SAR TEST REPORT

REPORT NO.: SA991004C14

MODEL NO.: AW-NU138

FCC ID: TLZ-NU138

IC ID: 6100A-NU138

RECEIVED: Oct. 04, 2010

TESTED: Nov. 01, 2010

ISSUED: Nov. 09, 2010

APPLICANT: AzureWave Technologies, Inc.

ADDRESS: 8F, No.94, Baozhong Rd., Xindian, Taipei, Taiwan 231.

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

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

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

This test report consists of 27 pages in total except Appendix. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agency. The test results in the report only apply to the tested sample.

TABLE OF CONTENTS

1. CERTIFICATION

PRODUCT:	IEEE 802.11b/g/n USB Wireless Adapter
MODEL:	AW-NU138
BRAND:	AzureWave
APPLICANT:	AzureWave Technologies, Inc.
TESTED:	Nov. 01, 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: AW-NU138) 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 : _Polly Chien_ , **DATE** : _Nov. 09, 2010_
Polly Chien / Specialist

TECHNICAL ACCEPTANCE :
Responsible for RF _Mason Chang_ , **DATE** : _Nov. 09, 2010_
Mason Chang / Engineer

APPROVED BY : _Gary Chang_ , **DATE** : _Nov. 09, 2010_
Gary Chang / Assistant Manager

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

EUT	IEEE 802.11b/g/n USB Wireless Adapter
MODEL NO.	AW-NU138
FCC ID	TLZ-NU138
IC ID	6100A-NU138
POWER SUPPLY	5Vdc
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 135.0Mbps
OPERATING FREQUENCY	2412 ~ 2462MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
MAXIMUM SAR (1g)	1.090W/kg
ANTENNA TYPE	PIFA Antenna (Main) with 0.9dBi gain PIFA Antenna (Aux) with -24.75dBi gain
DATA CABLE	NA
I/O PORTS	USB
ACCESSORY DEVICES	NA

NOTE:

1. The EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

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

2.2 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

DASY5 (software 5.2 Build 162) consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY5 software defined. The DASY5 software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.

EX3DV3 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: $\pm$ 0.2 dB (30 MHz to 6 GHz)
DIRECTIVITY	$\pm$ 0.3 dB in HSL (rotation around probe axis) $\pm$ 0.5 dB in tissue material (rotation normal to probe axis)
DYNAMIC RANGE	10 μW/g to > 100 mW/g Linearity: $\pm$ 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-1485	NA	NA
2	Signal Generator	Agilent	E8257C	MY43320668	Feb. 23, 2010	Feb. 22, 2011
3	E-Field Probe	S & P	EX3DV3	3504	Jan. 26, 2010	Jan. 25, 2011
4	DAE	S & P	DAE 3	579	Sep. 20, 2010	Sep. 19, 2011
5	Robot Positioner	Staubli Unimation	NA	NA	NA	NA
6	Validation Dipole	S & P	D2450V2	737	Feb. 19, 2010	Feb. 18, 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 DASY5 post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the micro-volt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1. The extraction of the measured data (grid and values) from the Zoom Scan

2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)

3. The generation of a high-resolution mesh within the measured volume

4. The interpolation of all measured values from the measurement grid to the high-resolution grid

5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface

6. The calculation of the averaged SAR within masses of 1g and 10g.

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

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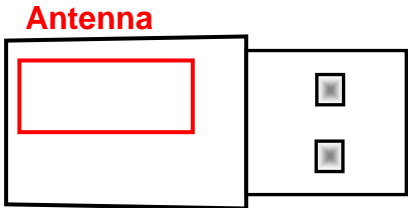
2.6 DESCRIPTION OF SUPPORT UNITS

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	PP18L	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).

3. DESCRIPTION OF ANTENNA LOCATION

Antenna

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 2450MHz SIMULATING LIQUID TABLE

INGREDIENT	BODY SIMULATING LIQUID 2450MHz (MSL-2450)
Water	69.83%
DGMBE	30.17%
Dielectric Parameters at 22 ℃	f= 2450MHz ε= 52.7 ± 5% σ= 1.95 ± 5% S/m

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

1. Turn Network Analyzer on and allow at least 30min. warm up.

2. Mount dielectric probe kit so that interconnecting cable to Network Analyzer will not be moved during measurements or calibration.

3. Pour de-ionized water and measure water temperature (±1°).

4. Set water temperature in Agilent-Software (Calibration Setup).

5. Perform calibration.

6. Validate calibration with dielectric material of known properties (e.g. polished ceramic slab with >8mm thickness ε'=10.0, ε''=0.0). If measured parameters do not fit within tolerance, repeat calibration (±0.2 for ε': ±0.1 for ε'').

7. Conductivity can be calculated from ε'' by $\sigma = \omega\, \varepsilon_0\, \varepsilon'' = \varepsilon''\, f\, [GHz] / 18$.

8. Measure liquid shortly after calibration. Repeat calibration every hour.

9. Stir the liquid to be measured. Take a sample (~ 50ml) with a syringe from the center of the liquid container.

10. Pour the liquid into a small glass flask. Hold the syringe at the bottom of the flask to avoid air bubbles.

11. Put the dielectric probe in the glass flask. Check that there are no air bubbles in front of the opening in the dielectric probe kit.

12. Perform measurements.

13. Adjust medium parameters in DASY5 for the frequencies necessary for the measurements ('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 2.4GHz BAND SIMULATING LIQUID

LIQUID TYPE	MSL-2450
SIMULATING LIQUID TEMP.	21.3
TEST DATE	Nov. 01, 2010
TESTED BY	Sam Onn

FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
2412.0	Permitivity (ε)	52.70	54.90	4.17	
2437.0		52.70	54.80	3.98	
2450.0		52.70	54.60	3.61	
2462.0		52.70	54.50	3.42	± 5
2412.0	Conductivity (σ) S/m	1.94	1.95	0.52	
2437.0		1.94	1.98	2.06	
2450.0		1.95	2.00	2.56	
2462.0		1.95	2.01	3.08	

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 DASY5 system is less than ±0.1mm.

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

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

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
MSL2450	13.10 (1g)	13.40	2.29	10mm	Nov. 01, 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	$\sqrt{3}$	0.7	0.7	0.10	0.10	∞
Hemispherical Isotropy	1.30	Rectangular	$\sqrt{3}$	0.7	0.7	0.53	0.53	∞
Boundary effects	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	0.30	Rectangular	$\sqrt{3}$	1	1	0.17	0.17	∞
System Detection Limits	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
Readout Electronics	0.30	Normal	1	1	1	0.30	0.30	∞
Response Time	0.80	Rectangular	$\sqrt{3}$	1	1	0.46	0.46	∞
Integration Time	2.60	Rectangular	$\sqrt{3}$	1	1	1.50	1.50	∞
RF Ambient Noise	3.00	Rectangular	$\sqrt{3}$	1	1	1.73	1.73	∞
RF Ambient Reflections	3.00	Rectangular	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe Positioner	0.40	Rectangular	$\sqrt{3}$	1	1	0.23	0.23	∞
Probe Positioning	2.90	Rectangular	$\sqrt{3}$	1	1	1.67	1.67	∞
Max. SAR Eval.	1.00	Rectangular	$\sqrt{3}$	1	1	0.58	0.58	∞
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 measurement	4.50	Rectangular	$\sqrt{3}$	1	1	2.60	2.60	1
Dipole Related								
Dipole Axis to Liquid Distance	1.60	Rectangular	$\sqrt{3}$	1	1	0.92	0.92	4
Input Power Drift	1.16	Rectangular	$\sqrt{3}$	1	1	0.67	0.67	1
Phantom and Tissue parameters								
Phantom Uncertainty	4.00	Rectangular	$\sqrt{3}$	1	1	2.31	2.31	∞
Liquid Conductivity (target)	5.00	Rectangular	$\sqrt{3}$	0.64	0.43	1.85	1.24	∞
Liquid Conductivity (measurement)	3.08	Normal	1	0.64	0.43	1.97	1.32	9
Liquid Permittivity (target)	5.00	Rectangular	$\sqrt{3}$	0.6	0.49	1.73	1.41	∞
Liquid Permittivity (measurement)	4.17	Normal	1	0.6	0.49	2.50	2.04	9
Combined Standard Uncertainty						9.19	8.79	
Coverage Factor for 95%						Kp=2		
Expanded Uncertainty (K=2)						18.37	17.58	

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

6. TEST RESULTS

6.1 TEST PROCEDURES

The EUT plugged into the notebook. Use the software to control the EUT channel and transmission power. Then record the conducted power before the testing. Place the EUT to the specific test location. After the testing, must writing down the conducted power of the EUT into the report. The SAR value was calculated via the 3D spline interpolation algorithm that has been implemented in the software of DASY5 SAR measurement system manufactured and calibrated by SPEAG. According to the IEEE 1528 standards, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

• Power reference measurement

• Verification of the power reference measurement

• Area scan

• Zoom scan

• Power reference measurement

The area scan was performed for the highest spatial SAR location. The zoom scan was performed for SAR value averaged over 1g and 10g spatial volumes.

In the zoom scan, the distance between the measurement point at the probe sensor location (geometric center behind the probe tip) and the phantom surface is 2mm and maintained at a constant distance of ±0.5mm during a zoom scan to determine peak SAR locations. The distance is 2mm between the first measurement point and the bottom surface of the phantom. The secondary measurement point to the bottom surface of the phantom is with 8mm separation distance. The cube size is 7 x 7 x 7 points consists of 343 points and the grid space is 5mm.

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

In the area scan, the separation distance is 2mm between the each measurement point and the phantom surface. The scan size shall be included the transmission portion of the EUT. The measurement time is the same as the zoom scan. At last the reference power drift shall be less than ±5%.

6.2 CONDUCTED POWER

TEST MODE				802.11b	
CHAN.	FREQ. (MHz)	MODULATION TYPE	DATA RATE (Mbps)	AVG	PEAK
1	2412 (Low)	DBPSK	1	15.1	17.4
6	2437 (Mid.)	DBPSK	1	15.1	17.5
11	2462 (High)	DBPSK	1	15.0	17.3

TEST MODE				802.11g	
CHAN.	FREQ. (MHz)	MODULATION TYPE	DATA RATE (Mbps)	AVG	PEAK
1	2412 (Low)	BPSK	6	15.0	23.1
6	2437 (Mid.)	BPSK	6	14.8	23.0
11	2462 (High)	BPSK	6	15.2	23.4

TEST MODE				802.11n (20MHz)	
CHAN.	FREQ. (MHz)	MODULATION TYPE	DATA RATE (Mbps)	AVG	PEAK
1	2412 (Low)	BPSK	6.5	12.1	20.8
6	2437 (Mid.)	BPSK	6.5	12.0	20.6
11	2462 (High)	BPSK	6.5	12.0	20.5

TEST MODE				802.11n (40MHz)	
CHAN.	FREQ. (MHz)	MODULATION TYPE	DATA RATE (Mbps)	AVG	PEAK
1	2422 (Low)	BPSK	13.5	10.0	19.1
4	2437 (Mid.)	BPSK	13.5	10.3	19.5
7	2452 (High)	BPSK	13.5	10.1	19.3

6.3 DESCRIPTION OF TEST CONDITION

TEST DATE	TEMPERATURE(°C)		HUMIDITY(%RH)	TESTED BY
	AIMBENT	LIQUID		
Nov. 01, 2010	22.6	21.3	59	Sam Onn

6.4 MEASURED SAR RESULT

	Distance between EUT and phantom is 5mm					
CHAN.	**FREQ. (MHz)**	**Horizontal-Down**	**Vertical-Front**	**Horizontal-Up**	**Vertical-Back**	**TIP**
			802.11b			
1	2412 (Low)	**1.090**	-	1.030	-	-
6	2437 (Mid.)	0.953	0.732	0.881	0.695	0.096
11	2462 (High)	0.830	-	0.849	-	-
			802.11g			
1	2412 (Low)	1.080	0.845	1.050	-	-
6	2437 (Mid.)	1.050	0.885	0.991	-	-
11	2462 (High)	1.020	0.808	0.988	0.634	0.106
			802.11n (20MHz)			
1	2412 (Low)	0.579	0.445	0.543	0.390	0.047
			802.11n (40MHz)			
4	2437 (Mid.)	0.396	0.307	0.344	0.253	0.033

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. Per KDB 447498, when 1-g SAR for the highest output channel is less than 0.8 W/kg, testing for the other channels is not required.

