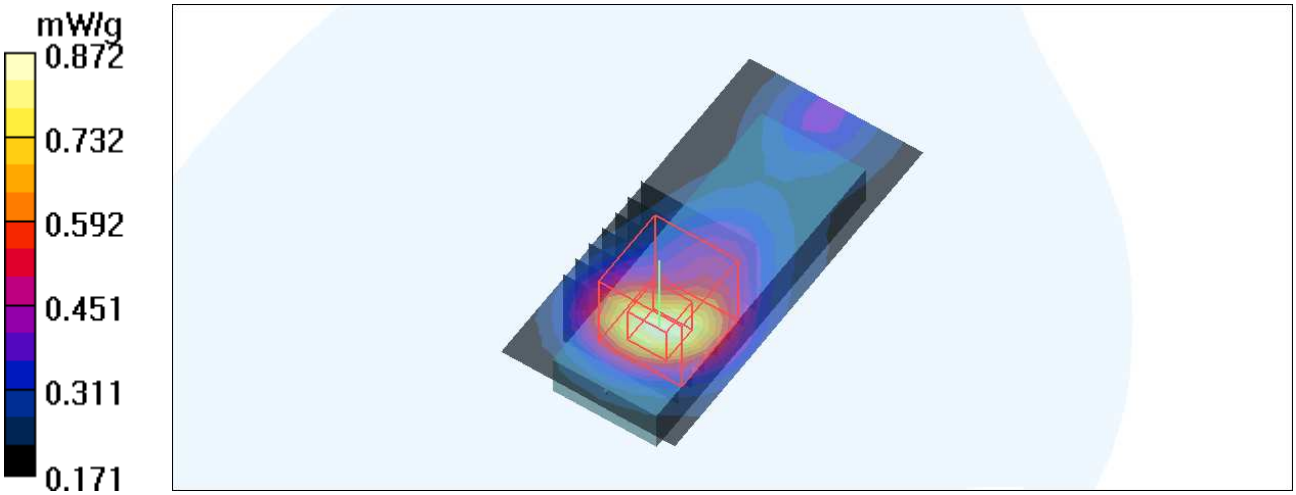
M07- Horizontal Up -10M-64QAM1_2 -Mid Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.21 mho/m; ε_r = 53.1; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.872 mW/g

Mid Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 14.0 V/m; Power Drift = -0.161 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.623 mW/g; SAR(10 g) = 0.364 mW/g
Maximum value of SAR (measured) = 0.771 mW/g



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Test Laboratory: Bureau Veritas ADT

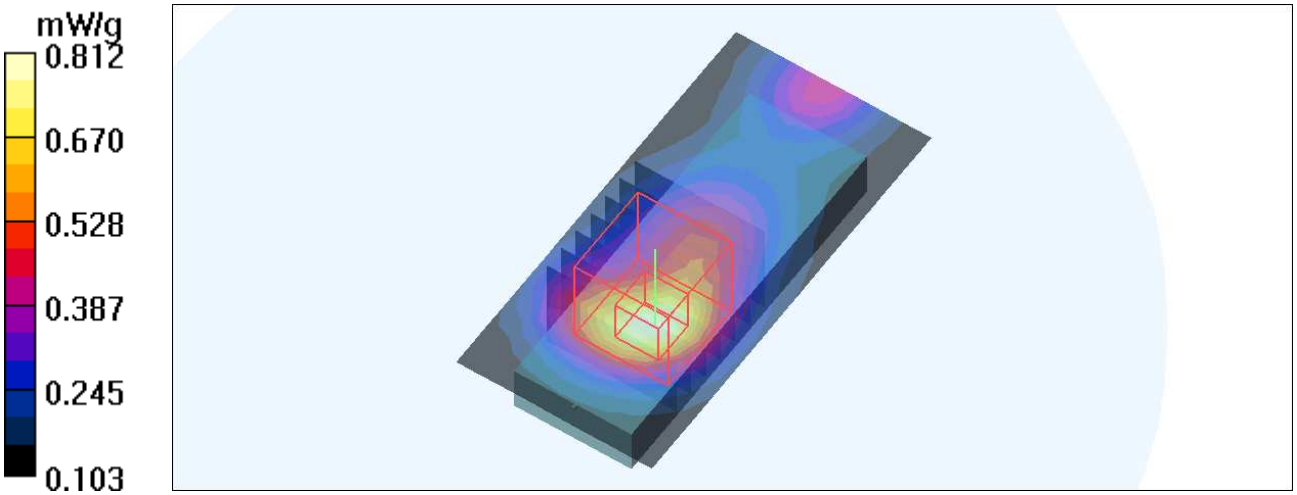
M07- Horizontal Up -10M-64QAM1_2 -High Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.26 mho/m; ε_r = 52.9; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.812 mW/g

High Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.70 V/m; Power Drift = 0.133 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.631 mW/g; SAR(10 g) = 0.353 mW/g
Maximum value of SAR (measured) = 0.797 mW/g



Test Laboratory: Bureau Veritas ADT

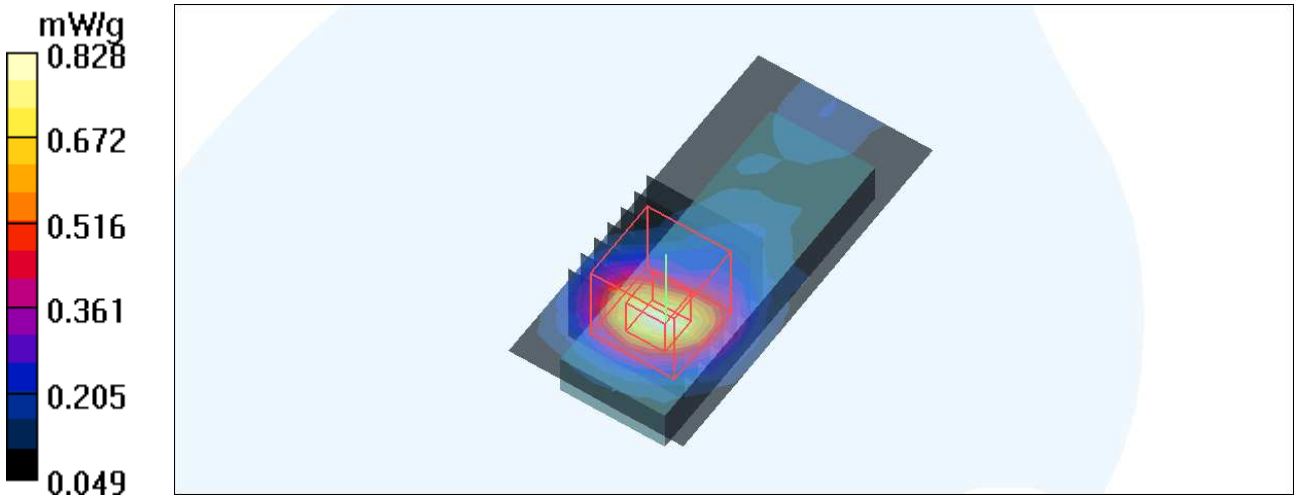
M08- Horizontal Up -10M-16QAM1_2 -Low Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2501 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2501 MHz; σ = 2.08 mho/m; ε_r = 53.2; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.828 mW/g

Low Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 11.2 V/m; Power Drift = -0.188 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.599 mW/g; SAR(10 g) = 0.304 mW/g
Maximum value of SAR (measured) = 0.765 mW/g



