SAR TEST REPORT

HCT CO., LTD

EUT Type:	USB Modem		
FCC ID:	XHG-U310		
Model:	U310	Trade Name	Franklin
Date of Issue:	Mar. 04, 2011		
Test report No.:	HCTA1102FS02		
Test Laboratory:	**HCT CO., LTD.** SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA TEL: +82 31 639 8565 FAX: +82 31 639 8525		
Applicant :	**Franklin Technology Inc.** 906 JEI Platz, 459-11, Gasan-Dong, Gumcheon-Gu, Seoul,Korea 153-803		
Testing has been carried out in accordance with:	47CFR §2.1093 FCC OET Bulletin 65(Edition 97-01), Supplement C (Edition 01-01) ANSI/ IEEE C95.1 – 2005 IEEE 1528-2003		
Test result:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		
Signature	Report prepared by : Sun-Hee Kim Test Engineer of SAR Part	Approved by : Jae-Sang So Manager of SAR Part	

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1. INTRODUCTION

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-2005 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (d*W*) absorbed by (dissipated in) an incremental mass (d*m*) contained in a volume element (d*V*) of a given density (*r*). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{\rho\, dv}\right)$$

Figure 2. SAR Mathematical Equation

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

$$SAR = \sigma E^2 / \rho$$

where:

σ	=	conductivity of the tissue-simulant material (S/m)
ρ	=	mass density of the tissue-simulant material (kg/m^3)
E	=	Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

2. DESCRIPTION OF DEVICE

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

EUT Type	USB Modem
FCC ID	XHG-U310
Model(s)	U310
Trade Name	Franklin
Serial Number(s)	#1
Application Type	Certification
Modulation(s)	WIMAX 2600
Tx Frequency	2 498.5 MHz – 2 687.5 MHz (5 MHz Bandwidth) 2 501.0 MHz – 2 685.0 MHz (10 MHz Bandwidth)
Rx Frequency	2 498.5 MHz – 2 687.5 MHz (5 MHz Bandwidth) 2 501.0 MHz – 2 685.0 MHz (10 MHz Bandwidth)
FCC Classification	Licensed Non-Broadcast Station Transmitter (TNB)
Production Unit or Identical Prototype	Prototype
Max. Scaled SAR	1.598 W/kg WIMAX2600 Body SAR
Date(s) of Tests	Jan. 3, 2011 ~ Jan. 4, 2011
Antenna Type	Intenna

3. DESCRIPTION OF TEST EQUIPMENT

3.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure.3.1).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the HP Pentium IV 3.0 GHz computer with Windows XP system and SAR Measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

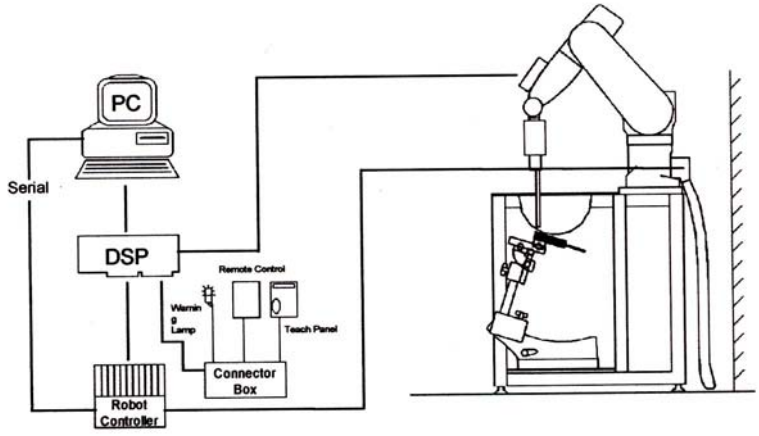


Figure 3.1 HCT SAR Lab. Test Measurement Set-up

The DAE4 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in.

3.2 DASY E-FIELD PROBE SYSTEM

3.2.1 ES3DV6 Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors
	Built-in shielding against static charges
	PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Basic Broad Band Calibration in air
	Conversion Factors (CF) for HSL 900 and HSL 1810
	Additional CF for other liquids and frequencies upon request
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis)
	± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm)
	Tip diameter: 3.9 mm (Body: 12 mm)
	Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz
	Dosimetry in strong gradient fields
	Compliance tests of mobile phones

Figure 4.1 Photograph of the probe and the Phantom

Figure 4.2 ES3DV6 E-field Probe

The SAR measurements were conducted with the dosimetric probe ET3DV6, designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box
on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches a maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle.
The DASY4 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting.
The approach is stopped at reaching the maximum.

3.3 PROBE CALIBRATION PROCESS

3.3.1 E-Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with an accuracy better than ± 10 %. The spherical isotropy was evaluated with the proper procedure and found to be better than ± 0.25 dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe is tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a waveguide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

where:

Δt = exposure time (30 seconds),

C = heat capacity of tissue (brain or muscle),

ΔT = temperature increase due to RF exposure.

SAR is proportional to $\Delta T / \Delta t$, the initial rate of tissue heating, before thermal diffusion takes place. Now it's possible to quantify the electric field in the simulated tissue by equating the thermally derived SAR to the E- field;

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

where:

σ = simulated tissue conductivity,

ρ = Tissue density (1.25 g/cm^3 for brain tissue)

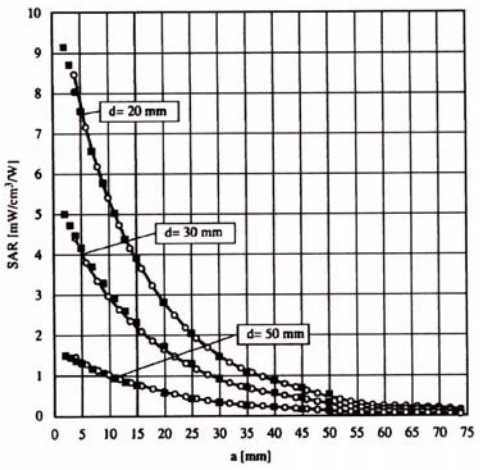


Figure 3.4 E-Field and Temperature measurements at 900 MHz

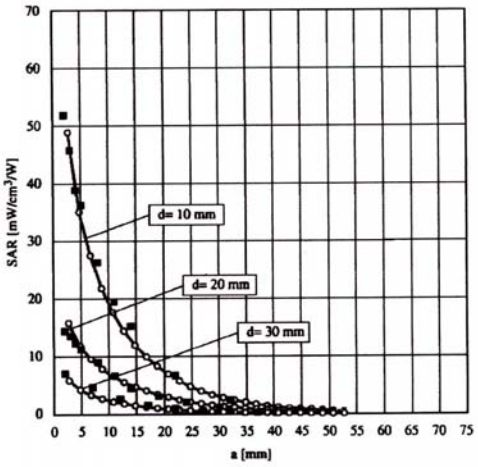


Figure 3.5 E-Field and temperature measurements at 1.8 GHz

3.3.2 Data Extrapolation

The DASY4 software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. 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 like below;

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

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

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

E-field probes:

$$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

with V_i = compensated signal of channel i (i = x,y,z)
$Norm_i$ = sensor sensitivity of channel i (i = x,y,z)
$\mu V/(V/m)^2$ for E-field probes
ConvF = sensitivity of enhancement in solution
E_i = electric field strength of channel i in V/m

The RSS value of the field components gives the total field strength (Hermetian 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.

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

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

The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = \frac{E_{tot}^2}{3770}$$

with P_{pwe} = equivalent power density of a plane wave in W/cm^2
E_{tot} = total electric field strength in V/m

3.4 SAM Phantom

The SAM Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90 % of all users. 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 the 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 in the robot.

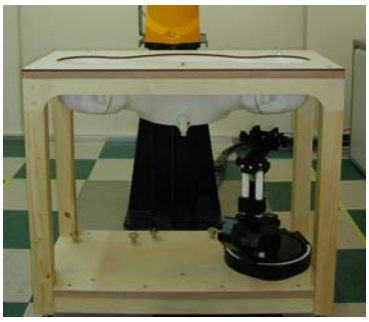


Figure 3.6 SAM Phantom

Shell Thickness	2.0 mm
Filling Volume	about 30 L
Dimensions	810 mm x 1 000 mm x 500 mm (H x L x W)

3.5 Device Holder for Transmitters

In combination with the SAM Phantom V 4.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatable positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations. To produce the Worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

Figure 3.7 Device Holder

3.6 Brain & Muscle Simulating Mixture Characterization

The brain and muscle mixtures consist of a viscous gel using hydrox-ethyl cellulose (HEC) gelling agent and saline solution (see Table 3.1). Preservation with a bacteriacide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The mixture characterizations used for the brain and muscle tissue simulating liquids are according to the data by C. Gabriel and G. Hartsgrove.

Ingredients (% by weight)	Frequency (MHz)											
	450		835		915		1 900		2 450		2600	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2	60.8	69.83
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04	0.3	0.00
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0	38.9	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7	0.0	30.17

Salt:	99 % Pure Sodium Chloride	Sugar:	98 % Pure Sucrose
Water:	De-ionized, 16M resistivity	HEC:	Hydroxyethyl Cellulose
DGBE:	99 % Di(ethylene glycol) butyl ether,[2-(2-butoxyethoxy) ethanol]		
Triton X-100(ultra pure):	Polyethylene glycol mono[4-(1,1,3,3-tetramethylbutyl)phenyl] ether		

Table 3.1 Composition of the Tissue Equivalent Matter

3.7 SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
Staubli	Robot RX90L	F01/5K09A1/A/01	N/A	N/A	N/A
Staubli	Robot ControllerCS7MB	F99/5A82A1/C/01	N/A	N/A	N/A
HP	Pavilion t000_puffer	KRJ51201TV	N/A	N/A	N/A
SPEAG	Light Alignment Sensor	265	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D221340.01	N/A	N/A	N/A
SPEAG	DAE4	869	Sep 18, 2010	Annual	Sep 18, 2011
SPEAG	E-Field Probe ES3DV3	3161	Mar 22, 2010	Annual	Mar 22, 2011
SPEAG	Validation Dipole D2600V2	1015	Mar. 18, 2010	Annual	Mar. 18, 2011
Agilent	Power Meter(F) E4419B	MY41291386	Nov. 05, 2010	Annual	Nov. 05, 2011
Agilent	Power Sensor(G) 8481	MY41090870	Nov. 05, 2010	Annual	Nov. 05, 2011
HP	Dielectric Probe Kit 85070C	00721521	N/A	N/A	N/A
HP	Dual Directional Coupler	16072	Nov. 05, 2010	Annual	Nov. 05, 2011
R&S	Base Station CMU200	110740	July 26, 2010	Annual	July 26, 2011
Agilent	Base Station E5515C	GB44400269	Feb. 10, 2011	Annual	Feb. 10, 2012
HP	Signal Generator E4438C	MY42082646	Nov. 11, 2010	Annual	Nov. 11, 2011
HP	Network Analyzer 8753ES	MY4000025	Sep. 02, 2010	Annual	Sep. 02, 2011

NOTE:

The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Validation measurement is performed by HCT Lab. before each test. The brain simulating material is calibrated by HCT using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain-equivalent material.

4. SAR MEASUREMENT PROCEDURE

The evaluation was performed with the following procedure:

1. The SAR value at a fixed location above the ear point was measured and was used as a reference value for assessing the power drop.

2. The SAR distribution at the exposed side of the head was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 20 mm x 20 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

3. Around this point, a volume of 32 mm x 32 mm x 30 mm was assessed by measuring 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

   a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
   b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR value, at the same location as procedure #1, was re-measured. If the value changed by more than 5 %, the evaluation is repeated.

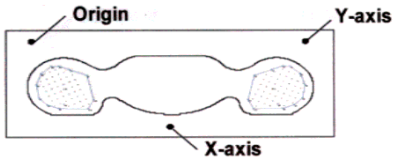


Figure 4.1 SAR Measurement Point in Area Scan

5. DESCRIPTION OF TEST POSITION

5.1 HEAD POSITION

The device was placed in a normal operating position with the Point A on the device, as illustrated in following drawing, aligned with the location of the RE(ERP) on the phantom. With the ear-piece pressed against the head, the vertical center line of the body of the handset was aligned with an imaginary plane consisting of the RE, LE and M. While maintaining these alignments, the body of the handset was gradually moved towards the cheek until any point on the mouth-piece or keypad contacted the cheek. This is a cheek/touch position. For ear/tilt position, while maintain the device aligned with the BM and FN lines, the device was pivot against ERP back for 15º or until the device antenna touch the phantom. Please refer to IEEE 1528-2003 illustration below.

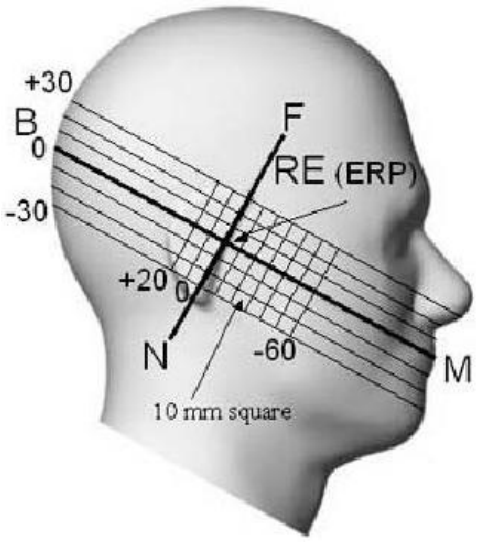


Figure 5.1 Side view of the phantom

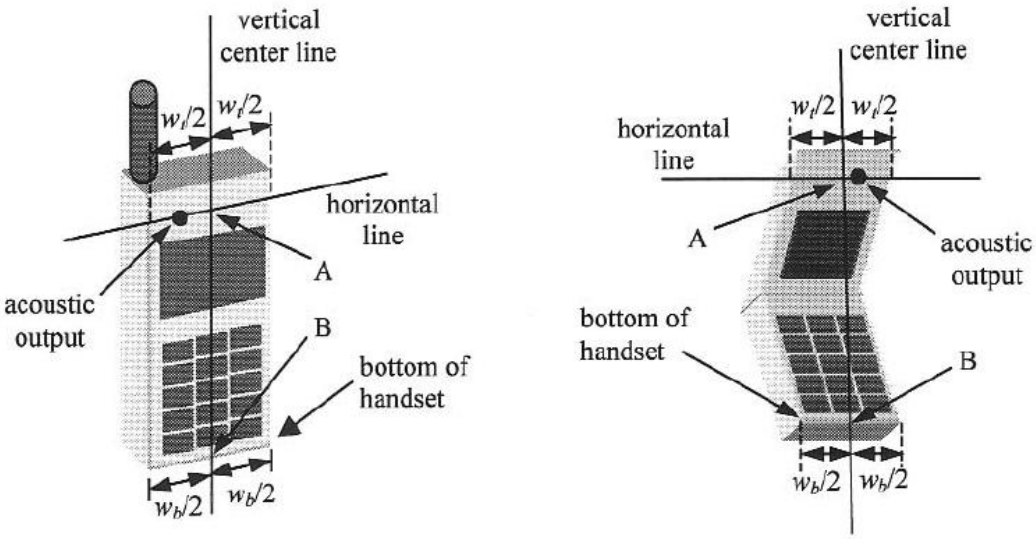


Figure 5.2 Handset vertical and horizontal reference lines

5.2 Body Holster/Belt Clip Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. A device with a headset output is tested with a headset connected to the device. Body dielectric parameters are used.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with each accessory. If multiple accessory share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some Devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used.

Since this EUT does not supply any body worn accessory to the end user a distance of 5 mm from the EUT back surface to the liquid interface is configured for the generic test.

"See the Test SET-UP Photo"

Transmitters that are designed to operate in front of a person’s face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessory(ies), Including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worstcase positioning is then documented and used to perform Body SAR testing.

5.3 Test Configurations

According to KDB 447498, the device that can be connected to a host through a cable must be tested with the device positioned in all applicable orientations against the flat phantom. And a separation distance ≤ 0.5 cm is required for USB-dongle transmitters.

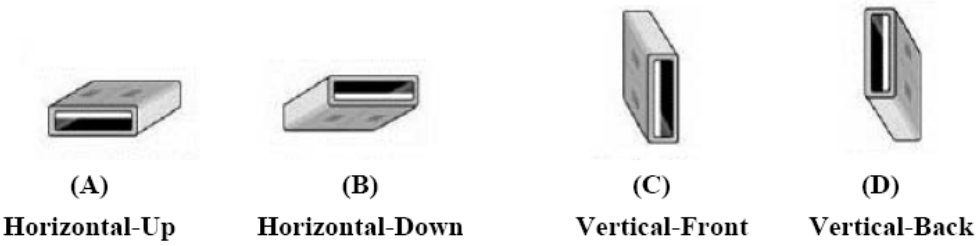


Figure 5.3 USB Connector Orientations Implemented on Laptop Computers

Therefore, the EUT was tested in following orientations;

1) Configuration 1: Front side of the EUT was tested with the direct-connection to the host device with Horizontal-Up (A), and separation distance between EUT and Phantom is 5 mm.

2) Configuration 2: Back side of the EUT was connected to the host device with Horizontal-Down (B) using a USB cable, and separation distance between EUT and Phantom is 5 mm.

3) Configuration 3: Right side of the EUT was connected to the host device with Vertical-Front (C)using a USB cable, and separation distance between EUT and Phantom is 5 mm.

4) Configuration 4: Left side of the EUT was tested with the direct-connection to the host device with Vertical-Back (D), and separation distance between EUT and Phantom is 5 mm.

5) Configuration 5: Top side of the EUT was tested with the direct-connection to the host device, and separation distance between EUT and Phantom is 5 mm.

Note;

This USB cable was used to operate this unit in the highest RF performance capability for SAR testing.

6. MEASUREMENT UNCERTAINTY

Error Description	Tol (± %)	Prob. dist.	Div.	c_i	Standard Uncertainty (± %)	v_{eff}
1. Measurement System						
Probe Calibration	5.50	N	1	1	5.50	∞
Axial Isotropy	4.70	R	1.73	0.7	1.90	∞
Hemispherical Isotropy	9.60	R	1.73	0.7	3.88	∞
Boundary Effects	1.00	R	1.73	1	0.58	∞
Linearity	4.70	R	1.73	1	2.71	∞
System Detection Limits	1.00	R	1.73	1	0.58	∞
Readout Electronics	0.30	N	1.00	1	0.30	∞
Response Time	0.8	R	1.73	1	0.46	∞
Integration Time	2.6	R	1.73	1	1.50	∞
RF Ambient Noise	3.00	R	1.73	1	1.73	∞
RF Ambient Reflection	3.00	R	1.73	1	1.73	∞
Probe Positioner	0.40	R	1.73	1	0.23	∞
Probe Positioning	2.90	R	1.73	1	1.67	∞
Max SAR Eval	1.00	R	1.73	1	0.58	∞
2.Test Sample Related						
Device Positioning	1.80	N	1.00	1	1.80	9
Device Holder	3.60	N	1.00	1	3.60	5
Power Drift	5.00	R	1.73	1	2.89	∞
3.Phantom and Setup						
Phantom Uncertainty	4.00	R	1.73	1	2.31	∞
Liquid Conductivity(target)	5.00	R	1.73	0.64	1.85	∞
Liquid Conductivity(meas.)	2.07	N	1	0.64	1.32	9
Liquid Permitivity(target)	5.00	R	1.73	0.6	1.73	∞
Liquid Permitivity(meas.)	5.02	N	1	0.6	3.01	9
Combind Standard Uncertainty					10.76	
Coverage Factor for 95 %					k=2	
Expanded STD Uncertainty					21.53	

Table 6.1 835 MHz – 2700 MHz

7. ANSI/ IEEE C95.1 - 2005 RF EXPOSURE LIMITS

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT Occupational (W/kg) or (mW/g)
SPATIAL PEAK SAR * (Brain)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.00

Table 7.1 Safety Limits for Partial Body Exposure

NOTES:

* The Spatial Peak value of the SAR averaged over any 1 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

** The Spatial Average value of the SAR averaged over the whole-body.

*** The Spatial Peak value of the SAR averaged over any 10 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e.as a result of employment or occupation).

8. SYSTEM VERIFICATION

8.1 Tissue Verification

Freq. [MHz]	Date	Liquid	Liquid Temp.[°C]	Parameters	Target Value	Measured Value	Deviation [%]	Limit [%]
2600	Jan. 3, 2011	Body	21.4	ε r	52.5	51.4	- 2.10	± 5
				σ	2.16	2.17	+ 0.46	± 5
2600	Jan. 4, 2011	Body	21.3	ε r	52.5	51.4	- 2.10	± 5
				σ	2.16	2.17	+ 0.46	± 5

8.2 System Validation

Prior to assessment, the system is verified to the ± 10 % of the specifications at 2 600 MHz by using the system validation kit. (Graphic Plots Attached)

* *Input Power: 100 mW

Freq. [MHz]	Date	Liquid	Liquid Temp. [°C]	SAR Average	Target Value (SPEAG) (mW/g)	* Measured Value (mW/g)	Deviation [%]	Limit [%]
2 600	Jan. 3, 2011	Body	21.4	1 g	57.3	5.92	+ 3.32	± 10
2 600	Jan. 4, 2011	Body	21.3	1 g	57.3	5.96	+ 4.01	± 10

8.3 System Validation Procedure

SAR measurement was Prior to assessment, the system is verified to the ± 10 % of the specifications at 2 600 MHz by using the system validation kit. (Graphic Plots Attached)

- Cabling the system, using the validation kit equipments.
- Generate about 100 mW Input Level from the Signal generator to the Dipole Antenna.
- Dipole Antenna was placed below the Flat phantom.
- The measured one-gram SAR at the surface of the phantom above the dipole feed-point should be within 10 % of the target reference value.

9.Devices with WIMAX

9.1 802.16e/WiMAX Device and System Operating Parameters

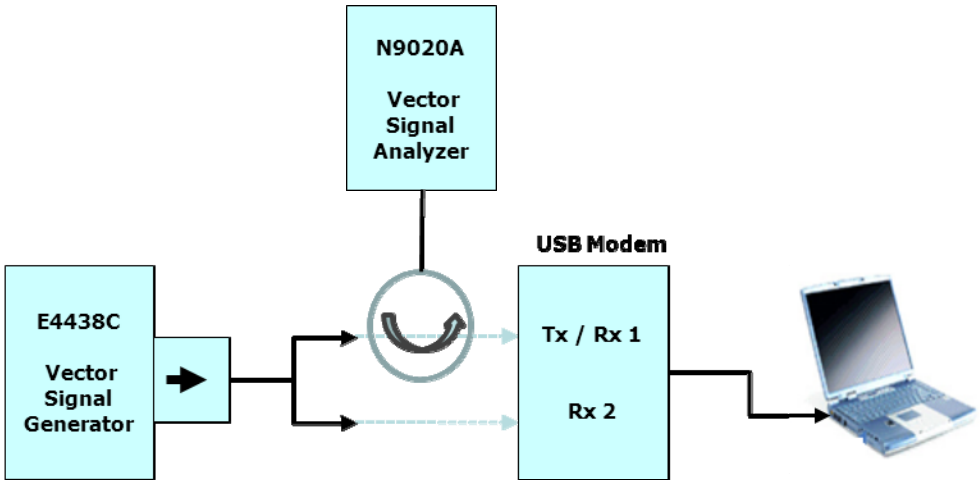
Description	Parameter		Comment
FCC ID	XHG-U310		Identify all related FCC ID
Radio Service	Part 27 subpart M		Rule parts
Transmit Frequency Range (MHz)	2496MHz-2690MHz		System parameter
System/Channel Bandwidth (MHz)	5MHz	10MHz	System parameter
System Profile	Revision 1.7.0		Defined by WiMax Forum
Modulation Schemes	QPSK, 16QAM		Identify all applicable UL modulations
Sampling Factor	28/25		System parameter
Sampling Frequency (MHz)	5.6MHz	11.2MHz	(F_s)
Sample Time (ns)	178.58ns	89.3ns	($1/F_s$)
FFT Size (N_{FFT})	512	1024	(N_{FFT})
Sub-Carrier Spacing (MHz)	0.01094		(Δf)
Useful Symbol time (μs)	91.43μs		($T_b=1/\Delta f$)
Guard Time (μs)	11.43us		($T_g=T_b/cp$); cp = cyclic prefix
OFDMA Symbol time (μs)	102.857us		($T_s=T_b+T_g$)
Frame Size (ms)	5ms		System parameter
TTG + RTG (us or number of symbols)	165.72μs		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 Ratios	29:18		Identify all applicable DL:UL ratios; used to determine UL duty factor
Power Class (dBm)	Power Class 2, 23±1dBm		Identify power class and tolerance
Wave1 / Wave2	Wave2, 2Rx+1Tx Diversity		Describe antenna diversity info and MIMO requirements separately
UL Zone Types (FUSC, PUSC, OFUSC, OPUSC, AMC, TUSC1, TUSC2)	PUSC		Describe separately the symbol and sub-carrier/sub-channel structures applicable to each zone type
Maximum Number of UL Sub-carriers	840	420	Identify the allowed and tested or to be tested parameters; include separated

Measured UL Burst Maximum Average Power	5 MHz QPSK 1/2: 22.86 dBm 10 MHz QPSK 1/2: 23.10 dBm		explanations on the control symbol configuration used in the power measurements and show the maximum power level is determined for the control symbols
UL Control Symbol Configuration	3 PUSC symbols (used for ranging, CQICH and ACK/NACK)		
UL Control Symbol Maximum Average Power	73.82 mW	35.86 mW	
UL Burst Peak-to-Average Power Ratio (PAR)	For 5 MHz Channel BW is between 6.25~6.56 dB(ANT1) 6.28~6.65 dB(ANT2) For 10 MHz Channel BW is between 6.29~6.51 dB(ANT1) 6.14~6.51 dB(ANT2)		Identify the expected range and measured/tested PAR; explain separately the methods used or to be used to address SAR probe calibration and measurement error issues
Frame Averaged UL Transmission Duty Factor (%)	Duty Factor = 15 * 102.86us / 5000us = 30.86 % CF= 3.24 5000 us/15*102.857 us		Show calculations separately and explain how the applicable *cf factor (duty factor)* used or to be use in the SAR measurements is derived and how the control symbols are accounted for

9.2. Information on Test Equipment and Measurement Results

Test Software

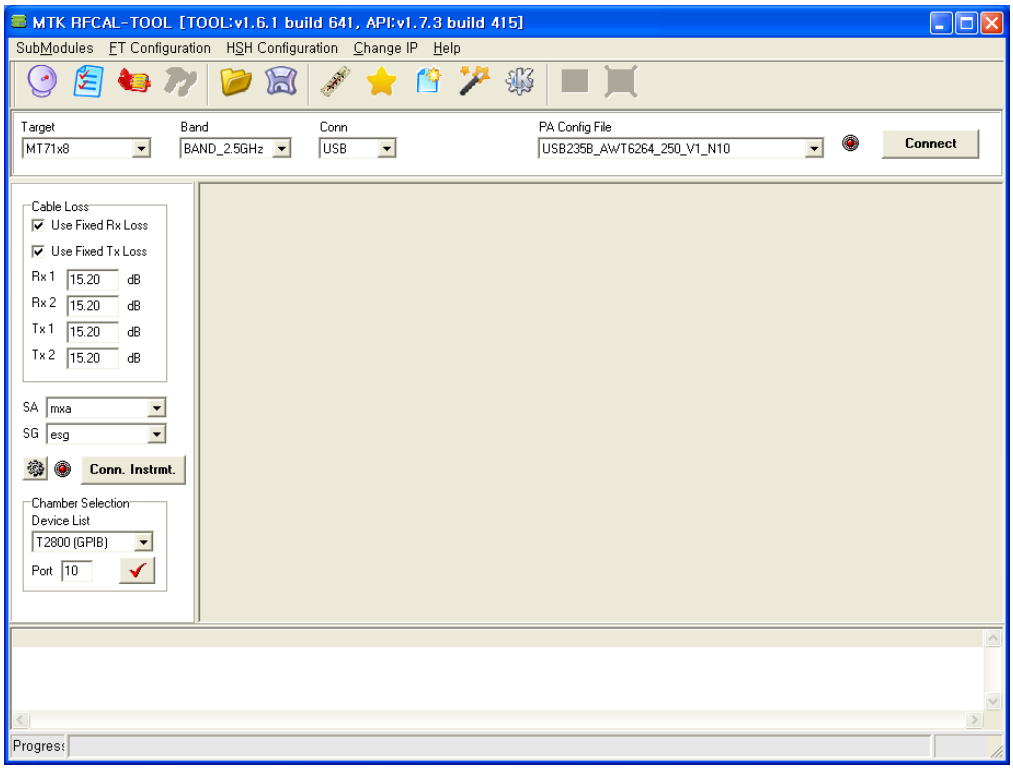
For the purposes of measuring SAR an Agilent Signal Generator (specify model number) is used to emulate the Base Station. The signal generator is loaded with a frame that simulates the Base station downlink. A drawing of the setup is shown below.