6.5 POWER DRIFT TABLE

Test Mode	Test Position	Communication Mode	Test Channel	Test Frequency	Power (dBm)		Power drift (%)
					Begin	After	
1	Horizontal Down	802.11b	1	2412	15.10	15.00	-2.28
			6	2437	15.10	15.00	-2.28
			11	2462	15.00	14.90	-2.28
2		802.11g	1	2412	15.00	14.90	-2.28
			6	2437	14.80	14.60	-4.50
			11	2462	15.20	15.10	-2.28
3		802.11n (20MHz)	1	2412	12.10	12.00	-2.28
4		802.11n (40MHz)	4	2437	10.30	10.10	-4.50
5	Vertical front	802.11b	6	2437	15.10	15.00	-2.28
6		802.11g	1	2412	15.00	14.90	-2.28
			6	2437	14.80	14.70	-2.28
			11	2462	15.20	15.10	-2.28
7		802.11n (20MHz)	1	2412	12.10	12.00	-2.28
8		802.11n (40MHz)	4	2437	10.30	10.10	-4.50
9	Horizontal up	802.11b	1	2412	15.10	15.00	-2.28
			6	2437	15.10	15.00	-2.28
			11	2462	15.00	14.90	-2.28
10		802.11g	1	2412	15.00	14.90	-2.28
			6	2437	14.80	14.60	-4.50
			11	2462	15.20	15.10	-2.28
11		802.11n (20MHz)	1	2412	12.10	12.00	-2.28
12		802.11n (40MHz)	4	2437	10.30	10.20	-2.28
13	Vertical back	802.11b	6	2437	15.10	15.00	-2.28
14		802.11g	11	2462	15.20	15.10	-2.28
15		802.11n (20MHz)	1	2412	12.10	12.00	-2.28
16		802.11n (40MHz)	4	2437	10.30	10.20	-2.28
17	Tip	802.11b	6	2437	15.10	15.00	-2.28
18		802.11g	11	2462	15.20	15.00	-4.50
19		802.11n (20MHz)	1	2412	12.10	12.00	-2.28
20		802.11n (40MHz)	4	2437	10.30	10.20	-2.28

6.6 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: This limits accord to 47 CFR 2.1093 – Safety Limit.

7. 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

MSL 2450MHz D=150mm

Test Laboratory: Bureau Veritas ADT

M01-11b-Ch1
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11b ; Frequency: 2412 MHz ; Duty Cycle: 1:1 ; Modulation type: DBPSK
Medium: MSL2450 Medium parameters used: f = 2412 MHz; σ = 1.95 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Low Ch1/Area Scan (6x6x1): Measurement grid: dx=8mm, dy=8mm
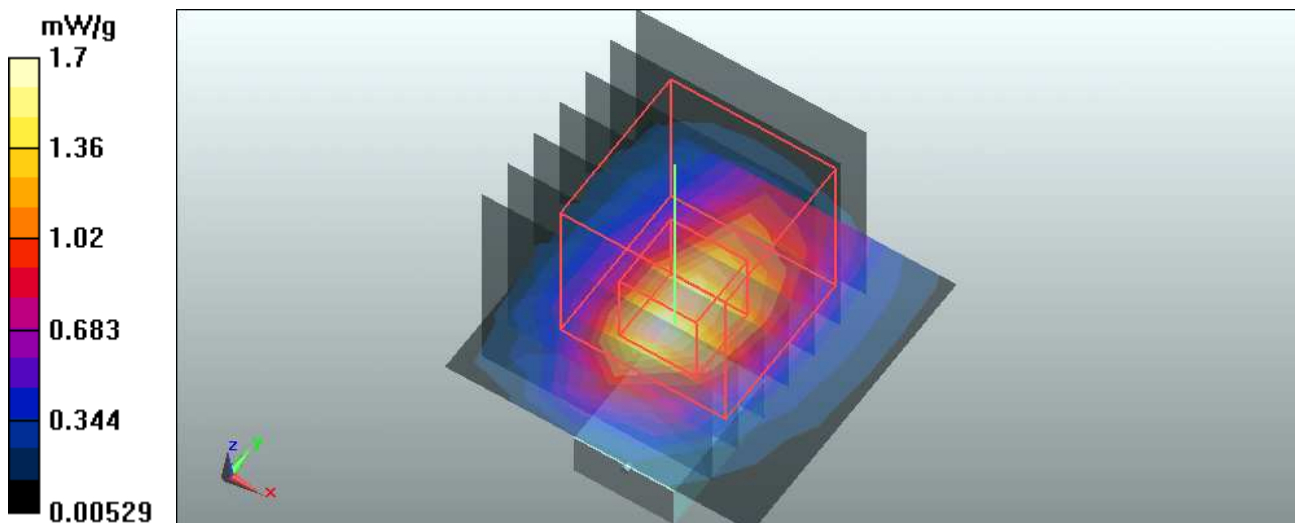Maximum value of SAR (measured) = 1.65 mW/g

Flat Section 5mm Low Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.9 V/m; Power Drift = -0.117 dB
Peak SAR (extrapolated) = 2.42 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.484 mW/g
Maximum value of SAR (measured) = 1.73 mW/g

Test Laboratory: Bureau Veritas ADT

M01-11b-Ch6
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11b ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: DBPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch6/Area Scan (6x6x1): Measurement grid: dx=8mm, dy=8mm
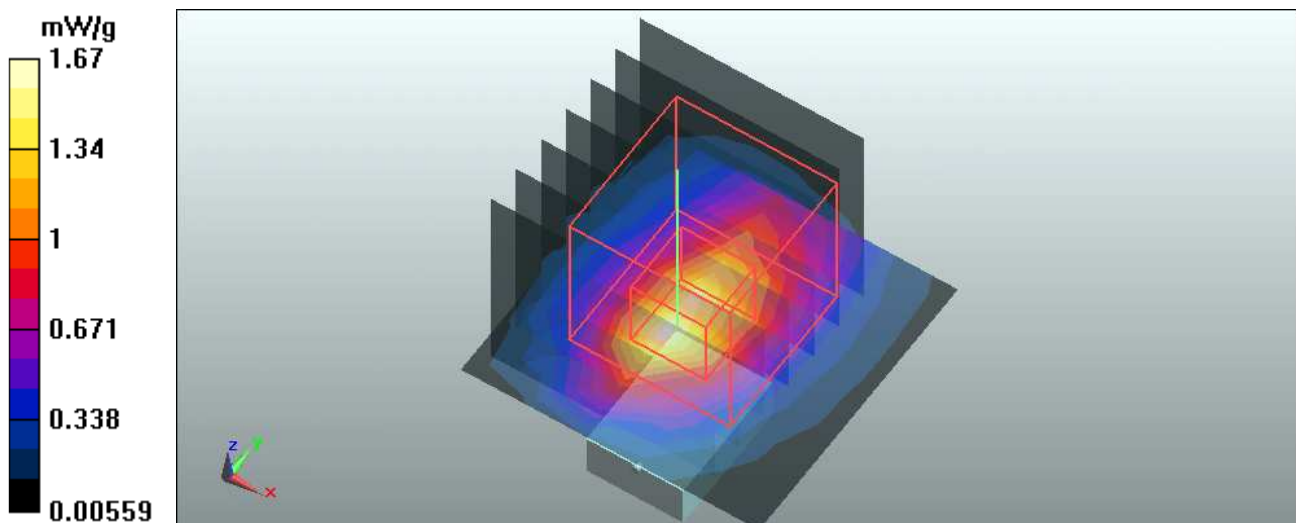Maximum value of SAR (measured) = 1.51 mW/g

Flat Section 5mm Mid Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.7 V/m; Power Drift = 0.101 dB
Peak SAR (extrapolated) = 2.19 W/kg
SAR(1 g) = 0.953 mW/g; SAR(10 g) = 0.413 mW/g
Maximum value of SAR (measured) = 1.53 mW/g

Test Laboratory: Bureau Veritas ADT

M01-11b-Ch11
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1 ; Modulation type: DBPSK
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.01 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm High Ch11/Area Scan (6x6x1): Measurement grid: dx=8mm, dy=8mm
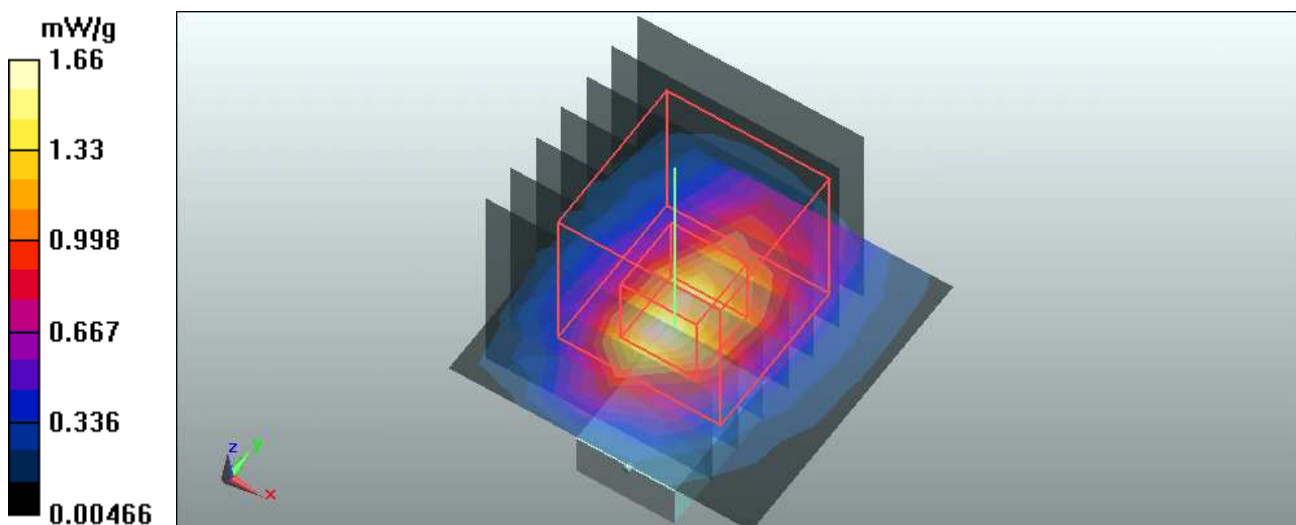Maximum value of SAR (measured) = 1.31 mW/g

Flat Section 5mm High Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.7 V/m; Power Drift = 0.166 dB
Peak SAR (extrapolated) = 1.9 W/kg
SAR(1 g) = 0.830 mW/g; SAR(10 g) = 0.363 mW/g
Maximum value of SAR (measured) = 1.34 mW/g

Test Laboratory: Bureau Veritas ADT

M02-11g-Ch1
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2412 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2412 MHz; σ = 1.95 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Low Ch1/Area Scan (6x6x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.67 mW/g

Flat Section 5mm Low Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.9 V/m; Power Drift = 0.188 dB
Peak SAR (extrapolated) = 2.41 W/kg
SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.473 mW/g
Maximum value of SAR (measured) = 1.7 mW/g