Test Laboratory: Bureau Veritas ADT

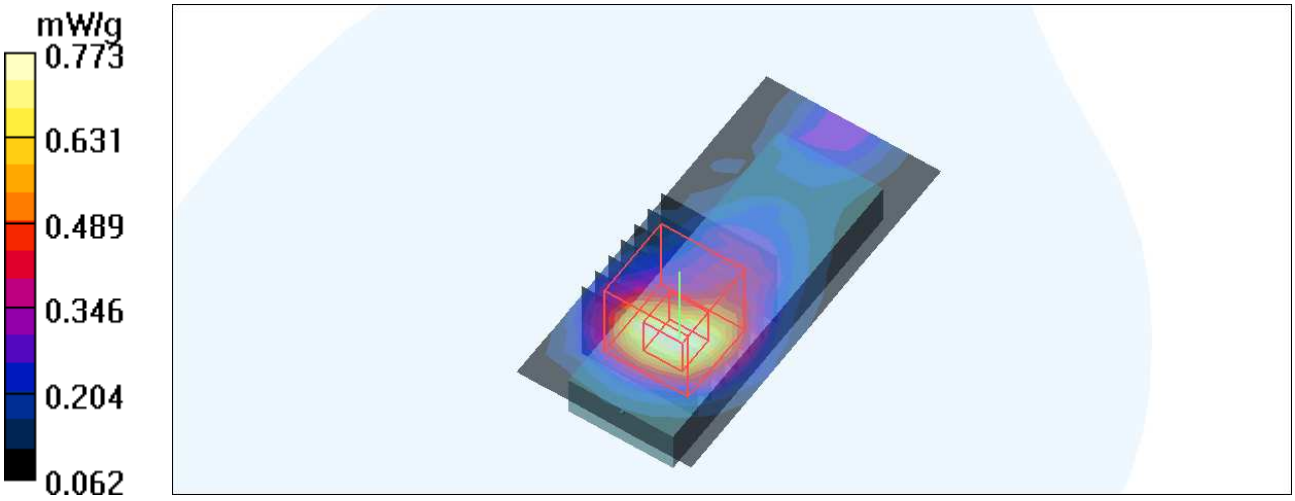
M08- Horizontal Up -10M-16QAM1_2 -Mid Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.21 mho/m; ε_r = 53.1; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.773 mW/g

Mid Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.92 V/m; Power Drift = -0.137 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.591 mW/g; SAR(10 g) = 0.312 mW/g
Maximum value of SAR (measured) = 0.746 mW/g



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Test Laboratory: Bureau Veritas ADT

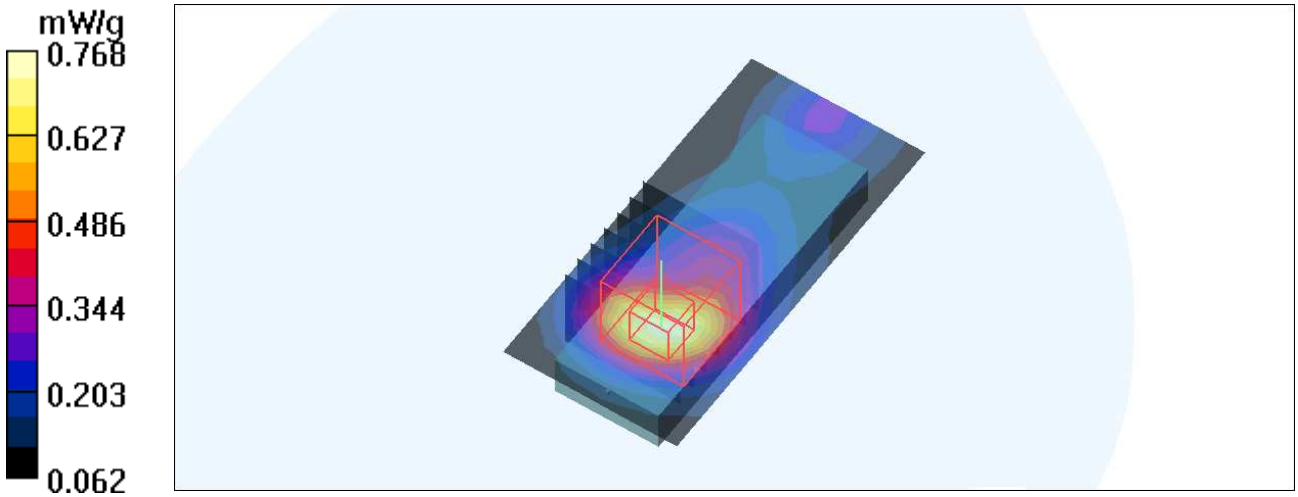
M08- Horizontal Up -10M-16QAM1_2 -High Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.26 mho/m; ε_r = 52.9; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.768 mW/g

High Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.14 V/m; Power Drift = -0.137 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.573 mW/g; SAR(10 g) = 0.306 mW/g
Maximum value of SAR (measured) = 0.735 mW/g



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Test Laboratory: Bureau Veritas ADT