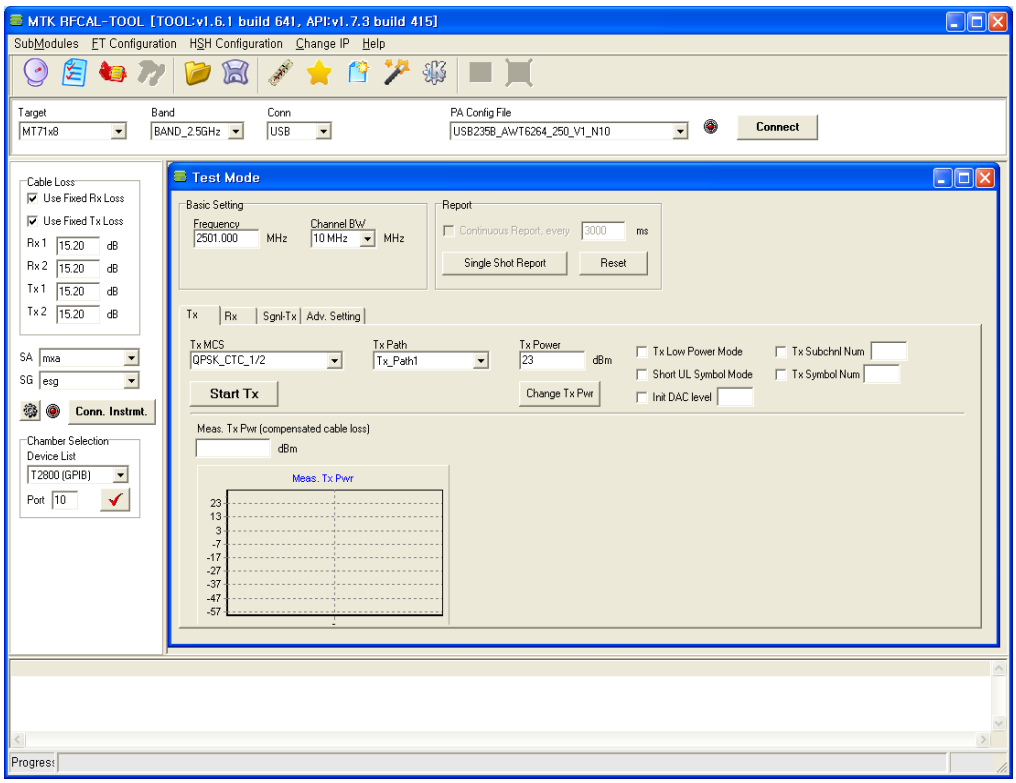


1. Drawing of test setup

The DUT receives and demodulates the DL frame. This frame instructs the DUT to transmit during the UL frame, with a specified data burst size, in a specific zone (PUSC) and a specific modulation (QPSK ½ ¾ or 16QAM ½ ¾).

The DUT is configured using the Mediatek Control Panel. This is a software tool which runs on the laptop that is connected to the USB modem. The MTK Control panel instructs the USB modem to transmit at maximum power and tells the USB modem which antenna to transmit with (Antenna 1 or Antenna 2).





MTK Control Panel

2. Screen dump of the MTK Diagnostic Control Panel

Signal Generator

Frame Profile loaded in Vector Signal Generator:

Test Vector File Name	BW	DL/UL Symbols
10M_QPSK_CTC_12	10 MHz	29:18
10M_QPSK_CTC_34	10 MHz	29:18
10M_16QAM_CTC_12	10 MHz	29:18
10M_16QAM_CTC_34	10 MHz	29:18
5M_QPSK_CTC_12	5 MHz	29:18
5M_QPSK_CTC_34	5 MHz	29:18
5M_16QAM_CTC_12	5 MHz	29:18
5M_16QAM_CTC_34	5 MHz	29:18

Agilent ESG Vector Signal Generator / Model :E4438C is used in conjunction with FTI supplied radio profile to configure the FTI WiMAX U310 modem for the SAR evaluation. ESG Vector Signal Generator is loaded with the downlink signal, containing the respective FCH, DL- MAP and UL-MAP required by the test device to configure the uplink transmission. The waveform is configured for a DL:UL symbol ratio of 29:18 , the effective power is only across 15 data symbols. On the PC and downloaded to the VSG. The test device can synchronize itself to the signal received from VSG, both in frequency and time. It then modulates the DL-MAP and UL-MAP transmitted in the downlink sub-frame and determine the DL:UL symbol ratio. The downlink burst is repeated in each frame, every 5ms, to simulate the normal transmission from a WiMAX base station. The UL-MAP received by the device is used to configure the uplink burst with all data symbols and sub-channels active. For TDD systems, both uplink and downlink transmissions are at the same frequency. The output power of the VSG is kept at least 80 dB lower than the test device to avoid interfering with the SAR measurements. The ESG is connected directly into the WiMAX card so as to allow the card to enter into transmit mode.

Communication Test Set

Modulation and channel bandwidth selection is loaded to Vector Signal Generator. when evaluating QPSK/16QAM with 10MHz channel Bandwidth, radio profile name "10M_QPSK_CTC_12, 10M_QPSK_CTC_34, 10M_16QAM_CTC_12, 10M_16QAM_CTC_34" is active on the Vector Signal Generator. when evaluating QPSK/16QAM with 5MHz channel Bandwidth, radio profile name "5M_QPSK_CTC_12, 5M_QPSK_CTC_34, 5M_16QAM_CTC_12, 5M_16QAM_CTC_34" is active on the Vector Signal Generator.

Parameter Value	Frame definition for 10 MHz RCT			
	Test Vector Name			
	10M_QPSK_CTC_12	10M_QPSK_CTC_34	10M_16QAM_CTC_12	10M_16QAM_CTC_34
Band Width	10MHz	10MHz	10MHz	10MHz
FFT size	1024	1024	1024	1024
DL/UL ratio	29:18	29:18	29:18	29:18
Down link				
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – PUSC
Burst profile / MCS	MCS: QPSK R1/2	MCS: QPSK R3/4	MCS: QAM16 R1/2	MCS : QAM16 R3/4
Up Link				
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – PUSC
Burst profile / MCS	MCS: QPSK R1/2	MCS: QPSK R3/4	MCS: QAM16 R1/2	MCS : QAM16 R3/4

Parameter Value	Frame definition for 5 MHz RCT			
	Test Vector Name			
	5M_QPSK_CTC_12	5M_QPSK_CTC_34	5M_16QAM_CTC_12	5M_16QAM_CTC_34
Band Width	5MHz	5MHz	5MHz	5MHz
FFT size	512	512	512	512
DL/UL ratio	29:18	29:18	29:18	29:18
Down link				
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – PUSC
Burst profile / MCS	MCS: QPSK R1/2	MCS: QPSK R3/4	MCS:QAM16 R1/2	MCS:QAM16 R3/4
Up Link				
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – PUSC
Burst profile / MCS	MCS: QPSK R1/2	MCS: QPSK R3/4	MCS:QAM16 R1/2	MCS:QAM16 R3/4

SAR Test Signal Characteristics and Structure

The Test frame loaded into the Signal Generator has the structure 29:18 corresponding the DL:UL ratio used by operators in the US. The UL consists of 15 symbols with data burst. There are a total of 16 (4x2x2) different frames corresponding to the allowed modulation (QPSK ½, QPSK 3/4, 16QAM ½, 16QAM 3/4) and zone (PUSC) and bandwidths (5 MHz /10 MHz).

The testing was done using a common 29:18 ratio. The 29 indicates the number of downlink (from the base station) symbols and the 18 indicates the number of uplink (transmitted from the MS) symbols. Inside the uplink, 15 of the symbols are used for data. The correct duty factor should be (15*102.86 us)/5000 us=30.86 %. This agrees with the above calculated duty cycle (30.86%) of this device. Using this calculation method eliminates all the other transmit time, guard time, etc, and only uses the transmit time.

The DUT does not transmit during the control symbols. Hence a correction needs to be applied to the SAR measurements to account for this.

Output Power Measurement

The maximum average conducted output power was measured at uplink burst-on period with different modulation. The same setup and device operation configurations were used for SAR & EMC power Measurements. Power was Measured with a spectrum analyzer (N9020A) and the device was connected to the vector signal generator through a circulator.

ANT 1

5 MHz Channel BW					
Channel	Frequency (MHz)	QPSK 1/2 (dBm)	QPSK 3/4 (dBm)	16QAM 1/2 (dBm)	16QAM 3/4 (dBm)
low	2498.5	22.76	22.74	22.65	22.76
middle	2593	22.70	22.69	22.66	22.73
high	2687.5	22.86	22.82	22.78	22.81
10 MHz Channel BW					
Channel	Frequency (MHz)	QPSK 1/2 (dBm)	QPSK 3/4 (dBm)	16QAM 1/2 (dBm)	16QAM 3/4 (dBm)
low	2501	23.10	22.73	22.78	22.77
middle	2593	22.66	22.67	22.69	22.65
high	2685	22.79	22.77	22.83	22.83

ANT 2

5 MHz Channel BW					
Channel	Frequency (MHz)	QPSK 1/2 (dBm)	QPSK 3/4 (dBm)	16QAM 1/2 (dBm)	16QAM 3/4 (dBm)
low	2498.5	22.74	22.55	22.50	22.51
middle	2593	22.59	22.64	22.55	22.56
high	2687.5	22.85	22.85	22.83	22.84
10 MHz Channel BW					
Channel	Frequency (MHz)	QPSK 1/2 (dBm)	QPSK 3/4 (dBm)	16QAM 1/2 (dBm)	16QAM 3/4 (dBm)
low	2501	23.04	22.74	22.82	22.79
middle	2593	22.71	22.67	22.73	22.74
high	2685	22.88	23.02	22.97	23.02

Note:

Spectrum Analyzer with Channel Power function and Gate On Peak power: RBW=300 kHz; VBW = 1 MHz with Peak detection, sweep time = 50 ms, Average power: RBW=300 kHz; VBW = 1 MHz with Average detection, sweep time = 50 ms

The conducted Output power is similar between Antenna1 and 2. So we performed the SAR testing both of Antenna1 and 2 to find the worst configuration.

9.3 Scaling Factor

	ANT	Maximum Power of 3 Control Symbol	Correction Factor
5 MHz	1	73.82	(73.82 * 3 + Maximum rated output power * 15)/ (Actual Measured Output Power *15)
	2	73.82	(73.82 * 3 + Maximum rated output power * 15)/ (Actual Measured Output Power *15)
10 MHz	1	35.86	(35.86 * 3 + Maximum rated output power * 15)/ (Actual Measured Output Power * 15)
	2	35.86	(35.86 * 3 + Maximum rated output power * 15)/ (Actual Measured Output Power * 15)

For example;

The maximum power tolerance is 23.0±1 dBm

Max radiated output power of **5 MHz** is 24 dBm = 251 mW

The maximum power in 5 MHz control traffic is 73.82 mW (5/17 of 251 mW)

At 2687.5 MHz, QPSK 1/2

Scaled factor for 5 MHz bandwidth = (73.82 mW * 3 + 15 * 251 mW)/(15 * 193.2 mW) =**1.376**

Max output power of **10 MHz** is 24 dBm = 251 mW

The maximum power in 10 MHz control traffic is 35.86 mW (5/35 of 251 mW)

At 2501 MHz, QPSK 1/2

Scaled factor for 10 MHz bandwidth = (35.86 mW * 3 + 15 * 251 mW)/(15 * 204.2 mW) =**1.264**

BW 5 MHz

TX antenna		ANT 1		ANT 2	
Channel (GHz)	Modulation	Measured Average Power (dBm)	Scaling Factor	Measured Average Power (dBm)	Scaling Factor
2498.5	QPSK 1/2	22.76	1.408	22.74	1.414
	QPSK 3/4	22.74	1.414	22.55	1.477
	16QAM 1/2	22.65	1.444	22.50	1.495
	16QAM 3/4	22.76	1.408	22.51	1.491
2593	QPSK 1/2	22.70	1.427	22.59	1.464
	QPSK 3/4	22.69	1.431	22.64	1.447
	16QAM 1/2	22.66	1.440	22.55	1.477
	16QAM 3/4	22.73	1.417	22.56	1.474
2687.5	QPSK 1/2	**22.86**	**1.376**	**22.85**	**1.379**
	QPSK 3/4	22.82	1.388	22.85	1.379
	16QAM 1/2	22.78	1.401	22.83	1.385
	16QAM 3/4	22.81	1.392	22.84	1.382

BW 10 MHz

TX antenna		ANT 1		ANT 2	
Channel (GHz)	Modulation	Measured Average Power (dBm)	Scaling Factor	Measured Average Power (dBm)	Scaling Factor
2501	QPSK 1/2	**23.10**	**1.264**	**23.04**	**1.282**
	QPSK 3/4	22.73	1.377	22.74	1.374
	16QAM 1/2	22.78	1.361	22.82	1.349
	16QAM 3/4	22.77	1.364	22.79	1.358
2593	QPSK 1/2	22.66	1.399	22.71	1.383
	QPSK 3/4	22.67	1.396	22.67	1.396
	16QAM 1/2	22.69	1.390	22.73	1.377
	16QAM 3/4	22.65	1.403	22.74	1.374
2685	QPSK 1/2	22.79	1.358	22.88	1.330
	QPSK 3/4	22.77	1.364	23.02	1.288
	16QAM 1/2	22.83	1.346	22.97	1.303
	16QAM 3/4	22.83	1.346	23.02	1.288

9.4 Duty Cycle & Time Vector Slots

5 MHz Channel BW					
Channel	**Frequency (MHz)**	**QPSK 1/2 (%)**	**QPSK 3/4 (%)**	**16QAM 1/2 (%)**	**16QAM 3/4(%)**
middle	2593	31.16	31.13	30.75	30.53
10 MHz Channel BW					
Channel	**Frequency (MHz)**	**QPSK 1/2 (%)**	**QPSK 3/4 (%)**	**16QAM 1/2 (%)**	**16QAM 3/4 (%)**
middle	2593	30.64	30.92	30.77	30.57

Duty Cycle calculated formula = (mark 2 – Mark 1) / (Mark 3 – Mark 1) * 100 %

Spectrum Analyzer setting

Sweep time 6 ms
RBW 8 MHz
VBW 3 MHz
Span 0 Hz

Note;

Control symbol is not allocated in UL. 15 traffic symbol s are transmitting at max. power and 3 control symbols are not used nor active.

Therefore, there is no control symbol in the time vector plot.

For example,

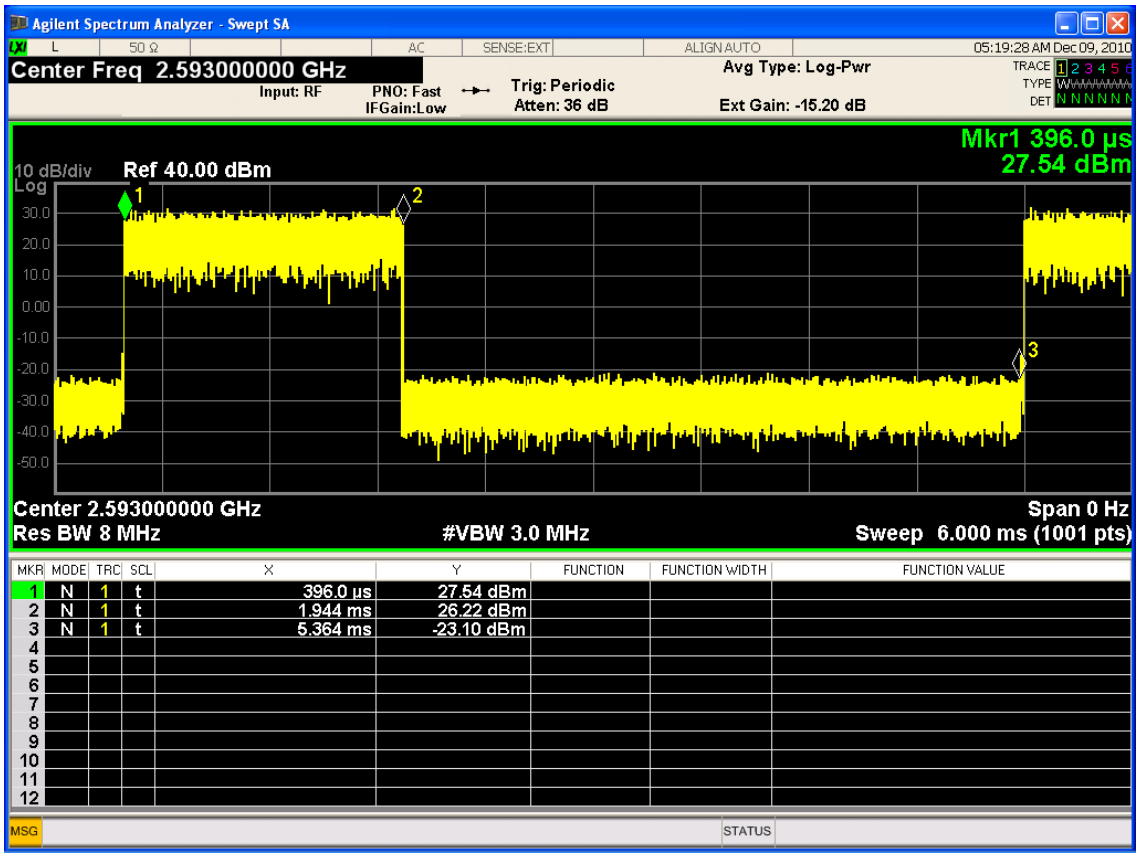
Ant1 5MHz 2593MHz configuration;

Frame length = Mark3- Mark1=5.364-0.396= 4.968 ms = about 5 ms

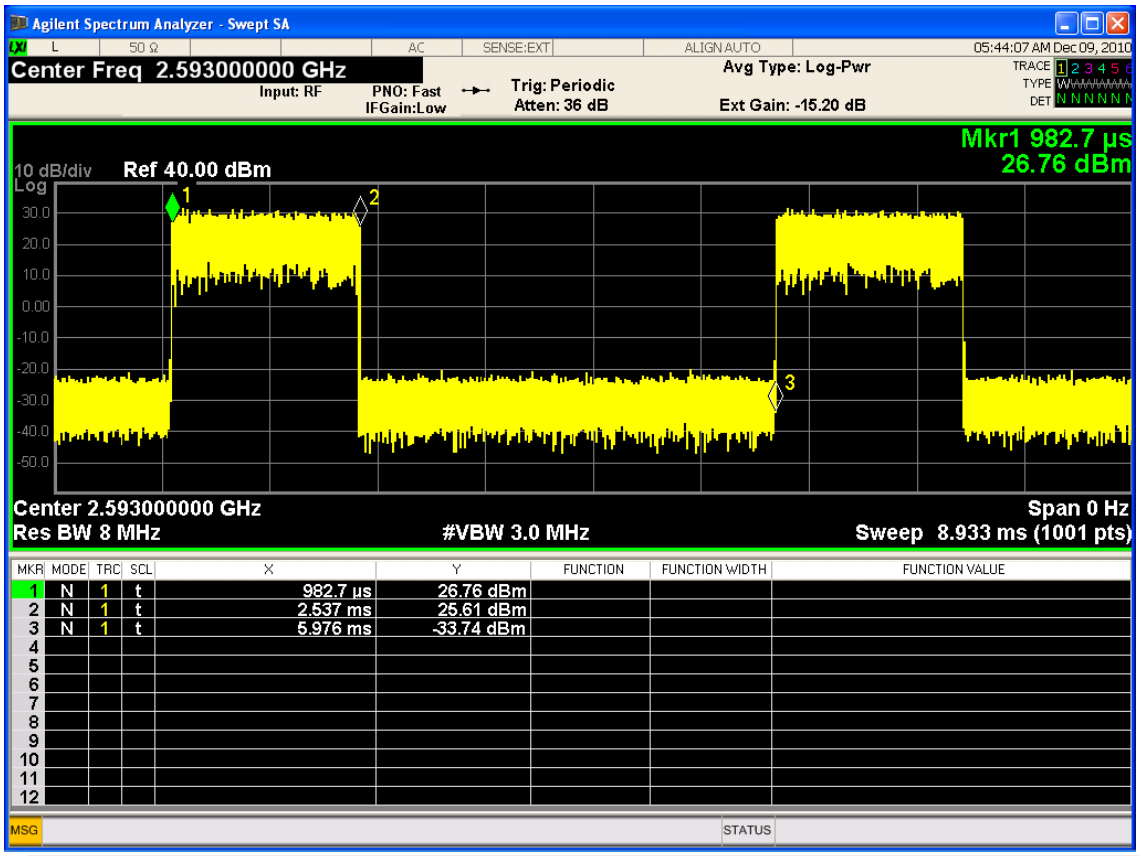
UL Data Symbols = Mark2- Mark1= 15 symbols UL time = 1.944-0.396 = 1.548 ms