Test Laboratory: Bureau Veritas ADT

M02-11g-Ch6
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61
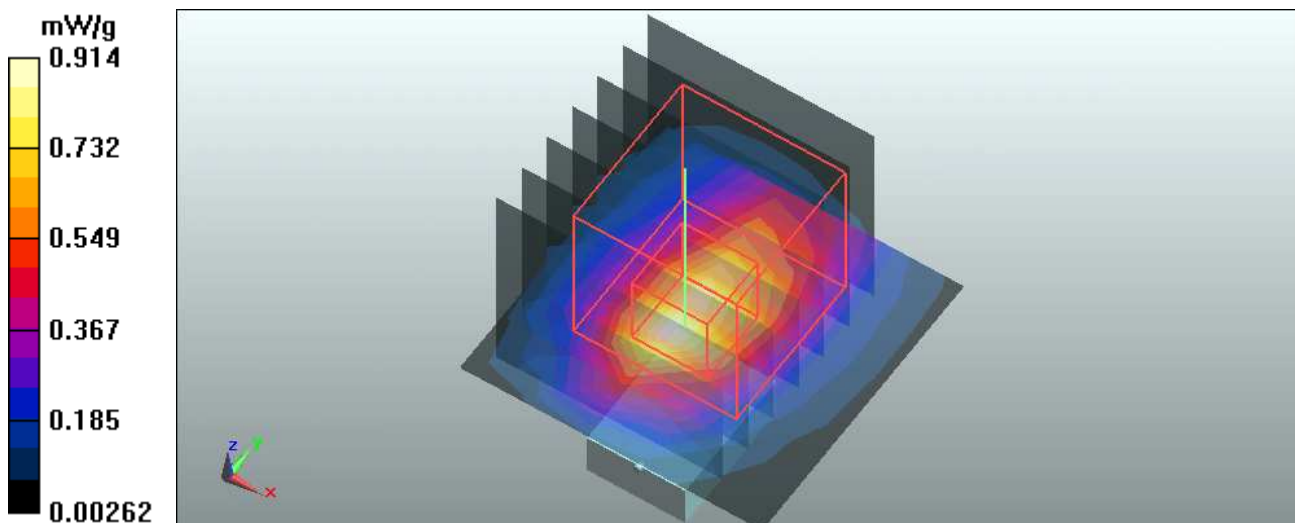
Flat Section 5mm Mid Ch6/Area Scan (6x6x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.62 mW/g

Flat Section 5mm Mid Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.3 V/m; Power Drift = 0.160 dB
Peak SAR (extrapolated) = 2.41 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.459 mW/g
Maximum value of SAR (measured) = 1.67 mW/g

Test Laboratory: Bureau Veritas ADT

M02-11g-Ch11
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2462 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.01 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm High Ch11/Area Scan (6x6x1): Measurement grid: dx=8mm, dy=8mm
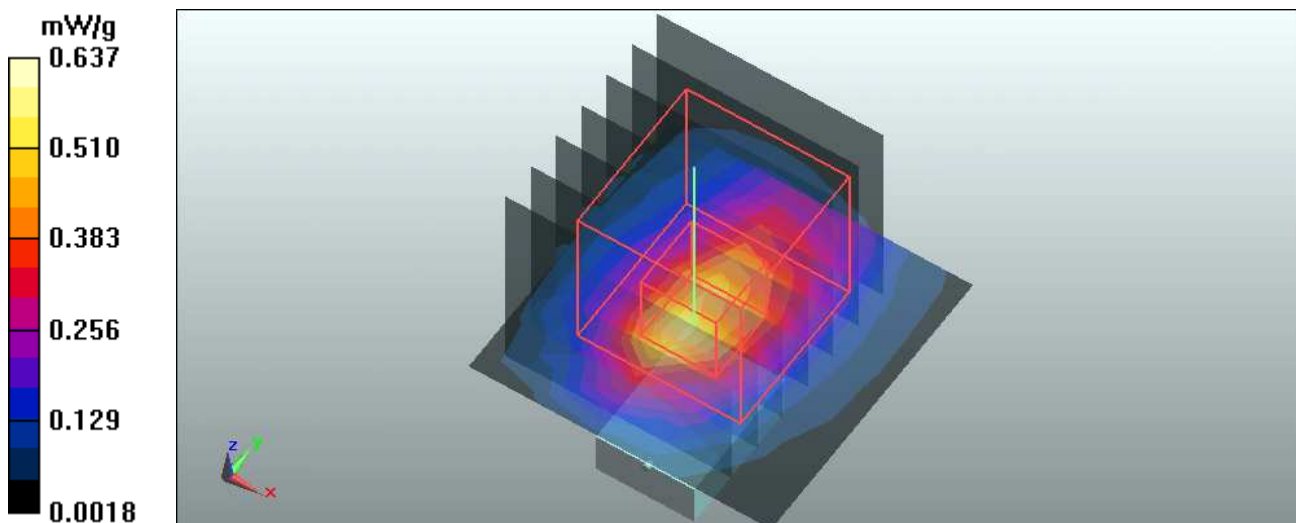Maximum value of SAR (measured) = 1.61 mW/g

Flat Section 5mm High Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.3 V/m; Power Drift = -0.014 dB
Peak SAR (extrapolated) = 2.38 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.446 mW/g
Maximum value of SAR (measured) = 1.66 mW/g

Test Laboratory: Bureau Veritas ADT

M03-11n 20M-Ch1
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11n 20MHz ; Frequency: 2412 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK

Medium: MSL2450 Medium parameters used: f = 2412 MHz; σ = 1.95 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3

Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Low Ch1/Area Scan (6x6x1): Measurement grid: dx=8mm, dy=8mm
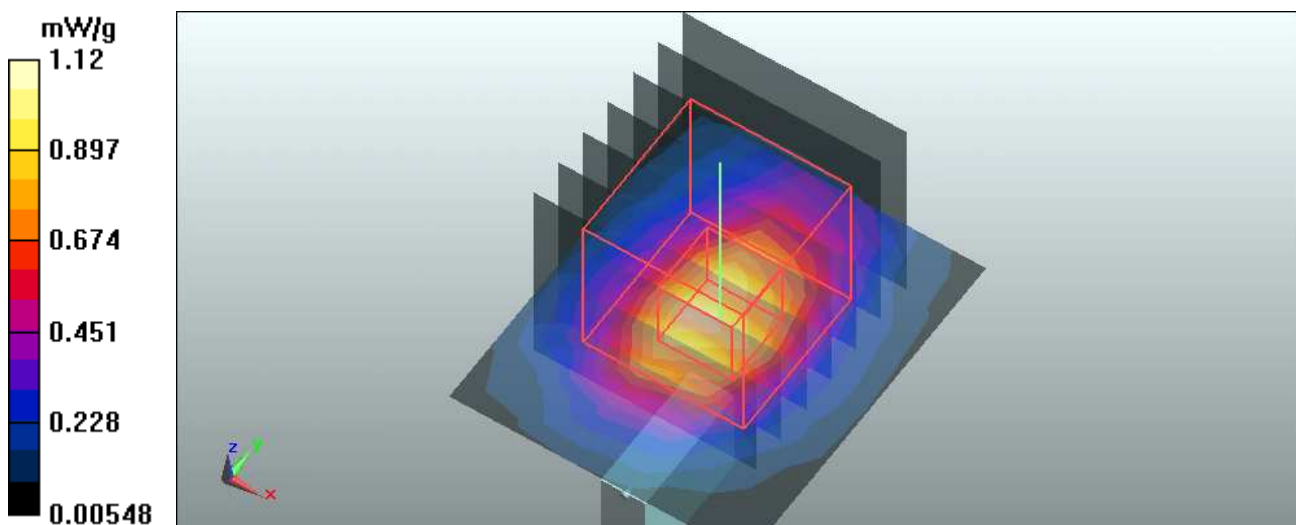Maximum value of SAR (measured) = 0.894 mW/g

Flat Section 5mm Low Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.579 mW/g; SAR(10 g) = 0.255 mW/g
Maximum value of SAR (measured) = 0.914 mW/g

Test Laboratory: Bureau Veritas ADT

M04-11n 40M-Ch4
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11n 40MHz ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Down side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch4/Area Scan (6x6x1): Measurement grid: dx=8mm, dy=8mm
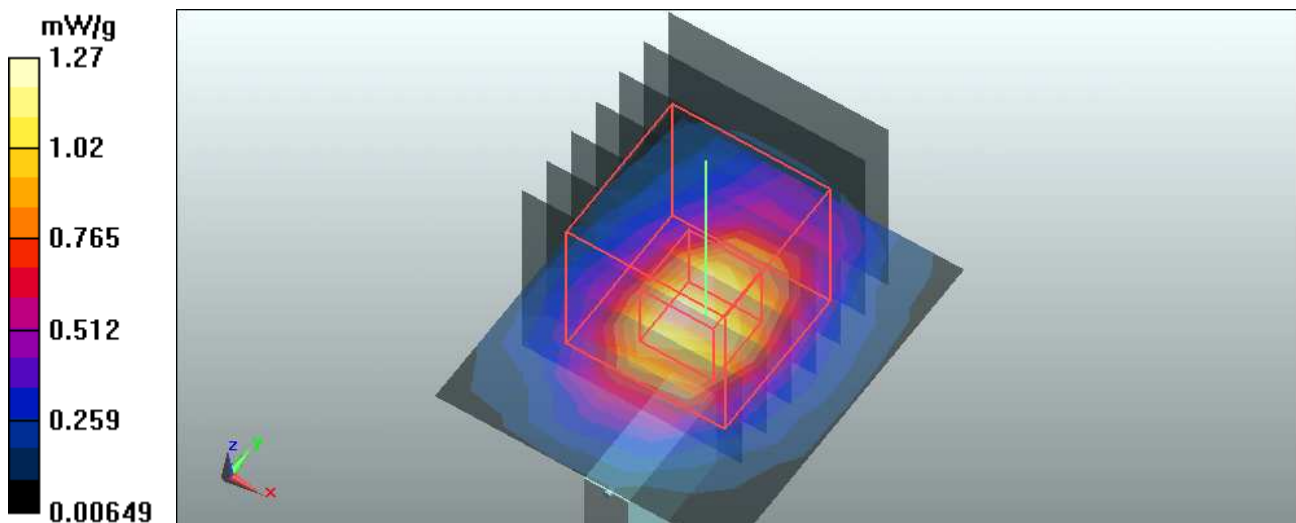Maximum value of SAR (measured) = 0.554 mW/g

Flat Section 5mm Mid Ch4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = 0.177 dB
Peak SAR (extrapolated) = 0.908 W/kg
SAR(1 g) = 0.396 mW/g; SAR(10 g) = 0.173 mW/g
Maximum value of SAR (measured) = 0.637 mW/g

Test Laboratory: Bureau Veritas ADT

M05-11b-Ch6
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11b ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: DBPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Vertical-Front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch6/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
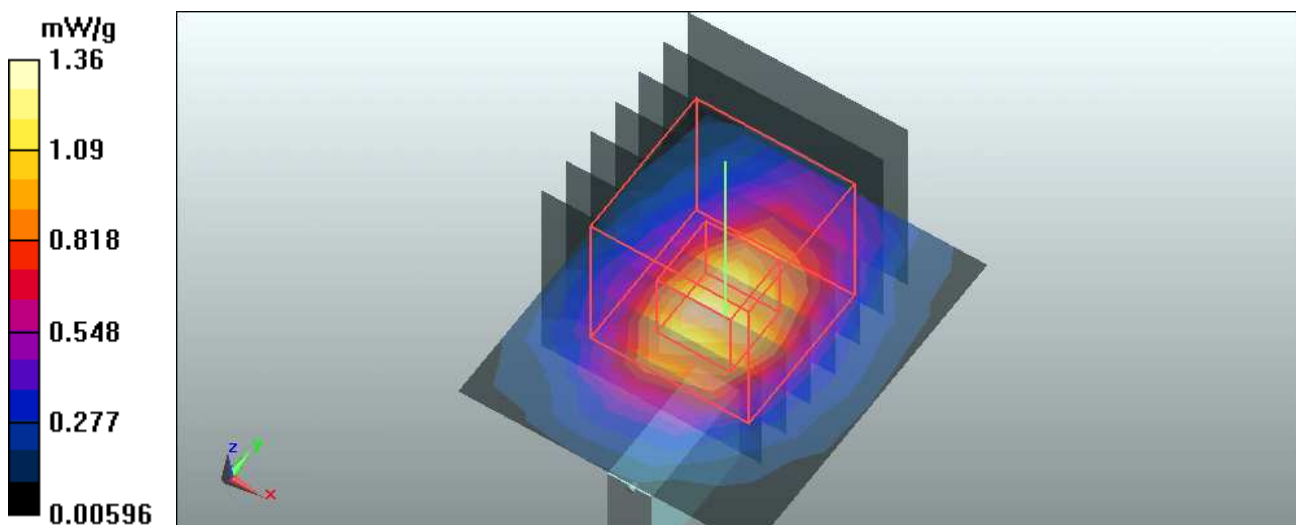Maximum value of SAR (measured) = 1.05 mW/g

