



SAR TEST REPORT

REPORT NO.: SA110418C25

MODEL NO.: UM1000 (refer to item 2.1 for more detail)

FCC ID: MXF-WLTUBG-102

RECEIVED: Apr. 18, 2011

TESTED: Jun. 27 ~ Jul. 05, 2011

ISSUED: Jul. 06, 2011

APPLICANT: Gemtek Technology Co., Ltd.

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
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Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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TABLE OF CONTENTS

RELEASE CONTROL RECORD.....	3
1. CERTIFICATION	4
2. GENERAL INFORMATION	5
2.1 GENERAL DESCRIPTION OF EUT.....	5
2.2 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	6
2.3 GENERAL INFORMATION OF THE SAR SYSTEM.....	7
2.4 TEST EQUIPMENT.....	11
2.5 GENERAL DESCRIPTION OF THE SPATIAL PEAK SAR EVALUATION	12
3. DESCRIPTION OF SUPPORT UNITS.....	15
4. SAR TEST CONSIDERATIONS.....	16
4.1. SUMMARY INFORMATION OF LTE.....	16
4.2. OTHER U.S. WIRELESS OPERATING MODES	16
4.3. CONDUCTED OUTPUT POWER AND RB CONFIGURATION.....	17
4.4. MPR AND A-MPR IMPLEMENTATION INFO.....	17
4.5. ANTENNA LOCATION AND FUNCTION	18
4.6. TEST SETUP	19
4.7. TEST LAPTOP	20
4.8. TEST SOFTWARE	21
4.9. NO SIMULTANEOUS TRANSMISSION SAR JUSTIFICATION	22
4.10. LINEARITY CONSIDERATION	22
5. RECIPES FOR TISSUE SIMULATING LIQUIDS	25
5. SYSTEM VALIDATION.....	28
5.1 TEST PROCEDURE	28
5.2 VALIDATION RESULTS	29
5.3 SYSTEM VALIDATION UNCERTAINTIES	30
6. TEST RESULTS	31
6.1 TEST PROCEDURES.....	31
6.2 DESCRIPTION OF TEST CONDITION.....	32
6.3 MEASURED SAR RESULT	33
6.4 POWER DRIFT TABLE	34
6.5 SAR LIMITS	36
7. INFORMATION ON THE TESTING LABORATORIES.....	37
APPENDIX A: TEST CONFIGURATIONS AND TEST DATA	
APPENDIX B: ADT SAR MEASUREMENT SYSTEM	
APPENDIX C: PHOTOGRAPHS OF SYSTEM VALIDATION	
APPENDIX D: SYSTEM CERTIFICATE & CALIBRATION	



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Jul. 06, 2011



1. CERTIFICATION

PRODUCT: LTE USB Dongle

MODEL NO.: UM1000 (refer to item 2.1 for more details)

BRAND: Motorola (refer to item 2.1 for more details)

APPLICANT: Gemtek Technology Co., Ltd.

TESTED: Jun. 27 ~ Jul. 05, 2011

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC Part 2 (Section 2.1093)

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

RSS-102 Issue 4 (2010-03)

The above equipment (model: UM1000) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Andrea Hsia , DATE: Jul. 06, 2011
Andrea Hsia / Specialist

APPROVED BY : Gary Chang , DATE: Jul. 06, 2011
Gary Chang / Assistant Manager

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	LTE USB Dongle
MODEL NO.	UM1000 (refer to NOTE for more details)
FCC ID	MXF-WLTUBG-102
NOMINAL VOLTAGE	5.0Vdc
MODULATION TYPE	QPSK, 16QAM
FREQUENCY RANGE	Uplink: 788MHz ~ 798MHz Downlink: 758MHz ~ 768MHz
CHANNEL BANDWIDTH	5MHz
MAXIMUM SAR (1g)	0.787W/kg
UE CATEGORY	3
ANTENNA TYPE	Dipole antenna with 0dBi gain
OPERATION TEMPERATURE RANGE	-10°C ~ 40°C
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	NA

NOTE:

1. All models are listed as below.

BRAND	MODEL	DESCRIPTION
Motorola	UM1000	All models are electrically identical, different brands and model names are for marketing purpose.
Gemtek	WLTUBG-102	

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



2.2 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 2 (2.1093)

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

RSS-102 Issue 4 (2010-03)

IEEE 1528-2003

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

2.3 GENERAL INFORMATION OF THE SAR SYSTEM

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

ES3DV3 ISOTROPIC E-FIELD PROBE

CONSTRUCTION	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
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 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
DIMENSIONS	Overall length: 337 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

NOTE

1. The Probe parameters have been calibrated by the SPEAG. Please reference "APPENDIX D" for the Calibration Certification Report.



EX3DV4 ISOTROPIC E-FIELD PROBE

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

NOTE

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

TWIN SAM V4.0

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

SYSTEM VALIDATION KITS:

CONSTRUCTION	Symmetrical dipole with 1/4 balun enables measurement of feedpoint impedance with NWA matched for use near flat phantoms filled with brain simulating solutions. Includes distance holder and tripod adaptor
CALIBRATION	Calibrated SAR value for specified position and input power at the flat phantom in brain simulating solutions
FREQUENCY	750MHz
RETURN LOSS	> 20dB at specified validation position
POWER CAPABILITY	> 100W (f < 1GHz); > 40W (f > 1GHz)
OPTIONS	Dipoles for other frequencies or solutions and other calibration conditions upon request

DEVICE HOLDER FOR SAM TWIN PHANTOM

CONSTRUCTION	The device holder for the mobile phone device is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles. The holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity =3 and loss tangent =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered. The device holder for the portable device makes up of the polyethylene foam. The dielectric parameters of material close to the dielectric parameters of the air.
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DATA ACQUISITION ELECTRONICS

CONSTRUCTION

The data acquisition electronics (DAE3) consists of a highly sensitive electrometer grade preamplifier with auto-zeroing, a channel and gain-switching multiplex, a fast 16 bit AD converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The mechanical probe is mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of the DAE3 box is 200M Ω ; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



2.4 TEST EQUIPMENT

FOR SAR MEASUREMENT

ITEM	NAME	BRAND	TYPE	SERIES NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	SAM Phantom	S & P	QD000 P40 CA	TP 1202	NA	NA
2	Signal Generator	Agilent	E8257C	MY43320668	Dec. 27, 2010	Dec. 26, 2011
3	E-Field Probe	S & P	ES3DV3	3177	Aug. 24, 2010	Aug. 23, 2011
4	DAE	S & P	DAE 3	579	Sep. 20, 2010	Sep. 19, 2011
5	Robot Positioner	Staubli Unimation	NA	NA	NA	NA
6	Validation Dipole	S & P	D750V	1013	May 25, 2011	May 24, 2012

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

FOR TISSUE PROPERTY

ITEM	NAME	BRAND	TYPE	SERIES NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	Network Analyzer	Agilent	E8358A	US41480538	Dec. 30, 2010	Dec. 29, 2011
2	Dielectric Probe	Agilent	85070D	US01440176	NA	NA

NOTE:

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

2.5 GENERAL DESCRIPTION OF THE SPATIAL PEAK SAR EVALUATION

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

Probe parameters:	- Sensitivity	Norm _i , a _{i0} , a _{i1} , a _{i2}
	- Conversion factor	ConvF _i
	- Diode compression point	dcp _i
Device parameters:	- Frequency	F
	- Crest factor	Cf
Media parameters:	- Conductivity	
	- Density	

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

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

V _i	=compensated signal of channel i	(i = x, y, z)
U _i	=input signal of channel i	(i = x, y, z)
Cf	=crest factor of exciting field	(DASY parameter)
dcp _i	=diode compression point	(DASY parameter)

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

$$\text{E-fieldprobes: } E_i = \sqrt{\frac{V_i}{\text{Norm}_i \cdot \text{ConvF}}}$$

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

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

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

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

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

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

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



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

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

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



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

3. DESCRIPTION OF SUPPORT UNITS

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.
1	SIGNAL GENERATOR	E4438C	MY47271120	Jul. 17, 2010
2	NOTEBOOK	DELL	D630	NA

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

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

4. SAR TEST CONSIDERATIONS

4.1. SUMMARY INFORMATION OF LTE

Operating frequency range of each LTE transmission band	Band 14: 788~798 MHz												
Channel bandwidths	5 MHz												
High, middle and low (H, M, L) channel numbers and frequencies in each LTE frequency band													
788~793MHz Band Only one channel is supported	793~798MHz Band Only one channel is supported												
<table border="1"> <thead> <tr> <th>Channel bandwidth (MHz)</th> <th>Channel No.</th> <th>Frequency (MHz)</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>23305</td> <td>790.5</td> </tr> </tbody> </table>	Channel bandwidth (MHz)	Channel No.	Frequency (MHz)	5	23305	790.5	<table border="1"> <thead> <tr> <th>Channel bandwidth (MHz)</th> <th>Channel No.</th> <th>Frequency (MHz)</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>23355</td> <td>795.5</td> </tr> </tbody> </table>	Channel bandwidth (MHz)	Channel No.	Frequency (MHz)	5	23355	795.5
Channel bandwidth (MHz)	Channel No.	Frequency (MHz)											
5	23305	790.5											
Channel bandwidth (MHz)	Channel No.	Frequency (MHz)											
5	23355	795.5											
UE category	3												
Uplink modulations	QPSK , 16QAM												
LTE transmitter and antenna implementation	1Tx 2Rx, please see section 4.5 for detail												
LTE antenna function	Only one monopole ant can transmit												
Maximum Power Reduction (MPR) is optional or mandatory	MPR is Mandatory												
A-MPR (additional MPR) is disabled or not	A-MPR was Disabled, not available to the EUT.												
Conducted output power for 1RB Upper, 1RB lower , 50% RB centered, 100 % RB	Average conducted power and RB configuration plots included in section 4.3												
Other U.S. wireless operating modes	No other wireless modes are supported												
Simultaneous transmission conditions	This is condition does not exist. The dongle only has LTE wireless mode.												
Power reduction for SAR	No												

4.2. OTHER U.S. WIRELESS OPERATING MODES

No other U.S wireless operating modes are supported.