Duty Cycle=1.548/4.968 *100% = 31.2%

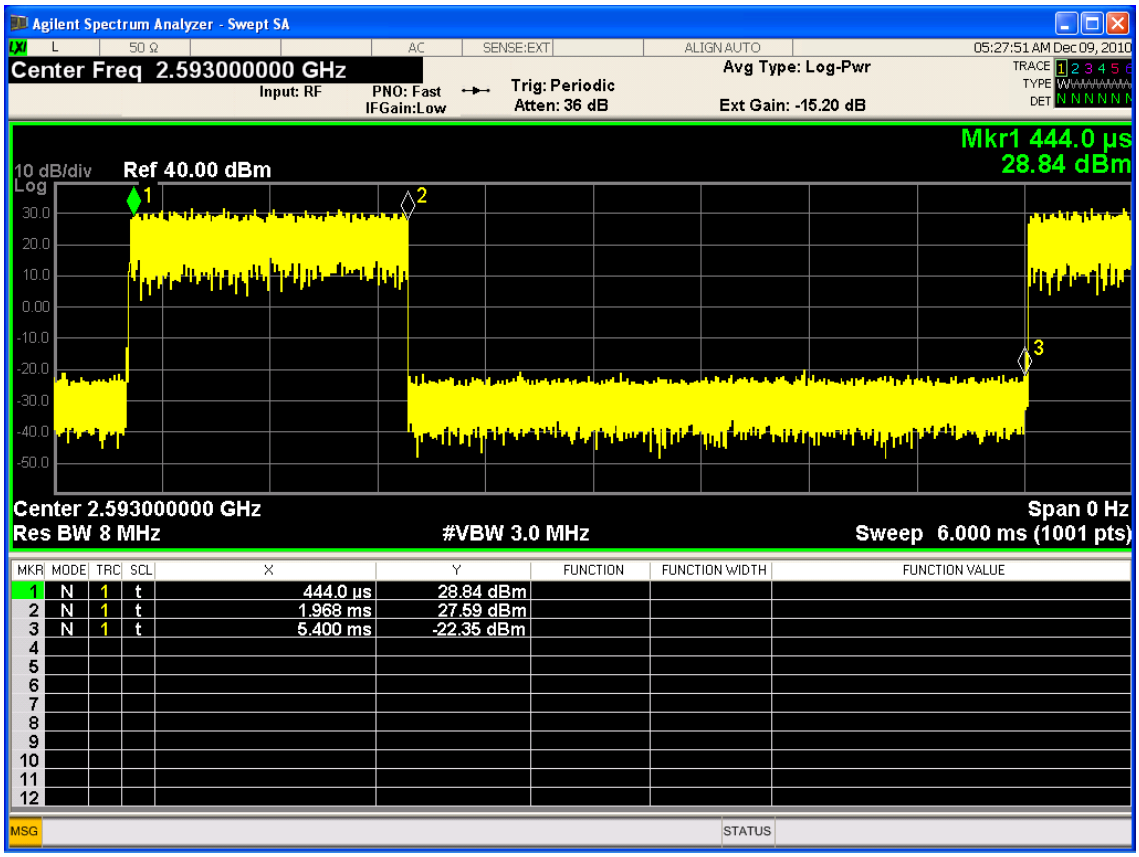
5MHz 2593 MHz QPSK 1/2



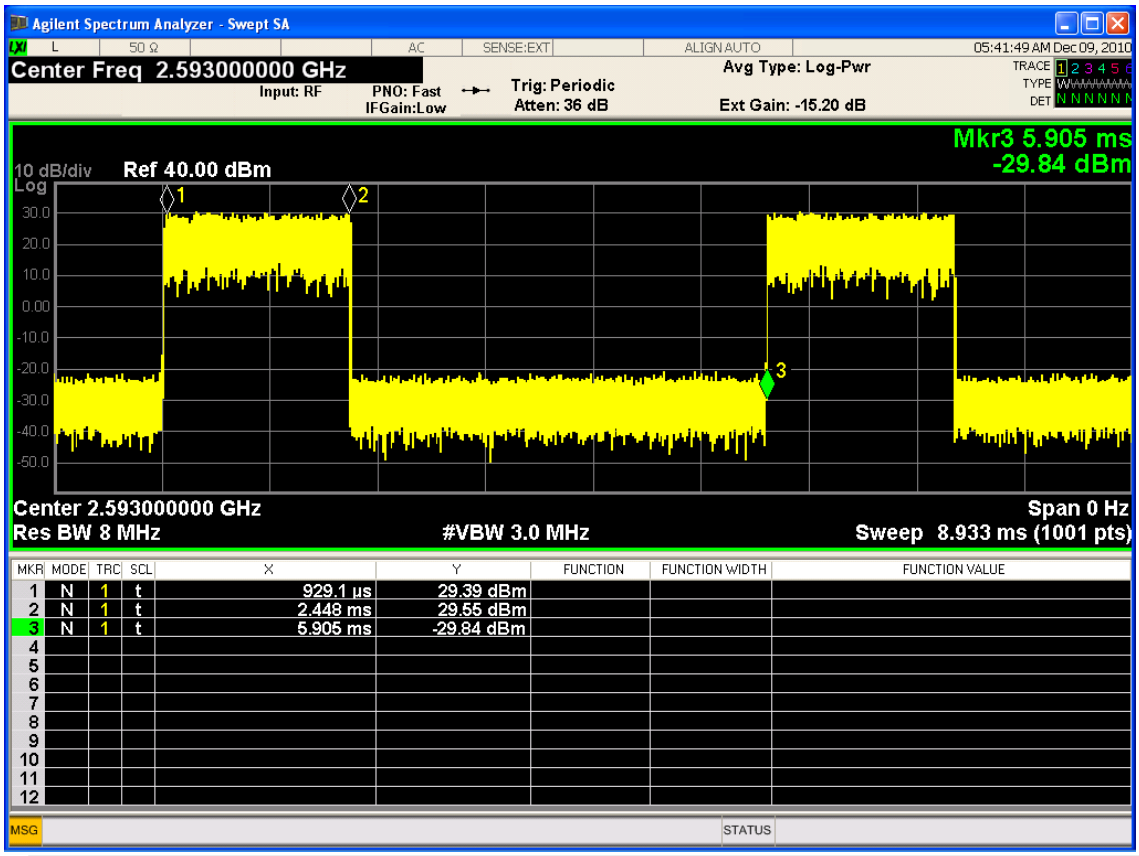
5MHz 2593 MHz QPSK 3/4



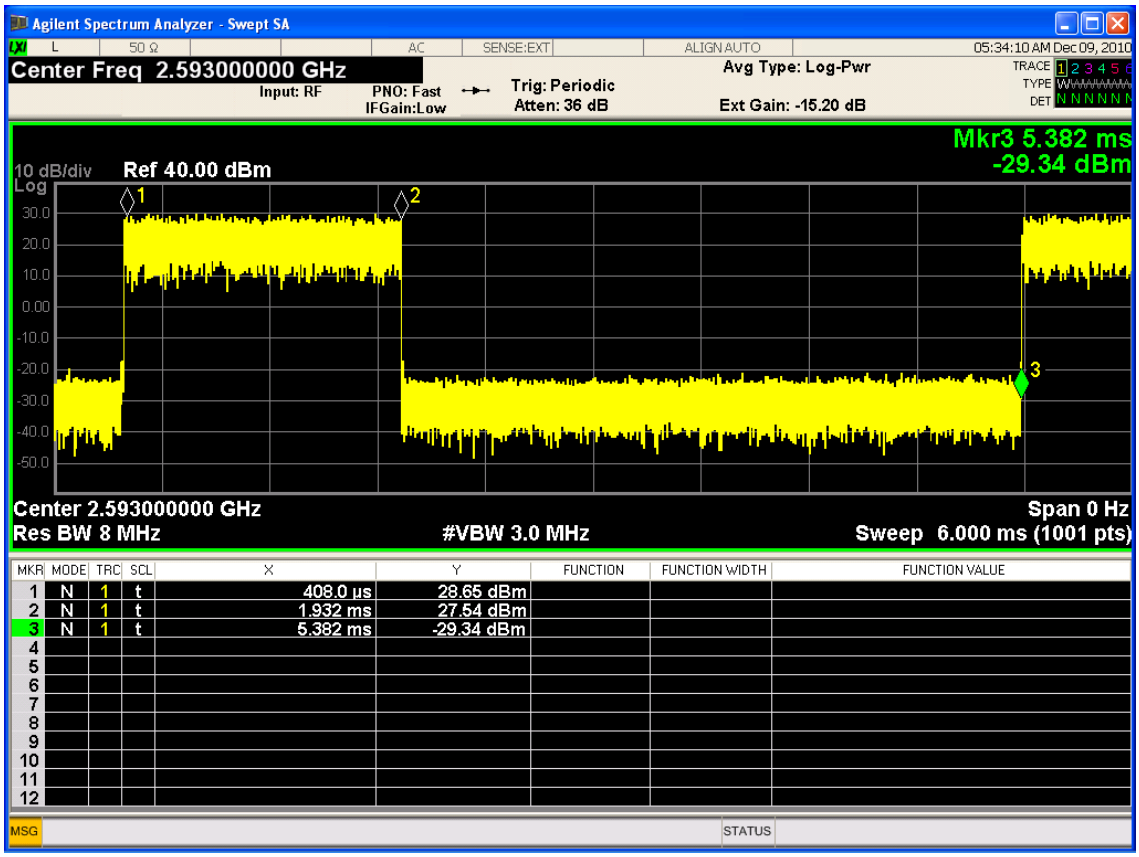
5MHz 2593 MHz 16QAM 1/2



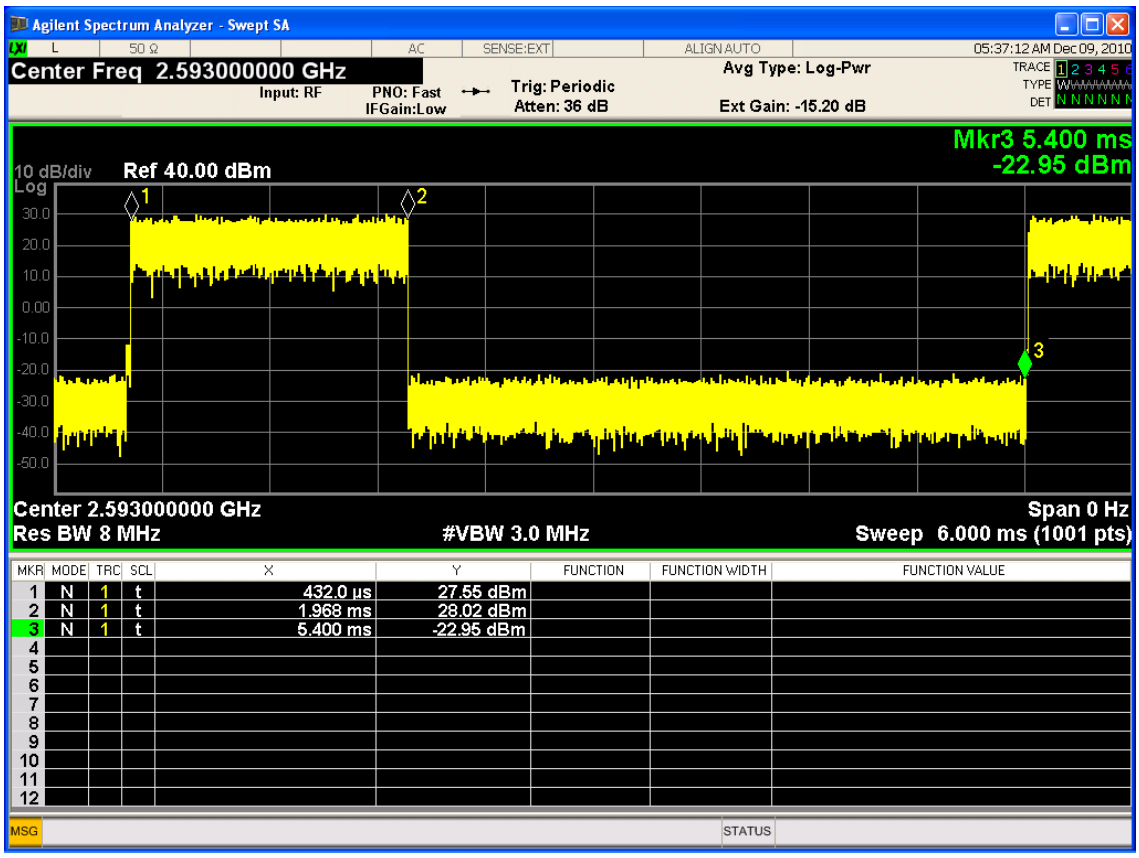
5MHz 2593 MHz 16QAM 3/4



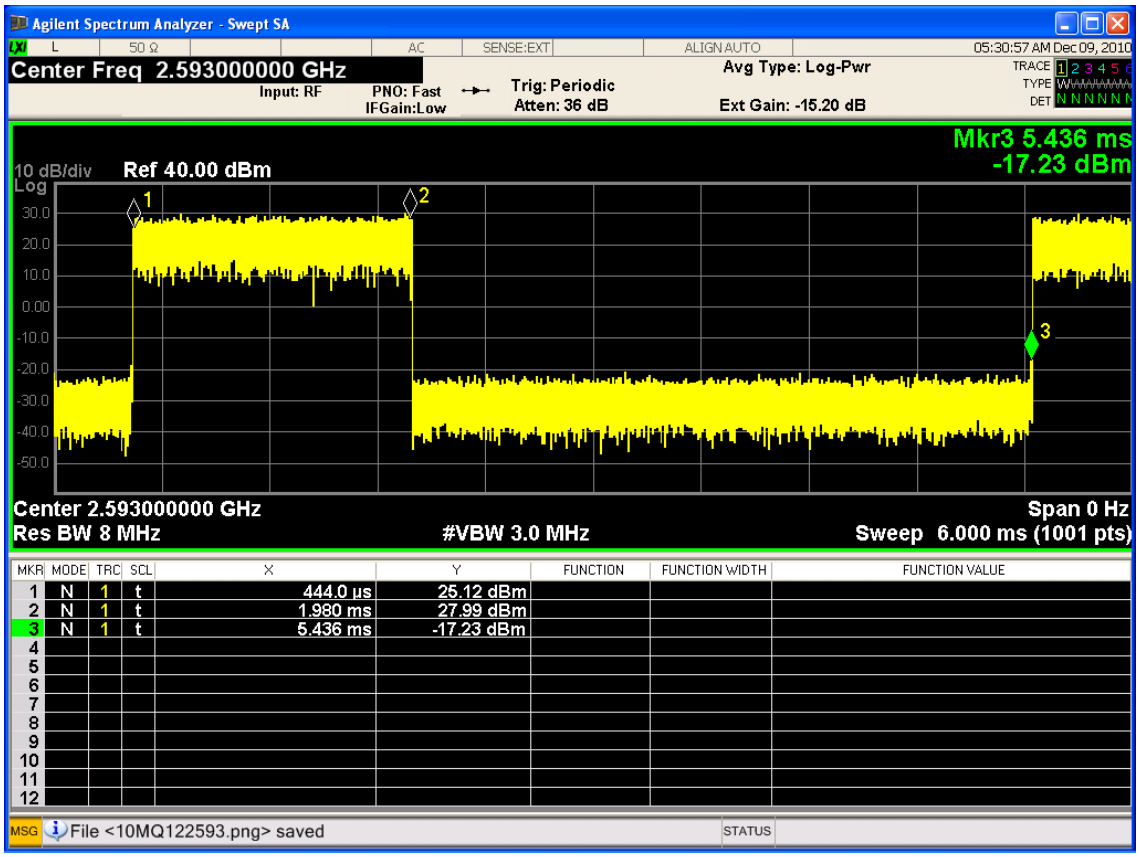
10MHz 2593 MHz QPSK 1/2



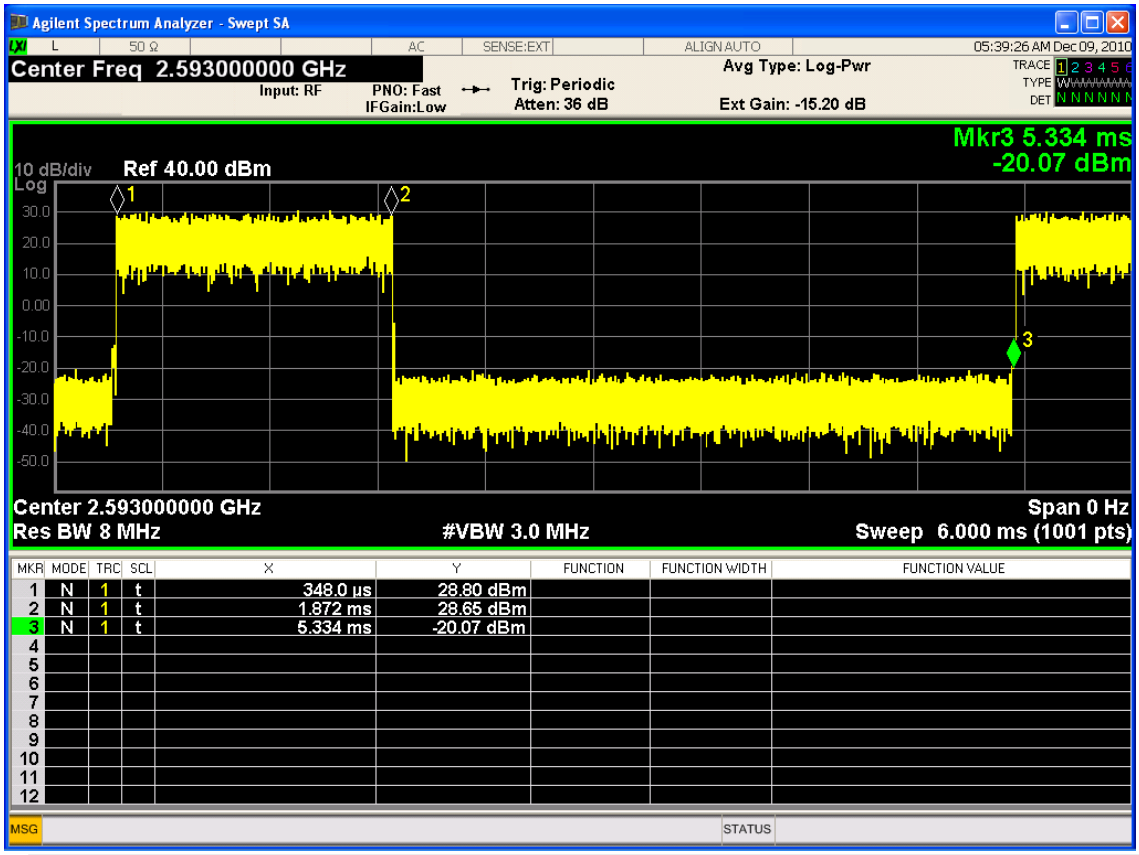
10MHz 2593 MHz QPSK 3/4



10MHz 2593 MHz 16QAM 1/2



10MHz 2593 MHz 16QAM 3/4



9.5 PAPR and SAR Error Considerations

9.5.1 PEAK TO AVERAGE Conducted Power RATIO

BW 5 MHz

TX Antenna		ANT 1			ANT 2		
Channel (GHz)	Modulation	Average Power (dBm)	Peak Power (dBm)	PAR (dB)	Average Power dBm)	Peak Power (dBm)	PAR (dB)
2498.5	QPSK 1/2	22.76	29.32	6.56	22.74	29.29	6.55
	QPSK 3/4	22.74	29.04	6.30	22.55	28.86	6.31
	16QAM 1/2	22.65	29.04	6.39	22.5	28.78	6.28
	16QAM 3/4	22.76	29.13	6.37	22.51	29.05	6.54
2593	QPSK 1/2	22.70	29.23	6.53	22.59	29.24	6.65
	QPSK 3/4	22.69	28.94	6.25	22.64	29.01	6.37
	16QAM 1/2	22.66	29.00	6.34	22.55	28.83	6.28
	16QAM 3/4	22.73	29.07	6.34	22.56	29.08	6.52
2687.5	QPSK 1/2	**22.86**	29.37	6.54	22.85	29.40	6.54
	QPSK 3/4	22.82	29.13	6.31	22.85	29.16	6.31
	16QAM 1/2	22.78	29.14	6.36	22.83	29.23	6.38
	16QAM 3/4	22.81	29.15	6.34	22.84	29.28	6.44

BW 10 MHz

TX Antenna		ANT 1			ANT 2		
Channel (GHz)	Modulation	Average Power (dBm)	Peak Power (dBm)	PAR (dB)	Average Power dBm)	Peak Power (dBm)	PAR (dB)
2501	QPSK 1/2	**23.10**	29.33	6.29	23.04	29.24	6.14
	QPSK 3/4	22.73	29.18	6.45	22.74	29.13	6.39
	16QAM 1/2	22.78	29.17	6.39	22.82	29.16	6.34
	16QAM 3/4	22.77	29.28	6.51	22.79	29.3	6.51
2593	QPSK 1/2	22.66	29.09	6.43	22.71	29.13	6.42
	QPSK 3/4	22.67	29.06	6.39	22.67	29.06	6.39
	16QAM 1/2	22.69	29.05	6.36	22.73	29.09	6.36
	16QAM 3/4	22.65	29.12	6.47	22.74	29.19	6.45
2685	QPSK 1/2	22.79	29.30	6.51	22.88	29.34	6.46
	QPSK 3/4	22.77	29.16	6.39	23.02	29.39	6.37
	16QAM 1/2	22.83	29.22	6.39	22.97	29.36	6.39
	16QAM 3/4	22.83	29.33	6.50	23.02	29.48	6.46

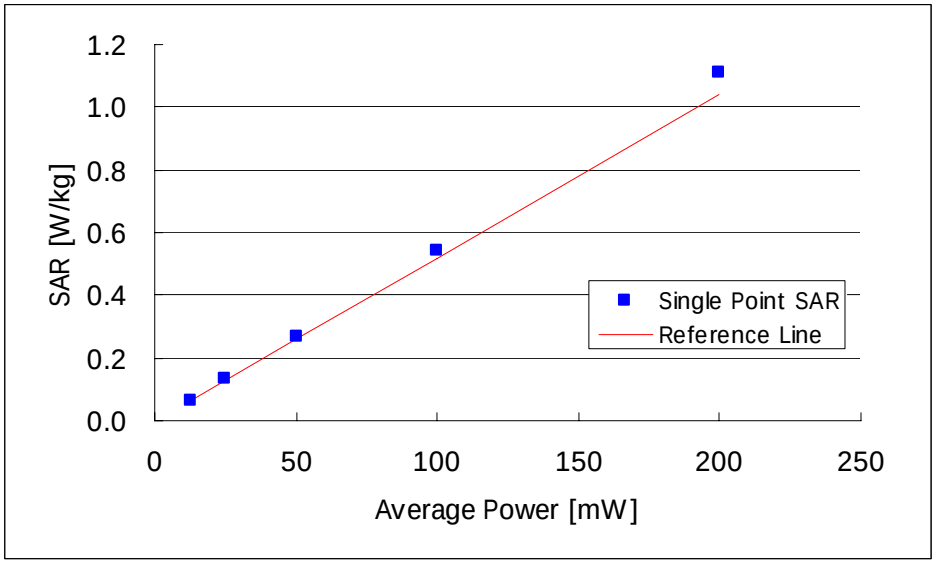
9.5.2 SAR Error considerations

The SAR probe used in the measurements is calibrated with a sinusoidal CW signal. Since the DL:UL symbol ratio configuration used in the SAR tests provides a periodic uplink burst, the duty factor can be compensated by selecting the correct conversion factor (cf) for the SAR measurements. If the duty factor were non-periodic, compensation is typically not possible and substantial SAR measurement error could be expected. The high PAPR of OFDM/OFDMA is expected to introduce additional SAR measurement errors because the SAR probe is not calibrated for this type of random noise-like signals with large amplitude and phase variations within the bursts. The SAR error is also expected to vary with the average power and average PAPR at each measurement point, both temporally and spatially. In order to estimate the measurement error due to PAPR issues, the configuration with the highest SAR in each channel bandwidth and frequency band is measured at various power levels, from approximately 12.5 mW, in 3 dB steps, until the maximum power level is reached. As shown by the results and plot below, SAR is linear to power only when the probe sensors are operating within the square-law region. The results demonstrate that there is no SAR underestimation.

Test Configuration: Horizontal A

Tx1 5 MHz QPSK 1/2 2593 MHz

Average Power (mW)	12.5	25	50	100	200
Single Point SAR (W/kg)	0.065	0.134	0.270	0.542	1.112
Reference Line (W/kg)	0.065	0.130	0.260	0.520	1.040
Deviation (%) from Ref. Line	0.00	3.08	3.85	4.23	6.92



According to the linearity calculation, estimated SAR value was calculated as follow;

Estimated SAR (mW/g)

2nd reference point = 0.065*(25/12.5) = 0.130

3nd reference point = 0.065*(50/12.5) = 0.260

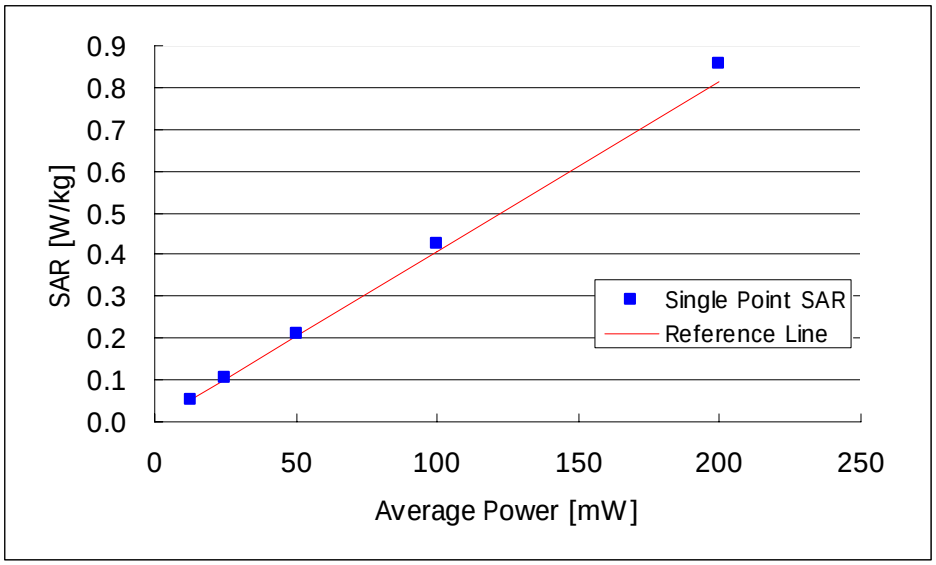
4nd reference point = 0.065*(100/12.5) = 0.520

5nd reference point = 0.065*(200/12.5) = 1.040

Test Configuration: Horizontal A

Tx1 5 MHz 16QAM 1/2 2593 MHz

Average Power (mW)	12.5	25	50	100	200
Single Point SAR (W/kg)	0.051	0.105	0.212	0.427	0.857
Reference Line (W/kg)	0.051	0.102	0.204	0.408	0.816
Deviation (%) from Ref. Line	0.00	2.94	3.92	4.66	5.02



According to the linearity calculation, estimated SAR value was calculated as follow;

Estimated SAR (mW/g)

2nd reference point = 0.051*(25/12.5) = 0.102

3nd reference point = 0.051*(50/12.5) = 0.204

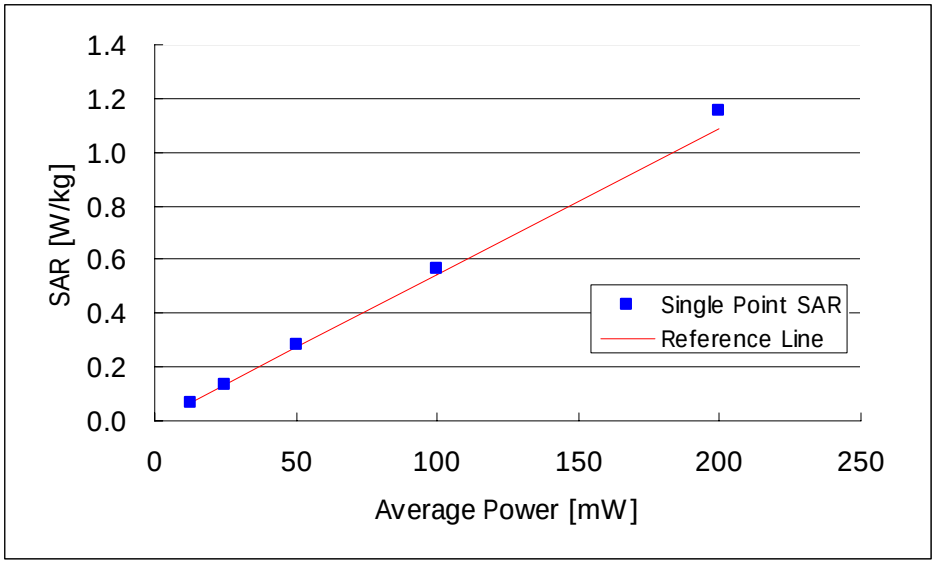
4nd reference point = 0.051*(100/12.5) = 0.408

5nd reference point = 0.051*(200/12.5) = 0.816

Test Configuration: Horizontal A

Tx 1 10 MHz QPSK 1/2 2501 MHz

Average Power (mW)	12.5	25	50	100	200
Single Point SAR (W/kg)	0.068	0.137	0.281	0.565	1.152
Reference Line (W/kg)	0.068	0.136	0.272	0.544	1.088
Deviation (%) from Ref. Line	0.00	0.74	3.31	3.86	5.88



According to the linearity calculation, estimated SAR value was calculated as follow;

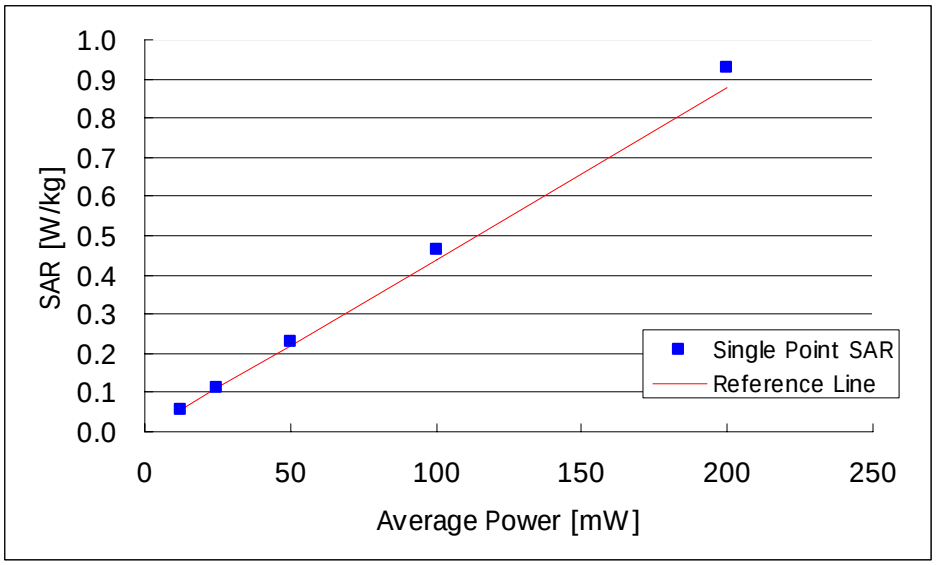
Estimated SAR (mW/g)

2nd reference point =	0.068*(25/12.5)	= 0.136
3nd reference point =	0.068*(50/12.5)	= 0.272
4nd reference point =	0.068*(100/12.5)	= 0.544
5nd reference point =	0.068*(200/12.5)	= 1.088

Test Configuration: Horizontal A

Tx1 10 MHz 16QAM 1/2 2501 MHz

Average Power (mW)	12.5	25	50	100	200
Single Point SAR (W/kg)	0.055	0.114	0.230	0.463	0.931
Reference Line (W/kg)	0.055	0.110	0.220	0.440	0.880
Deviation (%) from Ref. Line	0.00	3.64	4.55	5.23	5.80



According to the linearity calculation, estimated SAR value was calculated as follow;

Estimated SAR (mW/g)

2nd reference point =	0.055*(25/12.5)	= 0.110
3nd reference point =	0.055*(50/12.5)	= 0.220
4nd reference point =	0.055*(100/12.5)	= 0.440
5nd reference point =	0.055*(200/12.5)	= 0.880

SAR Linearity Test Setup description

- Placing USB dongle with 0.5 cm air-gap separation distance.
- The Probe was moved to the location of Maximum SAR.
- Then, perform single point SAR measurement using “multi-meter job” from around 12.5 mW with 3dB step until the max. power is achieved.

10. SAR TEST DATA SUMMARY

10.1 Measurement Results (WIMAX2600 5MHz QPSK 1/2) Ant 1

Frequency	Conducted Power (dBm)		Configuration	Separation Distance	Antenna Type	Measured SAR(mW/g)	Scaling Factor	Scaled SAR(mW/g)
MHz	Begin	End						
2 498.5	23.44	23.51	Horizontal up	5 mm	Intenna	0.802	1.408	1.129
2 593	23.11	23.13	Horizontal up	5 mm	Intenna	1.120	1.427	1.598
2 687.5	23.07	23.20	Horizontal up	5 mm	Intenna	0.972	1.376	1.337
2 687.5	23.07	23.21	Horizontal down	5 mm	Intenna	0.540	1.376	0.743
2 687.5	23.07	23.06	Vertical front	5 mm	Intenna	0.140	1.376	0.193
2 687.5	23.07	23.05	Vertical back	5 mm	Intenna	0.169	1.376	0.233
2 687.5	23.07	22.94	Top	5 mm	Intenna	0.494	1.376	0.680
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population					**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Power Supply Power supplied through host device (TOSHIBA)
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 All side of the device were tested.
8 Test Configuration ☐ With Holster ☒ Without Holster
The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
9 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
10 Justification for Reduced test configurations per Oct. 2010 TCB Workshop:
Test each channel bandwidth and modulation independently
- Use the lowest coding rate for each modulation when the same rated maximum output applies to all coding rates in a modulation.
- Test higher coding rates only if the rated maximum output is higher
- Use the scaled SAR to determine test reduction (<0.8 W/kg etc.)
- For each channel bandwidth, if QPSK SAR is < 0.8 W/kg and maximum power > 16 QAM, test highest output channel for 16 QAM.
- QPSK SAR is between 0.8 and 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK
- QPSK SAR is > 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK; and if the 16QAM SAR is > 1.2, test all channels in 16QAM

10.2 Measurement Results (WIMAX2600 5MHz 16QAM 1/2) Ant 1

Frequency	Conducted Power (dBm)		Configuration	Separation Distance	Antenna Type	Measured SAR(mW/g)	Scaling Factor	Scaled SAR(mW/g)
MHz	Begin	End						
2 593	23.09	23.17	Horizontal up	5 mm	Intenna	0.776	1.440	1.117
2 593	23.09	23.19	Horizontal down	5 mm	Intenna	0.632	1.440	0.910
2 593	23.09	23.22	Vertical front	5 mm	Intenna	0.130	1.440	0.187
2 593	23.09	23.05	Vertical back	5 mm	Intenna	0.136	1.440	0.196
2 593	23.09	23.03	Top	5 mm	Intenna	0.431	1.440	0.621
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population					**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Power Supply Power supplied through host device (TOSHIBA)
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 All side of the device were tested.
8 Test Configuration ☐ With Holster ☒ Without Holster
The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
9 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
10 Justification for Reduced test configurations per Oct. 2010 TCB Workshop:
Test each channel bandwidth and modulation independently
- Use the lowest coding rate for each modulation when the same rated maximum output applies to all coding rates in a modulation.
- Test higher coding rates only if the rated maximum output is higher
- Use the scaled SAR to determine test reduction (<0.8 W/kg etc.)
- For each channel bandwidth, if QPSK SAR is < 0.8 W/kg and maximum power > 16 QAM, test highest output channel for 16 QAM.
- QPSK SAR is between 0.8 and 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK
- QPSK SAR is > 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK; and if the 16QAM SAR is > 1.2, test all channels in 16QAM

10.3 Measurement Results (WIMAX2600 10MHz QPSK 1/2) Ant 1

Frequency	Conducted Power (dBm)		Configuration	Separation Distance	Antenna Type	Measured SAR(mW/g)	Scaling Factor	Scaled SAR(mW/g)
MHz	Begin	End						
2 501	22.98	22.98	Horizontal up	5 mm	Intenna	1.110	1.264	1.403
2 593	22.87	22.87	Horizontal up	5 mm	Intenna	1.050	1.399	1.469
2 685	22.75	22.75	Horizontal up	5 mm	Intenna	1.140	1.358	1.548
2 501	22.98	22.98	Horizontal down	5 mm	Intenna	0.394	1.264	0.498
2 501	22.98	22.98	Vertical front	5 mm	Intenna	0.064	1.264	0.081
2 501	22.98	22.98	Vertical back	5 mm	Intenna	0.104	1.264	0.131
2 501	22.98	22.98	Top	5 mm	Intenna	0.493	1.264	0.623
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population					**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Power Supply Power supplied through host device (TOSHIBA)
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 All side of the device were tested.
8 Test Configuration ☐ With Holster ☒ Without Holster
The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
9 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
10 Justification for Reduced test configurations per Oct. 2010 TCB Workshop:
Test each channel bandwidth and modulation independently
- Use the lowest coding rate for each modulation when the same rated maximum output applies to all coding rates in a modulation.
- Test higher coding rates only if the rated maximum output is higher
- Use the scaled SAR to determine test reduction (<0.8 W/kg etc.)
- For each channel bandwidth, if QPSK SAR is < 0.8 W/kg and maximum power > 16 QAM, test highest output channel for 16 QAM.
- QPSK SAR is between 0.8 and 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK
- QPSK SAR is > 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK; and if the 16QAM SAR is > 1.2, test all channels in 16QAM

10.4 Measurement Results (WIMAX2600 10MHz 16QAM 1/2) Ant 1

Frequency	Conducted Power (dBm)		Configuration	Separation Distance	Antenna Type	Measured SAR(mW/g)	Scaling Factor	Scaled SAR(mW/g)
MHz	Begin	End						
2 501	23.12	22.97	Horizontal up	5 mm	Intenna	1.080	1.361	1.470
2 593	22.75	22.86	Horizontal down	5 mm	Intenna	0.637	1.390	0.885
2 685	22.77	22.75	Horizontal down	5 mm	Intenna	0.904	1.346	1.217
2 685	22.77	22.81	Horizontal down	5 mm	Intenna	0.564	1.346	0.759
2 685	22.77	22.84	Vertical front	5 mm	Intenna	0.138	1.346	0.186
2 685	22.77	22.70	Vertical back	5 mm	Intenna	0.140	1.346	0.188
2 685	22.77	22.60	Top	5 mm	Intenna	0.378	1.346	0.509
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population					**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Power Supply Power supplied through host device (TOSHIBA)
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 All side of the device were tested.
8 Test Configuration ☐ With Holster ☒ Without Holster
The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
9 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
10 Justification for Reduced test configurations per Oct. 2010 TCB Workshop:
Test each channel bandwidth and modulation independently
- Use the lowest coding rate for each modulation when the same rated maximum output applies to all coding rates in a modulation.
- Test higher coding rates only if the rated maximum output is higher
- Use the scaled SAR to determine test reduction (<0.8 W/kg etc.)
- For each channel bandwidth, if QPSK SAR is < 0.8 W/kg and maximum power > 16 QAM, test highest output channel for 16 QAM.
- QPSK SAR is between 0.8 and 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK
- QPSK SAR is > 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK; and if the 16QAM SAR is > 1.2, test all channels in 16QAM