Flat Section 5mm Mid Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.8 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 0.732 mW/g; SAR(10 g) = 0.331 mW/g
Maximum value of SAR (measured) = 1.12 mW/g

Test Laboratory: Bureau Veritas ADT

M06-11g-Ch1
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2412 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2412 MHz; σ = 1.95 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Vertical-Front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Low Ch1/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
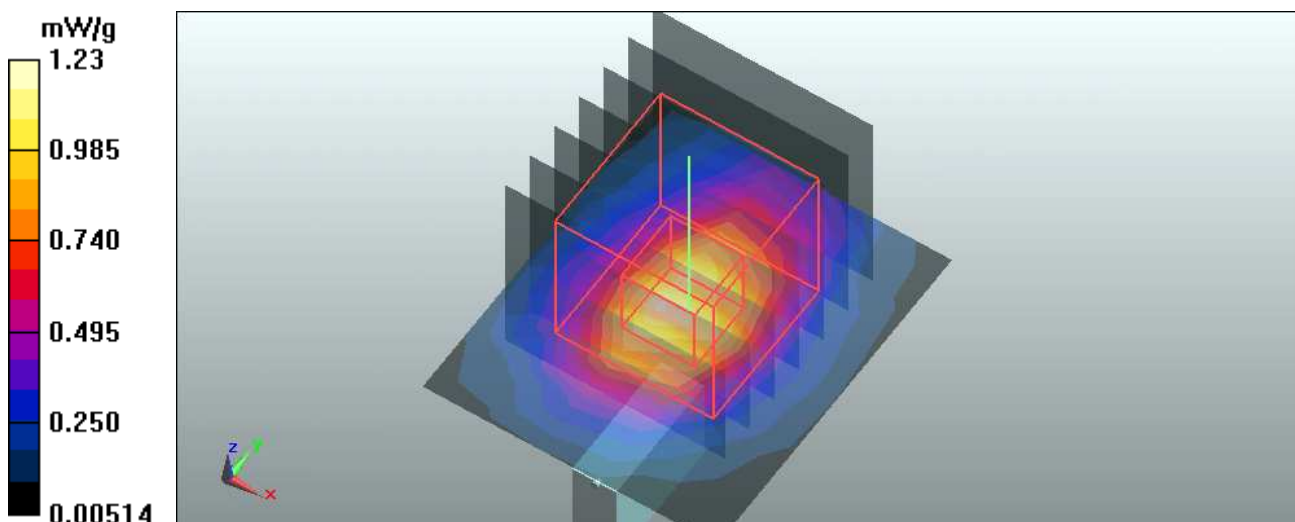Maximum value of SAR (measured) = 1.25 mW/g

Flat Section 5mm Low Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = 0.189 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 0.845 mW/g; SAR(10 g) = 0.382 mW/g
Maximum value of SAR (measured) = 1.27 mW/g

Test Laboratory: Bureau Veritas ADT

M06-11g-Ch6
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Vertical-Front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch6/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
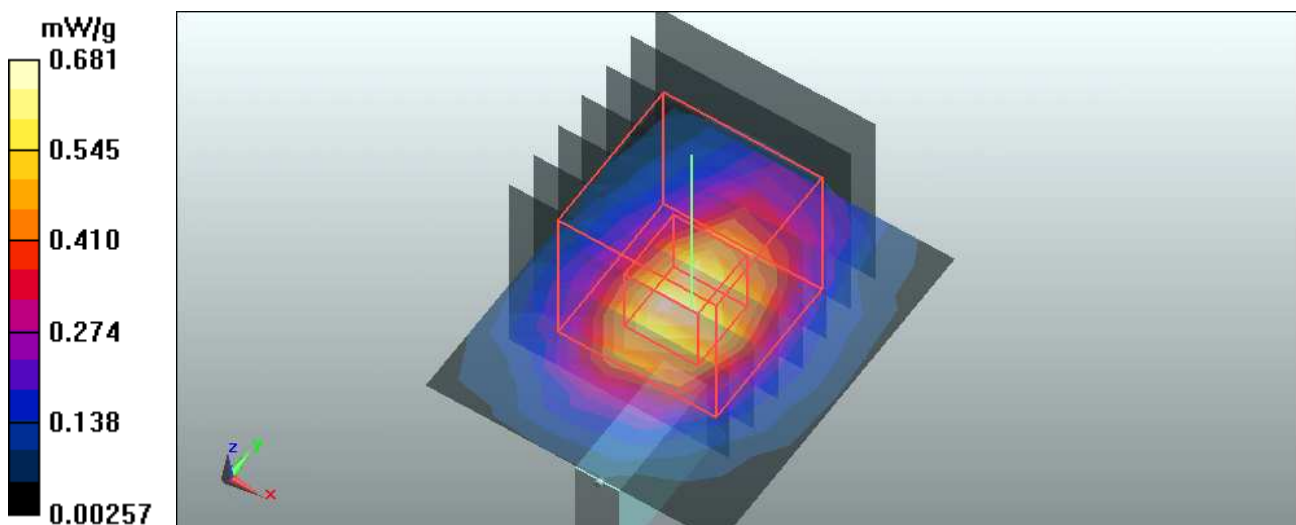Maximum value of SAR (measured) = 1.28 mW/g

Flat Section 5mm Mid Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = 0.014 dB
Peak SAR (extrapolated) = 1.86 W/kg
SAR(1 g) = 0.885 mW/g; SAR(10 g) = 0.399 mW/g
Maximum value of SAR (measured) = 1.36 mW/g

Test Laboratory: Bureau Veritas ADT

M06-11g-Ch11
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2462 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.01 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Vertical-Front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm High Ch11/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
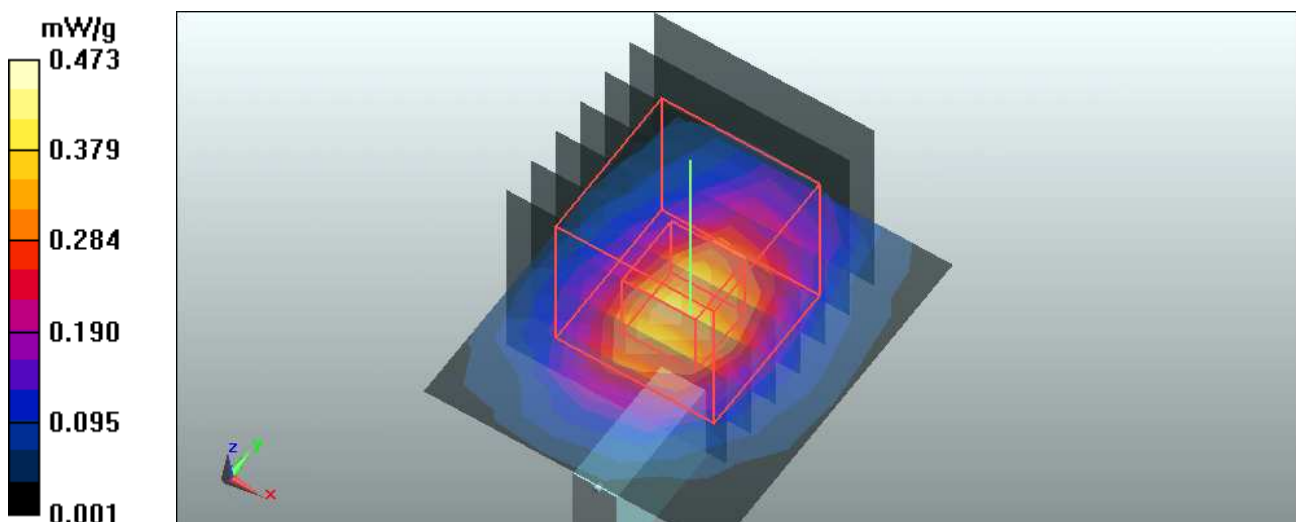Maximum value of SAR (measured) = 1.17 mW/g

Flat Section 5mm High Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 0.808 mW/g; SAR(10 g) = 0.359 mW/g
Maximum value of SAR (measured) = 1.23 mW/g

Test Laboratory: Bureau Veritas ADT

M07-11n 20M-Ch1
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11n 20MHz ; Frequency: 2412 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2412 MHz; σ = 1.95 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Vertical-Front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Low Ch1/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
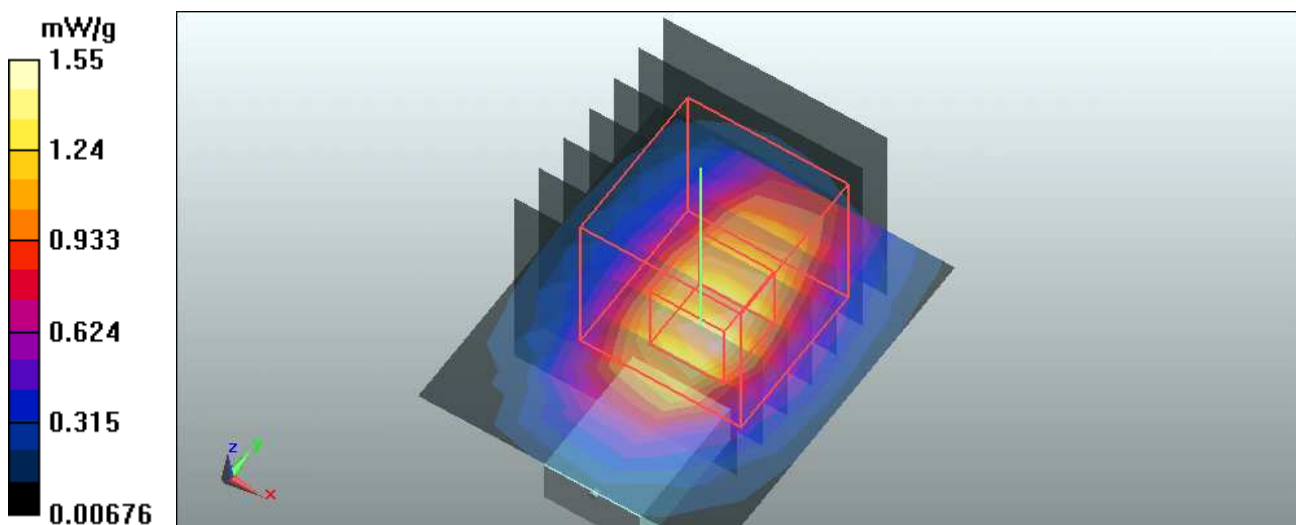Maximum value of SAR (measured) = 0.654 mW/g

Flat Section 5mm Low Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.09 V/m; Power Drift = 0.186 dB
Peak SAR (extrapolated) = 0.924 W/kg
SAR(1 g) = 0.445 mW/g; SAR(10 g) = 0.202 mW/g
Maximum value of SAR (measured) = 0.681 mW/g