4.3. CONDUCTED OUTPUT POWER AND RB CONFIGURATION

Conducted power table for 788~793MHz band (Unit: dBm)						
Channel	Frequency (MHz)	Modulation	1 RB lower edge	1 RB upper edge	50% RB centered	100% RB
23305	790.5	QPSK	22.62	22.81	21.23	21.20
23305	790.5	16QAM	21.84	22.01	20.53	20.52

Conducted power table for 793~798MHz band (Unit: dBm)						
Channel	Frequency (MHz)	Modulation	1 RB lower edge	1 RB upper edge	50% RB centered	100% RB
23355	795.5	QPSK	22.21	22.64	21.22	21.21
23355	795.5	16QAM	21.53	21.72	20.41	20.31

4.4. MPR AND A-MPR IMPLEMENTATION INFO

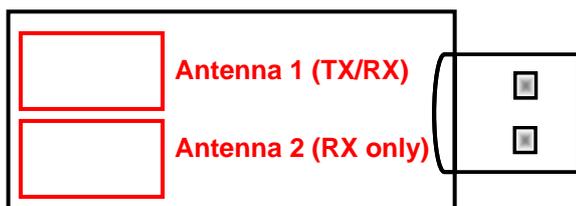
Modulation	Channel bandwidth / Transmission bandwidth configuration (RB)	MPR (dB)
	5MHz	
QPSK	> 8	1
16QAM	<=8	1
16QAM	> 8	2

MPR is according to the standard and implemented in the circuit (mandatory).

4.5. ANTENNA LOCATION AND FUNCTION

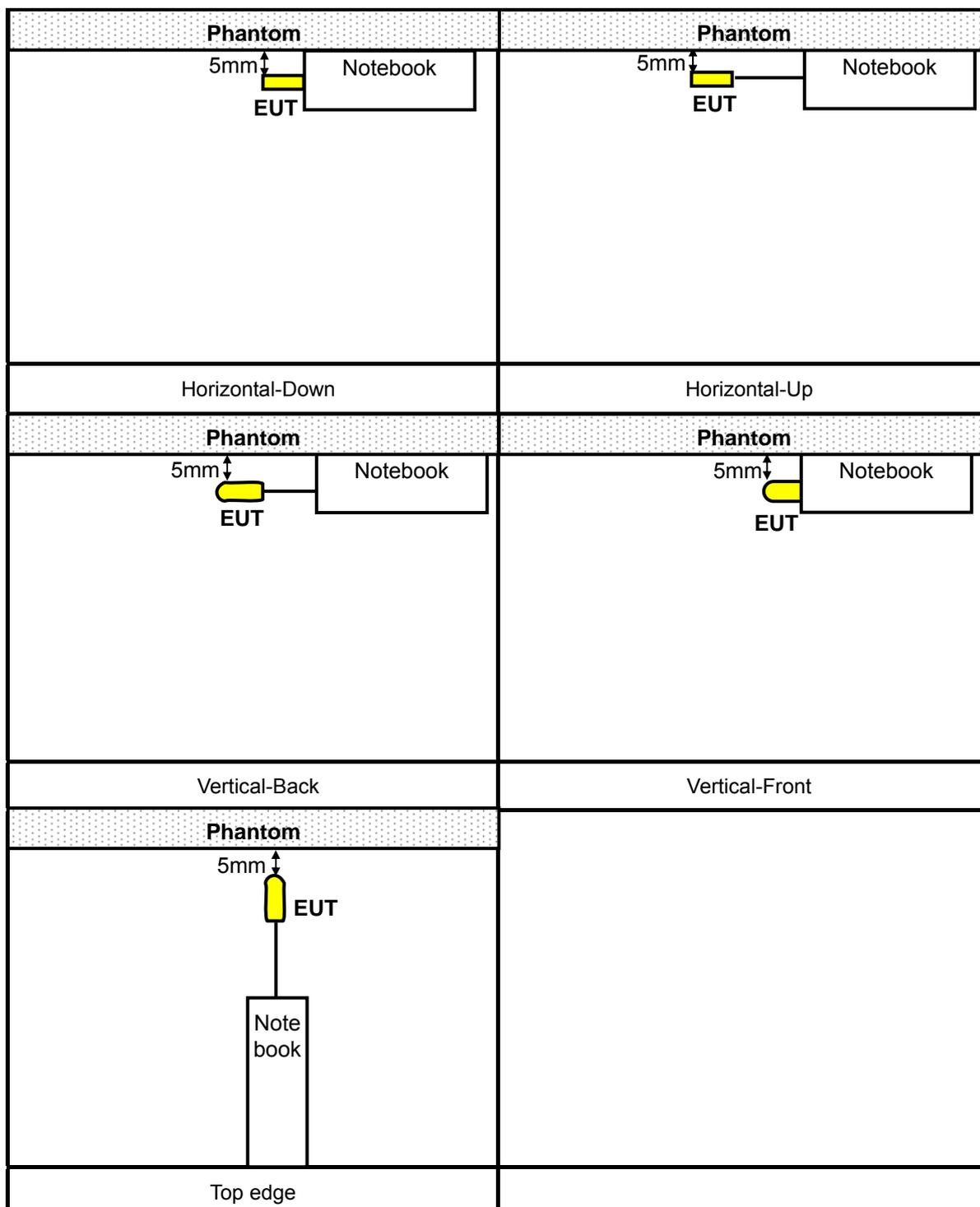
2 antennas are used for the device and 1TX / 2RX function is supported. TX switching diversity function is not supported. Only antenna 1 can transmit signal.

Antenna location



4.6. TEST SETUP

EUT was connected to NB directly for Horizontal-Down and Vertical-Back test position
 EUT was connected to NB via a short USB cable for Horizontal-up, Vertical-Back and Top edge position.

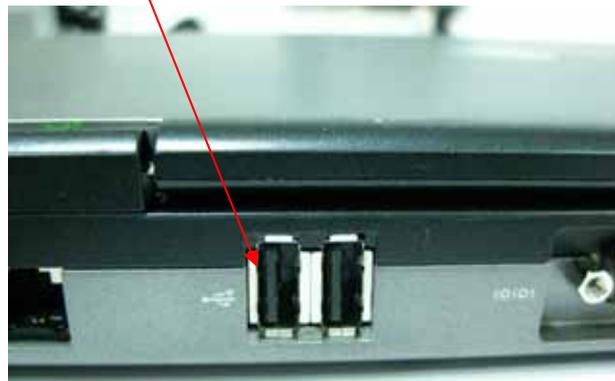
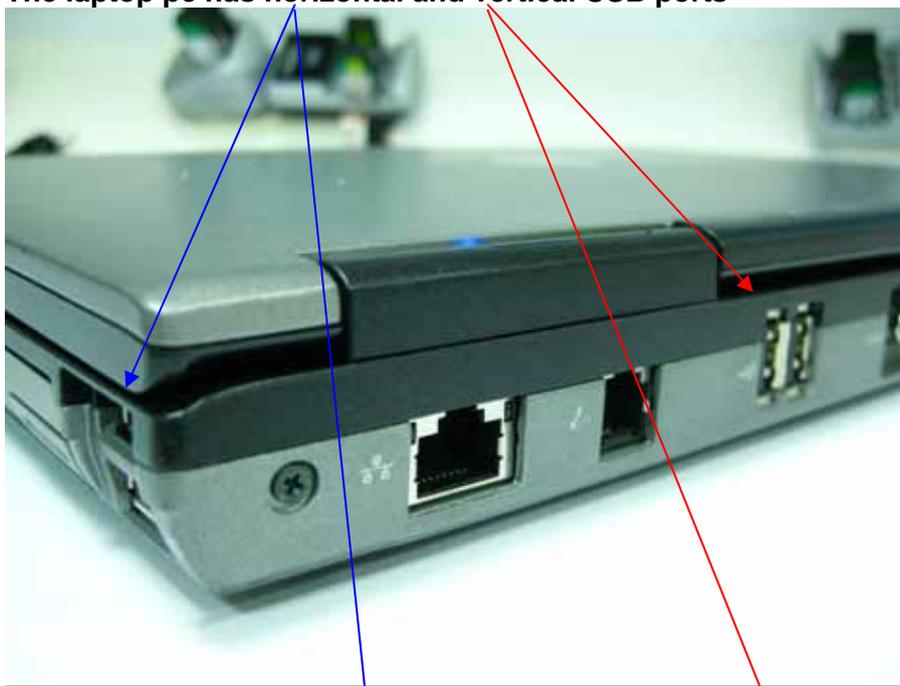