10.5 Measurement Results (WIMAX2600 5MHz QPSK 1/2) Ant 2

Frequency	Conducted Power (dBm)		Configuration	Separation Distance	Antenna Type	Measured SAR(mW/g)	Scaling Factor	Scaled SAR(mW/g)
MHz	Begin	End						
2 687.5	22.98	23.16	Horizontal up	5 mm	Intenna	0.497	1.379	0.685
2 498.5	23.31	23.31	Horizontal down	5 mm	Intenna	0.579	1.414	0.819
2 593	23.12	23.24	Horizontal down	5 mm	Intenna	0.644	1.464	0.943
2 687.5	22.98	22.89	Horizontal down	5 mm	Intenna	0.604	1.379	0.833
2 687.5	22.98	22.92	Vertical front	5 mm	Intenna	0.271	1.379	0.374
2 687.5	22.98	23.04	Vertical back	5 mm	Intenna	0.425	1.379	0.586
2 687.5	22.98	23.14	Top	5 mm	Intenna	0.066	1.379	0.091
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population					**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Power Supply Power supplied through host device (TOSHIBA)
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 All side of the device were tested.
8 Test Configuration ☐ With Holster ☒ Without Holster
The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
9 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
10 Justification for Reduced test configurations per Oct. 2010 TCB Workshop:
Test each channel bandwidth and modulation independently
- Use the lowest coding rate for each modulation when the same rated maximum output applies to all coding rates in a modulation.
- Test higher coding rates only if the rated maximum output is higher
- Use the scaled SAR to determine test reduction (<0.8 W/kg etc.)
- For each channel bandwidth, if QPSK SAR is < 0.8 W/kg and maximum power > 16 QAM, test highest output channel for 16 QAM.
- QPSK SAR is between 0.8 and 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK
- QPSK SAR is > 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK; and if the 16QAM SAR is > 1.2, test all channels in 16QAM

10.6 Measurement Results (WIMAX2600 5MHz 16QAM 1/2) Ant 2

Frequency	Conducted Power (dBm)		Configuration	Separation Distance	Antenna Type	Measured SAR(mW/g)	Scaling Factor	Scaled SAR(mW/g)
MHz	Begin	End						
2 593	22.55	22.73	Horizontal up	5 mm	Intenna	0.452	1.477	0.668
2 593	22.55	22.49	Horizontal down	5 mm	Intenna	0.668	1.477	0.987
2 593	22.55	22.58	Vertical front	5 mm	Intenna	0.585	1.477	0.864
2 593	22.55	22.66	Vertical back	5 mm	Intenna	0.419	1.477	0.619
2 593	22.55	22.65	Top	5 mm	Intenna	0.056	1.477	0.083
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population					**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Power Supply Power supplied through host device (TOSHIBA)
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 All side of the device were tested.
8 Test Configuration ☐ With Holster ☒ Without Holster
The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
9 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
10 Justification for Reduced test configurations per Oct. 2010 TCB Workshop:
Test each channel bandwidth and modulation independently
- Use the lowest coding rate for each modulation when the same rated maximum output applies to all coding rates in a modulation.
- Test higher coding rates only if the rated maximum output is higher
- Use the scaled SAR to determine test reduction (<0.8 W/kg etc.)
- For each channel bandwidth, if QPSK SAR is < 0.8 W/kg and maximum power > 16 QAM, test highest output channel for 16 QAM.
- QPSK SAR is between 0.8 and 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK
- QPSK SAR is > 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK; and if the 16QAM SAR is > 1.2, test all channels in 16QAM

10.7 Measurement Results (WIMAX2600 10MHz QPSK 1/2) Ant 2

Frequency	Conducted Power (dBm)		Configuration	Separation Distance	Antenna Type	Measured SAR(mW/g)	Scaling Factor	Scaled SAR(mW/g)
MHz	Begin	End						
2 501	22.76	22.88	Horizontal up	5 mm	Intenna	0.743	1.282	0.953
2 593	22.60	22.70	Horizontal up	5 mm	Intenna	0.756	1.383	1.046
2 685	22.68	22.70	Horizontal up	5 mm	Intenna	0.758	1.330	1.008
2 501	22.76	22.60	Horizontal down	5 mm	Intenna	0.705	1.282	0.904
2 593	22.60	22.52	Horizontal down	5 mm	Intenna	0.778	1.383	1.076
2 685	22.68	22.75	Horizontal down	5 mm	Intenna	0.630	1.330	0.838
2 501	22.76	22.93	Vertical front	5 mm	Intenna	0.457	1.282	0.586
2 501	22.76	22.85	Vertical back	5 mm	Intenna	0.503	1.282	0.645
2 501	22.76	22.81	Top	5 mm	Intenna	0.057	1.282	0.073
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population					**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Power Supply Power supplied through host device (TOSHIBA)
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 All side of the device were tested.
8 Test Configuration ☐ With Holster ☒ Without Holster
The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
9 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
10 Justification for Reduced test configurations per Oct. 2010 TCB Workshop:
Test each channel bandwidth and modulation independently
- Use the lowest coding rate for each modulation when the same rated maximum output applies to all coding rates in a modulation.
- Test higher coding rates only if the rated maximum output is higher
- Use the scaled SAR to determine test reduction (<0.8 W/kg etc.)
- For each channel bandwidth, if QPSK SAR is < 0.8 W/kg and maximum power > 16 QAM, test highest output channel for 16 QAM.
- QPSK SAR is between 0.8 and 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK
- QPSK SAR is > 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK; and if the 16QAM SAR is > 1.2, test all channels in 16QAM

10.8 Measurement Results (WIMAX2600 10MHz 16QAM 1/2) Ant 2

Frequency	Conducted Power (dBm)		Configuration	Separation Distance	Antenna Type	Measured SAR(mW/g)	Scaling Factor	Scaled SAR(mW/g)
MHz	Begin	End						
2 593	22.63	22.54	Horizontal up	5 mm	Intenna	0.564	1.377	0.777
2 593	22.63	22.54	Horizontal down	5 mm	Intenna	0.549	1.377	0.756
2 593	22.63	22.66	Vertical front	5 mm	Intenna	0.585	1.377	0.806
2 593	22.63	22.64	Vertical back	5 mm	Intenna	0.419	1.377	0.577
2 593	22.63	22.63	Top	5 mm	Intenna	0.056	1.377	0.077
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population					**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Power Supply Power supplied through host device (TOSHIBA)
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 All side of the device were tested.
8 Test Configuration ☐ With Holster ☒ Without Holster
The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
9 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
10 Justification for Reduced test configurations per Oct. 2010 TCB Workshop:
Test each channel bandwidth and modulation independently
- Use the lowest coding rate for each modulation when the same rated maximum output applies to all coding rates in a modulation.
- Test higher coding rates only if the rated maximum output is higher
- Use the scaled SAR to determine test reduction (<0.8 W/kg etc.)
- For each channel bandwidth, if QPSK SAR is < 0.8 W/kg and maximum power > 16 QAM, test highest output channel for 16 QAM.
- QPSK SAR is between 0.8 and 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK
- QPSK SAR is > 1.2 W/kg, test 16QAM using the highest SAR channel in QPSK; and if the 16QAM SAR is > 1.2, test all channels in 16QAM

11. CONCLUSION

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/ IEEE C95.1 2005.

These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests.

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Attachment 1. – SAR Test Plots

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2498.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 2.02 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

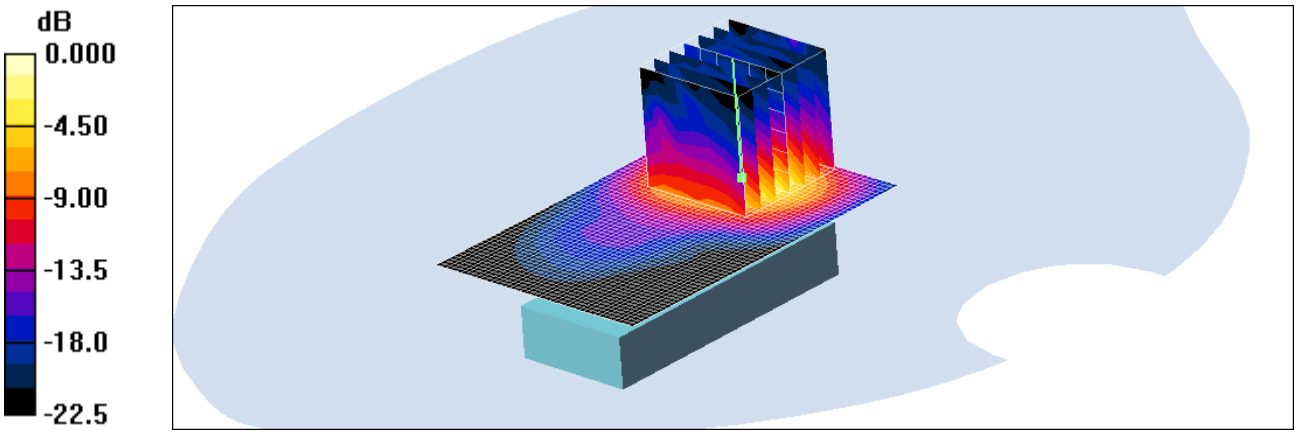
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.17, 4.17, 4.17); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 0ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.882 mW/g

WIMAX Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.2 V/m; Power Drift = 0.072 dB
Peak SAR (extrapolated) = 2.23 W/kg
SAR(1 g) = 0.802 mW/g; SAR(10 g) = 0.307 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.923 mW/g



0 dB = 0.923mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.16 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

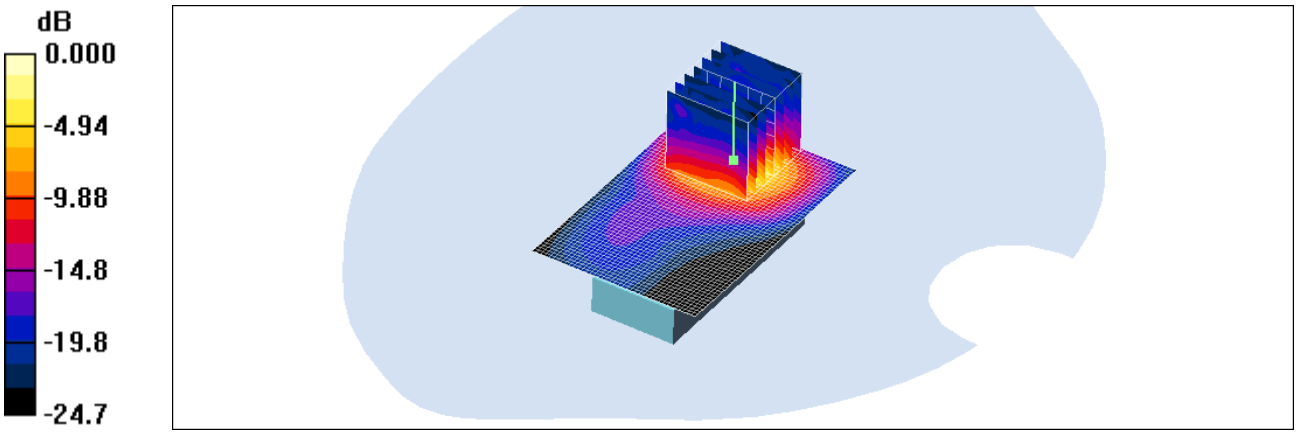
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 378ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.22 mW/g

WIMAX Body 378ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.2 V/m; Power Drift = 0.015 dB
Peak SAR (extrapolated) = 3.45 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.401 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.30 mW/g



0 dB = 1.30mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2687.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.31 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

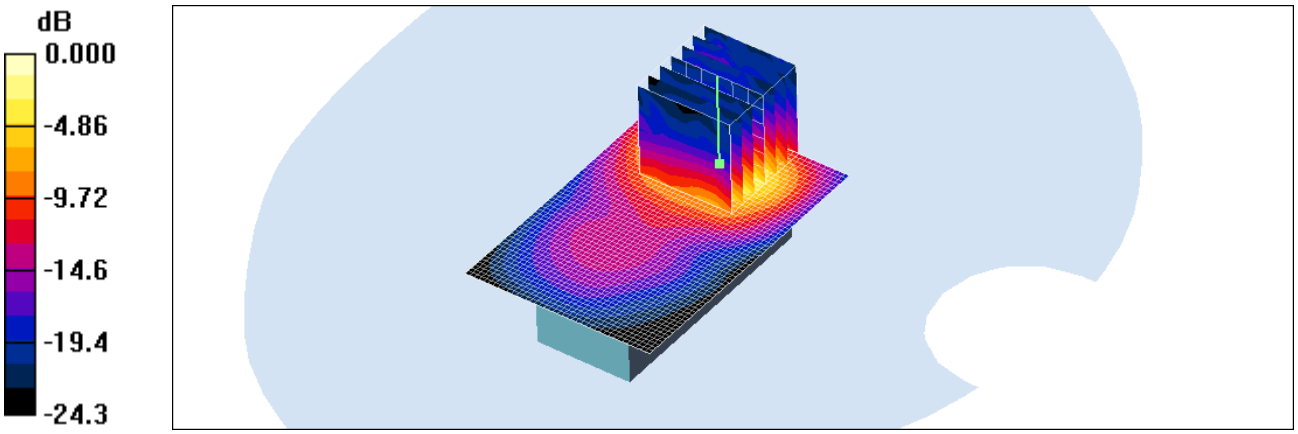
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 756ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.10 mW/g

WIMAX Body 756ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.9 V/m; Power Drift = 0.126 dB
Peak SAR (extrapolated) = 2.82 W/kg
SAR(1 g) = 0.972 mW/g; SAR(10 g) = 0.365 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.10 mW/g



0 dB = 1.10mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2687.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.31 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

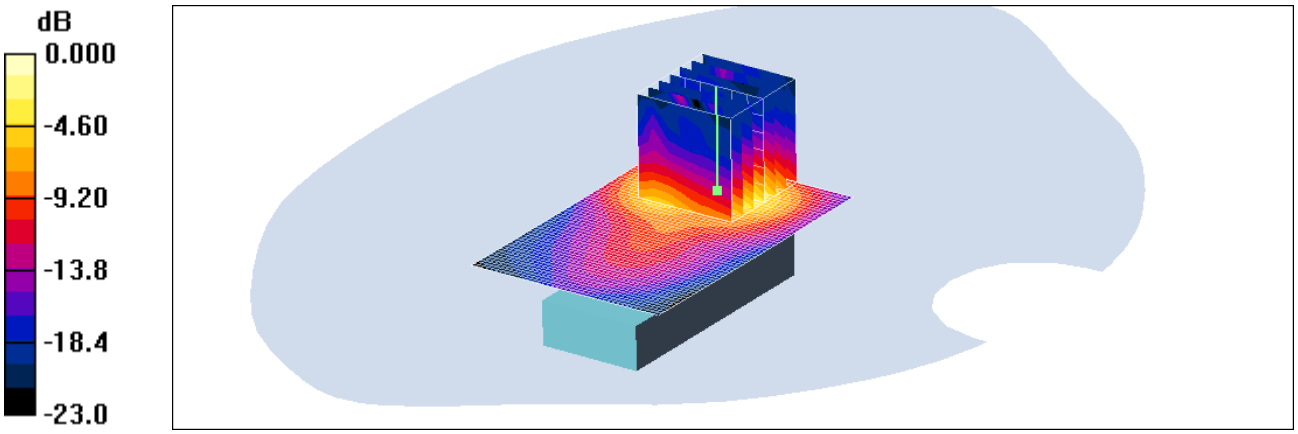
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 756ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.617 mW/g

WIMAX Body 756ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = 0.138 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.540 mW/g; SAR(10 g) = 0.220 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.643 mW/g



0 dB = 0.643mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2687.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.31 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

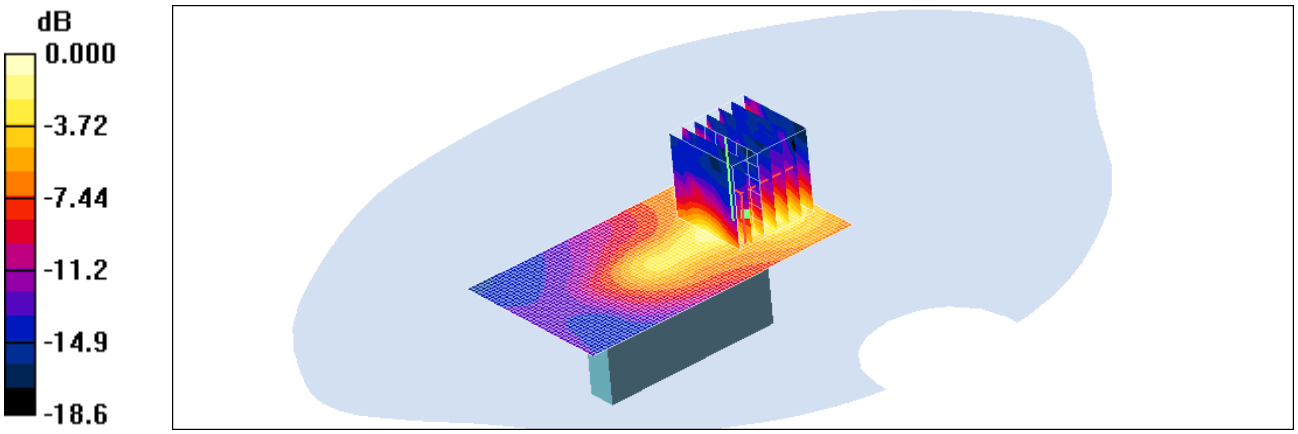
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 756ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.157 mW/g

Wimax Body 756ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.47 V/m; Power Drift = -0.009 dB
Peak SAR (extrapolated) = 0.384 W/kg
SAR(1 g) = 0.140 mW/g; SAR(10 g) = 0.064 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.163 mW/g



0 dB = 0.163mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2687.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.31 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

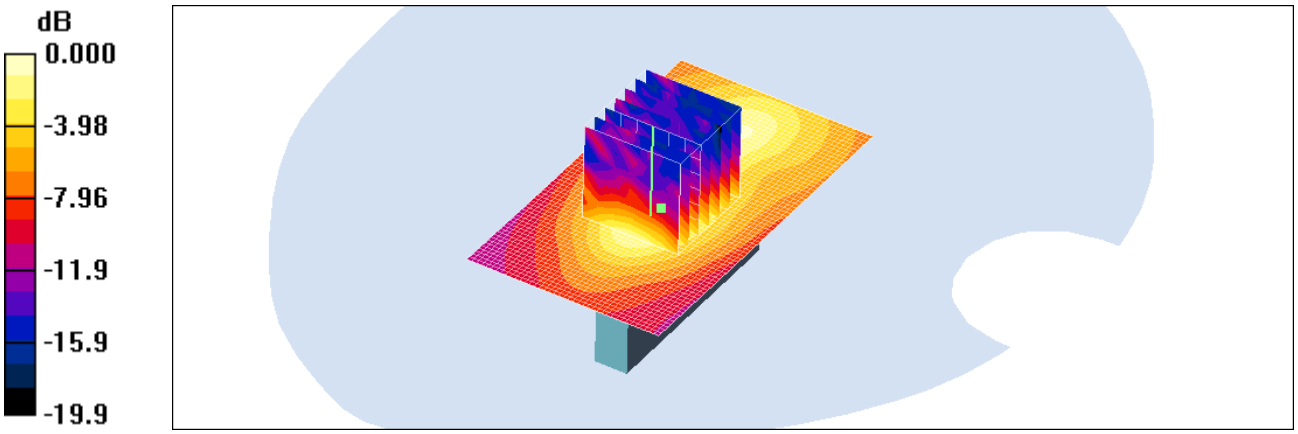
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 756ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.213 mW/g

Wimax Body 756ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.04 V/m; Power Drift = -0.020 dB
Peak SAR (extrapolated) = 0.340 W/kg
SAR(1 g) = 0.169 mW/g; SAR(10 g) = 0.074 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.204 mW/g



0 dB = 0.204mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2687.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.31 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

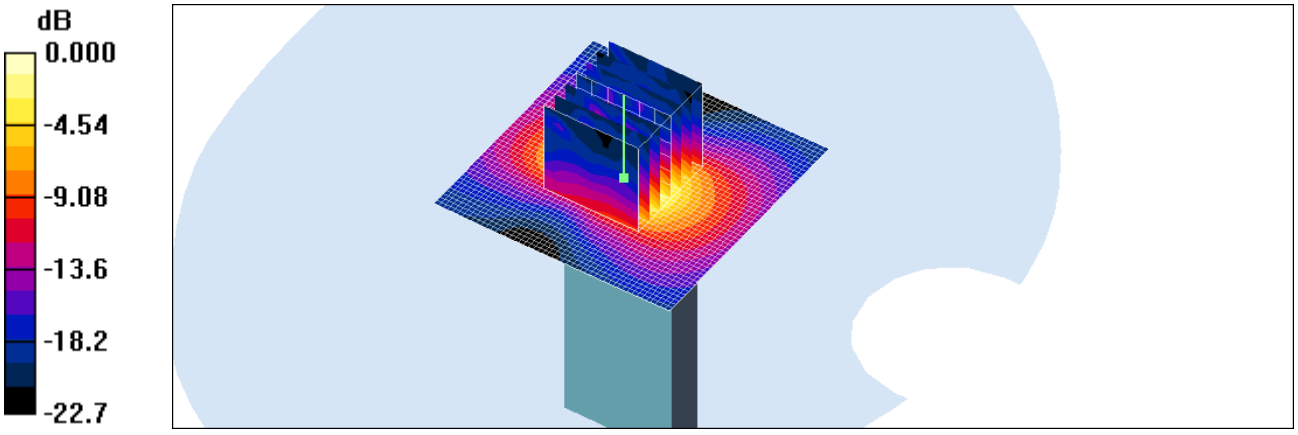
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 756ch/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.692 mW/g

Wimax Body 756ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.0 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.494 mW/g; SAR(10 g) = 0.187 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.570 mW/g



0 dB = 0.570mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.16 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

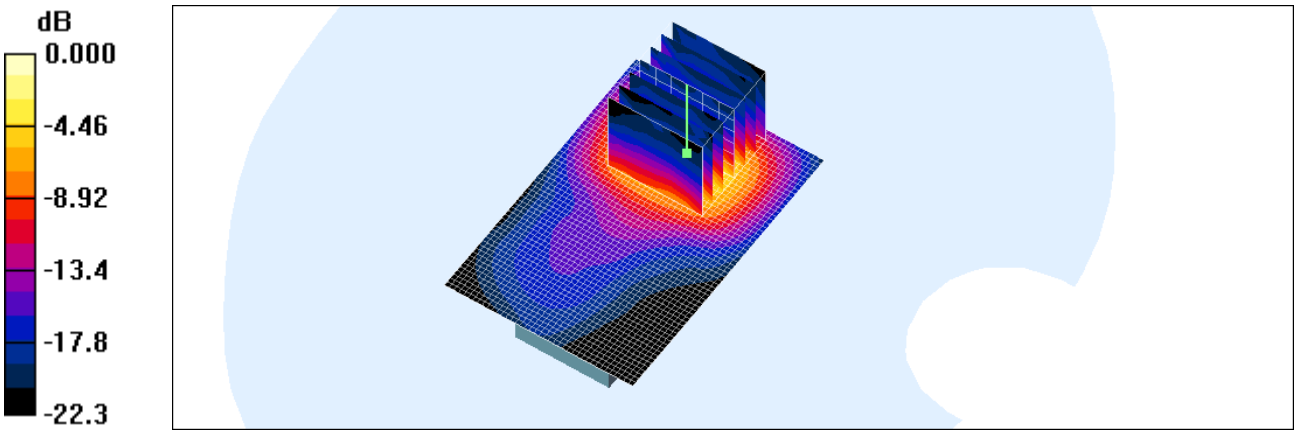
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 378ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.827 mW/g

WIMAX Body 378ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.7 V/m; Power Drift = 0.080 dB
Peak SAR (extrapolated) = 2.32 W/kg
SAR(1 g) = 0.776 mW/g; SAR(10 g) = 0.287 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.883 mW/g



0 dB = 0.883mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.16 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

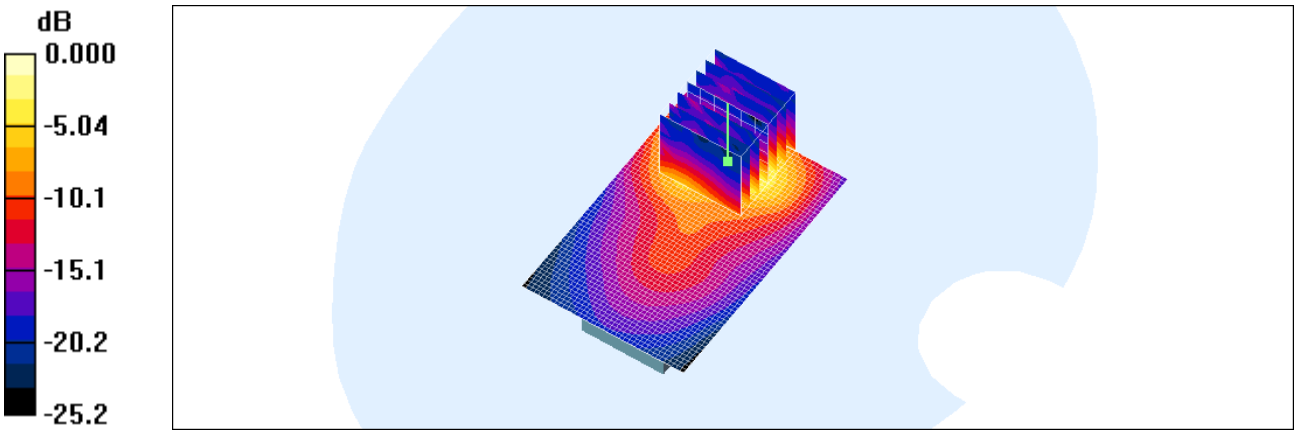
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 378ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.682 mW/g

WIMAX Body 378ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.9 V/m; Power Drift = 0.095 dB
Peak SAR (extrapolated) = 1.82 W/kg
SAR(1 g) = 0.632 mW/g; SAR(10 g) = 0.241 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.717 mW/g



0 dB = 0.717mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.16 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

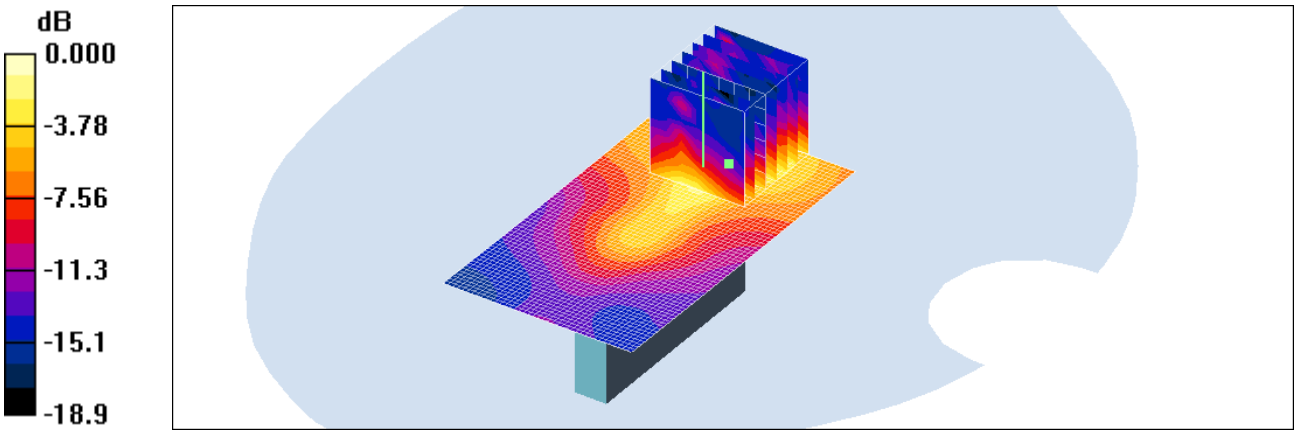
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 378ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.147 mW/g

Wimax Body 378ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.35 V/m; Power Drift = 0.127 dB
Peak SAR (extrapolated) = 0.286 W/kg
SAR(1 g) = 0.130 mW/g; SAR(10 g) = 0.059 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.146 mW/g



0 dB = 0.146mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.16 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

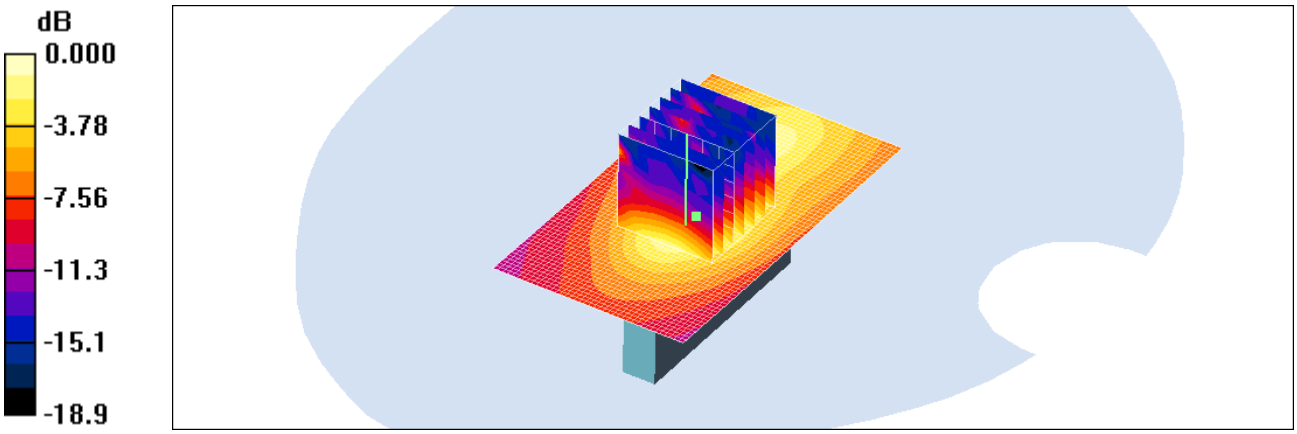
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 378ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.160 mW/g

Wimax Body 378ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.63 V/m; Power Drift = -0.040 dB
Peak SAR (extrapolated) = 0.585 W/kg
SAR(1 g) = 0.136 mW/g; SAR(10 g) = 0.061 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.153 mW/g



0 dB = 0.153mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.16 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