Test Laboratory: Bureau Veritas ADT

M08-11n 40M-Ch4
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11n 40MHz ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Vertical-Front side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch4/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
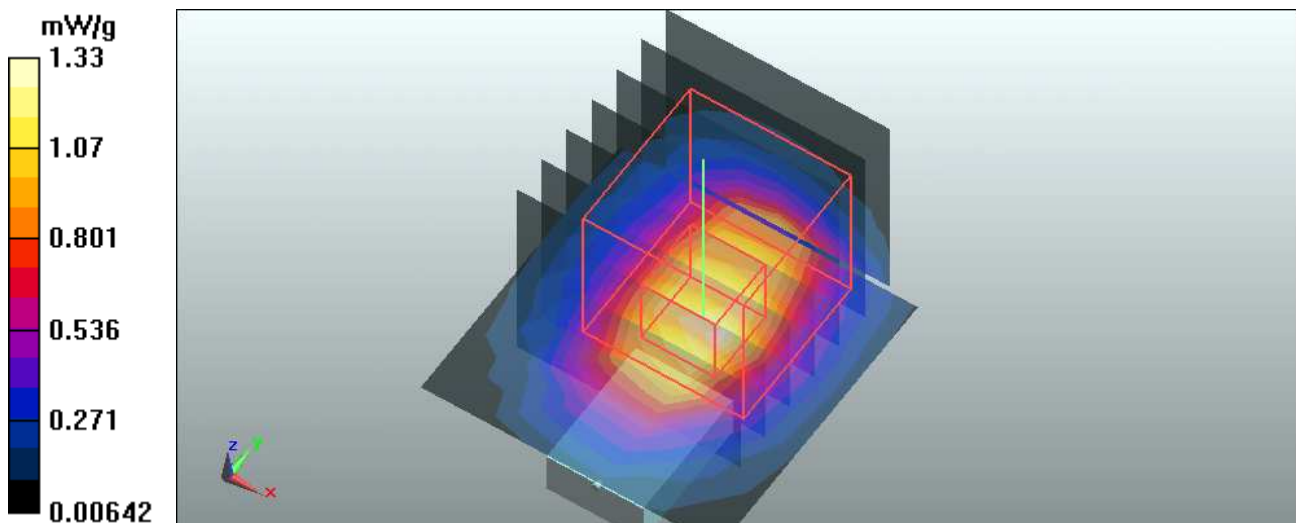Maximum value of SAR (measured) = 0.404 mW/g

Flat Section 5mm Mid Ch4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.56 V/m; Power Drift = 0.113 dB
Peak SAR (extrapolated) = 0.646 W/kg
SAR(1 g) = 0.307 mW/g; SAR(10 g) = 0.138 mW/g
Maximum value of SAR (measured) = 0.473 mW/g

Test Laboratory: Bureau Veritas ADT

M09-11b-Ch1
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11b ; Frequency: 2412 MHz ; Duty Cycle: 1:1 ; Modulation type: DBPSK
Medium: MSL2450 Medium parameters used: f = 2412 MHz; σ = 1.95 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Low Ch1/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
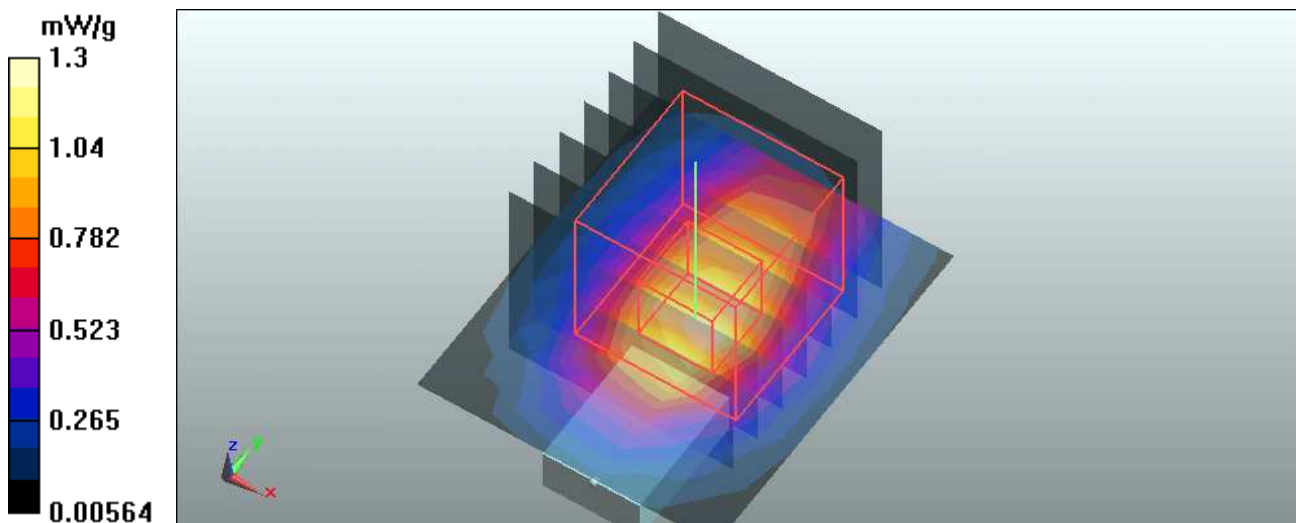Maximum value of SAR (measured) = 1.47 mW/g

Flat Section 5mm Low Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm,
dy=5mm, dz=5mm
Reference Value = 14.1 V/m; Power Drift = -0.153 dB
Peak SAR (extrapolated) = 2.09 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.474 mW/g
Maximum value of SAR (measured) = 1.55 mW/g

Test Laboratory: Bureau Veritas ADT

M09-11b-Ch6
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11b ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: DBPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch6/Area Scan (6x6x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 1.28 mW/g

Flat Section 5mm Mid Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.3 V/m; Power Drift = -0.192 dB
Peak SAR (extrapolated) = 1.79 W/kg
SAR(1 g) = 0.881 mW/g; SAR(10 g) = 0.413 mW/g
Maximum value of SAR (measured) = 1.33 mW/g

Test Laboratory: Bureau Veritas ADT

M09-11b-Ch11
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1 ; Modulation type: DBPSK
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.01 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm High Ch11/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
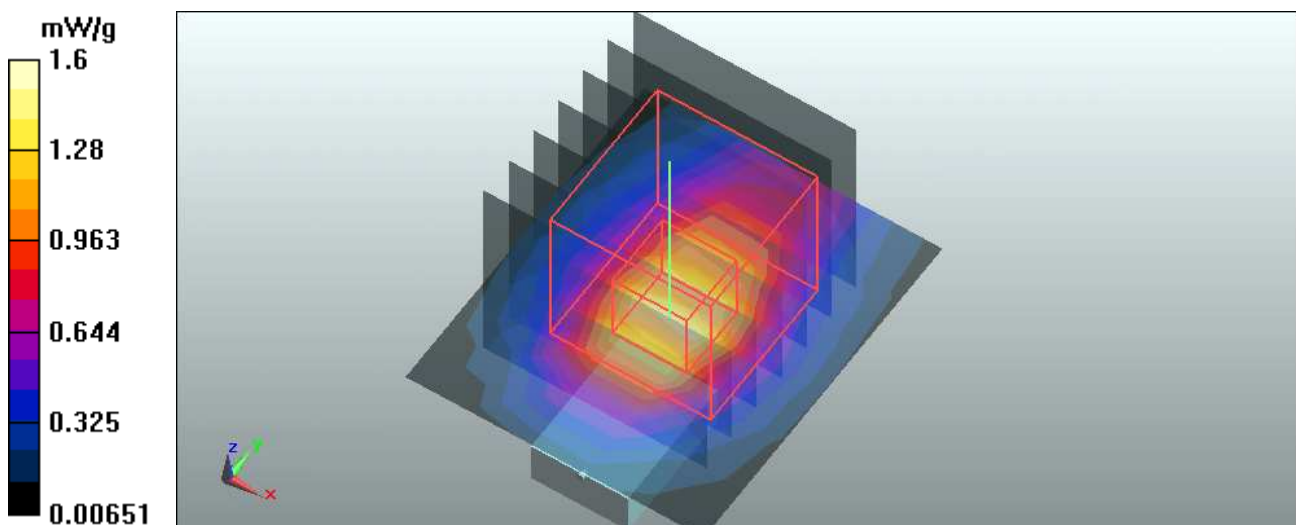Maximum value of SAR (measured) = 1.23 mW/g

Flat Section 5mm High Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.3 V/m; Power Drift = -0.123 dB
Peak SAR (extrapolated) = 1.75 W/kg
SAR(1 g) = 0.849 mW/g; SAR(10 g) = 0.396 mW/g
Maximum value of SAR (measured) = 1.3 mW/g

Test Laboratory: Bureau Veritas ADT

M10-11g-Ch1
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2412 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2412 MHz; σ = 1.95 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Low Ch1/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
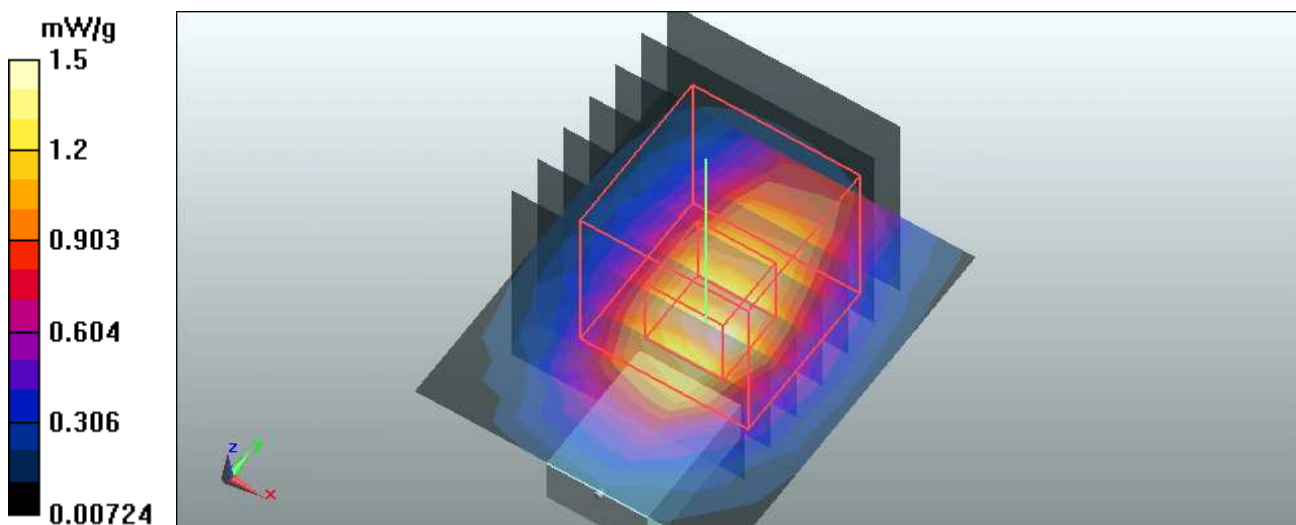Maximum value of SAR (measured) = 1.47 mW/g

Flat Section 5mm Low Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.5 V/m; Power Drift = -0.104 dB
Peak SAR (extrapolated) = 2.16 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.474 mW/g
Maximum value of SAR (measured) = 1.6 mW/g