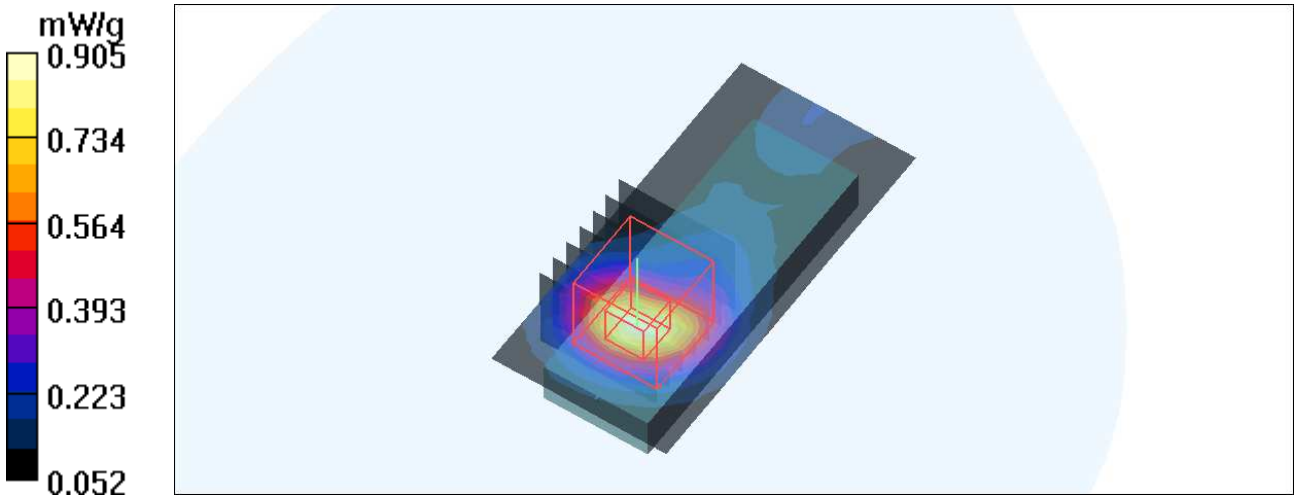
M09- Horizontal Up -10M-QPSK1_2 -Low Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2501 MHz ; Duty Cycle: 1:3.2; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2501 MHz; σ = 2.08 mho/m; ε_r = 53.2; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.905 mW/g

Low Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.8 V/m; Power Drift = -0.057 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.680 mW/g; SAR(10 g) = 0.340 mW/g
Maximum value of SAR (measured) = 0.864 mW/g



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Test Laboratory: Bureau Veritas ADT

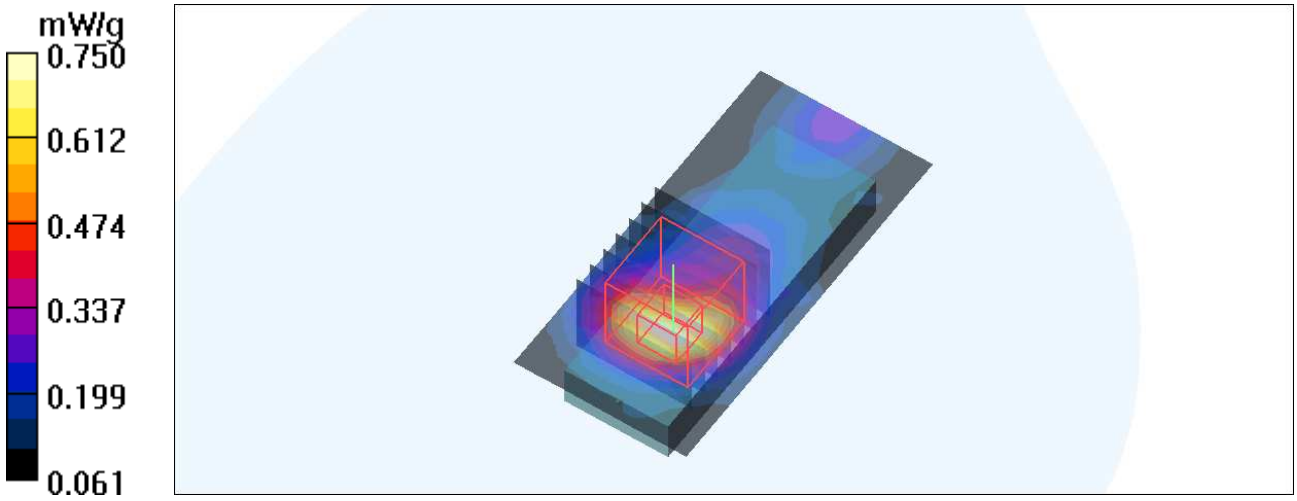
M09- Horizontal Up -10M-QPSK1_2 -Mid Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.21 mho/m; ε_r = 53.1; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.750 mW/g