4.7. TEST LAPTOP

Brand name: Dell

Model name: D630

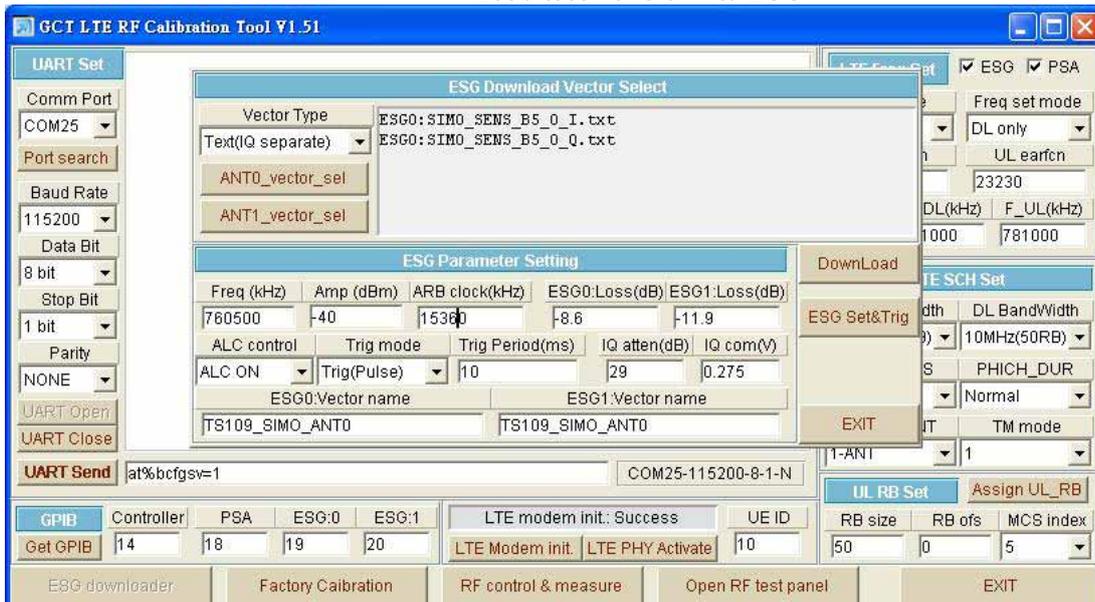
The laptop pc has horizontal and vertical USB ports



4.8. TEST SOFTWARE

User test tool to load test waveform to ESG which can use test waveform to produce signal and link up with this device. When link is established, run test tool to control EUT to transmit at specific frequency, modulation, RB configuration and output power level continuously.

Load test waveform to ESG

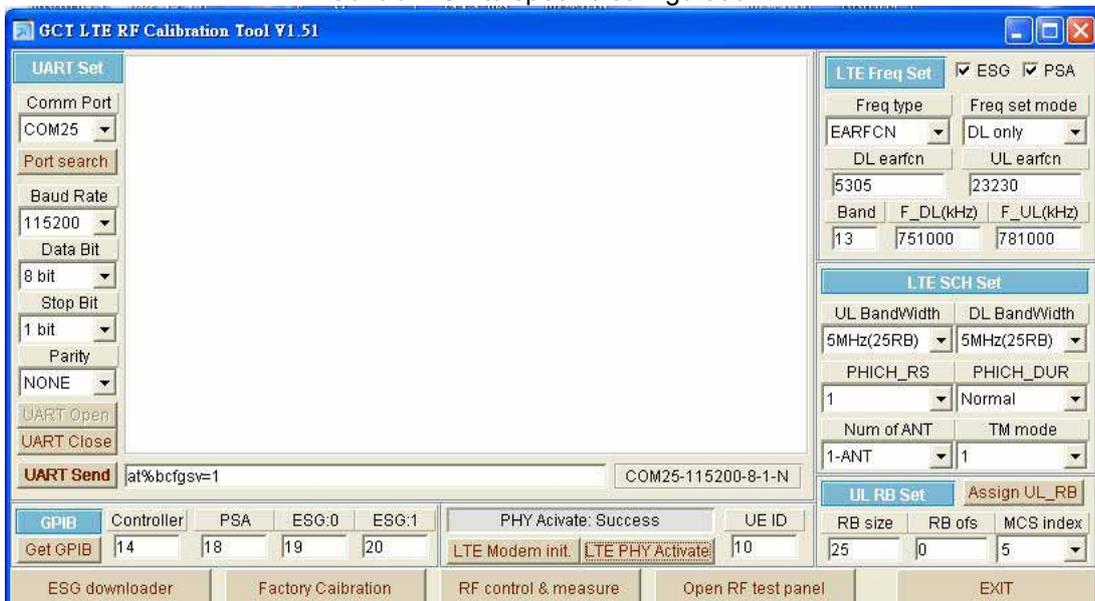


The screenshot shows the 'GCI LTE RF Calibration Tool V1.51' interface. A dialog box titled 'ESG Download Vector Select' is open, allowing the user to select a vector type and set parameters for ESG0 and ESG1. The 'Vector Type' is set to 'ESG0:SIMO_SENS_B5_0_I.txt' and 'ESG1:SIMO_SENS_B5_0_Q.txt'. The 'ESG Parameter Setting' table is as follows:

Freq (kHz)	Amp (dBm)	ARB clock(kHz)	ESG0:Loss(dB)	ESG1:Loss(dB)
760500	-40	15360	-8.6	-11.9

Other parameters include ALC control (ALC ON), Trig mode (Trig(Pulse)), Trig Period (ms) (10), IQ atten (dB) (29), and IQ com (V) (0.275). The vector names are 'ESG0:Vector name' and 'ESG1:Vector name', both set to 'TS109_SIMO_ANT0'. The 'Download' button is highlighted.

Control EUT to specific configuration



The screenshot shows the 'GCI LTE RF Calibration Tool V1.51' interface. The 'LTE Freq Set' and 'LTE SCH Set' panels are visible. The 'LTE Freq Set' panel shows the following configuration:

Band	F_DL(kHz)	F_UL(kHz)
13	751000	781000

The 'LTE SCH Set' panel shows the following configuration:

UL BandWidth	DL BandWidth
5MHz(25RB)	5MHz(25RB)

The 'PHY Activate: Success' status is shown, and the 'LTE PHY Activate' button is highlighted. The 'UL RB Set' panel shows RB size (25), RB ofs (0), and MCS index (5).

4.9. NO SIMULTANEOUS TRANSMISSION SAR JUSTIFICATION

The device only supports LTE wireless mode. No other wireless modes are supported. Therefore, simultaneous transmission SAR is not required.

4.10. LINEARITY CONSIDERATION

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

Test position	Horizontal Down
Test frequency	795.5MHz
TX antenna	Antenna 1
Modulation	QPSK, 16QAM

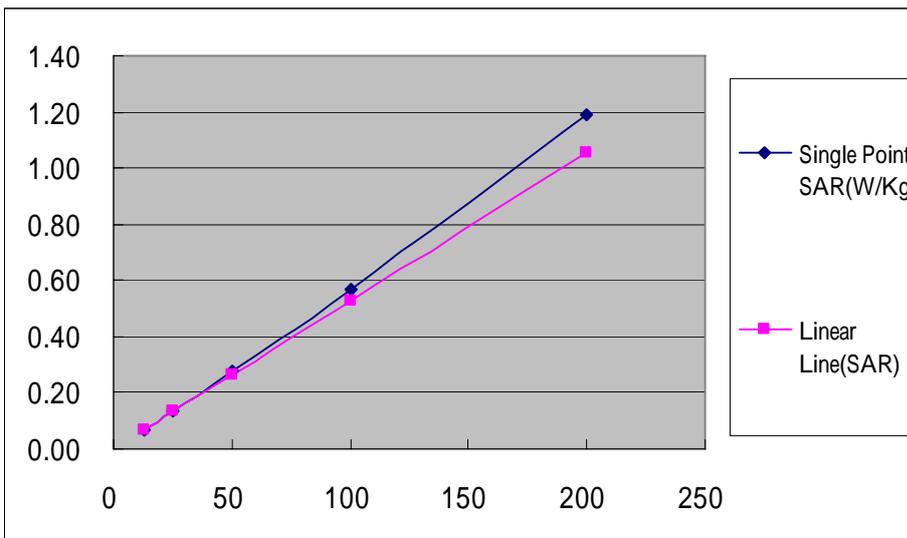
By tuning different power on this EUT and measuring the relative SAR to verify the high PAR of LTE is as below:



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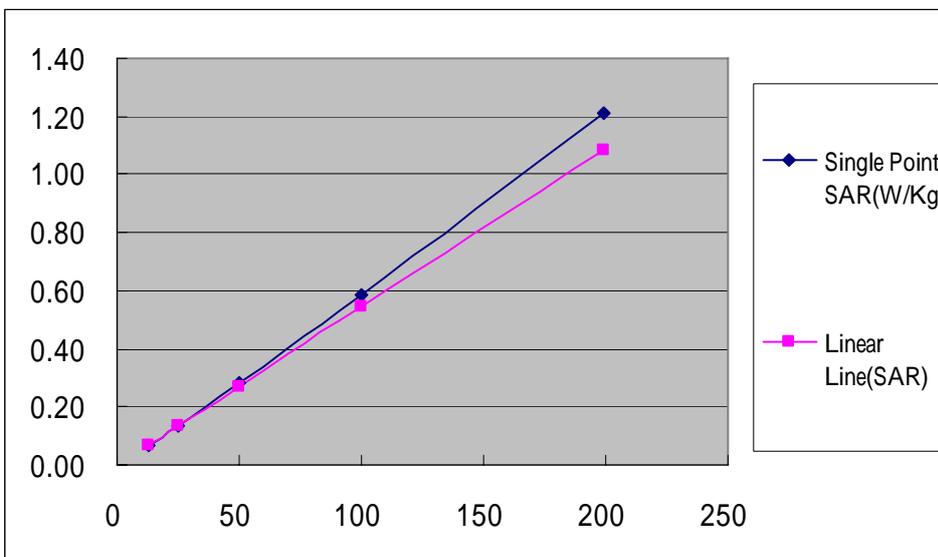
Modulation	QPSK / 1 RB upper edge
Position	Horizontal-Down 5mm
Frequency	795.5 MHz