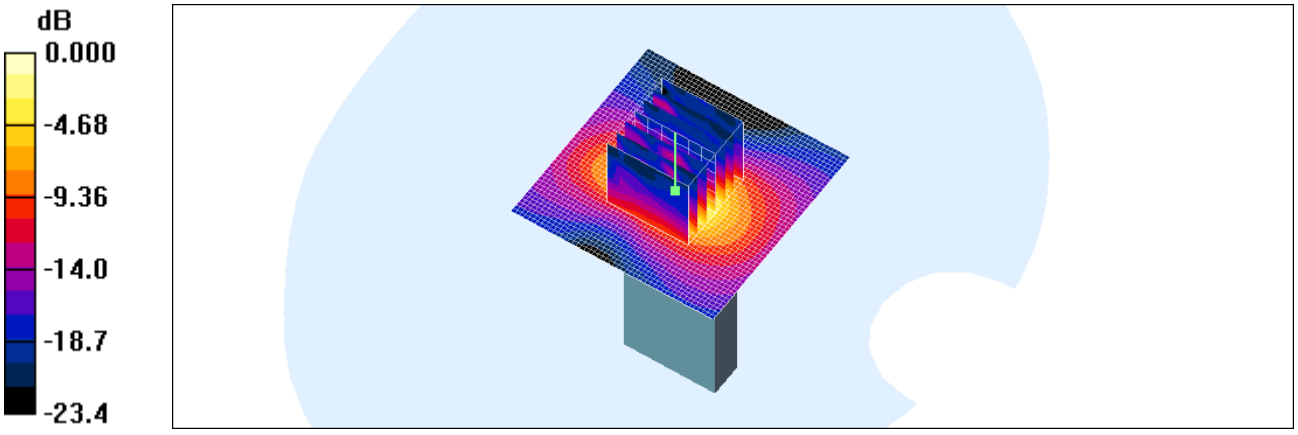
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 378ch/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.556 mW/g

Wimax Body 378ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.2 V/m; Power Drift = -0.056 dB
Peak SAR (extrapolated) = 0.998 W/kg
SAR(1 g) = 0.431 mW/g; SAR(10 g) = 0.162 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.532 mW/g



0 dB = 0.532mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

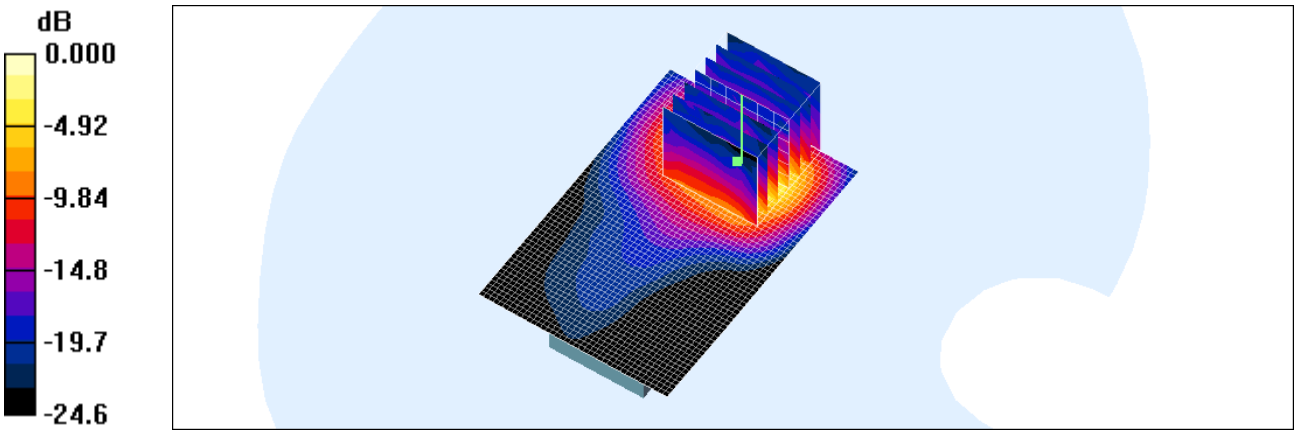
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 0ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.24 mW/g

WIMAX Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.1 V/m; Power Drift = -0.020 dB
Peak SAR (extrapolated) = 3.11 W/kg
SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.418 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.30 mW/g



0 dB = 1.30mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.16 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

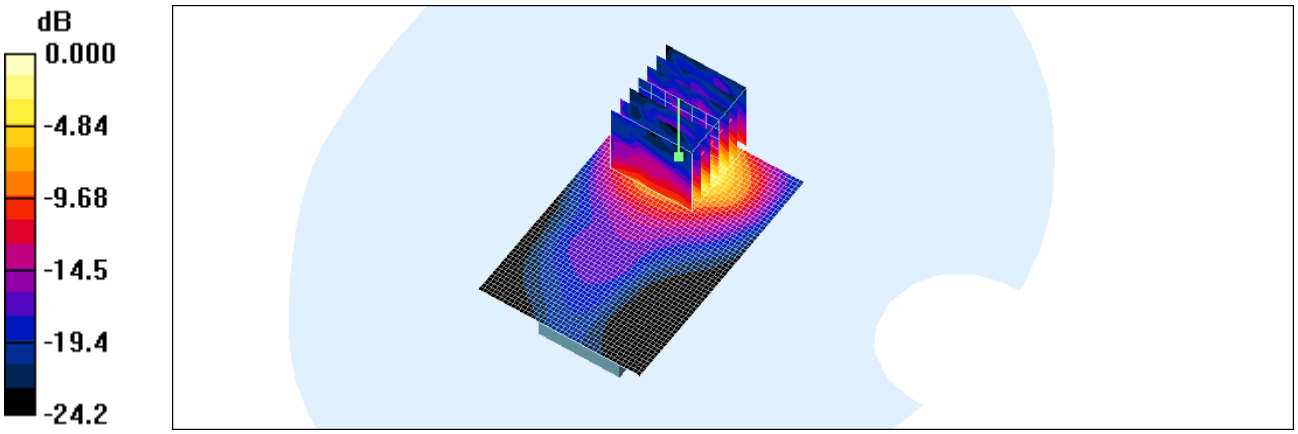
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 368ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.16 mW/g

WIMAX Body 368ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = 0.138 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.381 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.18 mW/g



0 dB = 1.18mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2685 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.3 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

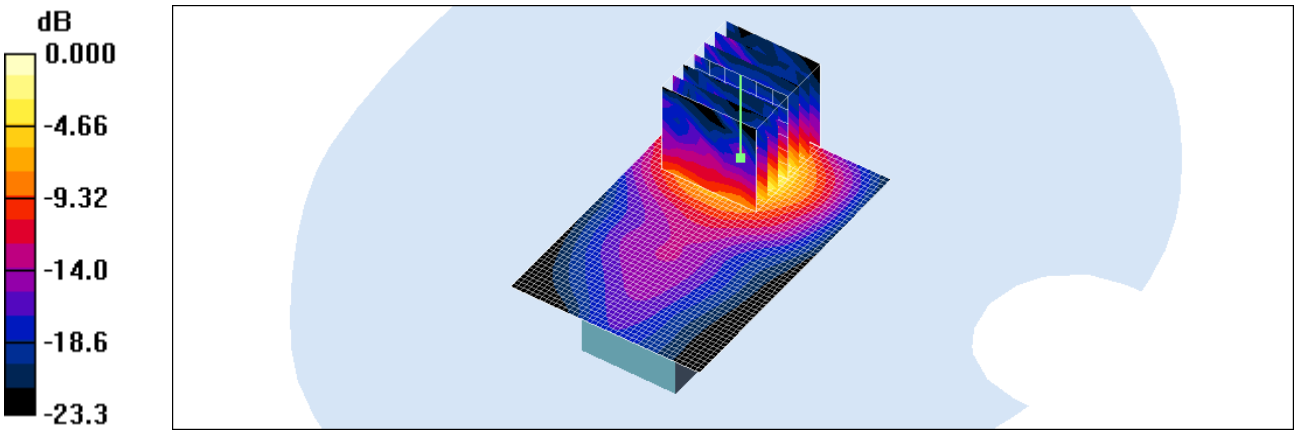
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 736ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.32 mW/g

WIMAX Body 736ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.0 V/m; Power Drift = -0.014 dB
Peak SAR (extrapolated) = 3.46 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.417 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.33 mW/g



0 dB = 1.33mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

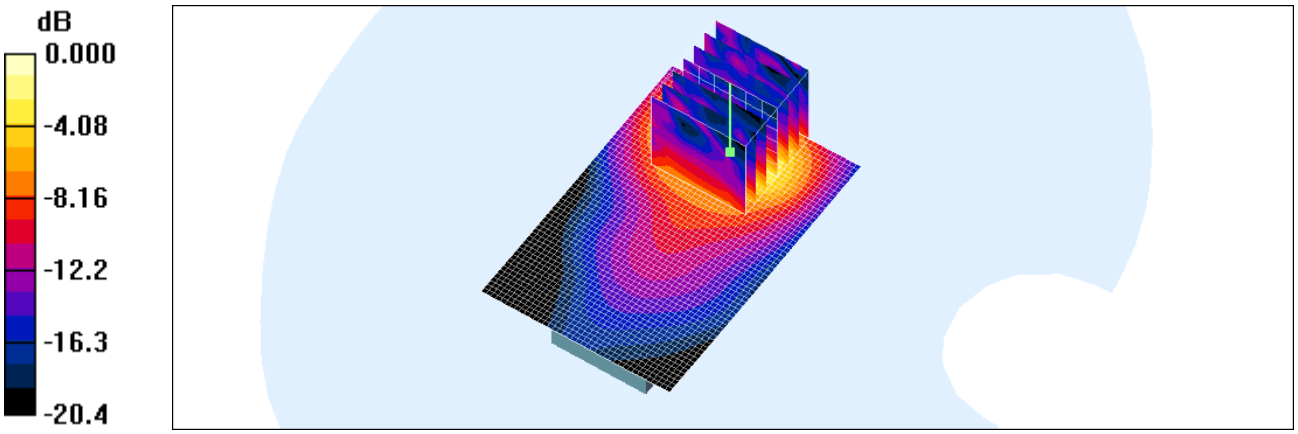
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 0ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.434 mW/g

WIMAX Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.3 V/m; Power Drift = -0.050 dB
Peak SAR (extrapolated) = 1.78 W/kg
SAR(1 g) = 0.394 mW/g; SAR(10 g) = 0.162 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.434 mW/g



0 dB = 0.434mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Jan. 03. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

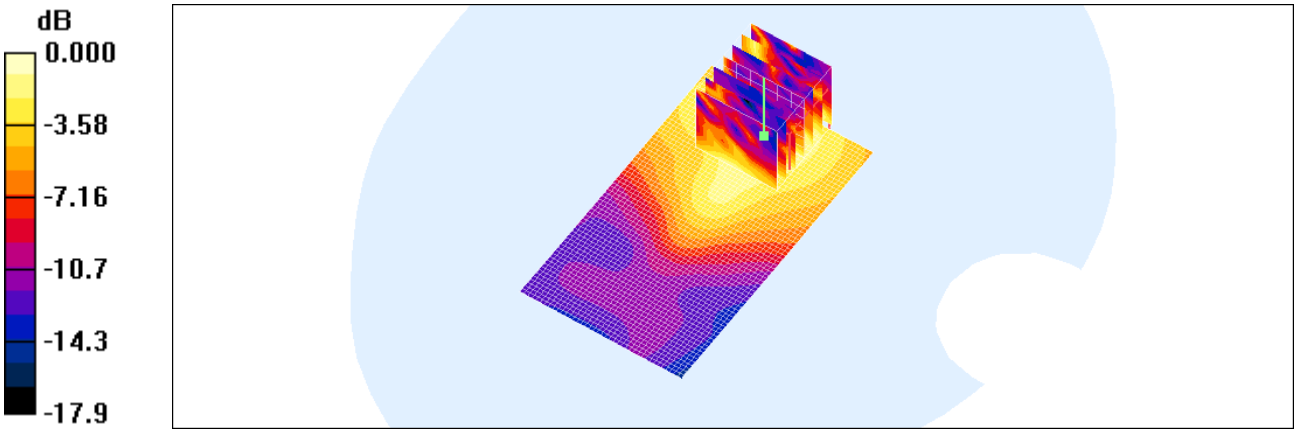
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 0ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.073 mW/g

Wimax Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.33 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 0.260 W/kg
SAR(1 g) = 0.064 mW/g; SAR(10 g) = 0.031 mW/g

Maximum value of SAR (measured) = 0.072 mW/g



0 dB = 0.072mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Jan. 03. 2011

DUT: U310; Type: side; Serial: #1

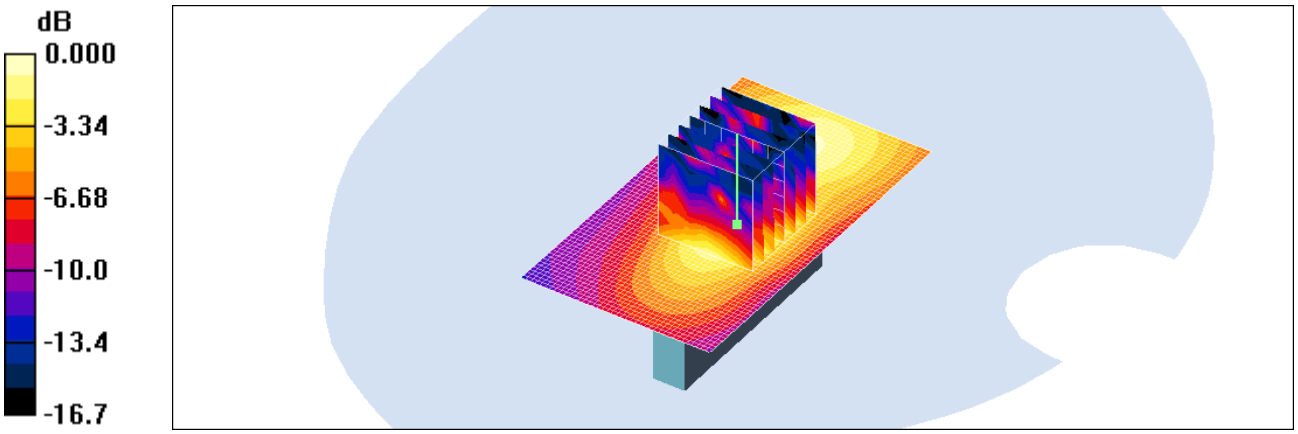
Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 0ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.128 mW/g

Wimax Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.47 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 0.227 W/kg
SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.048 mW/g
Maximum value of SAR (measured) = 0.123 mW/g



0 dB = 0.123mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

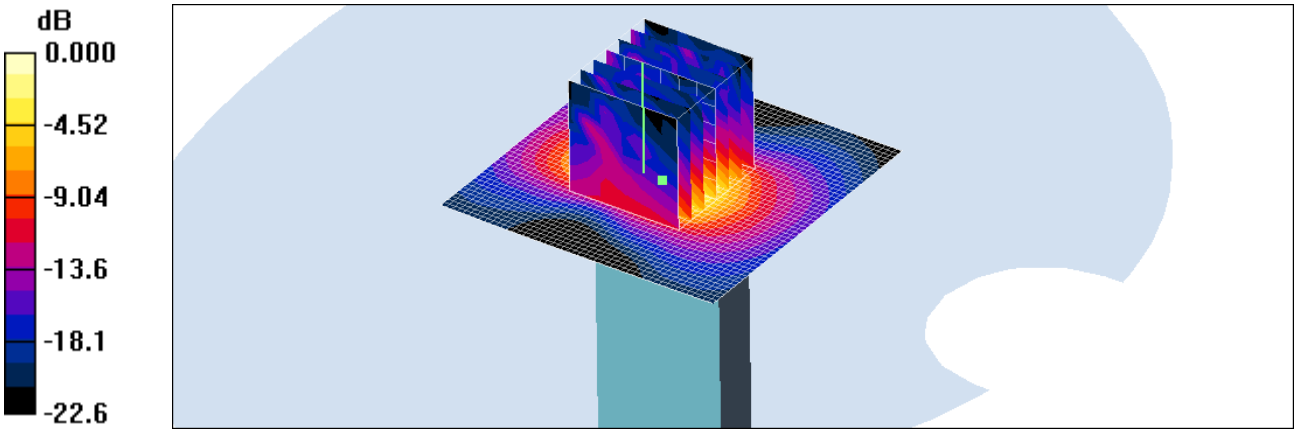
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 0ch/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.730 mW/g

Wimax Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.8 V/m; Power Drift = -0.130 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.493 mW/g; SAR(10 g) = 0.189 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.562 mW/g



0 dB = 0.562mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

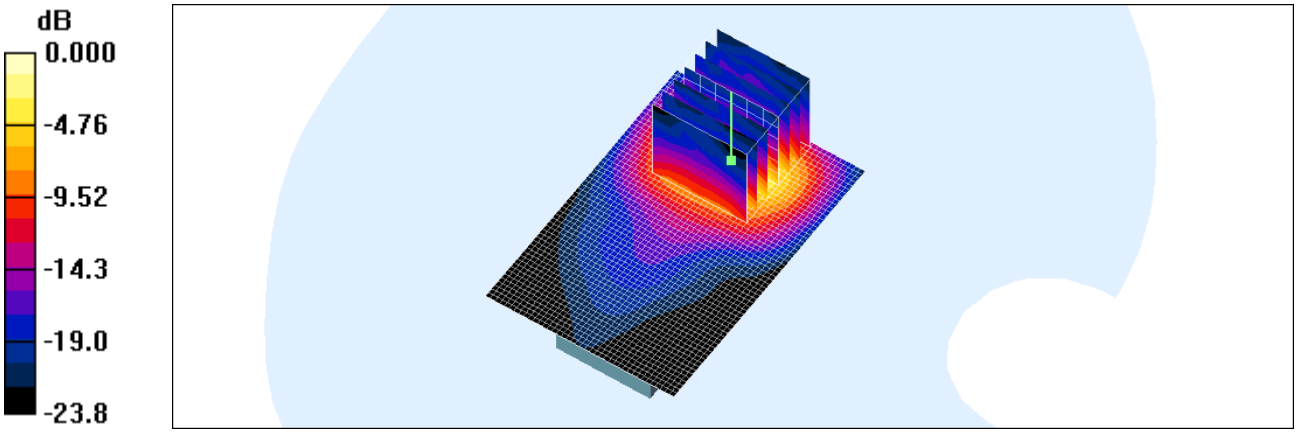
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 0ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.21 mW/g

WIMAX Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.6 V/m; Power Drift = 0.147 dB
Peak SAR (extrapolated) = 3.12 W/kg
SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.402 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.25 mW/g



0 dB = 1.25mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.16 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

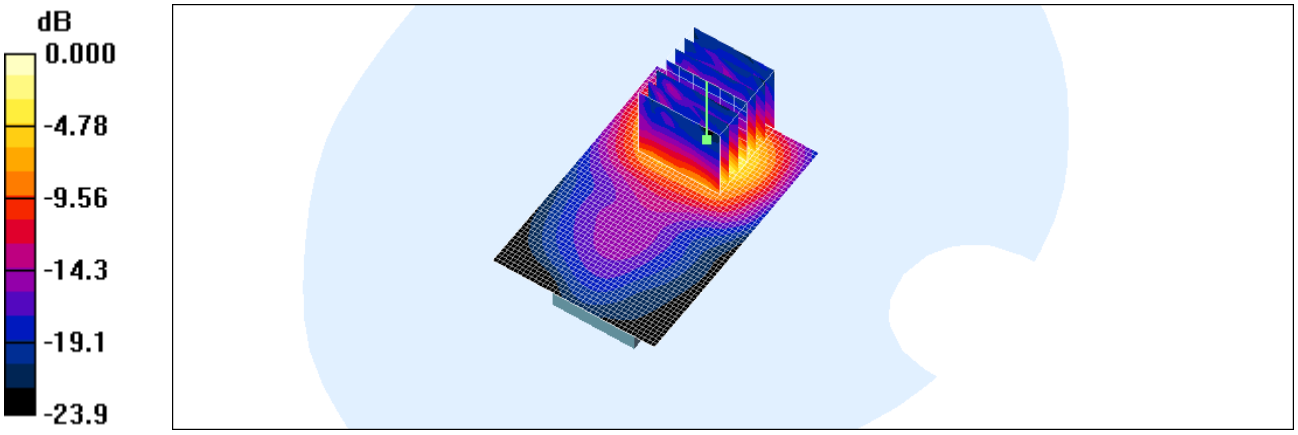
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 368ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.703 mW/g

WIMAX Body 368ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.5 V/m; Power Drift = 0.112 dB
Peak SAR (extrapolated) = 1.74 W/kg
SAR(1 g) = 0.637 mW/g; SAR(10 g) = 0.246 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.737 mW/g



0 dB = 0.737mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2685 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.3 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

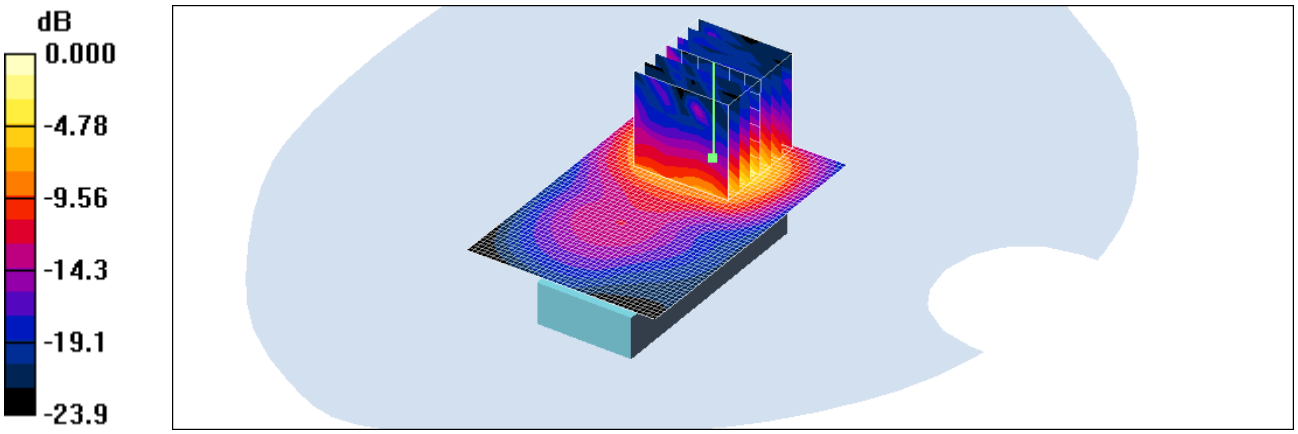
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 736ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.02 mW/g

WIMAX Body 736ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.4 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 2.66 W/kg
SAR(1 g) = 0.904 mW/g; SAR(10 g) = 0.339 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.02 mW/g



0 dB = 1.02mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2685 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.3 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

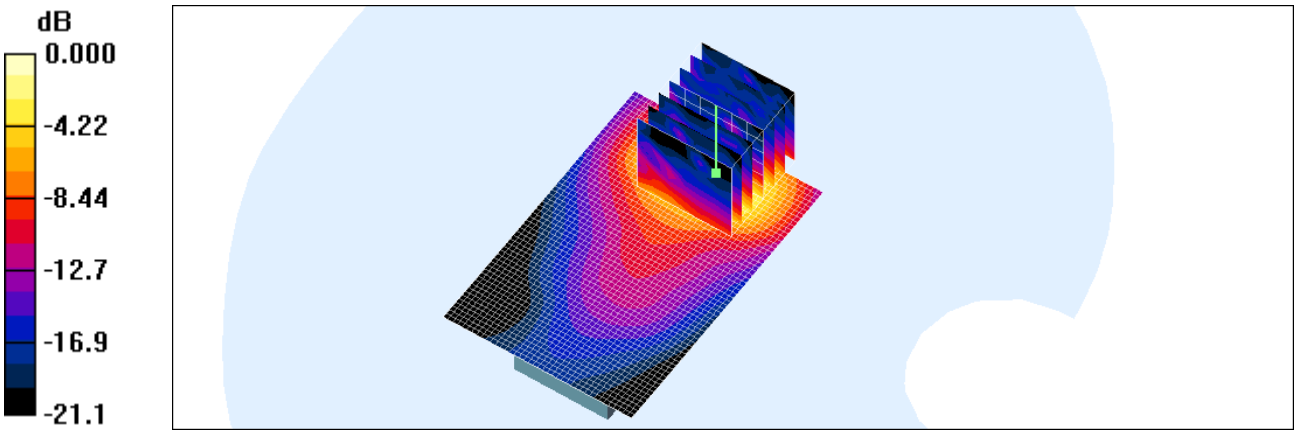
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 736ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.571 mW/g

WIMAX Body 736ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = 0.035 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.564 mW/g; SAR(10 g) = 0.215 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.654 mW/g



0 dB = 0.654mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2685 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.3 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

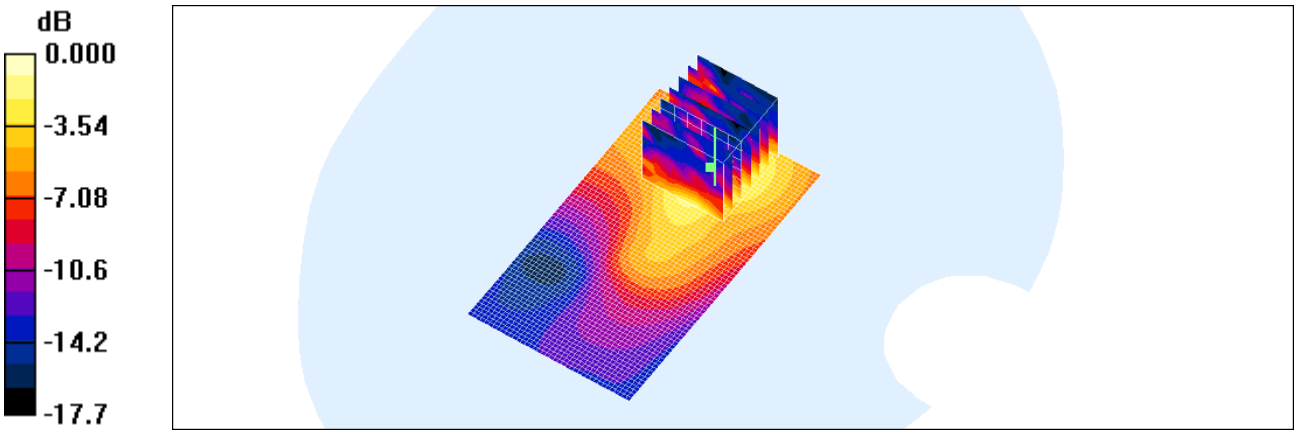
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 736ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.145 mW/g

Wimax Body 736ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.62 V/m; Power Drift = 0.072 dB
Peak SAR (extrapolated) = 0.485 W/kg
SAR(1 g) = 0.138 mW/g; SAR(10 g) = 0.065 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.149 mW/g



0 dB = 0.149mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2685 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.3 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

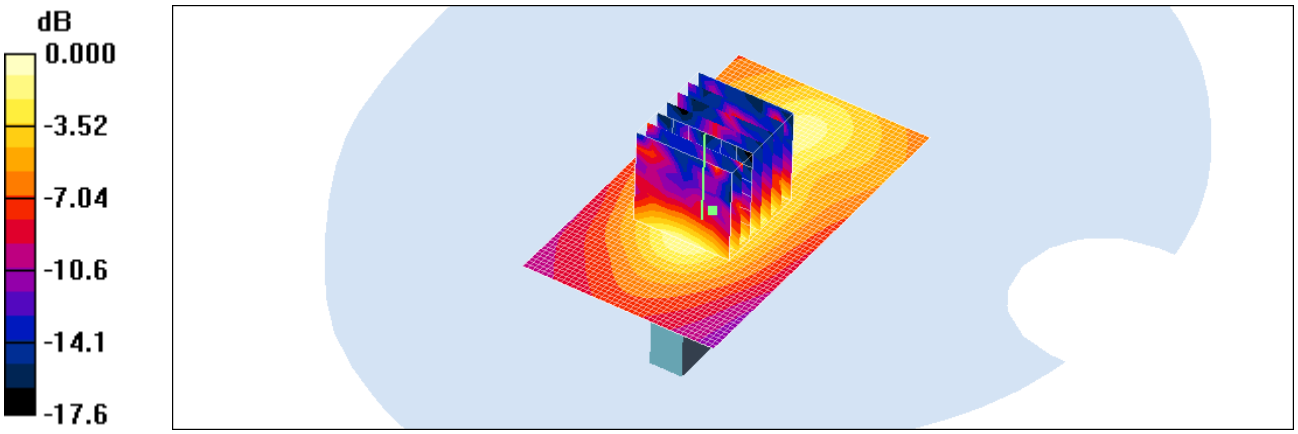
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 736ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.161 mW/g

Wimax Body 736ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.78 V/m; Power Drift = -0.075 dB
Peak SAR (extrapolated) = 0.277 W/kg
SAR(1 g) = 0.140 mW/g; SAR(10 g) = 0.065 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.159 mW/g



0 dB = 0.159mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2685 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.3 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

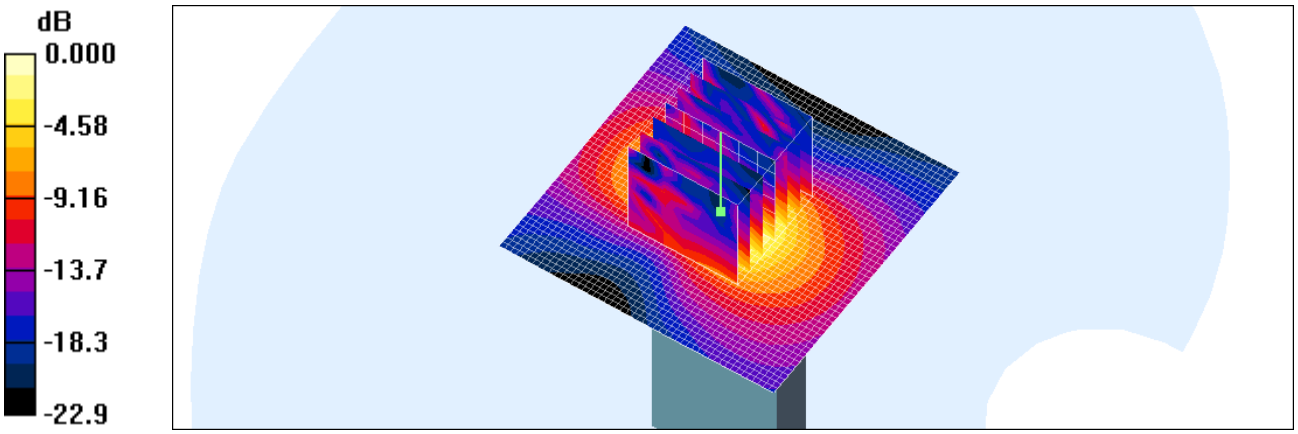
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Wimax Body 736ch/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.588 mW/g