Mid Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.6 V/m; Power Drift = -0.180 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.559 mW/g; SAR(10 g) = 0.298 mW/g
Maximum value of SAR (measured) = 0.708 mW/g



Test Laboratory: Bureau Veritas ADT

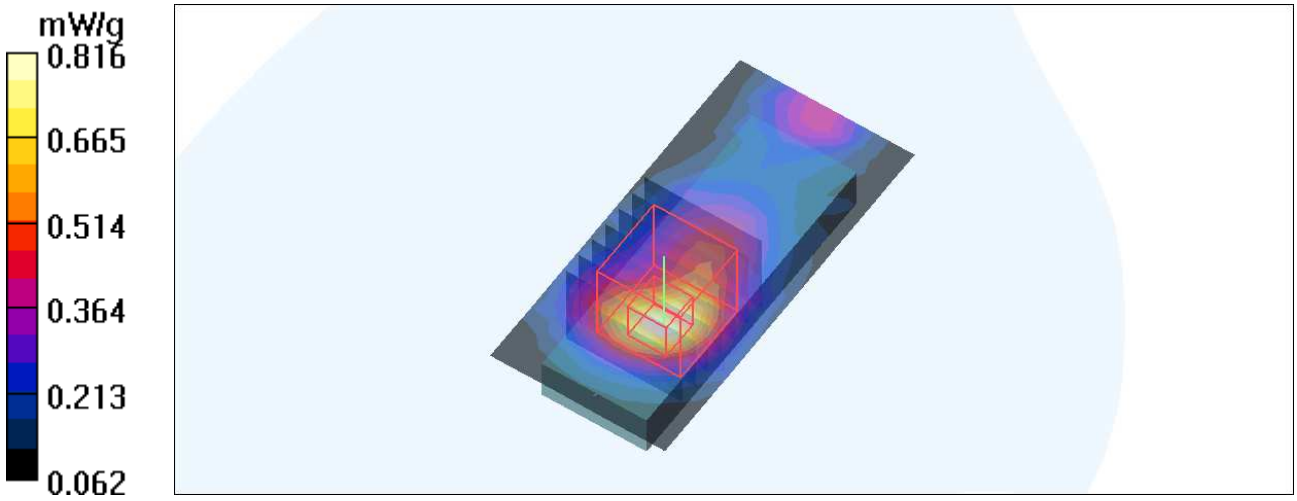
M09- Horizontal Up -10M-QPSK1_2 -High Channel-Ant1

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.2; Modulation type: QPSK
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.26 mho/m; ε_r = 52.9; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel/Area Scan (10x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.816 mW/g

High Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.33 V/m; Power Drift = -0.087 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.616 mW/g; SAR(10 g) = 0.327 mW/g
Maximum value of SAR (measured) = 0.779 mW/g



Date/Time: 2010/6/11 16:05:04

Test Laboratory: Bureau Veritas ADT

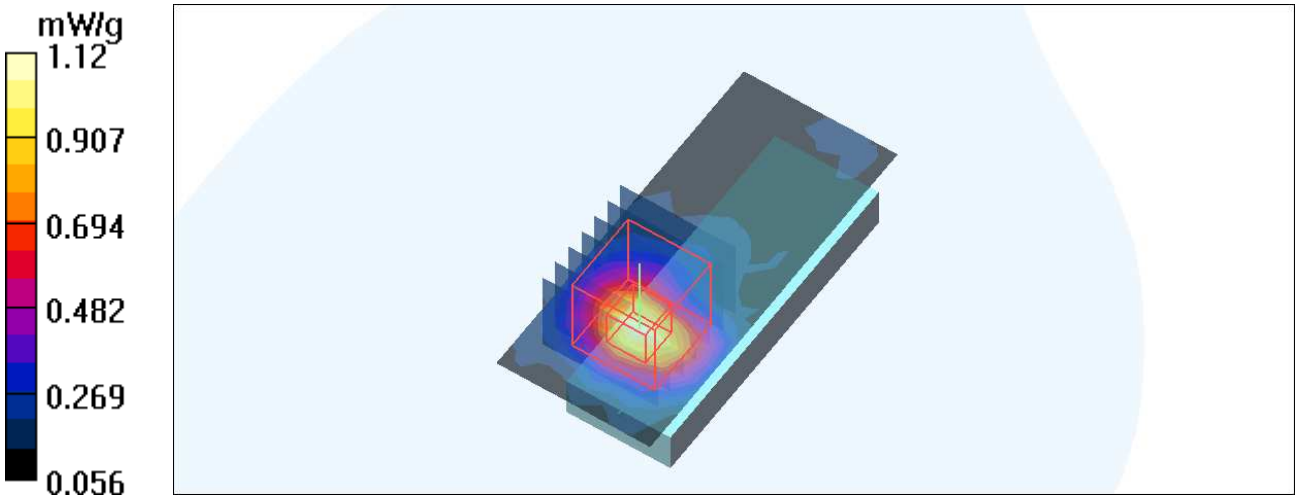
M10- Horizontal Up -10M-64QAM1_2 -Low Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2501 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2501 MHz; σ = 2.08 mho/m; ε_r = 53.2; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 1.12 mW/g