SAR (W/kg)	Power (mW)	12.59	25.12	50.12	100.00	199.53
5MHz	Point SAR	0.067	0.138	0.276	0.568	1.189
	Linear line	0.067	0.133	0.265	0.528	1.054
	Deviation(%)	0.00	3.76	4.15	7.58	12.81



Modulation	QPSK / 50% RB
Position	Horizontal-Down 5mm
Frequency	795.5 MHz

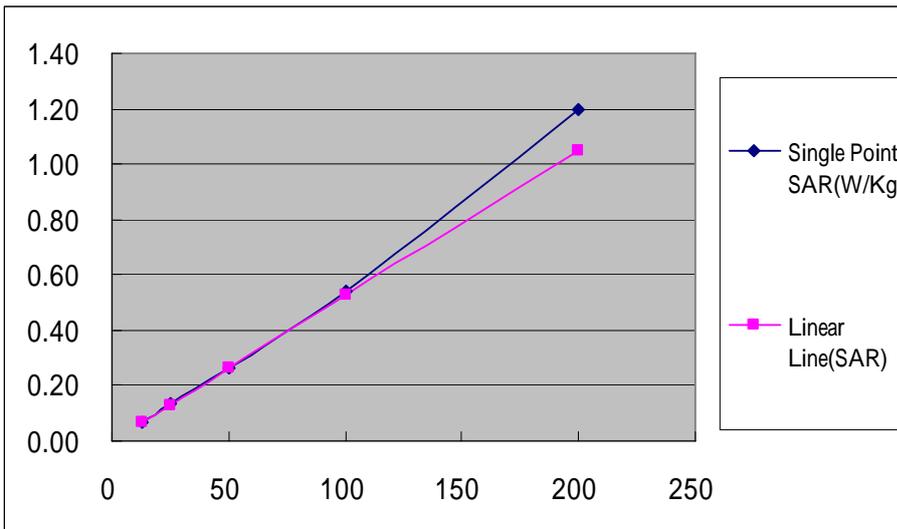
SAR (W/kg)	Power (mW)	12.59	25.12	50.12	100.00	199.53
5MHz	Point SAR	0.068	0.138	0.285	0.587	1.213
	Linear line	0.068	0.136	0.272	0.543	1.084
	Deviation(%)	0.00	1.47	4.78	8.10	11.90





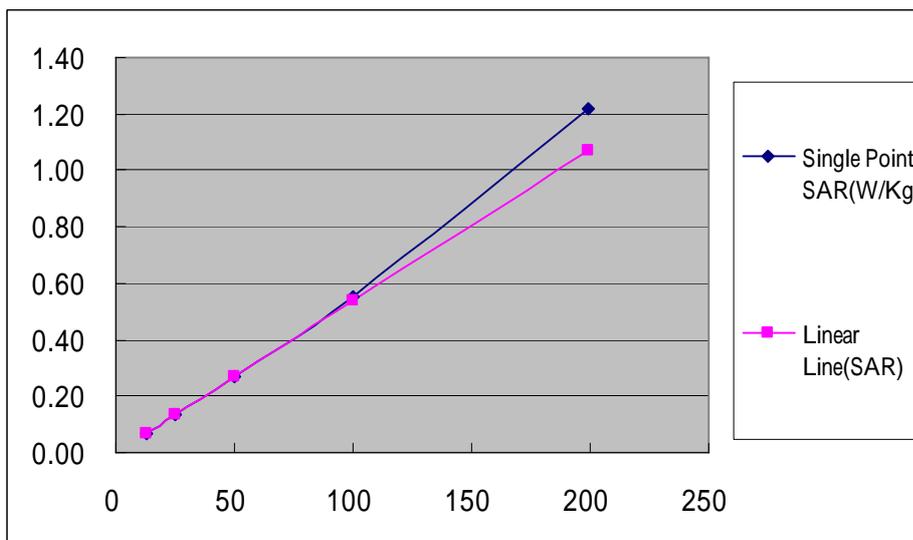
Modulation	16QAM / 1 RB upper edge
Position	Horizontal-Down 5mm
Frequency	795.5 MHz

SAR (W/kg)	Power (mW)	12.59	25.12	50.12	100.00	199.53
5MHz	Point SAR	0.066	0.134	0.264	0.544	1.198
	Linear line	0.066	0.132	0.263	0.524	1.047
	Deviation(%)	0.00	1.52	0.38	3.82	14.42



Modulation	16QAM / 50% RB
Position	Horizontal-Down 5mm
Frequency	795.5 MHz

SAR (W/kg)	Power (mW)	12.59	25.12	50.12	100.00	199.53
5MHz	Point SAR	0.068	0.136	0.271	0.553	1.216
	Linear line	0.068	0.135	0.269	0.538	1.073
	Deviation(%)	0.00	0.74	0.74	2.79	13.33



5. RECIPES FOR TISSUE SIMULATING LIQUIDS

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

The following are some common ingredients :

- **WATER-** Deionized water (pure H₂O), resistivity $\approx 16 \text{ M}$ - as basis for the liquid
- **SUGAR-** Refined sugar in crystals, as available in food shops - to reduce relative permittivity
- **SALT-** Pure NaCl - to increase conductivity
- **CELLULOSE-** Hydroxyethyl-cellulose, medium viscosity (75-125mPa.s, 2% in water, 20_C),
CAS # 54290 - to increase viscosity and to keep sugar in solution
- **PRESERVATIVE-** Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 - to prevent the spread of bacteria and molds
- **DGMBE-** Diethylenglycol-monobuthyl ether (DGMBE), Fluka Chemie GmbH, CAS # 112-34-5 - to reduce relative permittivity

THE RECIPES FOR 700MHz SIMULATING LIQUID TABLE

INGREDIENT	BODY SIMULATING LIQUID 700MHz (MSL-700)
Water	49%
Sugar	49.58%
Cellulose	0.12%
Salt	1.2%
Preventol	0.1%

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

1. Turn Network Analyzer on and allow at least 30min. warm up.
2. Mount dielectric probe kit so that interconnecting cable to Network Analyzer will not be moved during measurements or calibration.
3. Pour de-ionized water and measure water temperature ($\pm 1^\circ$).
4. Set water temperature in Agilent-Software (Calibration Setup).
5. Perform calibration.
6. Validate calibration with dielectric material of known properties (e.g. polished ceramic slab with $>8\text{mm}$ thickness $\epsilon' = 10.0$, $\epsilon'' = 0.0$). If measured parameters do not fit within tolerance, repeat calibration (± 0.2 for ϵ' : ± 0.1 for ϵ'').
7. Conductivity can be calculated from ϵ'' by $\sigma = \omega \epsilon_0 \epsilon'' = \epsilon'' f [\text{GHz}] / 18$.
8. Measure liquid shortly after calibration. Repeat calibration every hour.
9. Stir the liquid to be measured. Take a sample ($\sim 50\text{ml}$) with a syringe from the center of the liquid container.
10. Pour the liquid into a small glass flask. Hold the syringe at the bottom of the flask to avoid air bubbles.
11. Put the dielectric probe in the glass flask. Check that there are no air bubbles in front of the opening in the dielectric probe kit.
12. Perform measurements.
13. Adjust medium parameters in DASY4 for the frequencies necessary for the measurements ('Setup Config', select medium (e.g. Brain 900MHz) and press 'Option'-button.
14. Select the current medium for the frequency of the validation (e.g. Setup Medium Brain 900MHz).



FOR BAND SIMULATING LIQUID

LIQUID TYPE		MSL-750			
SIMULATING LIQUID TEMP.		21.2			
TEST DATE		Jun. 27, 2011			
TESTED BY		Sam Onn			
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
750.0	Permittivity ()	55.53	55.16	-0.67	±5
790.5		55.37	55.10	-0.49	
795.5		55.35	55.09	-0.47	
750.0	Conductivity () S/m	0.96	0.98	2.08	
790.5		0.97	0.99	2.06	
795.5		0.97	0.99	2.06	

LIQUID TYPE		MSL-750			
SIMULATING LIQUID TEMP.		21.6			
TEST DATE		Jul. 05, 2011			
TESTED BY		Sam Onn			
FREQ. (MHz)	LIQUID PARAMETER	STANDARD VALUE	MEASUREMENT VALUE	ERROR PERCENTAGE (%)	LIMIT(%)
750.0	Permittivity ()	55.53	55.62	0.16	±5
790.5		55.37	55.58	0.38	
795.5		55.35	55.53	0.33	
750.0	Conductivity () S/m	0.96	0.97	1.04	
790.5		0.97	0.98	1.03	
795.5		0.97	0.98	1.03	

5. SYSTEM VALIDATION

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

5.1 TEST PROCEDURE

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

1. The "Power Reference Measurement" and "Power Drift Measurement" jobs are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the amplifier output power. If it is too high (above ± 0.1 dB), the system performance check should be repeated; some amplifiers have very high drift during warm-up. A stable amplifier gives drift results in the DASY system below ± 0.02 dB.
2. The "Surface Check" job tests the optical surface detection system of the DASY system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1 mm). In that case it is better to abort the system performance check and stir the liquid.