Test Laboratory: Bureau Veritas ADT

M10-11g-Ch6
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch6/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
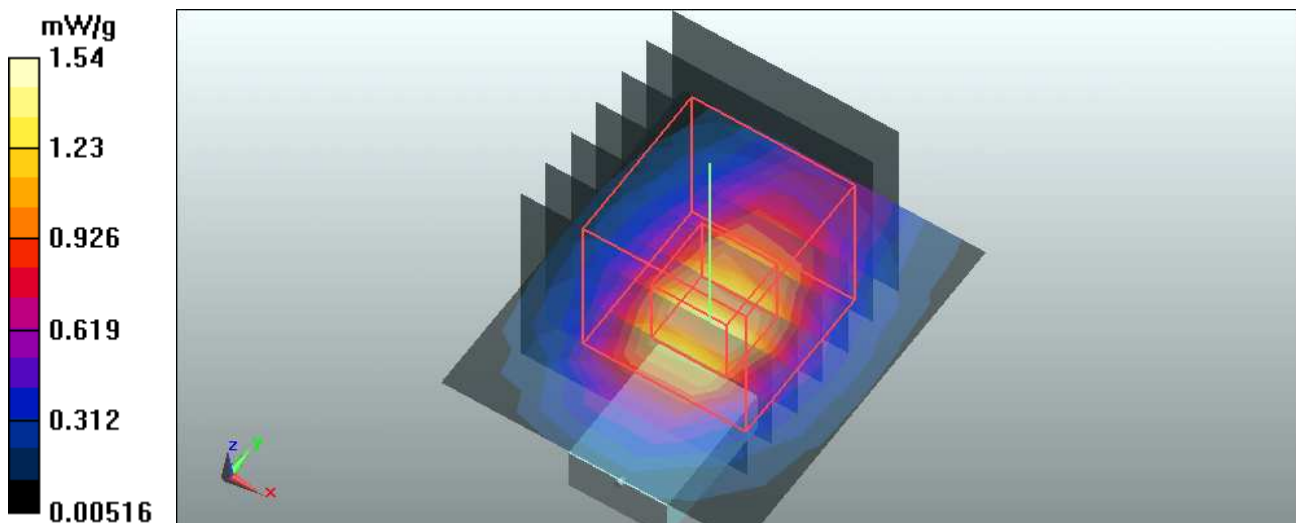Maximum value of SAR (measured) = 1.47 mW/g

Flat Section 5mm Mid Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.7 V/m; Power Drift = 0.044 dB
Peak SAR (extrapolated) = 2.02 W/kg
SAR(1 g) = 0.991 mW/g; SAR(10 g) = 0.464 mW/g
Maximum value of SAR (measured) = 1.5 mW/g

Test Laboratory: Bureau Veritas ADT

M10-11g-Ch11
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2462 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.01 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm High Ch11/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
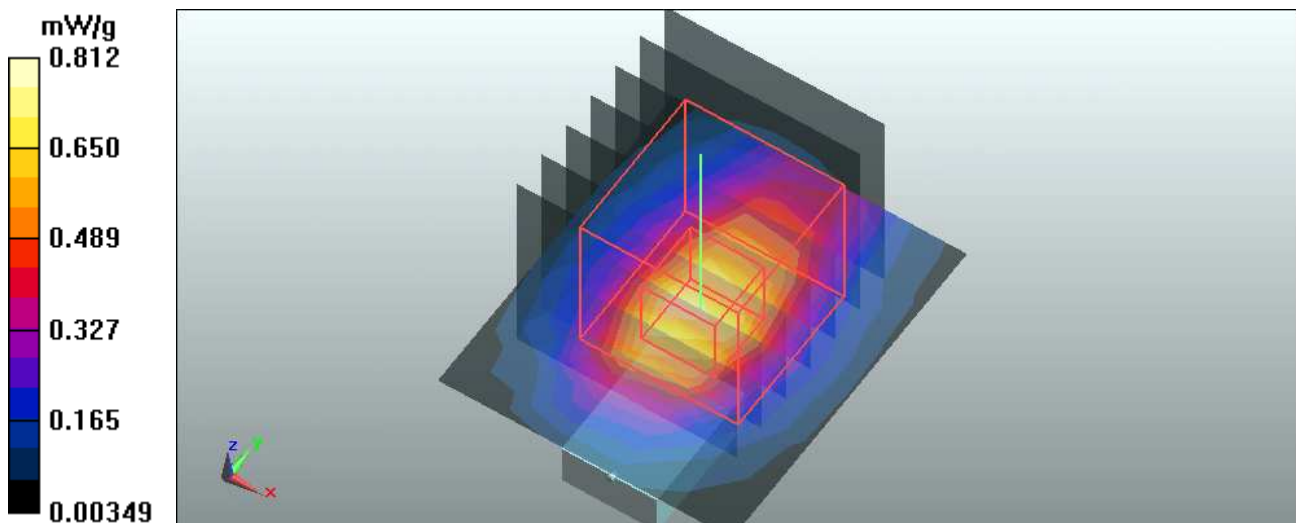Maximum value of SAR (measured) = 1.36 mW/g

Flat Section 5mm High Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = -0.091 dB
Peak SAR (extrapolated) = 2.1 W/kg
SAR(1 g) = 0.988 mW/g; SAR(10 g) = 0.441 mW/g
Maximum value of SAR (measured) = 1.54 mW/g

Test Laboratory: Bureau Veritas ADT

M11-11n 20M-Ch1
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11n 20MHz ; Frequency: 2412 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK

Medium: MSL2450 Medium parameters used: f = 2412 MHz; σ = 1.95 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3

Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Low Ch1/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
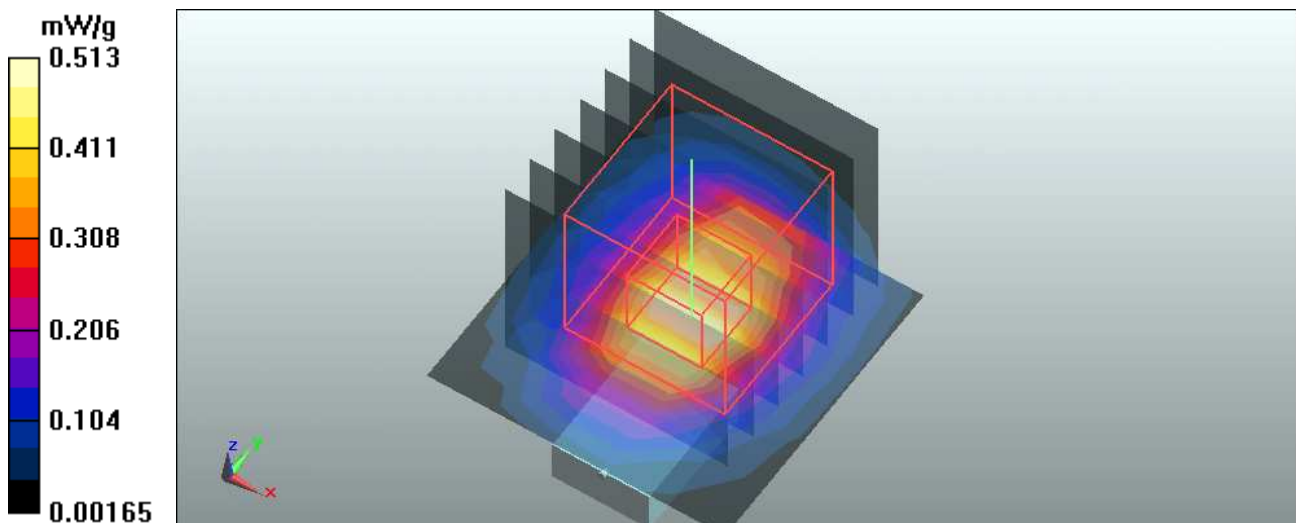Maximum value of SAR (measured) = 0.750 mW/g

Flat Section 5mm Low Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.1 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.543 mW/g; SAR(10 g) = 0.245 mW/g
Maximum value of SAR (measured) = 0.812 mW/g

Test Laboratory: Bureau Veritas ADT

M12-11n 40M-Ch4
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11n 40MHz ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Horizontal-Up side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch4/Area Scan (6x6x1): Measurement grid: dx=8mm, dy=8mm
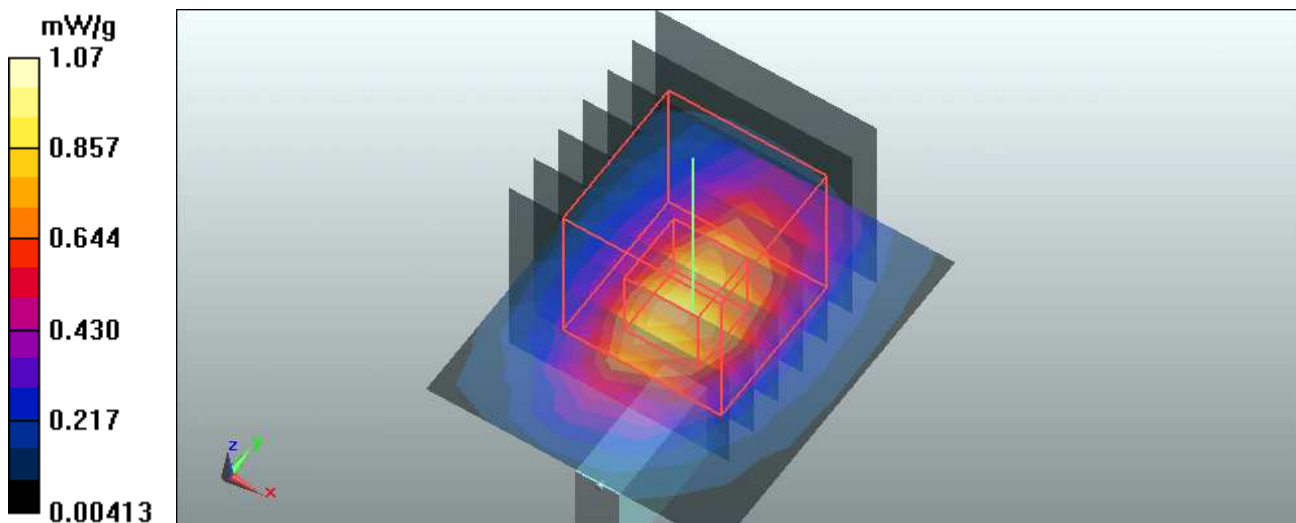Maximum value of SAR (measured) = 0.487 mW/g

Flat Section 5mm Mid Ch4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.04 V/m; Power Drift = 0.130 dB
Peak SAR (extrapolated) = 0.703 W/kg
SAR(1 g) = 0.344 mW/g; SAR(10 g) = 0.156 mW/g
Maximum value of SAR (measured) = 0.513 mW/g

Test Laboratory: Bureau Veritas ADT

M13-11b-Ch6
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11b ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: DBPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m³
Phantom section: Flat Section ; Separation distance : 5 mm (The Vertical-Back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch6/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
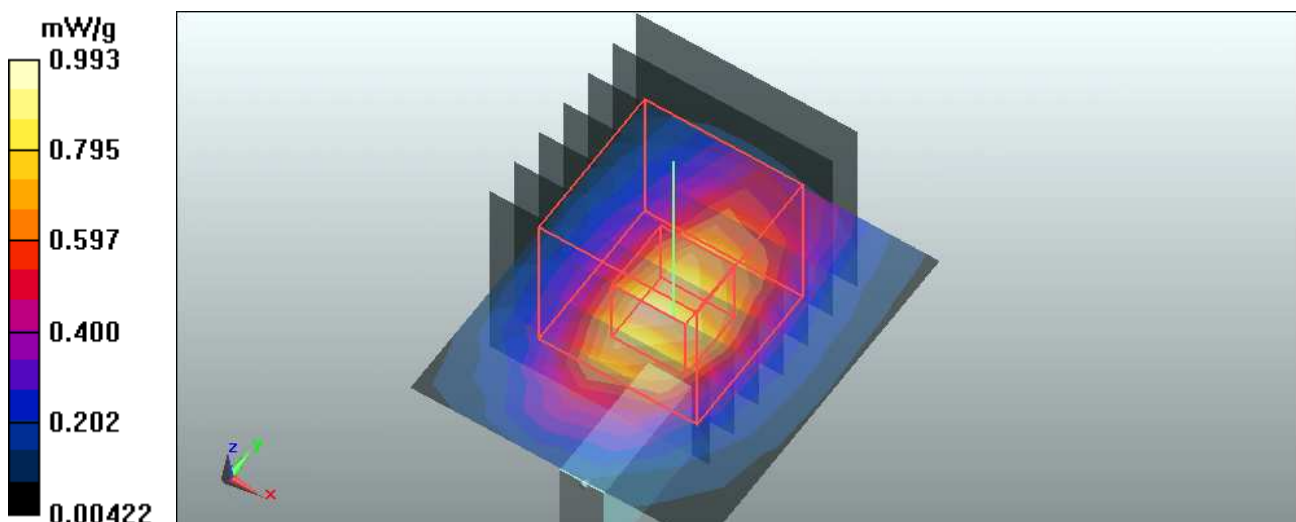Maximum value of SAR (measured) = 0.927 mW/g