Low Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 12.5 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 1.68 W/kg
SAR(1 g) = 0.862 mW/g; SAR(10 g) = 0.443 mW/g
Maximum value of SAR (measured) = 1.11 mW/g



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Test Laboratory: Bureau Veritas ADT

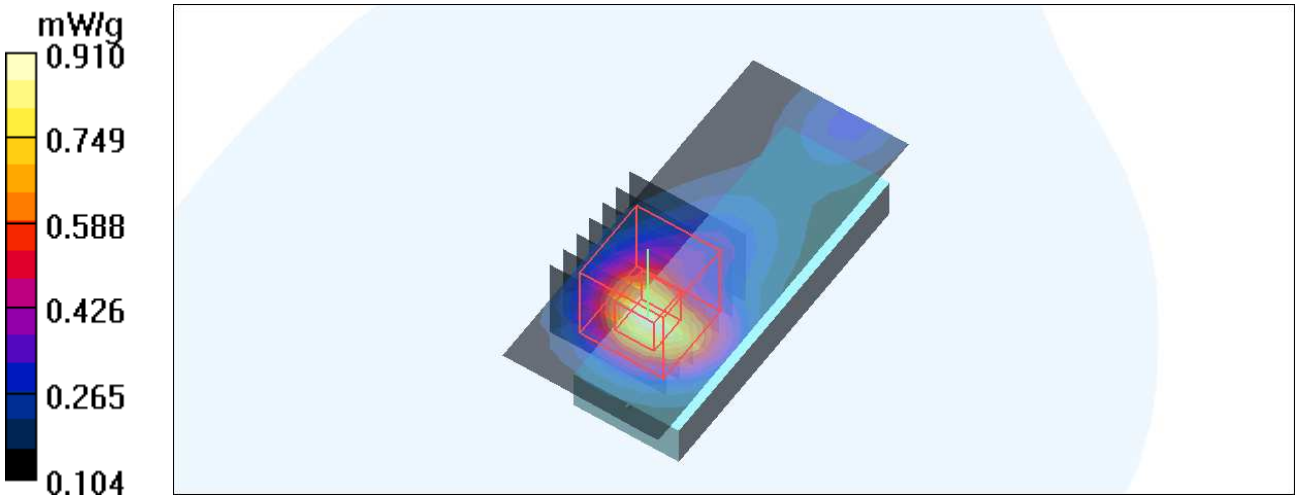
M10- Horizontal Up -10M-64QAM1_2 -Mid Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.21 mho/m; ε_r = 53.1; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.910 mW/g

Mid Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 11.3 V/m; Power Drift = -0.103 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.678 mW/g; SAR(10 g) = 0.371 mW/g
Maximum value of SAR (measured) = 0.855 mW/g