3. The "Area Scan" job measures the SAR above the dipole on a plane parallel to the surface. It is used to locate the approximate location of the peak SAR. The proposed scan uses large grid spacing for faster measurement; due to the symmetric field, the peak detection is reliable. If a finer graphic is desired, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result.
4. The "Zoom Scan" job measures the field in a volume around the peak SAR value assessed in the previous "Area Scan" job (for more information see the application note on SAR evaluation).

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

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

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

5.2 VALIDATION RESULTS

SYSTEM VALIDATION TEST OF SIMULATING LIQUID					
FREQUENCY (MHz)	REQUIRED SAR (mW/g)	MEASURED SAR (mW/g)	DEVIATION (%)	SEPARATION DISTANCE	TESTED DATE
MSL 750	2.23 (1g)	2.12	-4.93	15mm	Jun. 27, 2011
MSL 750	2.23 (1g)	2.18	-2.24	15mm	Jul. 05, 2011
TESTED BY	Sam Onn				

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

5.3 SYSTEM VALIDATION UNCERTAINTIES

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

Error Description	Tolerance (±%)	Probability Distribution	Divisor	(C _i)		Standard Uncertainty (±%)		(V _i)
				(1g)	(10g)	(1g)	(10g)	
Measurement System								
Probe Calibration	5.50	Normal	1	1	1	5.50	5.50	
Axial Isotropy	0.25	Rectangular	3	0.7	0.7	0.10	0.10	
Hemispherical Isotropy	1.30	Rectangular	3	0.7	0.7	0.53	0.53	
Boundary effects	1.00	Rectangular	3	1	1	0.58	0.58	
Linearity	0.30	Rectangular	3	1	1	0.17	0.17	
System Detection Limits	1.00	Rectangular	3	1	1	0.58	0.58	
Readout Electronics	0.30	Normal	1	1	1	0.30	0.30	
Response Time	0.80	Rectangular	3	1	1	0.46	0.46	
Integration Time	2.60	Rectangular	3	1	1	1.50	1.50	
RF Ambient Noise	3.00	Rectangular	3	1	1	1.73	1.73	9
RF Ambient Reflections	3.00	Rectangular	3	1	1	1.73	1.73	9
Probe Positioner	0.40	Rectangular	3	1	1	0.23	0.23	
Probe Positioning	2.90	Rectangular	3	1	1	1.67	1.67	
Max. SAR Eval.	1.00	Rectangular	3	1	1	0.58	0.58	
Test sample related								
Sample positioning	1.90	Normal	1	1	1	1.90	1.90	4
Device holder uncertainty	2.80	Normal	1	1	1	2.80	2.80	4
Output power variation-SAR drift measurement	4.50	Rectangular	3	1	1	2.60	2.60	1
Dipole Related								
Dipole Axis to Liquid Distance	1.60	Rectangular	3	1	1	0.92	0.92	4
Input Power Drift	0.95	Rectangular	3	1	1	0.55	0.55	1
Phantom and Tissue parameters								
Phantom Uncertainty	4.00	Rectangular	3	1	1	2.31	2.31	
Liquid Conductivity (target)	5.00	Rectangular	3	0.64	0.43	1.85	1.24	
Liquid Conductivity (measurement)	2.08	Normal	1	0.64	0.43	1.33	0.89	9
Liquid Permittivity (target)	5.00	Rectangular	3	0.6	0.49	1.73	1.41	
Liquid Permittivity (measurement)	0.67	Normal	1	0.6	0.49	0.40	0.33	9
Combined Standard Uncertainty						8.72	8.49	
Coverage Factor for 95%						Kp=2		
Expanded Uncertainty (K=2)						17.44	16.98	

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

6. TEST RESULTS

6.1 TEST PROCEDURES

The EUT plugged into the notebook. Use the software to control the EUT channel and transmission power. Then record the conducted power before the testing. Place the EUT to the specific test location. After the testing, must writing down the conducted power of the EUT into the report. The SAR value was calculated via the 3D spline interpolation algorithm that has been implemented in the software of DASY4 SAR measurement system manufactured and calibrated by SPEAG. According to the IEEE 1528 standards, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

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

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

In the zoom scan, the distance between the measurement point at the probe sensor location (geometric center behind the probe tip) and the phantom surface is 3mm and maintained at a constant distance of ± 0.5 mm during a zoom scan to determine peak SAR locations. The distance is 3mm between the first measurement point and the bottom surface of the phantom. The secondary measurement point to the bottom surface of the phantom is with 7mm separation distance. The cube size is 7 x 7 x 7 points consists of 343 points and the grid space is 5mm.

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

In the area scan, the separation distance is 3mm between the each measurement point and the phantom surface. The scan size shall be included the transmission portion of the EUT. The measurement time is the same as the zoom scan. At last the reference power drift shall be less than $\pm 5\%$.

6.2 DESCRIPTION OF TEST CONDITION

TEST DATE	TISSUE TYPE / FREQ.	TEMPERATURE (°C)		HUMIDITY (%RH)	TESTED BY
		AIRBENT	LIQUID		
Jun. 27, 2011	MSL 750	22.3	21.2	52	Sam Onn
Jul. 05, 2011	MSL 750	22.8	21.6	58	Sam Onn

6.3 MEASURED SAR RESULT

LTE Band 14 (788-793MHz) / Bandwidth: 5MHz / Modulation: QPSK

Channel	Freq (MHz)	C.P (dBm)	RB Size	RB Offset	SAR value of each test position (W/ Kg)				
					H-D	V-F	H-U	V-B	Top edge
23305	790.5	21.23	12	6	0.471	0.315	0.371	0.062	0.083
		22.62	1	0	0.672	0.479	0.580	0.090	0.126
		22.81	1	24	0.643	0.437	0.498	0.085	0.100

LTE Band 14 (788-793MHz) / Bandwidth: 5MHz / Modulation: 16QAM

Channel	Freq (MHz)	C.P (dBm)	RB Size	RB Offset	SAR value of each test position (W/ Kg)				
					H-D	V-F	H-U	V-B	Top edge
23305	790.5	20.53	12	6	0.405	0.269	0.283	0.033	0.051
		21.84	1	0	0.591	0.419	0.401	0.050	0.079
		22.01	1	24	0.593	0.404	0.402	0.051	0.070

LTE Band 14 (793-798MHz) / Bandwidth: 5MHz / Modulation: QPSK

Channel	Freq (MHz)	C.P (dBm)	RB Size	RB Offset	SAR value of each test position (W/ Kg)				
					H-D	V-F	H-U	V-B	Top edge
23355	795.5	21.22	12	6	0.542	0.366	0.482	0.081	0.087
		22.21	1	0	0.601	0.408	0.504	0.088	0.099
		22.64	1	24	0.787	0.517	0.641	0.118	0.115

LTE Band 14 (793-798MHz) / Bandwidth: 5MHz / Modulation: 16QAM

Channel	Freq (MHz)	C.P (dBm)	RB Size	RB Offset	SAR value of each test position (W/ Kg)				
					H-D	V-F	H-U	V-B	Top edge
23355	795.5	20.41	12	6	0.516	0.338	0.349	0.046	0.056
		21.53	1	0	0.587	0.383	0.288	0.050	0.069
		21.72	1	24	0.771	0.491	0.377	0.072	0.084

NOTE:

1. Please see the Appendix A for the data.
2. The variation of the EUT conducted power measured before and after SAR testing should not over 5%.
3. Distance between EUT and phantom is 5mm for test of body position.
4. Per DA-02-1438A1, when 1-g SAR for the middle channel is less than 0.8 W/kg, testing for the other channels is not required
5. C.P: Conducted power
 H-D: Horizontal Down
 V-F: Vertical Front
 H-U: Horizontal Up
 V-B: Vertical Back



6.4 POWER DRIFT TABLE

LTE Band 14 / QPSK modulation

Test Mode	Test Position	RB Size	RB offset	Test Channel	Test Frequency	Power (dBm)		Power Drift (%)
						Begin	After	
1	Horizontal-Down	12	6	23305	790.5MHz	21.23	21.17	-1.37
2		1	0	23305	790.5MHz	22.62	22.55	-1.60
3		1	24	23305	790.5MHz	22.81	22.73	-1.83
4	Vertical-Front	12	6	23305	790.5MHz	21.23	21.14	-2.05
5		1	0	23305	790.5MHz	22.62	22.52	-2.28
6		1	24	23305	790.5MHz	22.81	22.70	-2.50
7	Horizontal-Up	12	6	23305	790.5MHz	21.23	21.11	-2.73
8		1	0	23305	790.5MHz	22.62	22.49	-2.95
9		1	24	23305	790.5MHz	22.81	22.67	-3.17
10	Vertical-Back	12	6	23305	790.5MHz	21.23	21.08	-3.39
11		1	0	23305	790.5MHz	22.62	22.46	-3.62
12		1	24	23305	790.5MHz	22.81	22.64	-3.84
13	Top edge	12	6	23305	790.5MHz	21.23	21.05	-4.06
14		1	0	23305	790.5MHz	22.62	22.43	-4.28
15		1	24	23305	790.5MHz	22.81	22.61	-4.50
16	Horizontal-Down	12	6	23355	795.5MHz	21.22	21.19	-0.69
17		1	0	23355	795.5MHz	22.21	22.17	-0.92
18		1	24	23355	795.5MHz	22.64	22.59	-1.14
19	Vertical-Front	12	6	23355	795.5MHz	21.22	21.16	-1.37
20		1	0	23355	795.5MHz	22.21	22.14	-1.60
21		1	24	23355	795.5MHz	22.64	22.56	-1.83
22	Horizontal-Up	12	6	23355	795.5MHz	21.22	21.13	-2.05
23		1	0	23355	795.5MHz	22.21	22.11	-2.28
24		1	24	23355	795.5MHz	22.64	22.53	-2.50
25	Vertical-Back	12	6	23355	795.5MHz	21.22	21.10	-2.73
26		1	0	23355	795.5MHz	22.21	22.08	-2.95
27		1	24	23355	795.5MHz	22.64	22.50	-3.17
28	Top edge	12	6	23355	795.5MHz	21.22	21.07	-3.39
29		1	0	23355	795.5MHz	22.21	22.05	-3.62
30		1	24	23355	795.5MHz	22.64	22.47	-3.84