Wimax Body 736ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = -0.170 dB
Peak SAR (extrapolated) = 0.836 W/kg
SAR(1 g) = 0.378 mW/g; SAR(10 g) = 0.145 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.454 mW/g



0 dB = 0.454mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2687.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.31 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

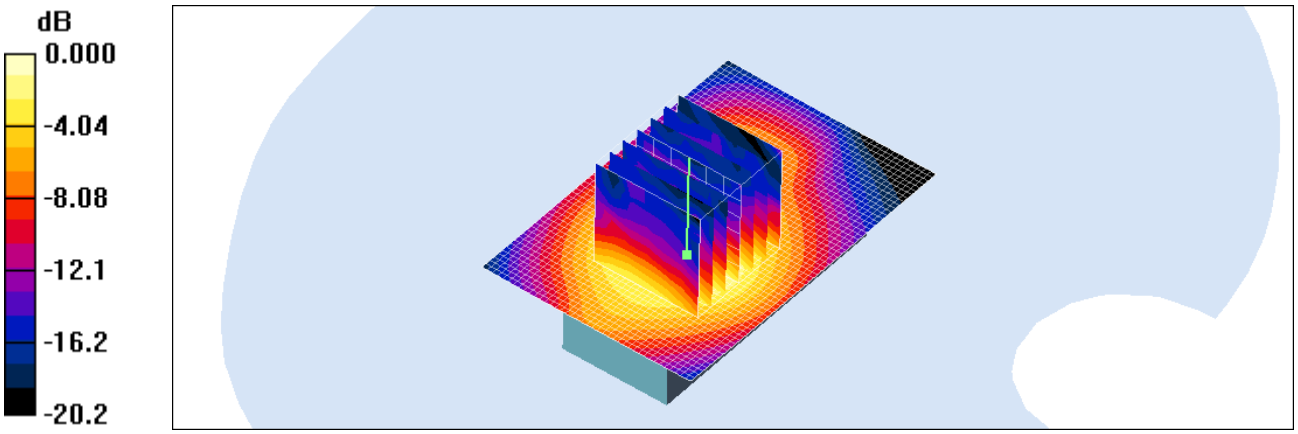
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 756/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.534 mW/g

WIMAX Body 756/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.06 V/m; Power Drift = 0.181 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.497 mW/g; SAR(10 g) = 0.245 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.532 mW/g



0 dB = 0.532mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2498.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2498.5 MHz; σ = 2.02 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

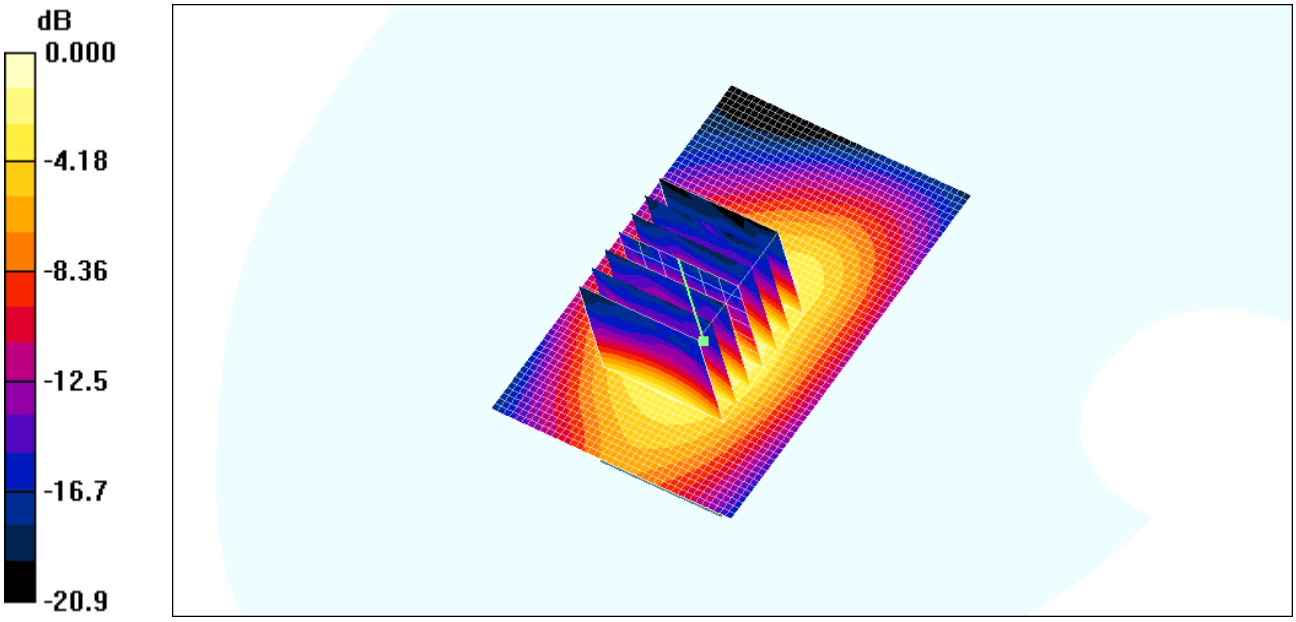
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.17, 4.17, 4.17); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 0ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.647 mW/g

WIMAX Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.21 V/m; Power Drift = 0.001 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.579 mW/g; SAR(10 g) = 0.279 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.615 mW/g



0 dB = 0.615mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

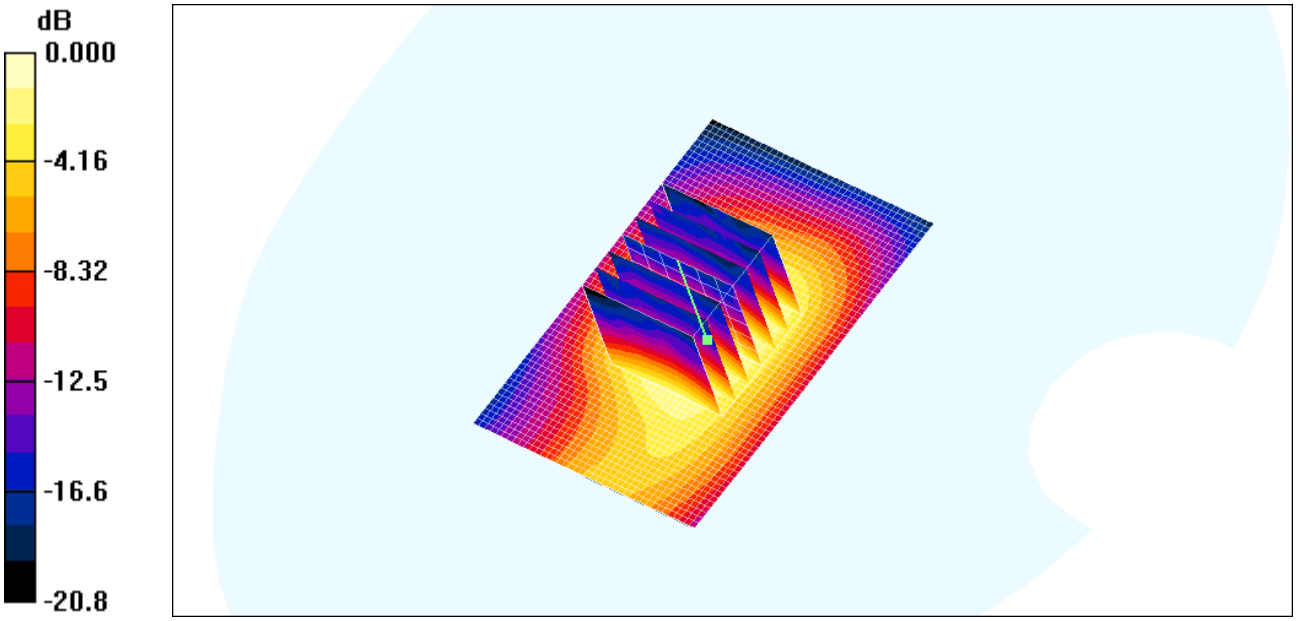
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 378/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.725 mW/g

WIMAX Body 378/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.57 V/m; Power Drift = 0.116 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.644 mW/g; SAR(10 g) = 0.329 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.692 mW/g



0 dB = 0.692mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2687.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.31 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

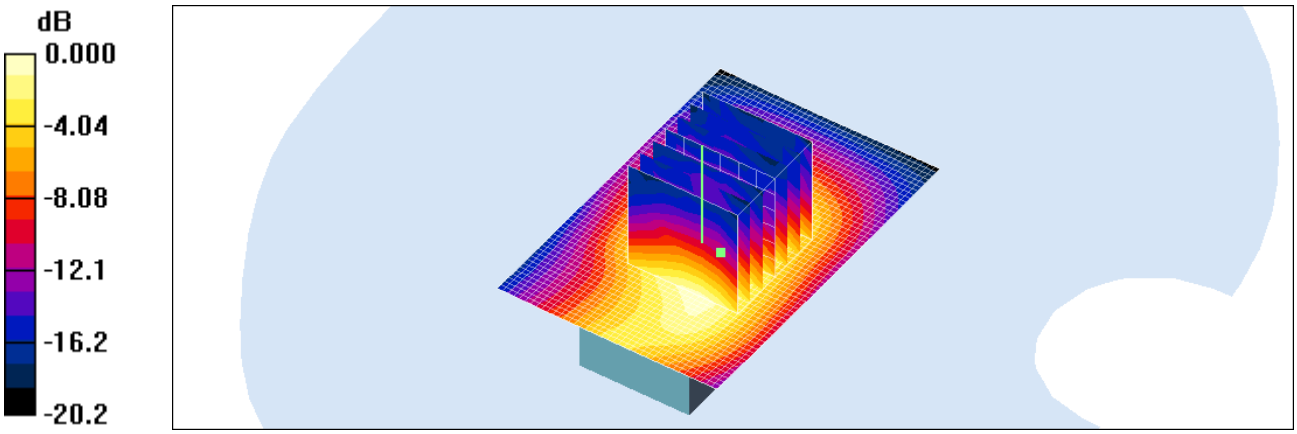
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 756/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.695 mW/g

WIMAX Body 756/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.13 V/m; Power Drift = -0.091 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.604 mW/g; SAR(10 g) = 0.312 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.649 mW/g



0 dB = 0.649mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2687.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.31 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

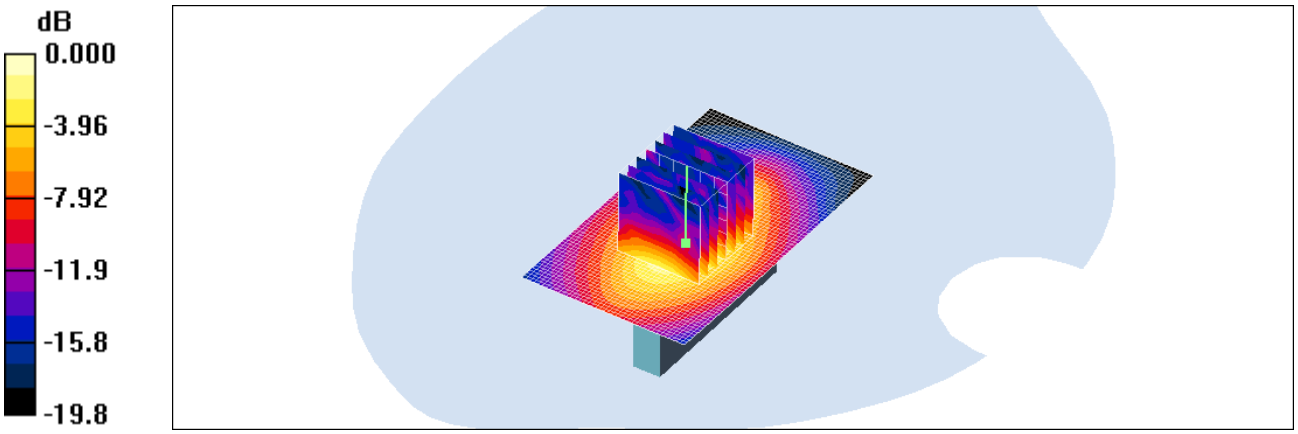
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 756ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.287 mW/g

Wimax Body 756ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.56 V/m; Power Drift = -0.061 dB
Peak SAR (extrapolated) = 0.700 W/kg
SAR(1 g) = 0.271 mW/g; SAR(10 g) = 0.121 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.298 mW/g



0 dB = 0.298mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2687.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.31 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

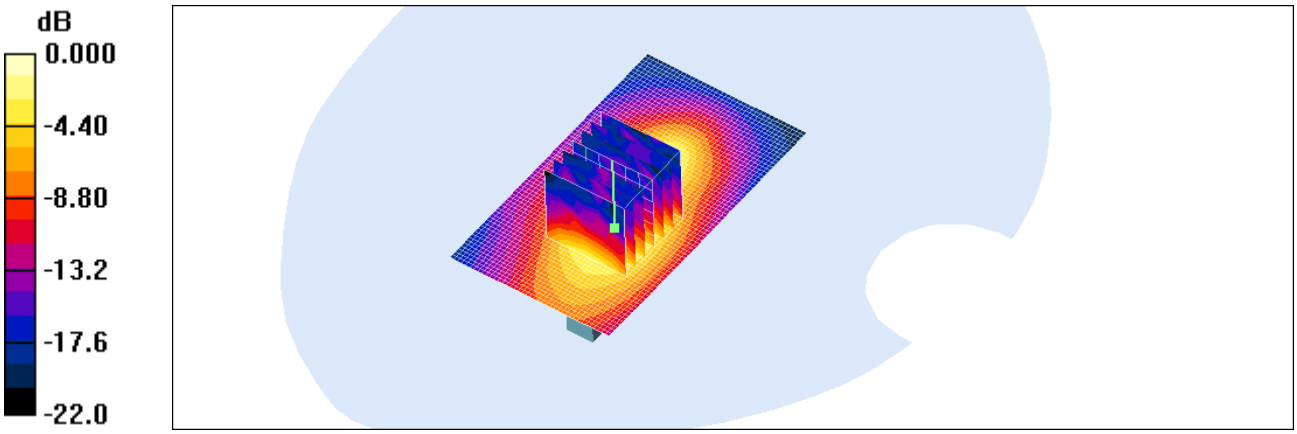
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 756ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.445 mW/g

Wimax Body 756ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.95 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.425 mW/g; SAR(10 g) = 0.188 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.475 mW/g



0 dB = 0.475mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2687.5 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2687.5 MHz; σ = 2.31 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

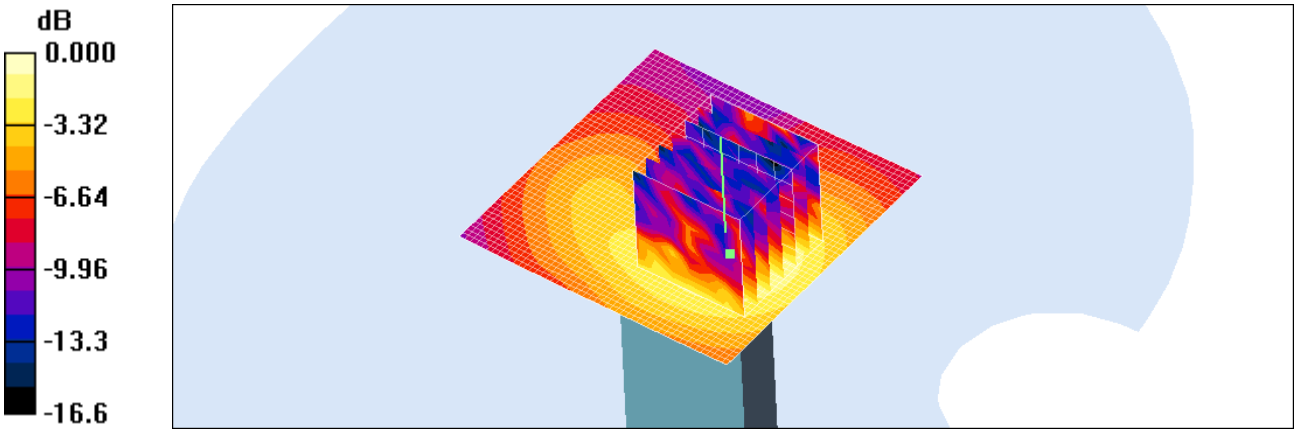
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 756ch/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.068 mW/g

Wimax Body 756ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.42 V/m; Power Drift = 0.163 dB
Peak SAR (extrapolated) = 0.253 W/kg
SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.028 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.071 mW/g



0 dB = 0.071mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

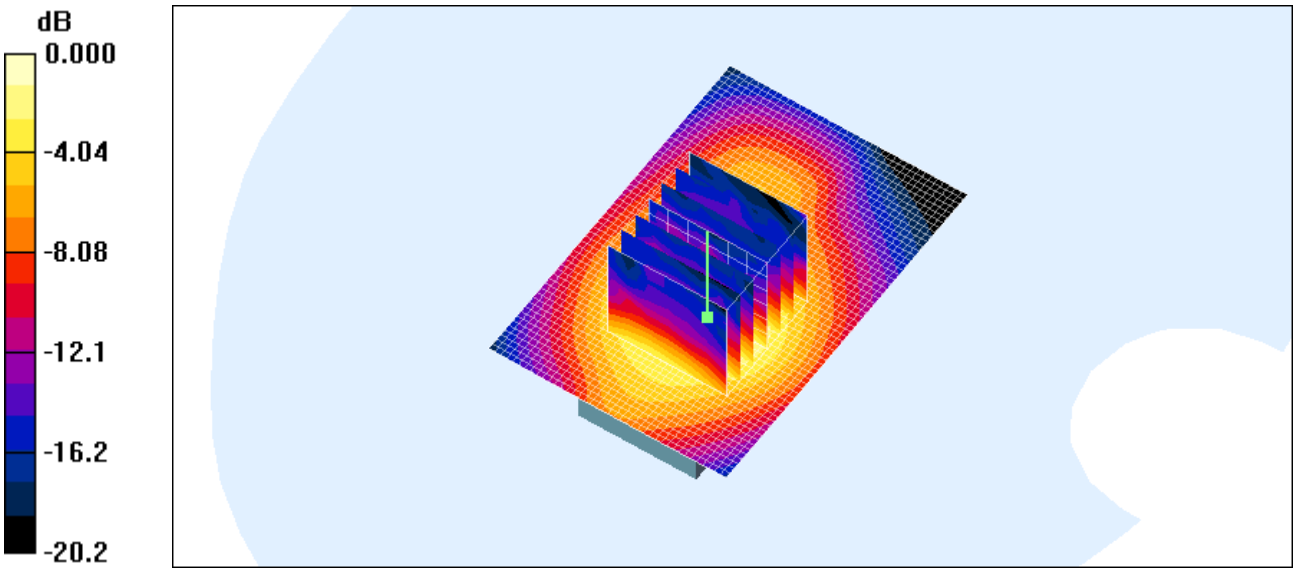
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 378/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.485 mW/g

WIMAX Body 378/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.93 V/m; Power Drift = 0.181 dB
Peak SAR (extrapolated) = 1.00 W/kg
SAR(1 g) = 0.452 mW/g; SAR(10 g) = 0.222 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.484 mW/g



0 dB = 0.484mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

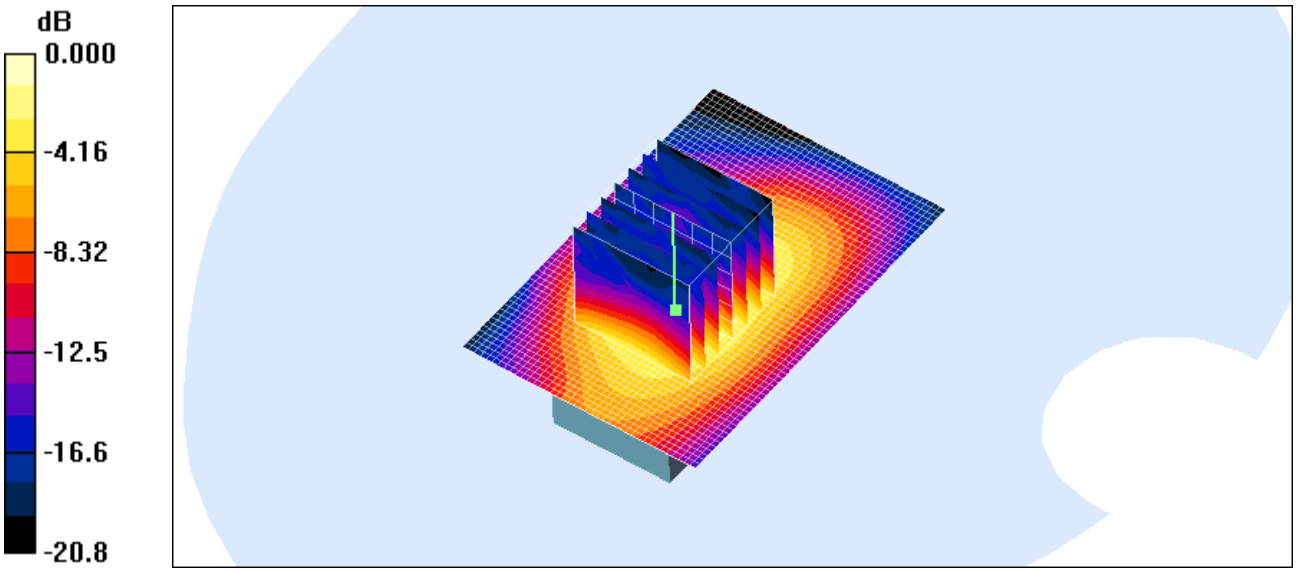
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 378/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.764 mW/g

WIMAX Body 378/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.76 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 1.49 W/kg
SAR(1 g) = 0.668 mW/g; SAR(10 g) = 0.321 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.723 mW/g



0 dB = 0.723mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jan. 04. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

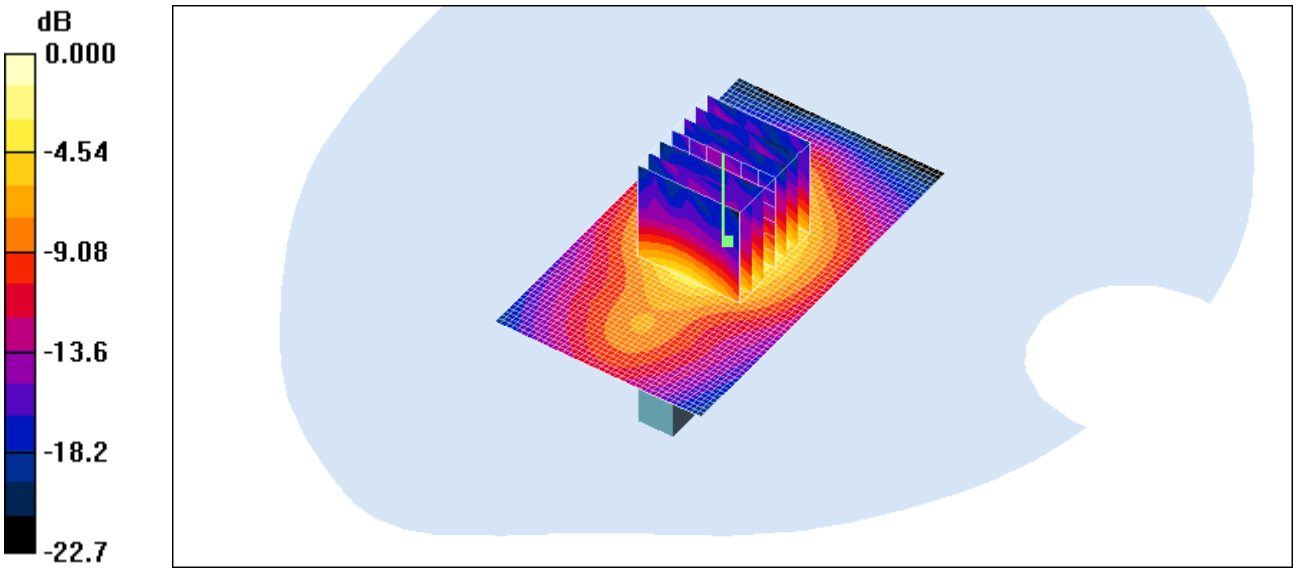
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 378/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.657 mW/g

Wimax Body 378/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.585 mW/g; SAR(10 g) = 0.268 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.633 mW/g



0 dB = 0.633mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jan. 04. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

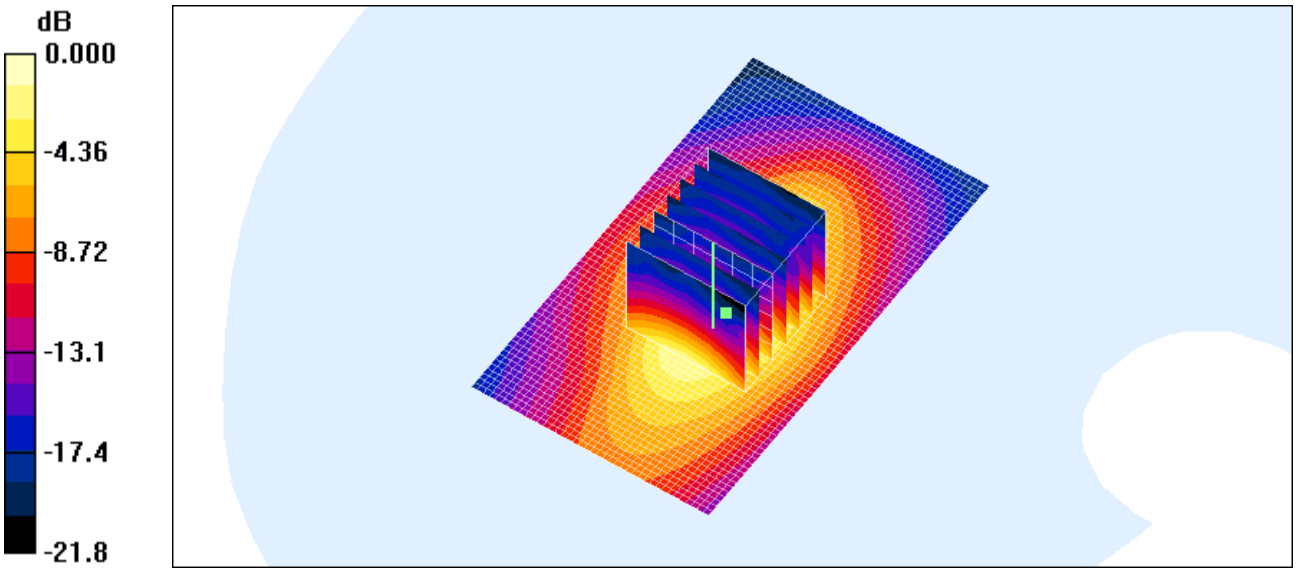
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 378/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.464 mW/g

Wimax Body 378/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.18 V/m; Power Drift = 0.109 dB
Peak SAR (extrapolated) = 0.934 W/kg
SAR(1 g) = 0.419 mW/g; SAR(10 g) = 0.197 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.457 mW/g



0 dB = 0.457mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

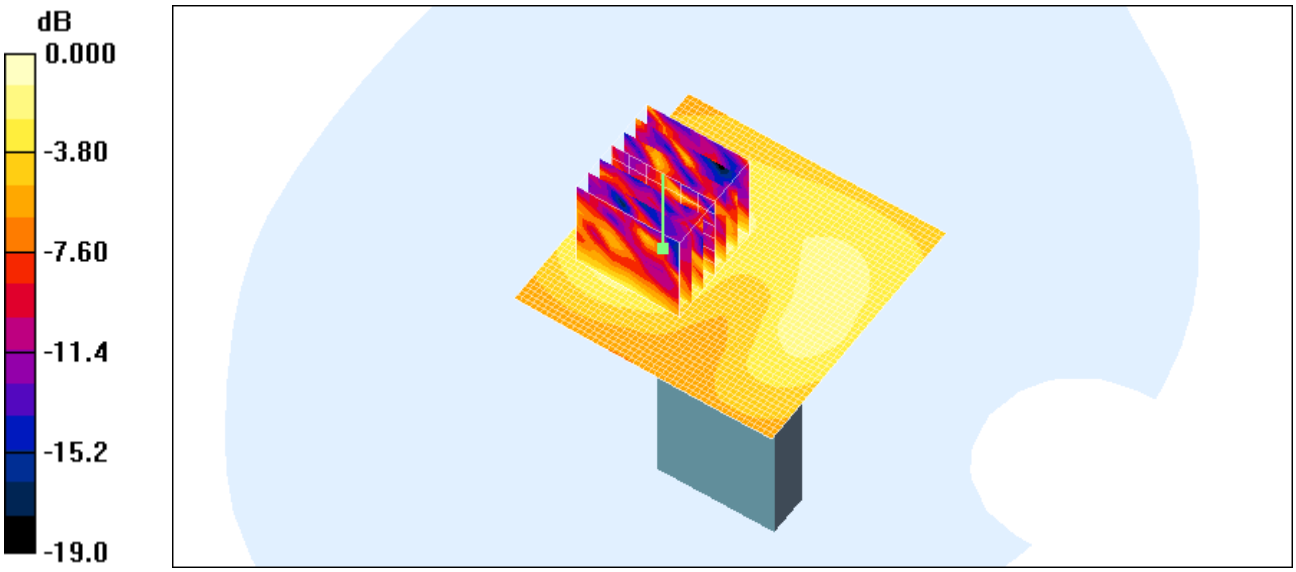
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 378/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.052 mW/g