Date/Time: 2010/6/11 17:06:07

Test Laboratory: Bureau Veritas ADT

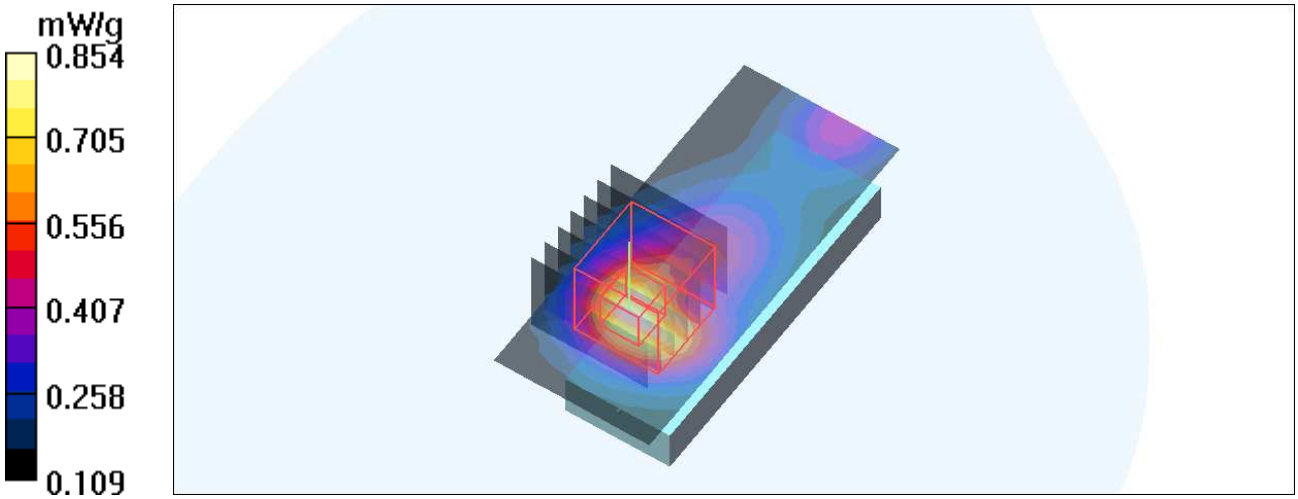
M10- Horizontal Up -10M-64QAM1_2 -High Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.2; Modulation type: 64QAM
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.26 mho/m; ε_r = 52.9; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
-Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.854 mW/g

High Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.6 V/m; Power Drift = -0.109 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.657 mW/g; SAR(10 g) = 0.368 mW/g
Maximum value of SAR (measured) = 0.822 mW/g



Test Laboratory: Bureau Veritas ADT

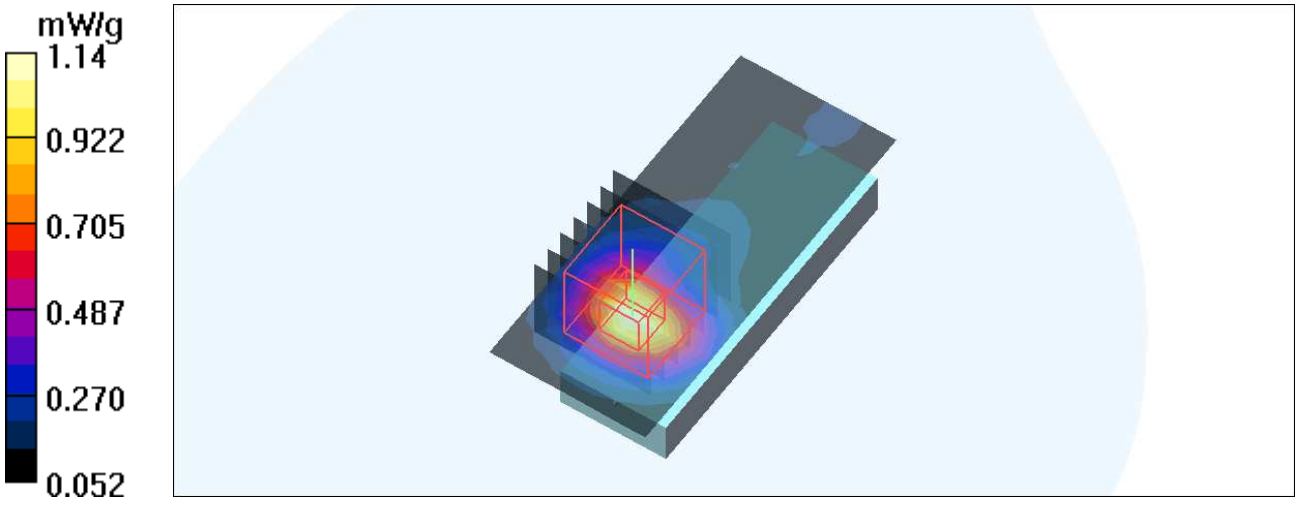
M11- Horizontal Up -10M-16QAM1_2 -Low Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2501 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2501 MHz; σ = 2.08 mho/m; ε_r = 53.2; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Low Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 1.14 mW/g