LTE Band 14 / 16QAM modulation

Test Mode	Test Position	RB Size	RB offset	Test Channel	Test Frequency	Power (dBm)		Power Drift (%)
						Begin	After	
31	Horizontal-Down	12	6	23305	790.5MHz	20.53	20.35	-4.06
32		1	0	23305	790.5MHz	21.84	21.65	-4.28
33		1	24	23305	790.5MHz	22.01	21.81	-4.50
34	Vertical-Front	12	6	23305	790.5MHz	20.53	20.52	-0.23
35		1	0	23305	790.5MHz	21.84	21.82	-0.46
36		1	24	23305	790.5MHz	22.01	21.98	-0.69
37	Horizontal-Up	12	6	23305	790.5MHz	20.53	20.49	-0.92
38		1	0	23305	790.5MHz	21.84	21.79	-1.14
39		1	24	23305	790.5MHz	22.01	21.95	-1.37
40	Vertical-Back	12	6	23305	790.5MHz	20.53	20.46	-1.60
41		1	0	23305	790.5MHz	21.84	21.76	-1.83
42		1	24	23305	790.5MHz	22.01	21.92	-2.05
43	Top edge	12	6	23305	790.5MHz	20.53	20.43	-2.28
44		1	0	23305	790.5MHz	21.84	21.73	-2.50
45		1	24	23305	790.5MHz	22.01	21.89	-2.73
46	Horizontal-Down	12	6	23355	795.5MHz	20.41	20.28	-2.95
47		1	0	23355	795.5MHz	21.53	21.39	-3.17
48		1	24	23355	795.5MHz	21.72	21.57	-3.39
49	Vertical-Front	12	6	23355	795.5MHz	20.41	20.25	-3.62
50		1	0	23355	795.5MHz	21.53	21.36	-3.84
51		1	24	23355	795.5MHz	21.72	21.54	-4.06
52	Horizontal-Up	12	6	23355	795.5MHz	20.41	20.22	-4.28
53		1	0	23355	795.5MHz	21.53	21.33	-4.50
54		1	24	23355	795.5MHz	21.72	21.71	-0.23
55	Vertical-Back	12	6	23355	795.5MHz	20.41	20.39	-0.46
56		1	0	23355	795.5MHz	21.53	21.50	-0.69
57		1	24	23355	795.5MHz	21.72	21.68	-0.92
58	Top edge	12	6	23355	795.5MHz	20.41	20.36	-1.14
59		1	0	23355	795.5MHz	21.53	21.47	-1.37
60		1	24	23355	795.5MHz	21.72	21.65	-1.60



6.5 SAR LIMITS

HUMAN EXPOSURE	SAR (W/kg)	
	(GENERAL POPULATION / UNCONTROLLED EXPOSURE ENVIRONMENT)	(OCCUPATIONAL / CONTROLLED EXPOSURE ENVIRONMENT)
Spatial Peak (averaged over 1 g)	1.6	8.0

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



7. INFORMATION ON THE TESTING LABORATORIES

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

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

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

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Tel: 886-3-3183232

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Email: service.adt@tw.bureauveritas.com

Web Site: www.adt.com.tw

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

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香港商立德國際商品試驗有限公司桃園分公司

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

A D T

APPENDIX A: TEST DATA

Product Name: LTE USB Modem ; Model Number: WLTUBG-102

Liquid Level Photo

Tissue 750MHz D=150mm



M01-LTE700-Ch23305 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.553 mW/g

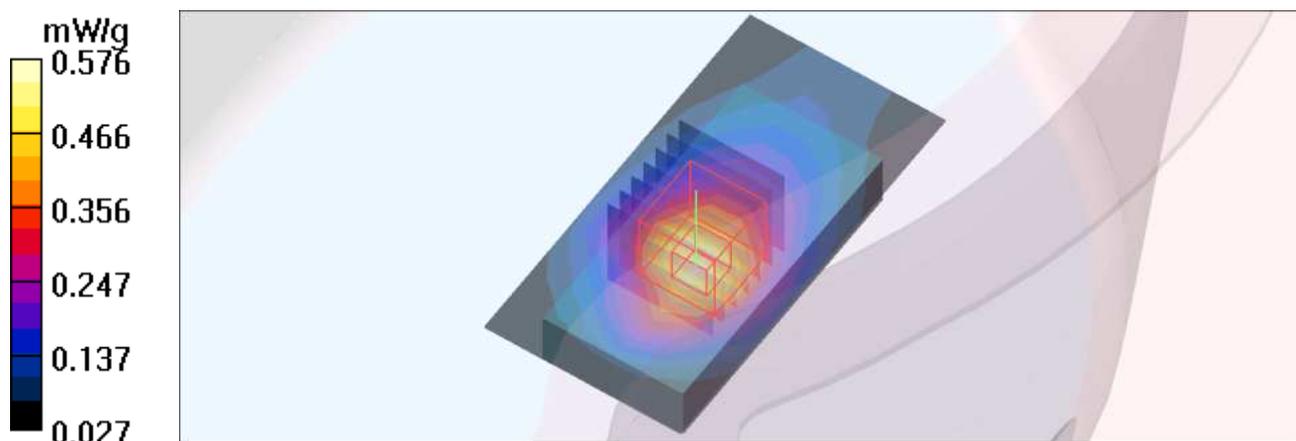
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.0 V/m; Power Drift = -0.152 dB

Peak SAR (extrapolated) = 0.817 W/kg

SAR(1 g) = 0.471 mW/g; SAR(10 g) = 0.279 mW/g

Maximum value of SAR (measured) = 0.576 mW/g



M02-LTE700-Ch23305 (1RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.791 mW/g

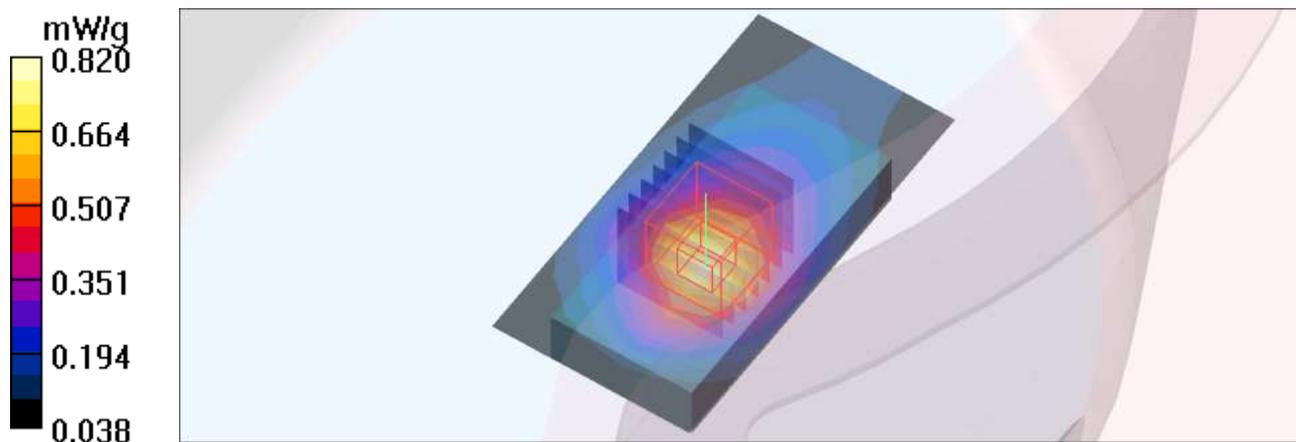
Body Position - Ch23305 /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.8 V/m; Power Drift = -0.131 dB

Peak SAR (extrapolated) = 1.16 W/kg

SAR(1 g) = 0.672 mW/g; SAR(10 g) = 0.400 mW/g

Maximum value of SAR (measured) = 0.820 mW/g



M03-LTE700-Ch23305 (1RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.769 mW/g