Flat Section 5mm Mid Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12 V/m; Power Drift = 0.195 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.695 mW/g; SAR(10 g) = 0.317 mW/g
Maximum value of SAR (measured) = 1.07 mW/g

Test Laboratory: Bureau Veritas ADT

M14-11g-Ch11
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2462 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.01 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Vertical-Back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm High Ch11/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
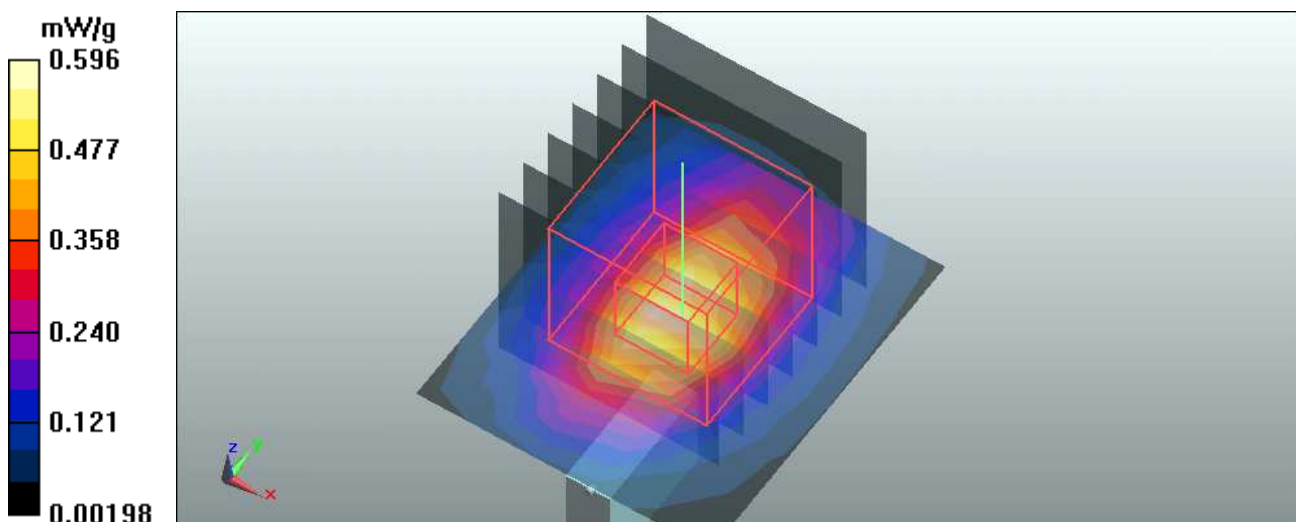Maximum value of SAR (measured) = 0.930 mW/g

Flat Section 5mm High Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.6 V/m; Power Drift = -0.114 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.634 mW/g; SAR(10 g) = 0.288 mW/g
Maximum value of SAR (measured) = 0.993 mW/g

Test Laboratory: Bureau Veritas ADT

M15-11n 20M-Ch1
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11n 20MHz ; Frequency: 2412 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2412 MHz; σ = 1.95 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Vertical-Back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Low Ch1/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.568 mW/g

Flat Section 5mm Low Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.92 V/m; Power Drift = 0.141 dB
Peak SAR (extrapolated) = 0.810 W/kg
SAR(1 g) = 0.390 mW/g; SAR(10 g) = 0.178 mW/g
Maximum value of SAR (measured) = 0.596 mW/g

27

Test Laboratory: Bureau Veritas ADT

M16-11n 40M-Ch4
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11n 40MHz ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The Vertical-Back side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch4/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
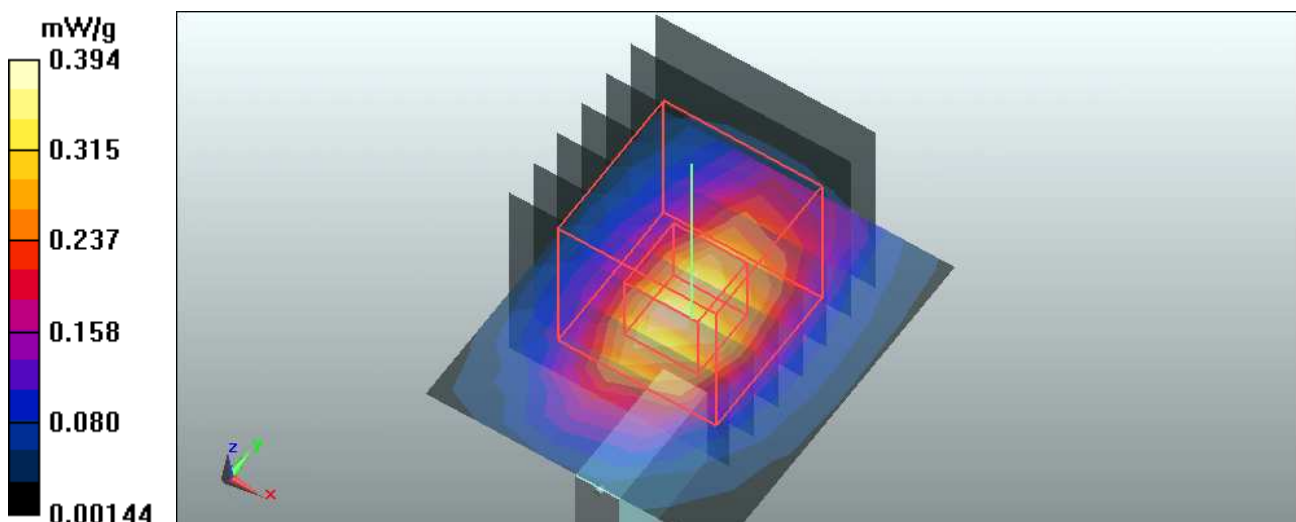Maximum value of SAR (measured) = 0.369 mW/g

Flat Section 5mm Mid Ch4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.3 V/m; Power Drift = 0.198 dB
Peak SAR (extrapolated) = 0.538 W/kg
SAR(1 g) = 0.253 mW/g; SAR(10 g) = 0.115 mW/g
Maximum value of SAR (measured) = 0.394 mW/g

Test Laboratory: Bureau Veritas ADT

M17-11b-Ch6
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11b ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: DBPSK
Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The tip side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm Mid Ch6/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
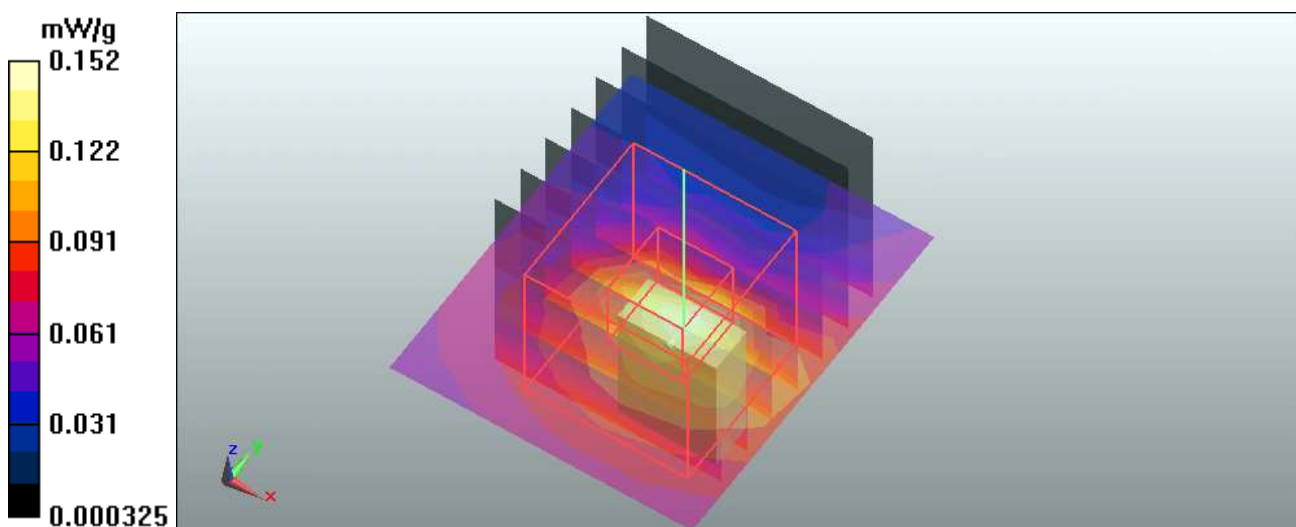Maximum value of SAR (measured) = 0.149 mW/g

Flat Section 5mm Mid Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.52 V/m; Power Drift = 0.115 dB
Peak SAR (extrapolated) = 0.227 W/kg
SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.047 mW/g
Maximum value of SAR (measured) = 0.152 mW/g

Test Laboratory: Bureau Veritas ADT

M18-11g-Ch11
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11g ; Frequency: 2462 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.01 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The tip side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat Section 5mm High Ch11/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
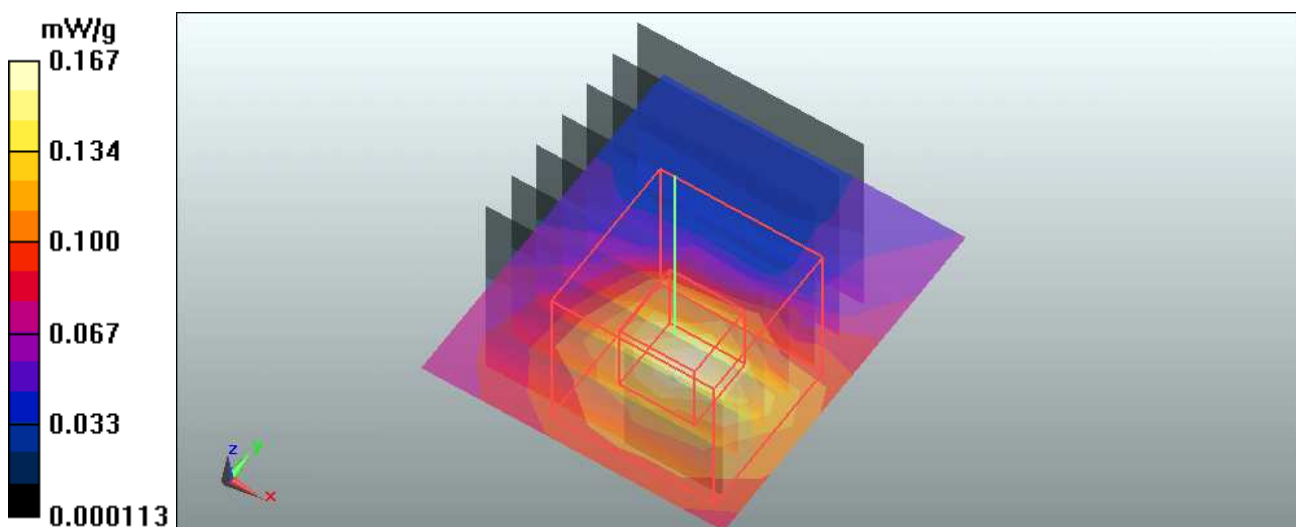Maximum value of SAR (measured) = 0.164 mW/g

Flat Section 5mm High Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm,
dy=5mm, dz=5mm
Reference Value = 9.3 V/m; Power Drift = -0.149 dB
Peak SAR (extrapolated) = 0.250 W/kg
SAR(1 g) = 0.106 mW/g; SAR(10 g) = 0.052 mW/g
Maximum value of SAR (measured) = 0.167 mW/g