Wimax Body 378/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.27 V/m; Power Drift = 0.102 dB
Peak SAR (extrapolated) = 0.268 W/kg
SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.023 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.056 mW/g



0 dB = 0.056mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

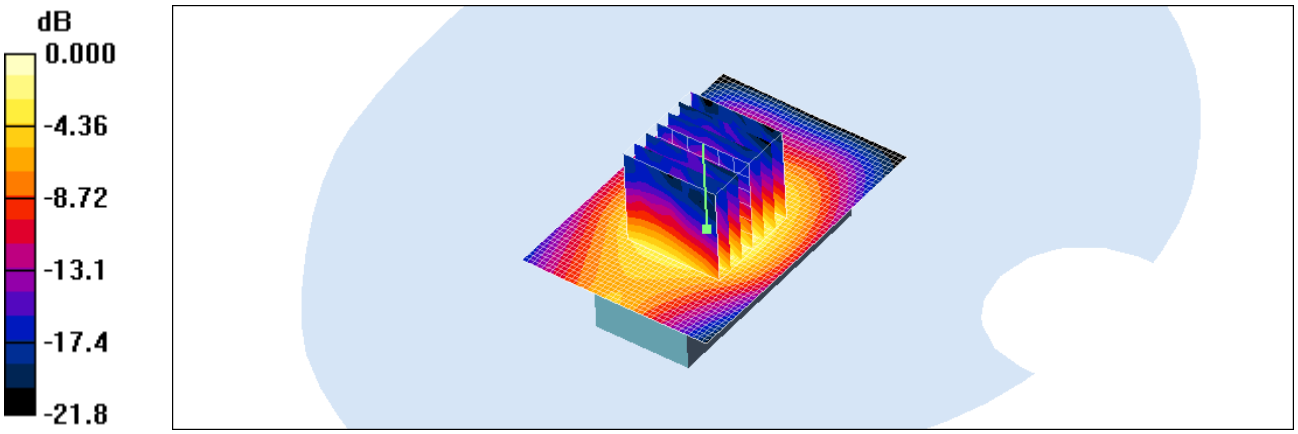
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 0ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.809 mW/g

WIMAX Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.82 V/m; Power Drift = 0.124 dB
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 0.743 mW/g; SAR(10 g) = 0.365 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.806 mW/g



0 dB = 0.806mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

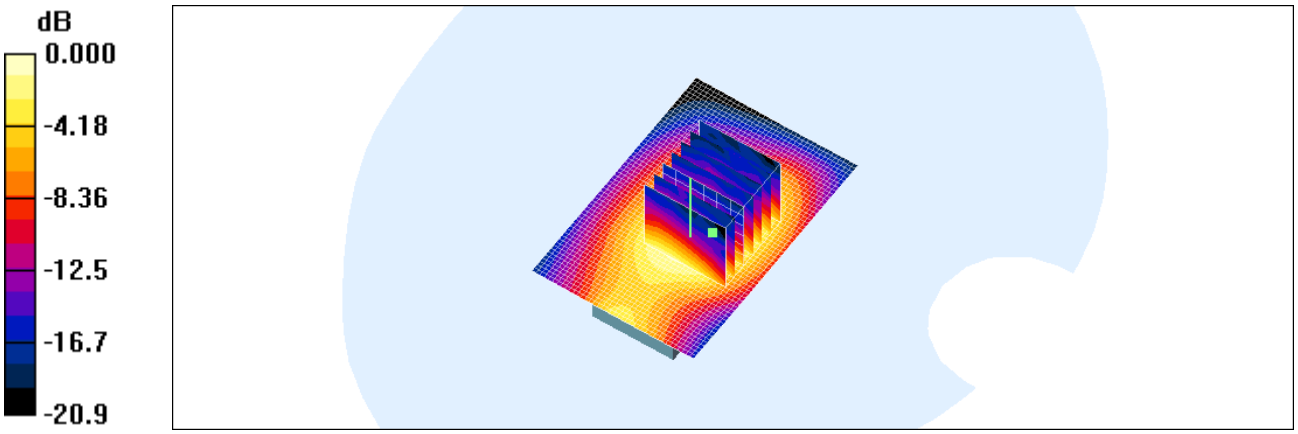
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 368/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.920 mW/g

WIMAX Body 368/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.86 V/m; Power Drift = 0.102 dB
Peak SAR (extrapolated) = 1.55 W/kg
SAR(1 g) = 0.756 mW/g; SAR(10 g) = 0.384 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.812 mW/g



0 dB = 0.812mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2685 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.3 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

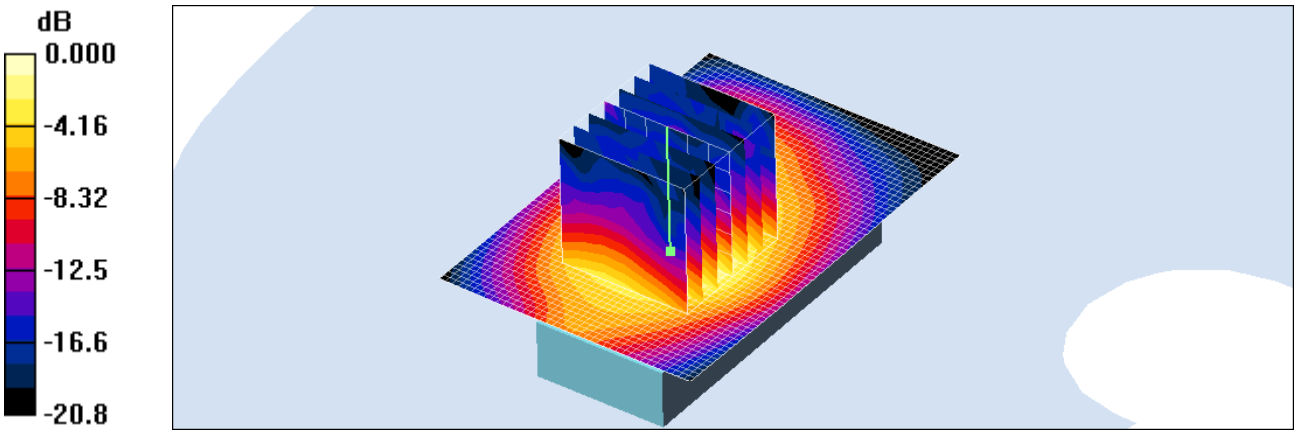
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 736/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.797 mW/g

WIMAX Body 736/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.2 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 0.758 mW/g; SAR(10 g) = 0.363 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.819 mW/g



0 dB = 0.819mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

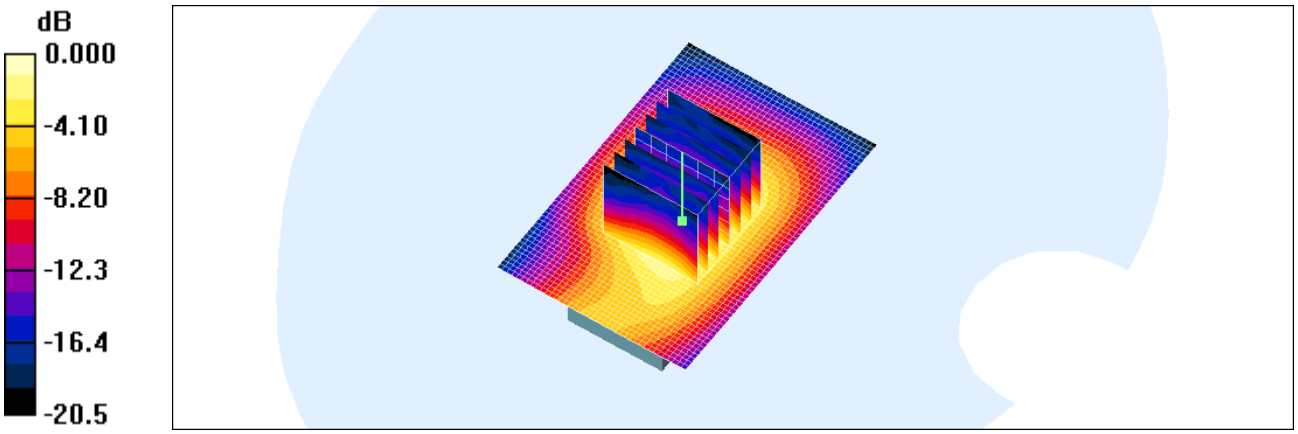
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 0ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.790 mW/g

WIMAX Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.5 V/m; Power Drift = -0.165 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.705 mW/g; SAR(10 g) = 0.355 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.752 mW/g



0 dB = 0.752mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

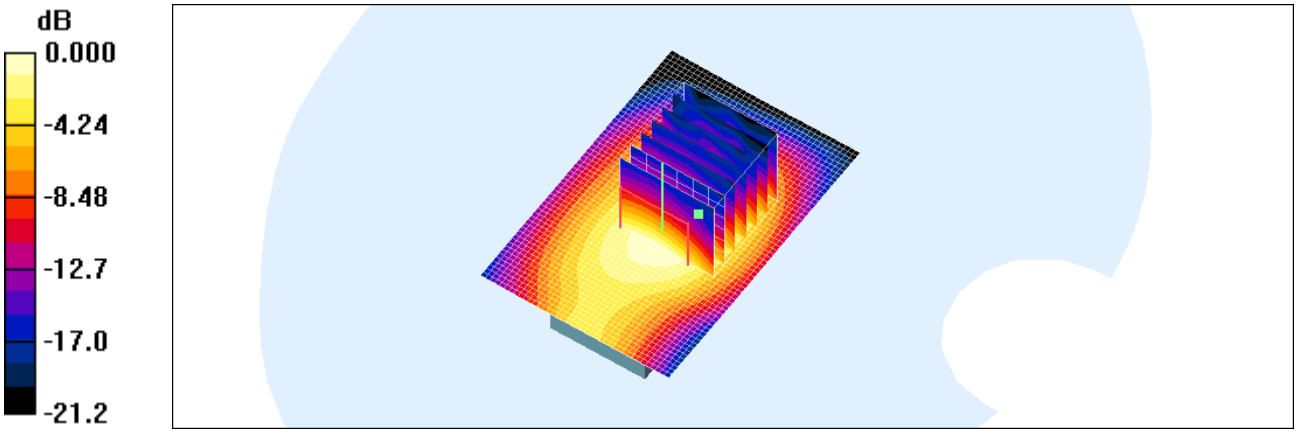
Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 368/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.866 mW/g

WIMAX Body 368/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = -0.078 dB
Peak SAR (extrapolated) = 1.58 W/kg
SAR(1 g) = 0.778 mW/g; SAR(10 g) = 0.400 mW/g
Maximum value of SAR (measured) = 0.831 mW/g



0 dB = 0.831mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2685 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2685 MHz; σ = 2.3 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

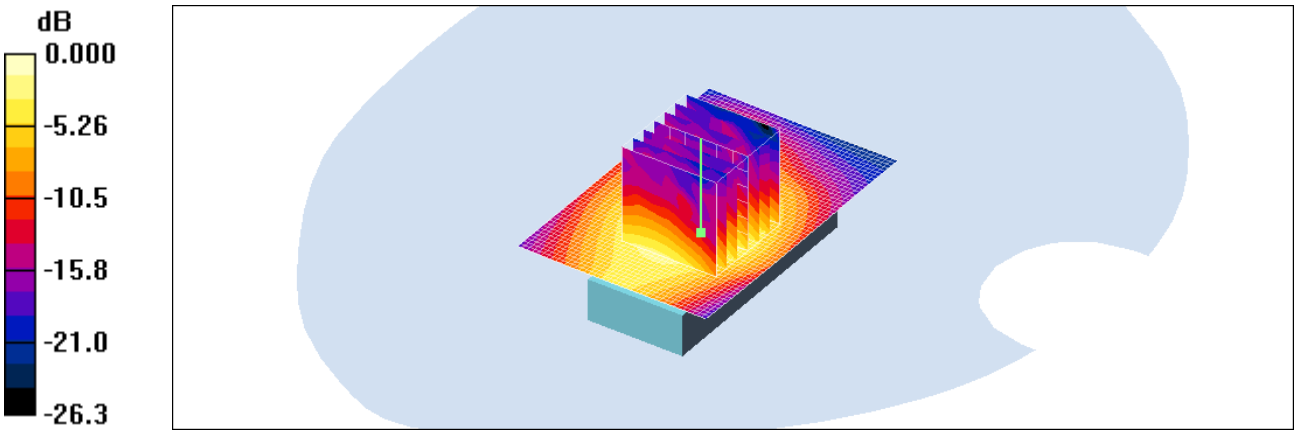
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 736/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.685 mW/g

WIMAX Body 736/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.47 V/m; Power Drift = 0.068 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.630 mW/g; SAR(10 g) = 0.305 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.681 mW/g



0 dB = 0.681mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

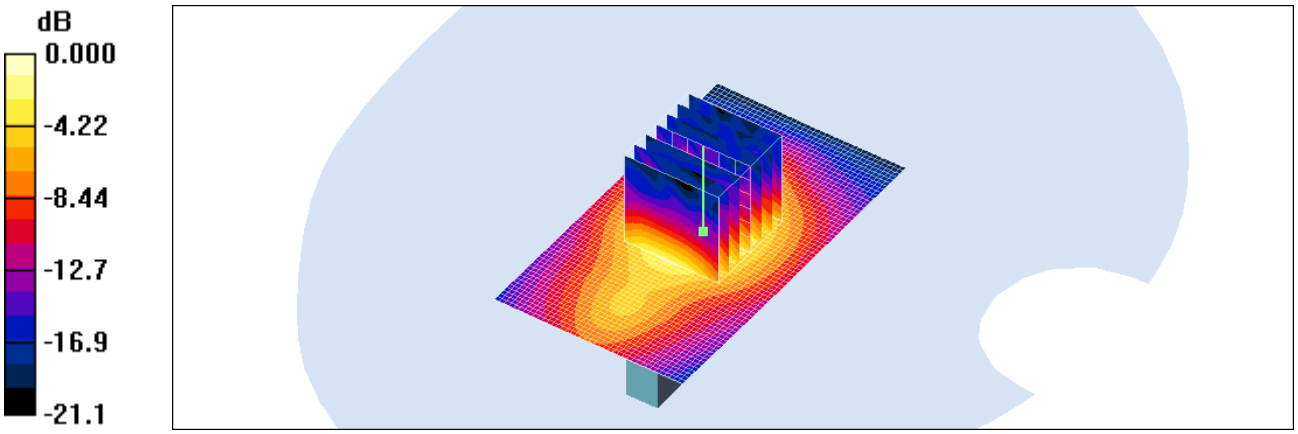
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 0ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.533 mW/g

Wimax Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.67 V/m; Power Drift = 0.172 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.457 mW/g; SAR(10 g) = 0.217 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.499 mW/g



0 dB = 0.499mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jan. 04. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

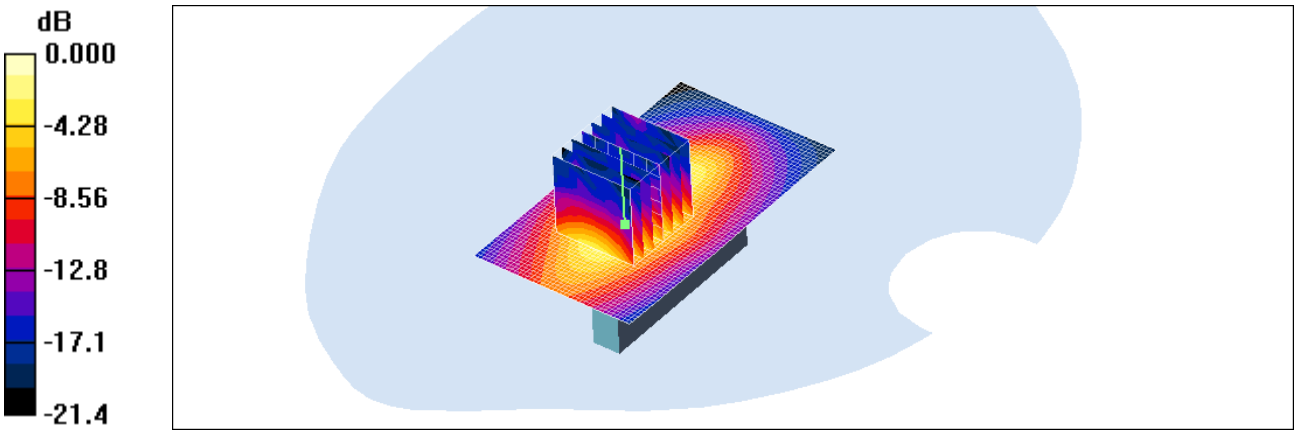
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 0ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.538 mW/g

Wimax Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.33 V/m; Power Drift = 0.090 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.503 mW/g; SAR(10 g) = 0.225 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.564 mW/g



0 dB = 0.564mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2501 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2501 MHz; σ = 2.03 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

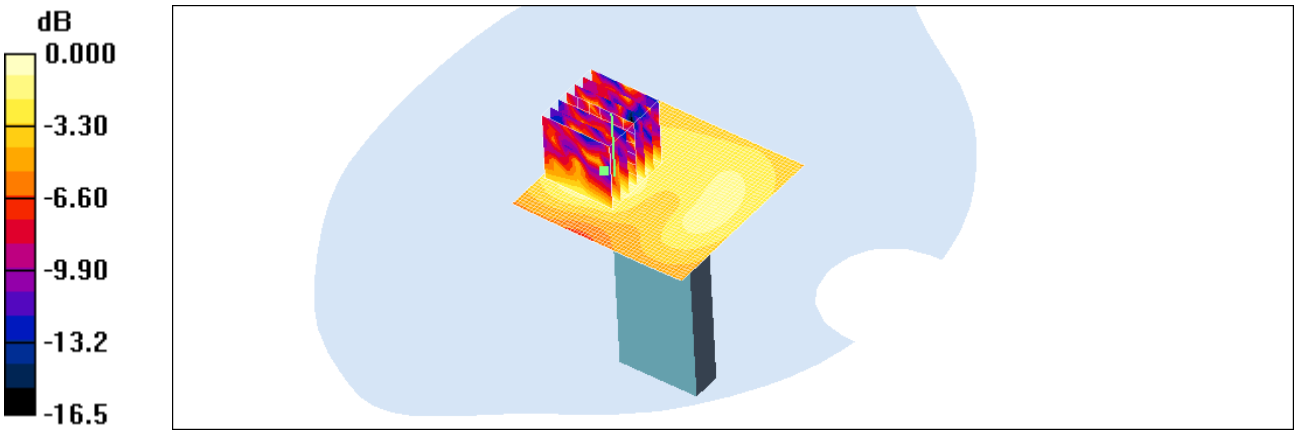
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 0ch/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.050 mW/g

Wimax Body 0ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.12 V/m; Power Drift = 0.048 dB
Peak SAR (extrapolated) = 0.268 W/kg
SAR(1 g) = 0.057 mW/g; SAR(10 g) = 0.023 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.053 mW/g



0 dB = 0.053mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

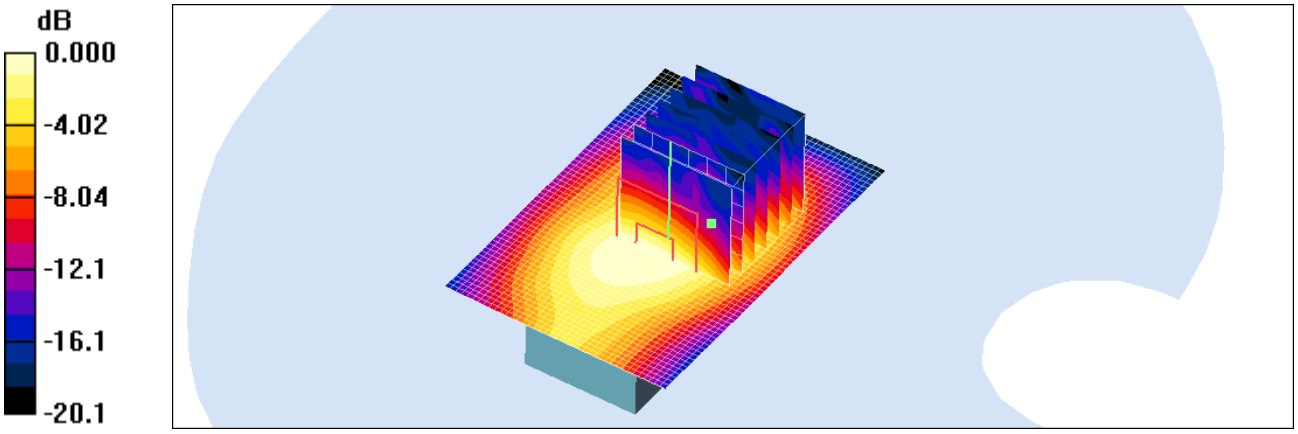
Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 368/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.656 mW/g

WIMAX Body 368/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.0 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.564 mW/g; SAR(10 g) = 0.291 mW/g
Maximum value of SAR (measured) = 0.608 mW/g



0 dB = 0.608mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

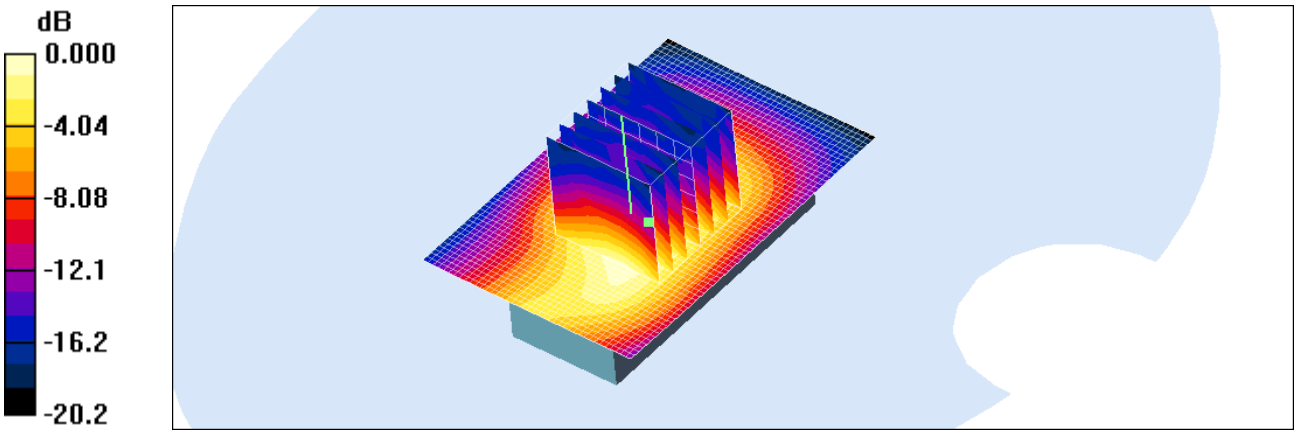
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

WIMAX Body 368/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.632 mW/g

WIMAX Body 368/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.98 V/m; Power Drift = -0.091 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.549 mW/g; SAR(10 g) = 0.284 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.590 mW/g



0 dB = 0.590mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jan. 04. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

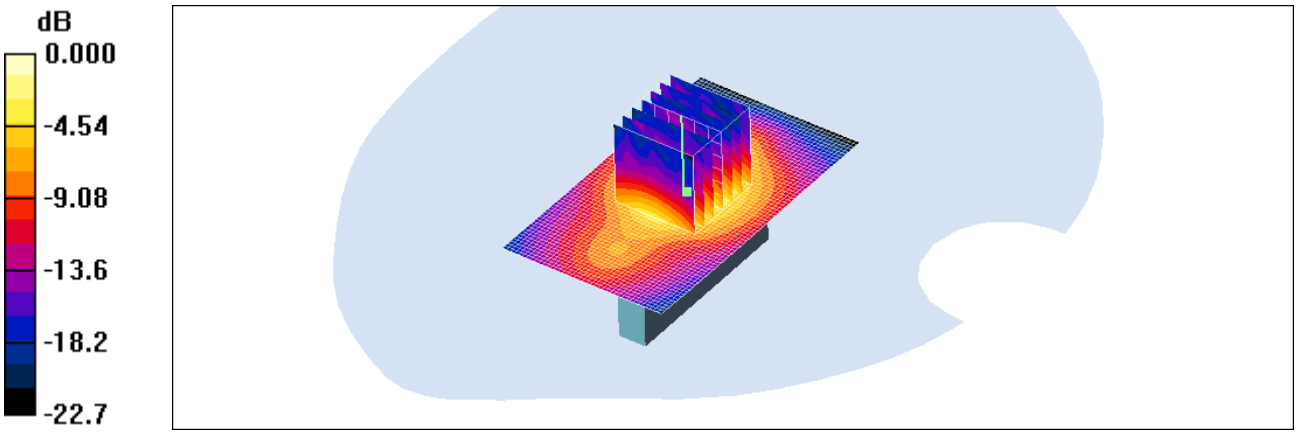
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 368/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.657 mW/g

Wimax Body 368/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.585 mW/g; SAR(10 g) = 0.268 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.633 mW/g



0 dB = 0.633mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	USB Modem
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jan. 04. 2011

DUT: U310; Type: side; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

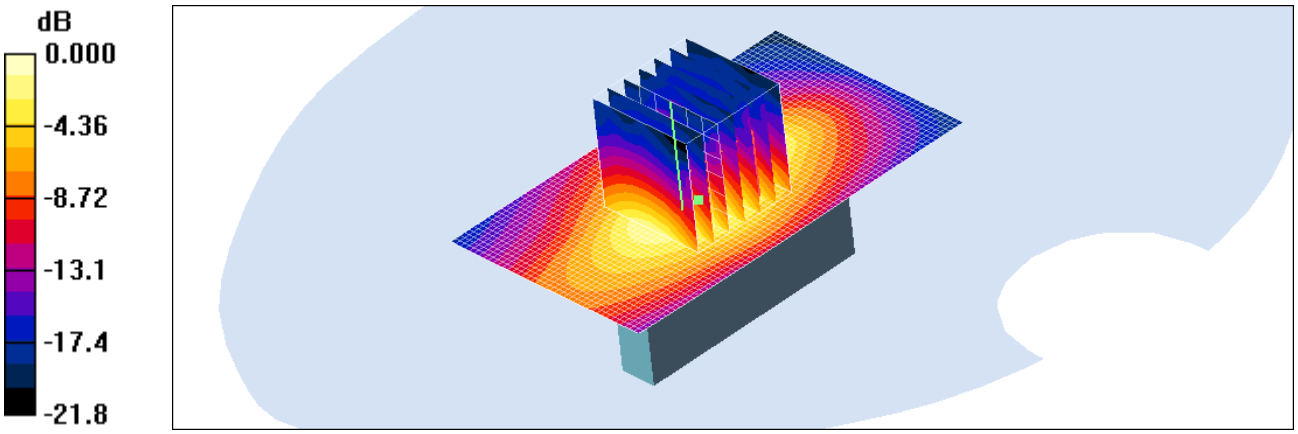
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 368/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.464 mW/g

Wimax Body 368/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.18 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.934 W/kg
SAR(1 g) = 0.419 mW/g; SAR(10 g) = 0.197 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.457 mW/g



0 dB = 0.457mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.3 ℃
Ambient Temperature: 21.5 ℃
Test Date: Jan. 04. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

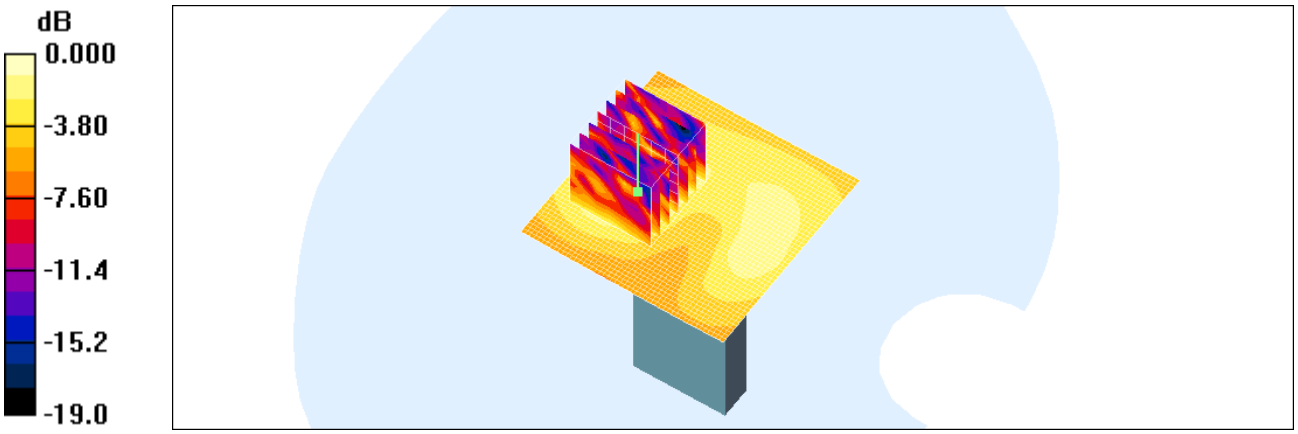
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Wimax Body 368/Area Scan (51x51x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.052 mW/g

Wimax Body 368/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.27 V/m; Power Drift = 0.002 dB
Peak SAR (extrapolated) = 0.268 W/kg
SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.023 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.056 mW/g



0 dB = 0.056mW/g

Test Laboratory: HCT CO., LTD
EUT Type: USB Modem
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Jan. 03. 2011

DUT: U310; Type: Bar; Serial: #1

Communication System: WiMAX 2600MHz FCC; Frequency: 2593 MHz;Duty Cycle: 1:3.24
Medium parameters used (interpolated): f = 2593 MHz; σ = 2.16 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