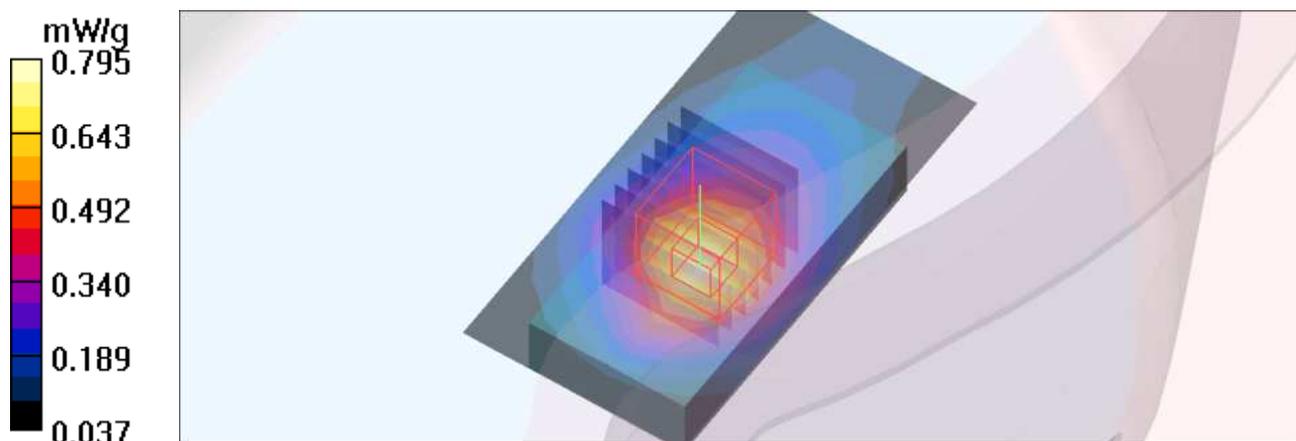
Body Position - Ch23305 /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.8 V/m; Power Drift = -0.123 dB

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.643 mW/g; SAR(10 g) = 0.384 mW/g

Maximum value of SAR (measured) = 0.795 mW/g



M04-LTE700-Ch23305 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.383 mW/g

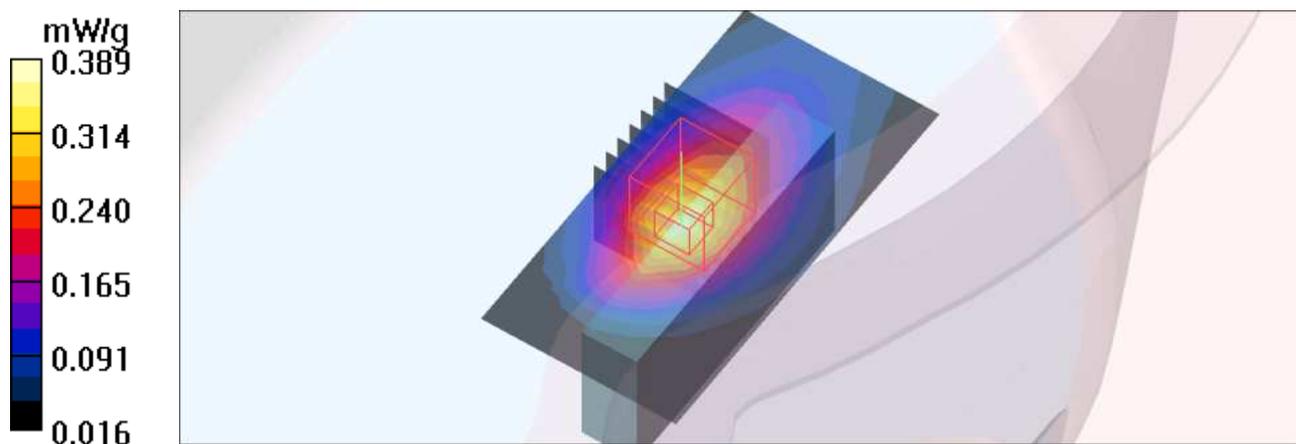
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.15 V/m; Power Drift = 0.174 dB

Peak SAR (extrapolated) = 0.548 W/kg

SAR(1 g) = 0.315 mW/g; SAR(10 g) = 0.189 mW/g

Maximum value of SAR (measured) = 0.389 mW/g



M05-LTE700-Ch23305 (1RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.573 mW/g

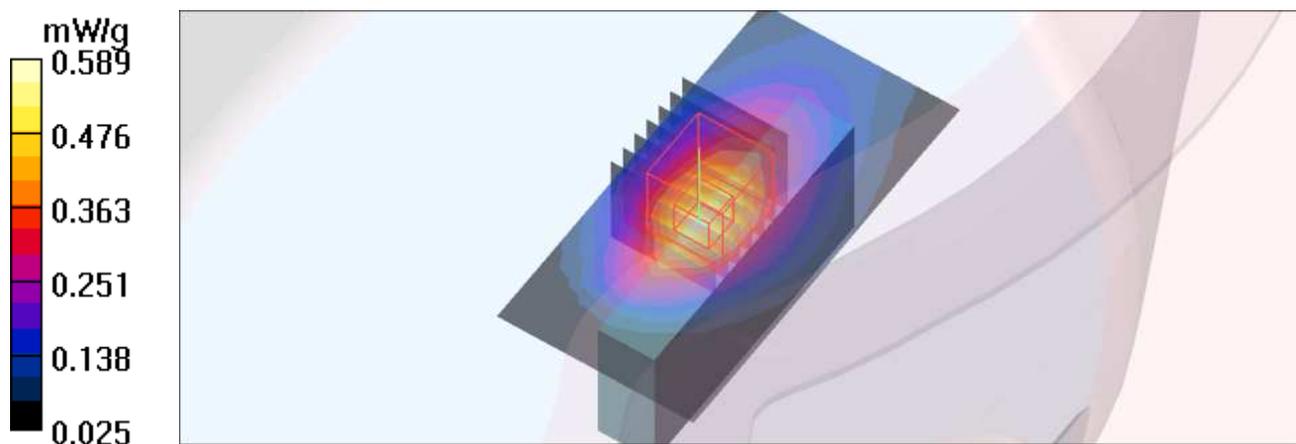
Body Position - Ch23305 /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.66 V/m; Power Drift = 0.145 dB

Peak SAR (extrapolated) = 0.828 W/kg

SAR(1 g) = 0.479 mW/g; SAR(10 g) = 0.287 mW/g

Maximum value of SAR (measured) = 0.589 mW/g



M06-LTE700-Ch23305 (1RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.530 mW/g

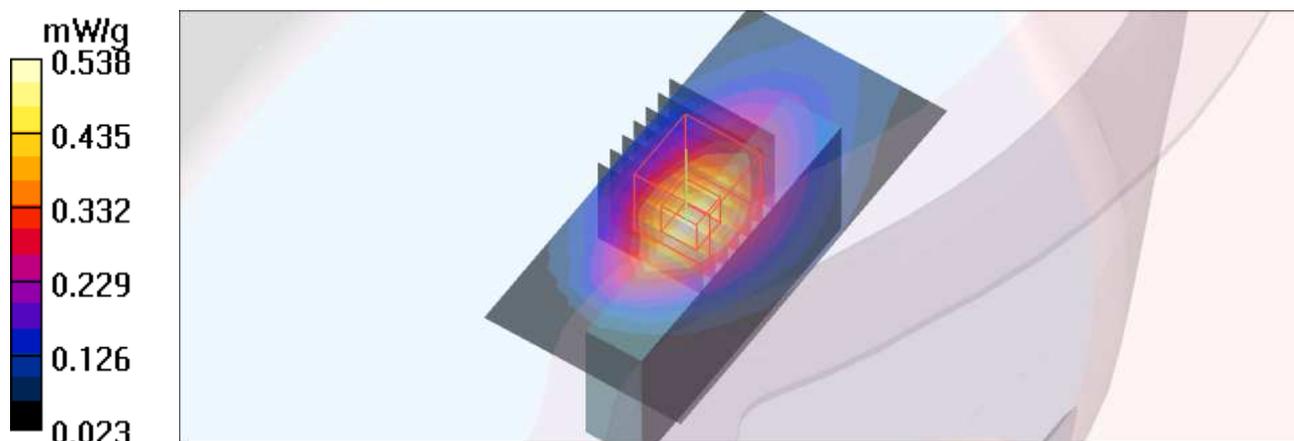
Body Position - Ch23305 /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.53 V/m; Power Drift = -0.025 dB

Peak SAR (extrapolated) = 0.758 W/kg

SAR(1 g) = 0.437 mW/g; SAR(10 g) = 0.261 mW/g

Maximum value of SAR (measured) = 0.538 mW/g



M07-LTE700-Ch23305 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm

Maximum value of SAR (measured) = 0.446 mW/g

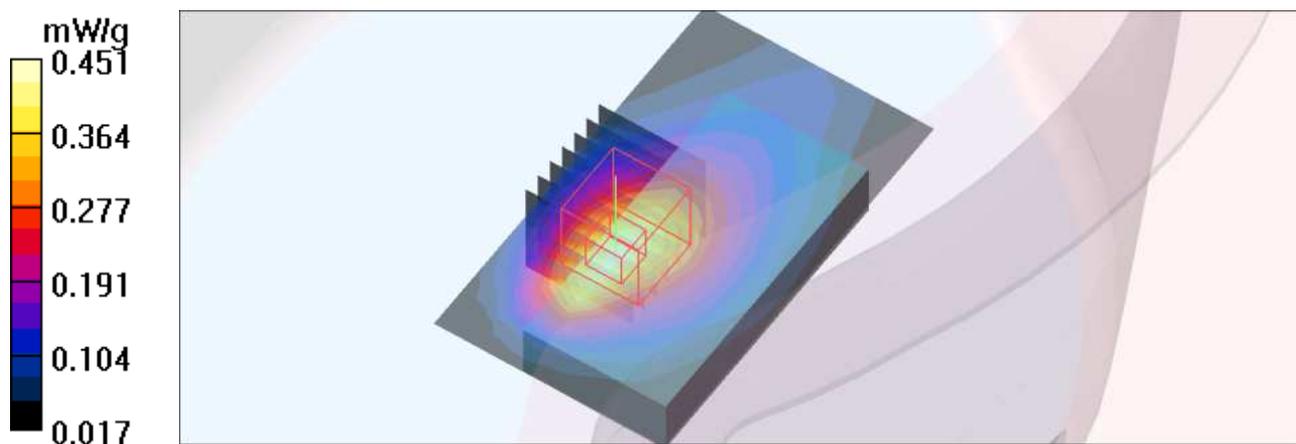
Body Position - Ch23305/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.8 V/m; Power Drift = -0.096 dB