Test Laboratory: Bureau Veritas ADT

M19-11n 20M-Ch1
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11n 20MHz ; Frequency: 2412 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK
Medium: MSL2450 Medium parameters used: f = 2412 MHz; σ = 1.95 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Separation distance : 5 mm (The tip side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Flat-Section MSL/Flat Section 5mm Low Ch1/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
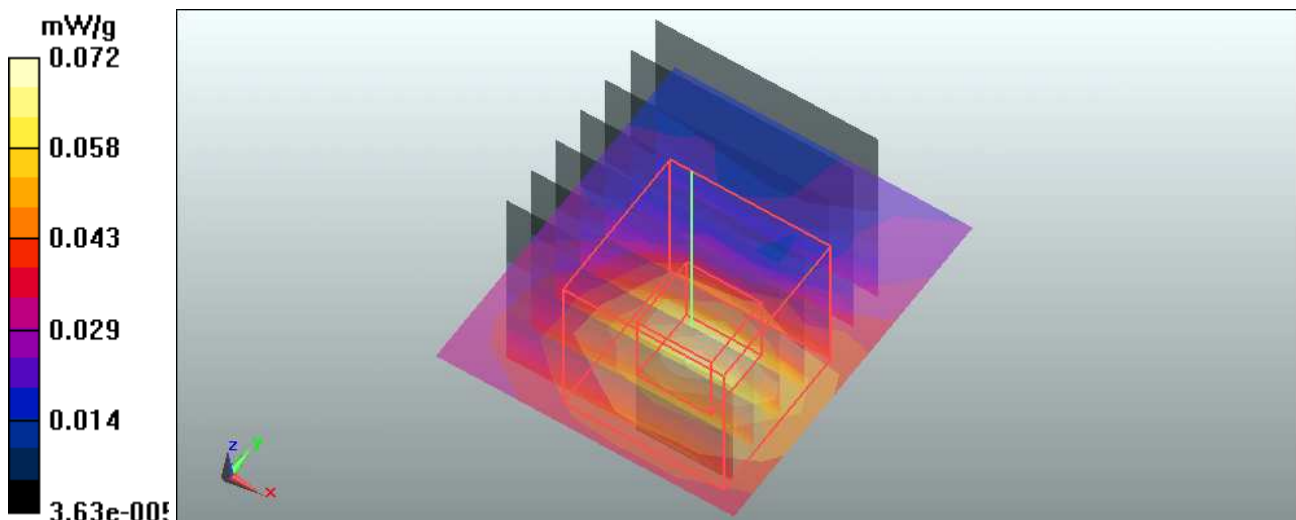Maximum value of SAR (measured) = 0.065 mW/g

Flat-Section MSL/Flat Section 5mm Low Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.03 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 0.108 W/kg
SAR(1 g) = 0.047 mW/g; SAR(10 g) = 0.023 mW/g
Maximum value of SAR (measured) = 0.072 mW/g

Test Laboratory: Bureau Veritas ADT

M20-11n 40M-Ch4
DUT: IEEE 802.11b/g/n USB Wireless Adapter ; Type: AW-NU138

Communication System: 802.11n 40MHz ; Frequency: 2437 MHz ; Duty Cycle: 1:1 ; Modulation type: BPSK

Medium: MSL2450 Medium parameters used: f = 2437 MHz; σ = 1.98 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3

Phantom section: Flat Section ; Separation distance : 5 mm (The tip side of the EUT to the Phantom)

DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61
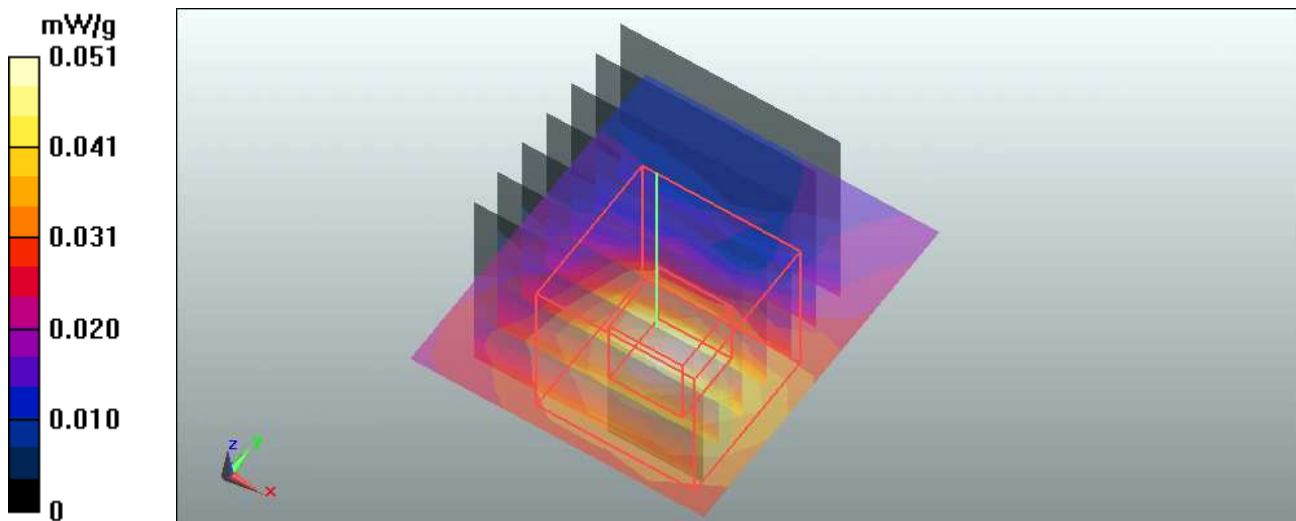
Flat Section 5mm Mid Ch4/Area Scan (6x7x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.051 mW/g

Flat Section 5mm Mid Ch4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.11 V/m; Power Drift = 0.076 dB
Peak SAR (extrapolated) = 0.079 W/kg
SAR(1 g) = 0.033 mW/g; SAR(10 g) = 0.016 mW/g

Test Laboratory: Bureau Veritas ADT

SystemPerformanceCheck-D2450V2-MSL2450
DUT: Dipole 2450 MHz D2450V2 ; Type: D2450V2 ; Serial: D2450V2 - SN:737 ; Test Frequency: 2450 MHz

Communication System: CW ; Frequency: 2450 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL2450;Medium parameters used: f = 2450 MHz; σ = 2 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3 ;
Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feet point of the dipole to the Phantom)Air temp. : 22.6 degrees ; Liquid temp. : 21.3 degrees

 DASY5 Configuration:

- Probe: EX3DV3 - SN3504; ConvF(7.91, 7.91, 7.91); Calibrated: 2010/1/26

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn579; Calibrated: 2010/9/20

- Phantom: SAM with CRP; Type: SAM; Serial: TP-1485

- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 13.4 mW/g
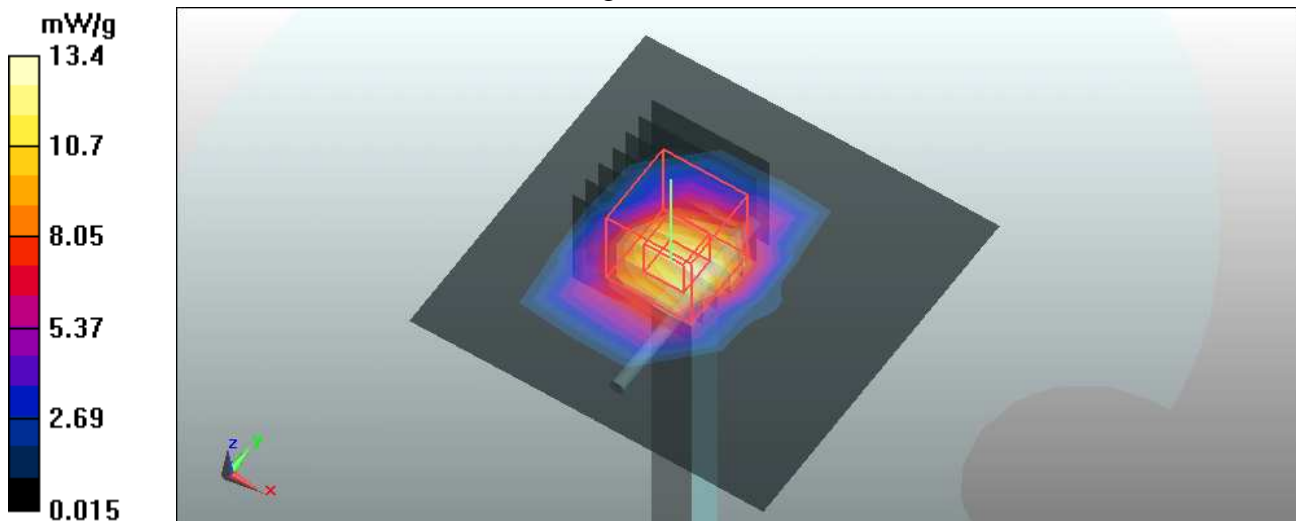**d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0:**
Measurement grid: dx=5mm, dy=5mm, dz=5mm
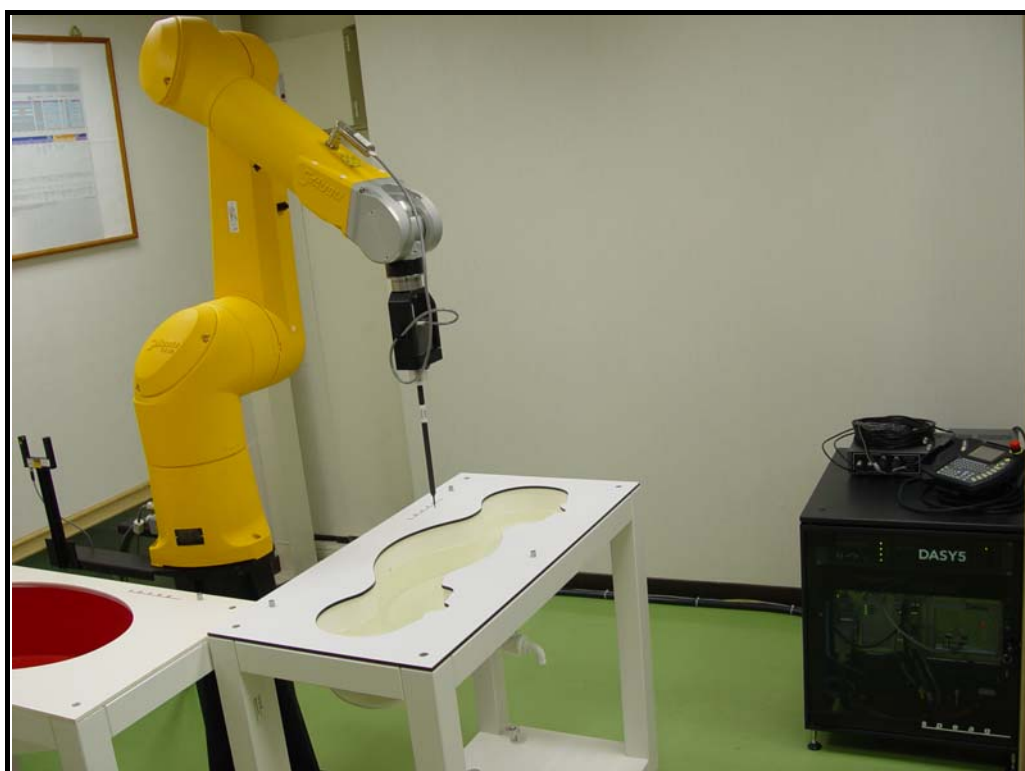Reference Value = 100.2 V/m; Power Drift = 0.050 dB
Peak SAR (extrapolated) = 27.4 W/kg
SAR(1 g) = 13.4 mW/g; SAR(10 g) = 6.12 mW/g
Maximum value of SAR (measured) = 20.3 mW/g

APPENDIX B: BV ADT SAR MEASUREMENT SYSTEM

APPENDIX C: PHOTOGRAPHS OF SYSTEM VALIDATION