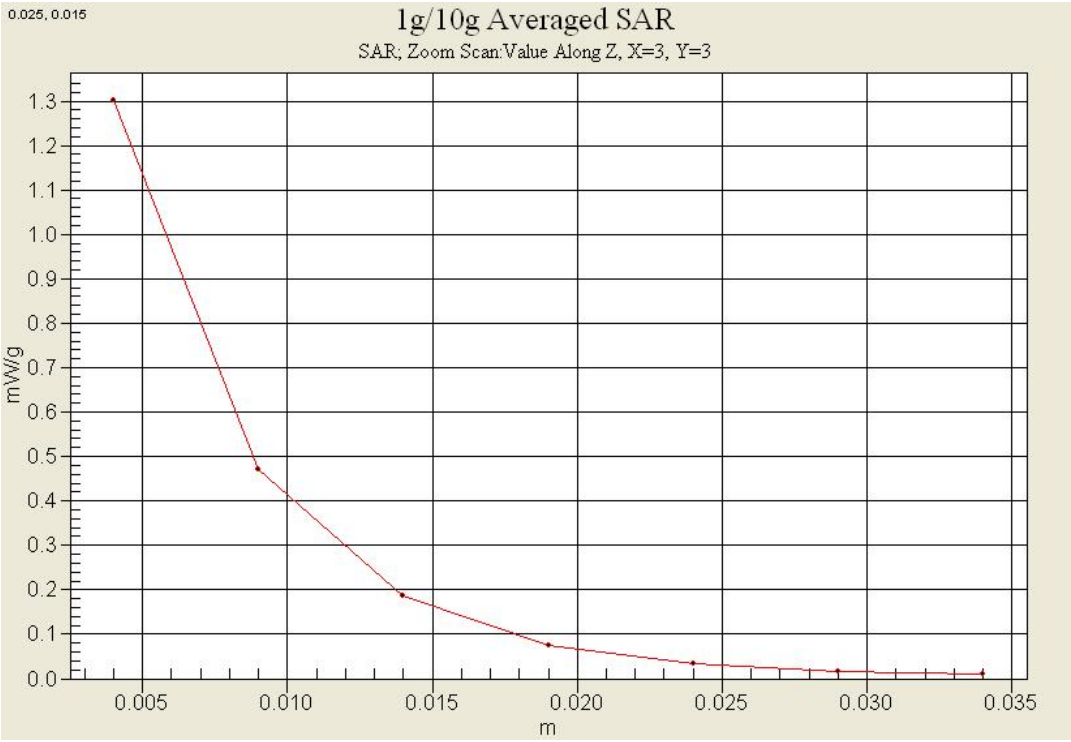
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

WIMAX Body 378ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.22 mW/g

WIMAX Body 378ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.2 V/m; Power Drift = 0.015 dB
Peak SAR (extrapolated) = 3.45 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.401 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.30 mW/g



Attachment 2. – Dipole Validation Plots

■ Validation Data (2600 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.4 ℃

Test Date: Jan. 3, 2011

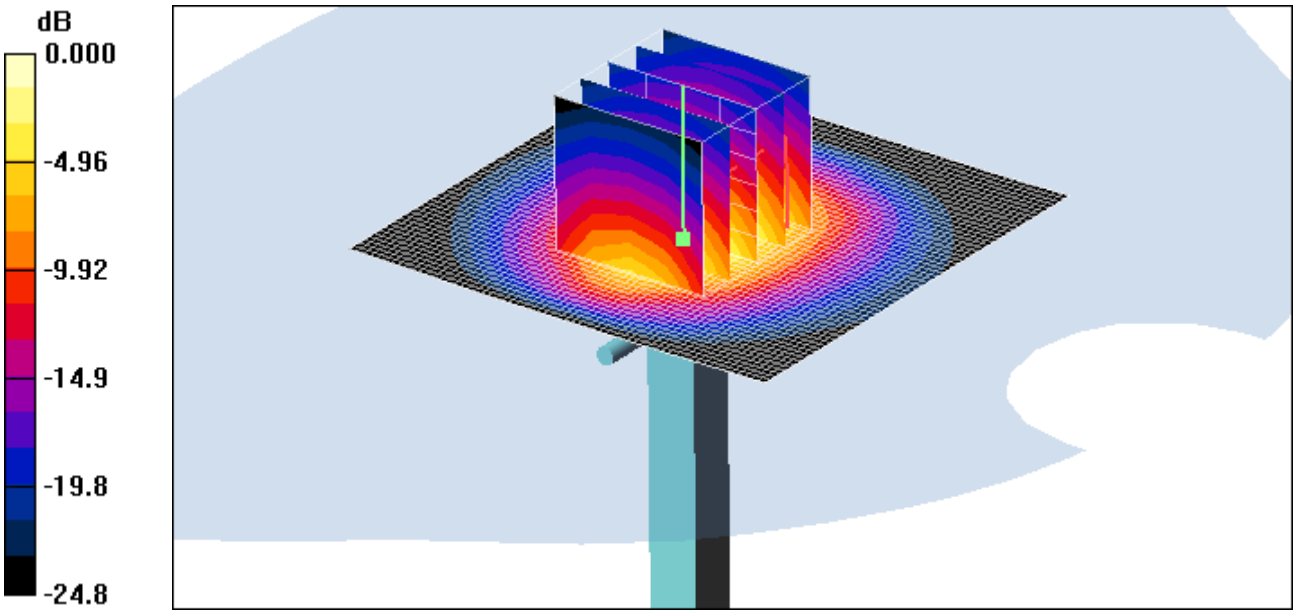
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 – SN:1015

Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Validation 2600MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 7.42 mW/g

Validation 2600MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.2 V/m; Power Drift = -0.125 dB
Peak SAR (extrapolated) = 13.3 W/kg
SAR(1 g) = 5.92 mW/g; SAR(10 g) = 2.65 mW/g
Maximum value of SAR (measured) = 6.54 mW/g



0 dB = 6.54mW/g

■ Validation Data (2600 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.4 ℃

Test Date: Jan. 4, 2011

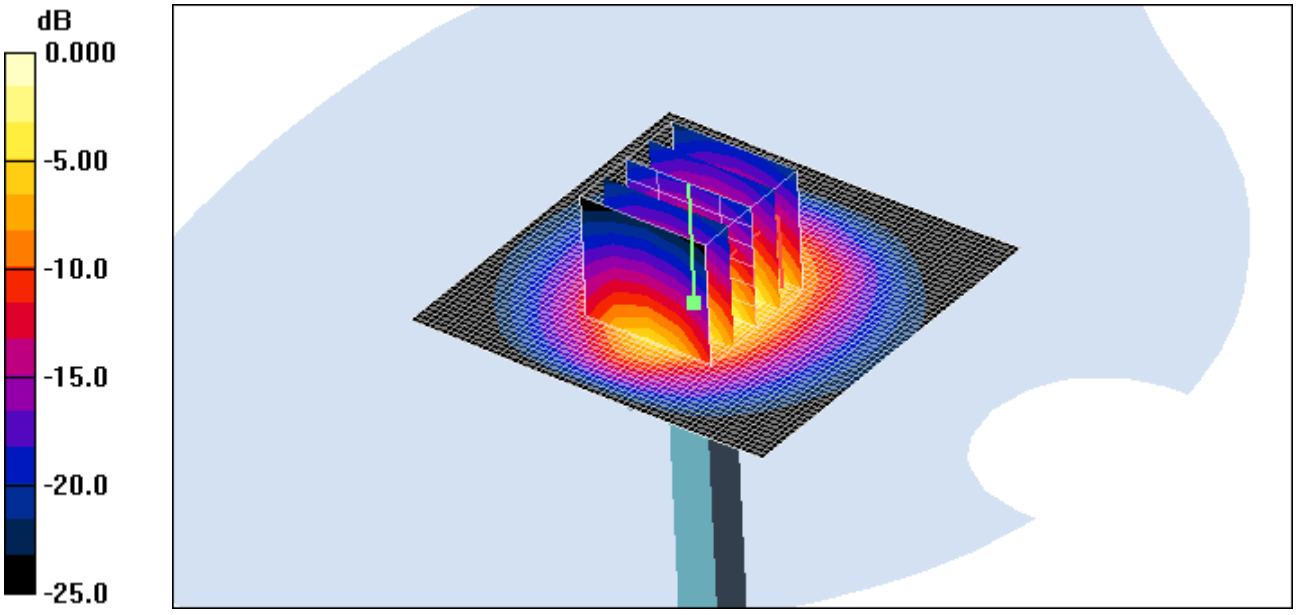
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 – SN:1015

Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.17 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.07, 4.07, 4.07); Calibrated: 2010-03-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 1800/1900 Phantom; Type: SAM

Validation 2600MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 7.48 mW/g

Validation 2600MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.4 V/m; Power Drift = -0.123 dB
Peak SAR (extrapolated) = 13.4 W/kg
SAR(1 g) = 5.96 mW/g; SAR(10 g) = 2.66 mW/g
Maximum value of SAR (measured) = 6.58 mW/g



0 dB = 6.58mW/g

■ Dielectric Parameter (2600 MHz Body)

Title	U310
SubTitle	WiMAX 2600 MHz (Head)
Test Date	Jan. 3, 2011

Frequency	e'	e''
2450000000.0000	51.9887	14.4515
2460000000.0000	51.9466	14.4765
2470000000.0000	51.9059	14.4928
2480000000.0000	51.8307	14.5280
2490000000.0000	51.7680	14.5251
2500000000.0000	51.6874	14.5657
2510000000.0000	51.6762	14.6379
2520000000.0000	51.6624	14.6953
2530000000.0000	51.6888	14.7615
2540000000.0000	51.6641	14.8195
2550000000.0000	51.6731	14.8640
2560000000.0000	51.6025	14.9196
2570000000.0000	51.6022	14.9546
2580000000.0000	51.5440	14.9800
2590000000.0000	51.4531	14.9889
2600000000.0000	51.3547	15.0054
2610000000.0000	51.2893	15.0282
2620000000.0000	51.2419	15.0660
2630000000.0000	51.1997	15.1517
2640000000.0000	51.1920	15.1713
2650000000.0000	51.2205	15.2579
2660000000.0000	51.2128	15.3061
2670000000.0000	51.2110	15.3545
2680000000.0000	51.1640	15.4086
2690000000.0000	51.1043	15.4304
2700000000.0000	51.0242	15.4509
2710000000.0000	50.9394	15.4754
2720000000.0000	50.8468	15.4689
2730000000.0000	50.7635	15.4818

■ Dielectric Parameter (2600 MHz Body)

Title	U310
SubTitle	WiMAX 2600 MHz (Body)
Test Date	Jan. 4, 2011

Frequency	e'	e''
2450000000.0000	52.0117	14.4221
2460000000.0000	51.9629	14.5011
2470000000.0000	51.8914	14.4963
2480000000.0000	51.8178	14.5181
2490000000.0000	51.7861	14.5244
2500000000.0000	51.7170	14.5651
2510000000.0000	51.6797	14.6639
2520000000.0000	51.6650	14.7148
2530000000.0000	51.6832	14.7804
2540000000.0000	51.6830	14.8135
2550000000.0000	51.6648	14.8636
2560000000.0000	51.6191	14.9434
2570000000.0000	51.6140	14.9463
2580000000.0000	51.5202	14.9853
2590000000.0000	51.4396	15.0073
2600000000.0000	51.3593	15.0144
2610000000.0000	51.2758	15.0466
2620000000.0000	51.2522	15.0904
2630000000.0000	51.2037	15.1462
2640000000.0000	51.1787	15.1897
2650000000.0000	51.2094	15.2499
2660000000.0000	51.2117	15.2997
2670000000.0000	51.2094	15.3645
2680000000.0000	51.1629	15.4023
2690000000.0000	51.1026	15.4486
2700000000.0000	51.0158	15.4588
2710000000.0000	50.9340	15.4633
2720000000.0000	50.8771	15.4570
2730000000.0000	50.7658	15.4944

Attachment 4. – Probe Calibration Data

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

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

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

Accreditation No.: SCS 108

Client HCT (Dymstec)

Certificate No: ES3-3161_Mar10

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3161

Calibration procedure(s) QA CAL-01.v6, QA CAL-12.v6, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes

Calibration date: March 22, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: March 25, 2010

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

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

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

Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

Probe ES3DV3

SN:3161

Manufactured:	October 8, 2007
Last calibrated:	July 22, 2009
Recalibrated:	March 22, 2010

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ES3DV3 SN:3161 March 22, 2010

DASY - Parameters of Probe: ES3DV3 SN:3161

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.11	1.27	1.21	± 10.1%
DCP (mV)[B]	89.6	92.5	91.0	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300.0	± 1.5%
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

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

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

[B] Numerical linearization parameter: uncertainty not required.

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

ES3DV3 SN:3161 March 22, 2010

DASY - Parameters of Probe: ES3DV3 SN:3161

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
450	± 50 / ± 100	43.5 ± 5%	0.87 ± 5%	6.23	6.23	6.23	0.24	1.47	± 13.3%
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	5.96	5.96	5.96	0.82	1.12	± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	5.82	5.82	5.82	0.74	1.17	± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	4.97	4.97	4.97	0.40	1.69	± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.79	4.79	4.79	0.42	1.63	± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.67	4.67	4.67	0.37	1.79	± 11.0%
2300	± 50 / ± 100	39.5 ± 5%	1.67 ± 5%	4.54	4.54	4.54	0.34	2.02	± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.26	4.26	4.26	0.39	1.91	± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	4.22	4.22	4.22	0.53	1.57	± 11.0%

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

ES3DV3 SN:3161 March 22, 2010

DASY - Parameters of Probe: ES3DV3 SN:3161

Calibration Parameter Determined in Body Tissue Simulating Media

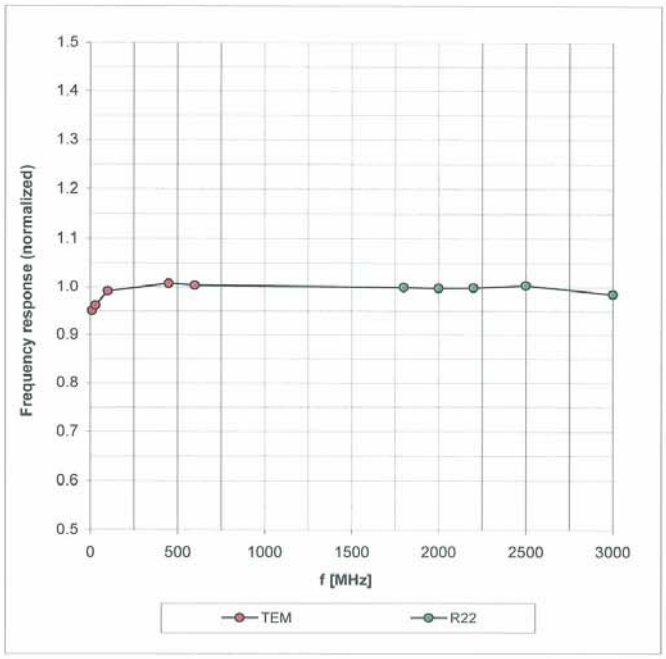
f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
450	± 50 / ± 100	56.7 ± 5%	0.94 ± 5%	6.69	6.69	6.69	0.15	1.27	± 13.3%
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	5.84	5.84	5.84	0.70	1.23	± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.74	4.74	4.74	0.34	2.11	± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.52	4.52	4.52	0.31	2.37	± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.64	4.64	4.64	0.35	2.18	± 11.0%
2300	± 50 / ± 100	52.8 ± 5%	1.85 ± 5%	4.35	4.35	4.35	0.41	1.83	± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.17	4.17	4.17	0.77	1.17	± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	4.07	4.07	4.07	0.82	1.20	± 11.0%

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

ES3DV3 SN:3161 March 22, 2010

Frequency Response of E-Field

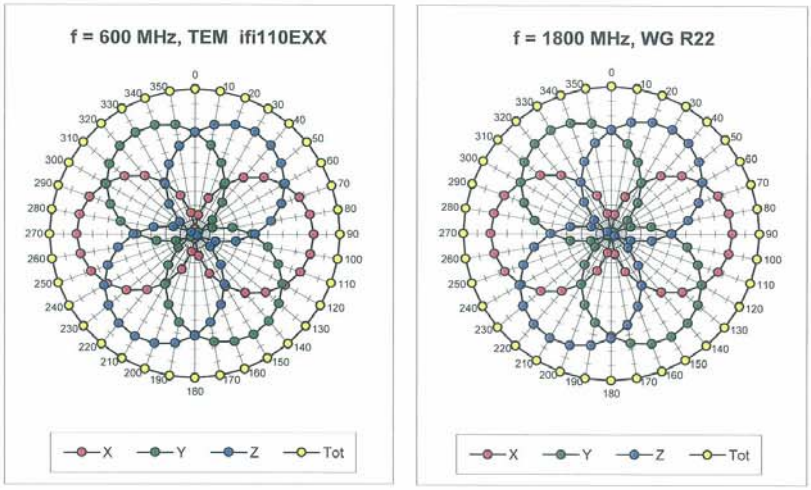
(TEM-Cell:ifi110 EXX, Waveguide: R22)

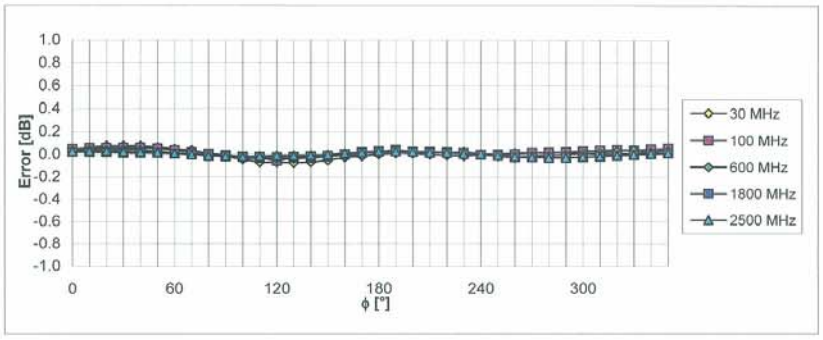


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ES3DV3 SN:3161 March 22, 2010

Receiving Pattern (ϕ), ϑ = 0°



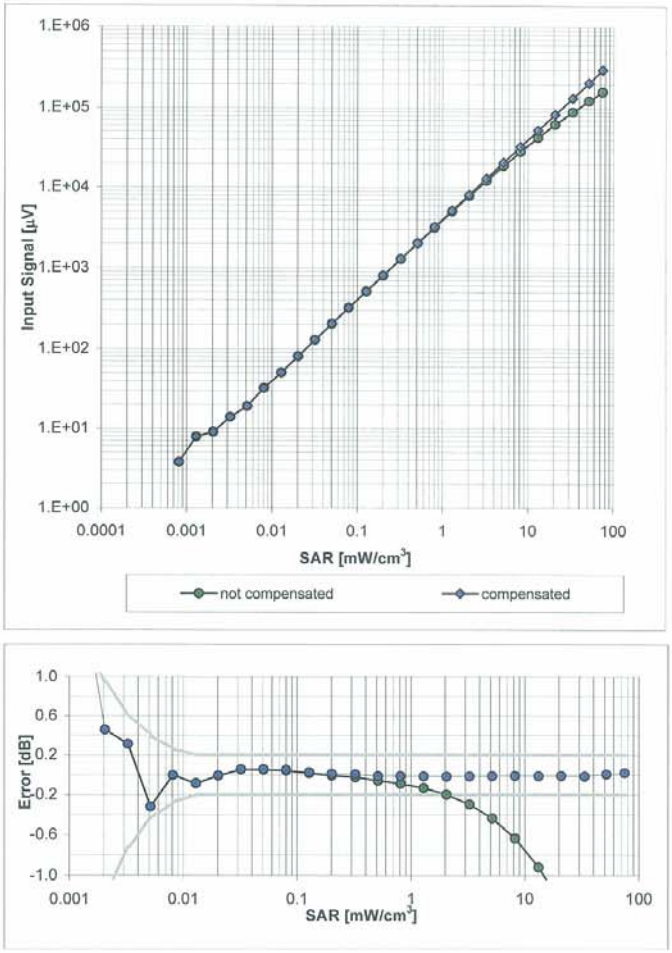


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

ES3DV3 SN:3161 March 22, 2010

Dynamic Range f(SAR_{head})

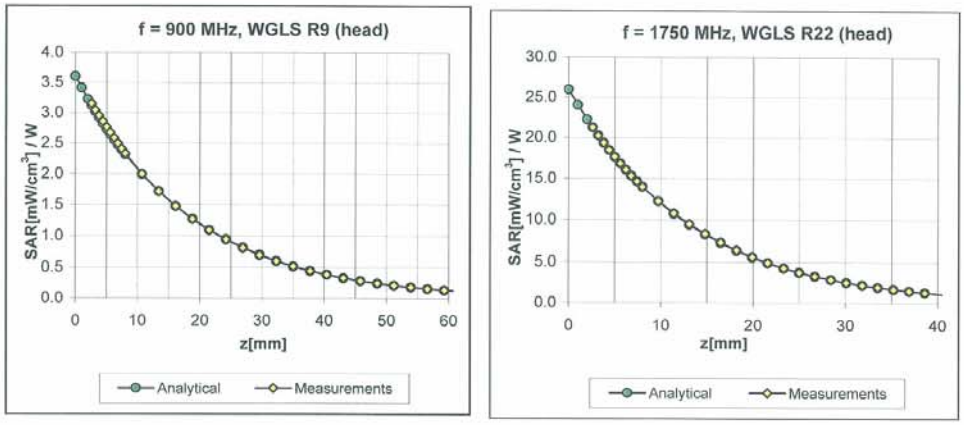
(Waveguide R22, f = 1800 MHz)



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

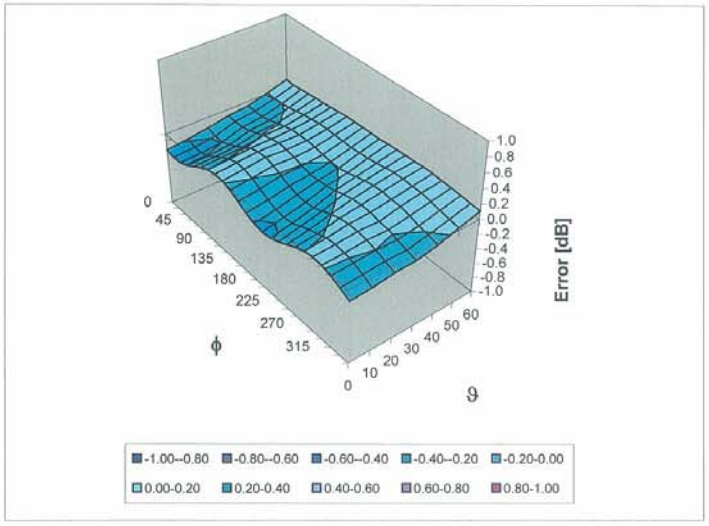
ES3DV3 SN:3161 March 22, 2010

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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

Certificate No: ES3-3161_Mar10 Page 10 of 11

ES3DV3 SN:3161 March 22, 2010

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4.0 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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s p e a g

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV3**
Serial Number:	**3161**
Place of Assessment:	**Zurich**
Date of Assessment:	**May 3, 2010**
Probe Calibration Date:	**March 22, 2010**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1750 MHz.

Assessed by:

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Dosimetric E-Field Probe ES3DV3 - SN:3161

Conversion factor (± standard deviation)

1500 ± 50 MHz	*ConvF*	5.20 ± 7%

ε_r = 40.4 ± 5%
σ = 1.23 ± 5% mho/m
(head tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also DASY Manual.

Attachment 5. – Dipole Calibration Data

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

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

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

Accreditation No.: **SCS 108**

Client **HCT (Dymstec)**

Certificate No: **D2600V2_1015_Mar10**

CALIBRATION CERTIFICATE

Object D2600V2 - SN: 1015

Calibration procedure(s) QA CAL-05.v7
Calibration procedure for dipole validation kits

Calibration date: March 18, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV3	SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10
DAE4	SN: 601	02-Mar-10 (No. DAE4-601_Mar10)	Mar-11

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

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

Issued: March 22, 2010

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

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Swiss Calibration Service

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

Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V5.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.2 ± 6 %	1.91 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C	-------	------

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.0 mW / g
SAR normalized	normalized to 1W	56.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**57.0 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.37 mW / g
SAR normalized	normalized to 1W	25.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**25.7 mW / g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.1 ± 6 %	2.14 mho/m ± 6 %
Body TSL temperature during test	(21.2 ± 0.2) °C	-------	------

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	condition	
SAR measured	250 mW input power	14.2 mW / g
SAR normalized	normalized to 1W	56.8 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**57.3 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.40 mW / g
SAR normalized	normalized to 1W	25.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**25.7 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.3 Ω - 2.6 jΩ
Return Loss	- 31.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.9 Ω - 2.0 jΩ
Return Loss	- 26.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.151 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 30, 2007

DASY5 Validation Report for Head TSL

Date/Time: 18.03.2010 11:44:52

Test Laboratory: SPEAG, Zurich, Switzerland

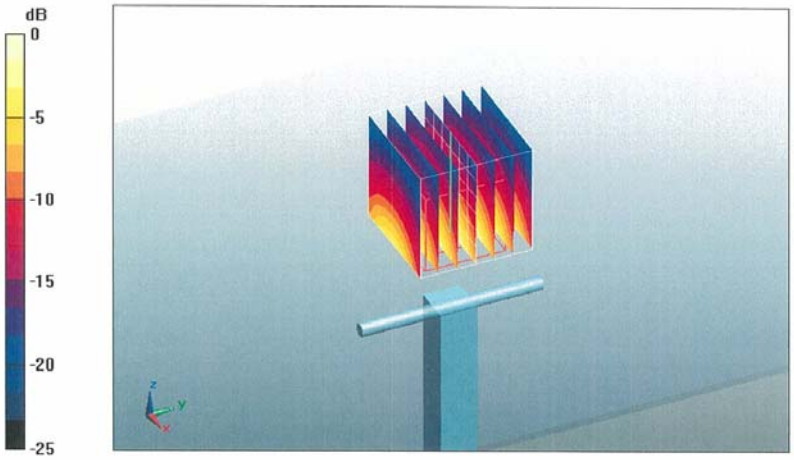
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1015

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: HSL U11 BB
Medium parameters used: f = 2600 MHz; σ = 1.91 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

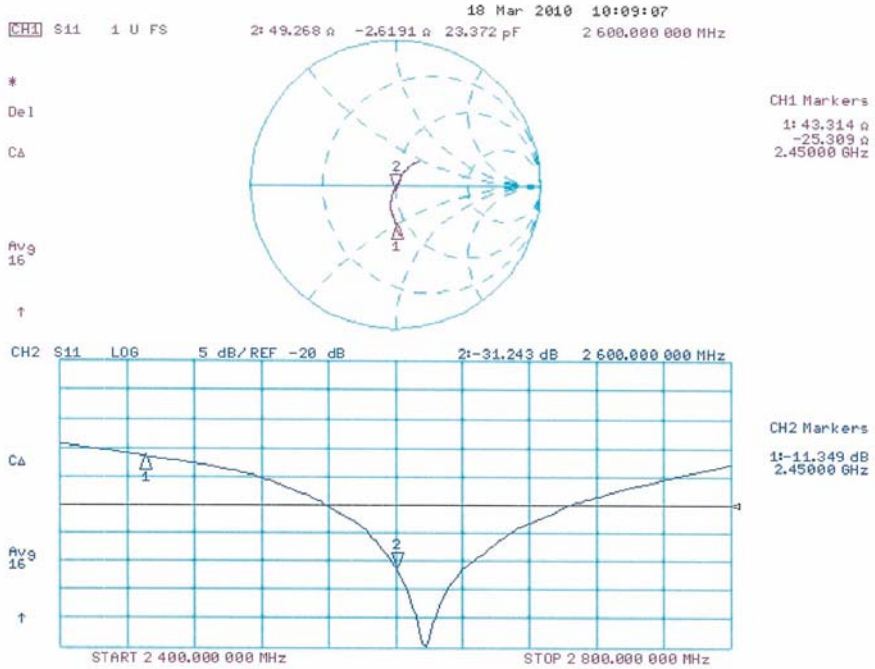
- Probe: ES3DV3 - SN3205; ConvF(4.47, 4.47, 4.47); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Pin=250 mW/d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.5 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 29.1 W/kg
SAR(1 g) = 14 mW/g; SAR(10 g) = 6.37 mW/g
Maximum value of SAR (measured) = 18.2 mW/g



0 dB = 18.2mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 18.03.2010 13:43:35

est Laboratory: SPEAG, Zurich, Switzerland

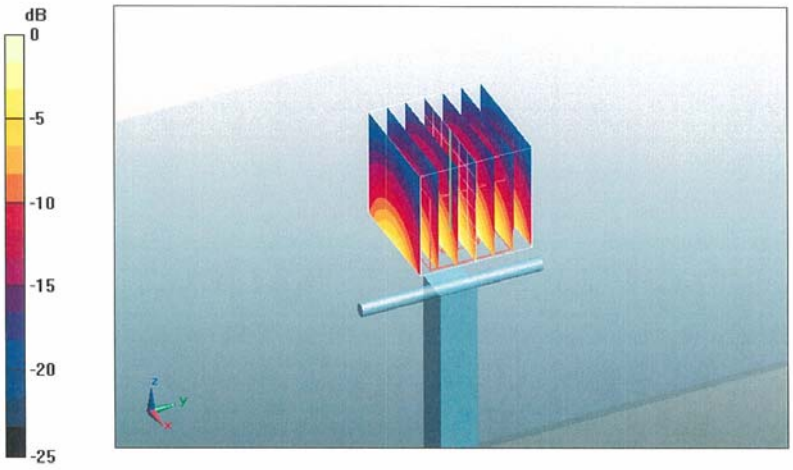
DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1015

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: MSL U11 BB
Medium parameters used: f = 2600 MHz; σ = 2.15 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.18, 4.18, 4.18); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Pin250 mW/d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.9 V/m; Power Drift = 0.00741 dB
Peak SAR (extrapolated) = 30.8 W/kg
SAR(1 g) = 14.2 mW/g; SAR(10 g) = 6.4 mW/g
Maximum value of SAR (measured) = 19 mW/g



0 dB = 19mW/g

Impedance Measurement Plot for Body TSL