Low Channel/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 11.6 V/m; Power Drift = 0.096 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.822 mW/g; SAR(10 g) = 0.402 mW/g
Maximum value of SAR (measured) = 1.07 mW/g



Date/Time: 2010/6/11 18:05:23

Test Laboratory: Bureau Veritas ADT

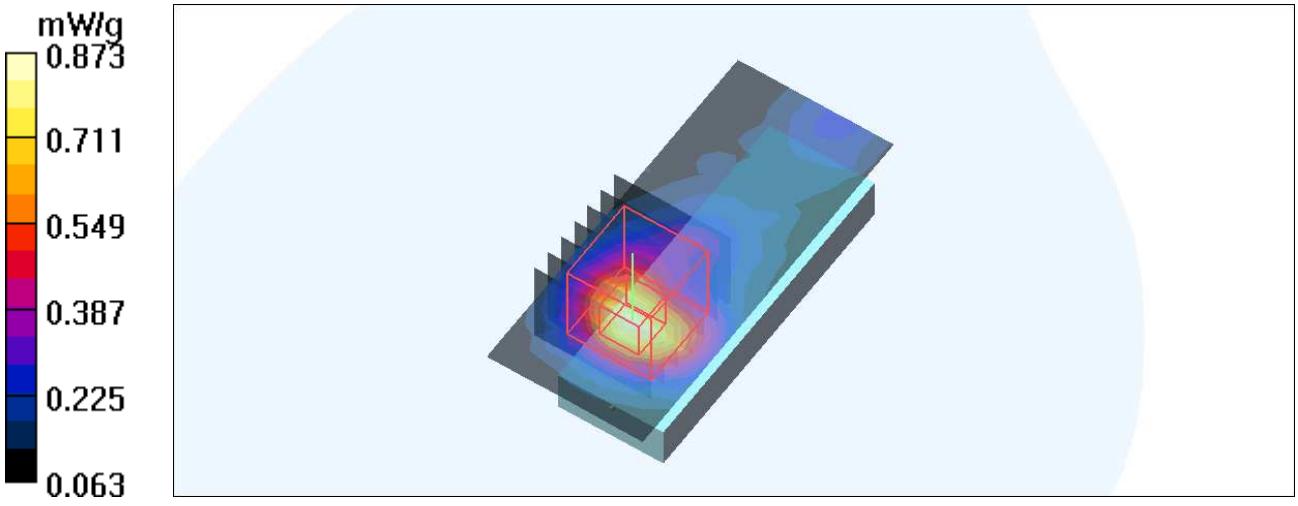
M11- Horizontal Up -10M-16QAM1_2 -Mid Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2600 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2600 MHz; σ = 2.21 mho/m; ε_r = 53.1; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

Mid Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.873 mW/g

Mid Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.3 V/m; Power Drift = -0.189 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.653 mW/g; SAR(10 g) = 0.335 mW/g
Maximum value of SAR (measured) = 0.825 mW/g



Date/Time: 2010/6/11 18:36:05

Test Laboratory: Bureau Veritas ADT

M11- Horizontal Up -10M-16QAM1_2 -High Channel-Ant2

DUT: Mobile WiMax USB Adapter ; Type: WIXUBB-110
Communication System: Wimax_2.6GHz 10M ; Frequency: 2685 MHz ; Duty Cycle: 1:3.2; Modulation type: 16QAM
Medium: MSL2600 Medium parameters used: f = 2685 MHz; σ = 2.26 mho/m; ε_r = 52.9; 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(8.04, 8.04, 8.04) ; Calibrated: 2010/3/25
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861 ; Calibrated: 2010/1/22
- Phantom: SAM 12 ; Type: SAM V4.0 ; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80 ; Postprocessing SW: SEMCAD, V1.8 Build 186

High Channel/Area Scan (9x20x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 0.837 mW/g

High Channel/Zoom Scan(7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.69 V/m; Power Drift = -0.093 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.624 mW/g; SAR(10 g) = 0.331 mW/g
Maximum value of SAR (measured) = 0.788 mW/g