Peak SAR (extrapolated) = 0.649 W/kg

SAR(1 g) = 0.371 mW/g; SAR(10 g) = 0.224 mW/g

Maximum value of SAR (measured) = 0.451 mW/g



M08-LTE700-Ch23305 (1RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.688 mW/g

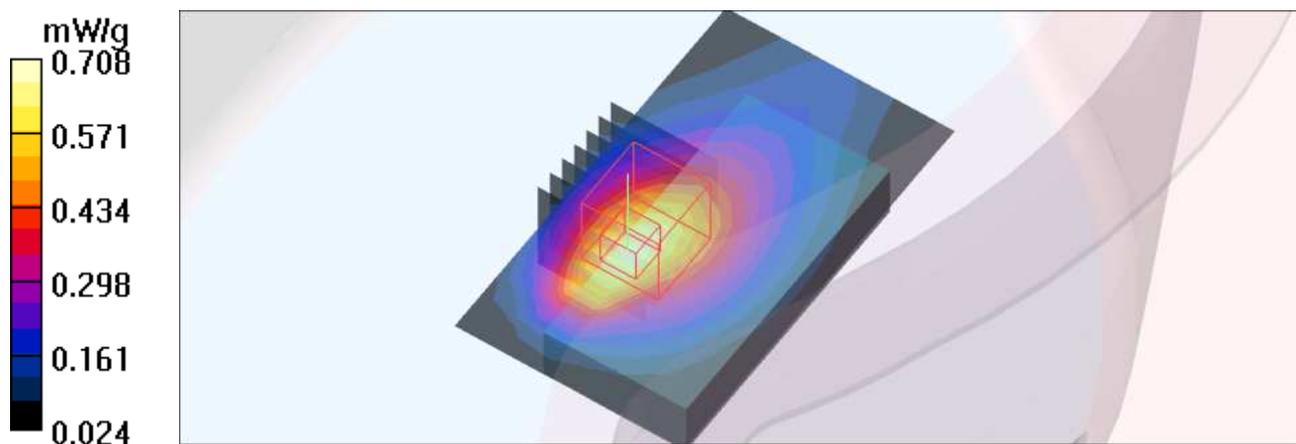
Body Position - Ch23305 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.8 V/m; Power Drift = 0.125 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.580 mW/g; SAR(10 g) = 0.349 mW/g

Maximum value of SAR (measured) = 0.708 mW/g



M09-LTE700-Ch23305 (1RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.597 mW/g

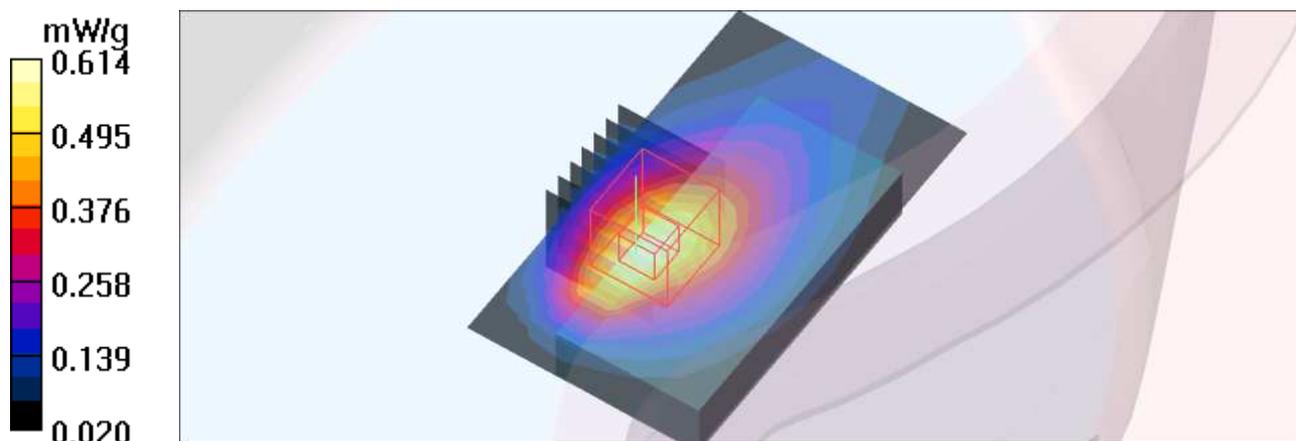
Body Position - Ch23305 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.2 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 0.867 W/kg

SAR(1 g) = 0.498 mW/g; SAR(10 g) = 0.303 mW/g

Maximum value of SAR (measured) = 0.614 mW/g



M10-LTE700-Ch23305 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm

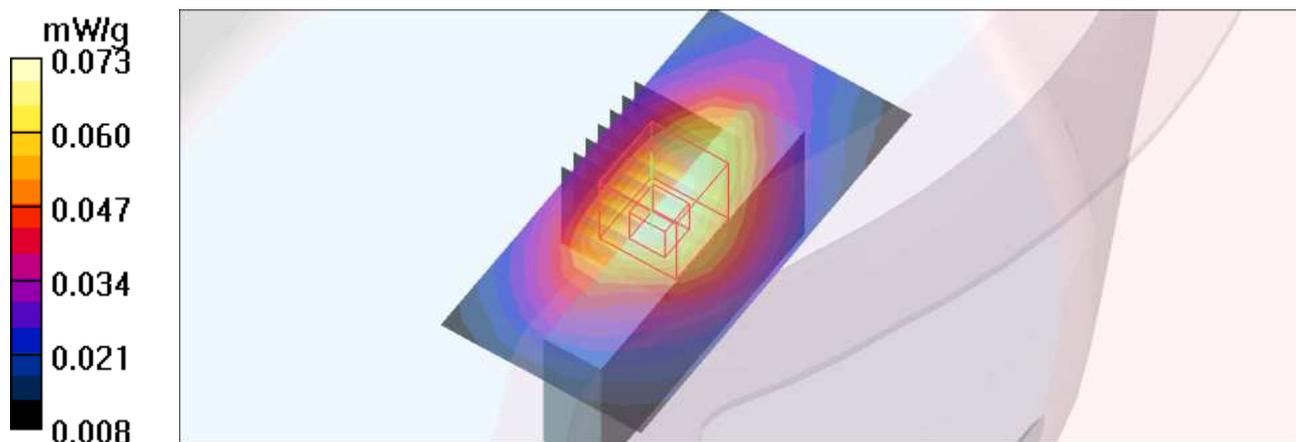
Maximum value of SAR (measured) = 0.073 mW/g

Body Position - Ch23305/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.99 V/m; Power Drift = -0.046 dB

Peak SAR (extrapolated) = 0.092 W/kg

SAR(1 g) = 0.062 mW/g; SAR(10 g) = 0.042 mW/g



M11-LTE700-Ch23305 (1RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

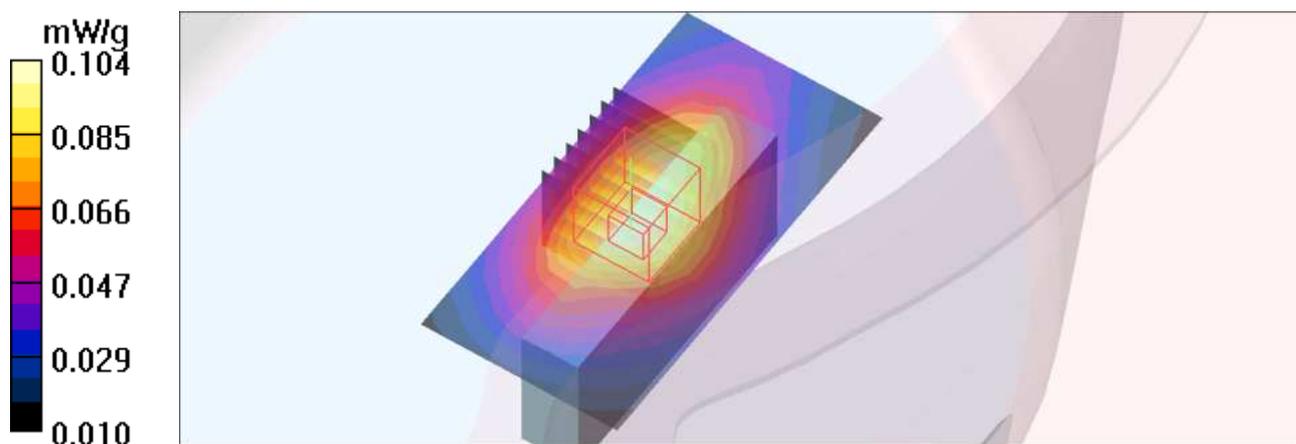
Body Position - Ch23305 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.104 mW/g

Body Position - Ch23305 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.27 V/m; Power Drift = 0.115 dB

Peak SAR (extrapolated) = 0.133 W/kg

SAR(1 g) = 0.090 mW/g; SAR(10 g) = 0.060 mW/g



M12-LTE700-Ch23305 (1RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.10$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.097 mW/g

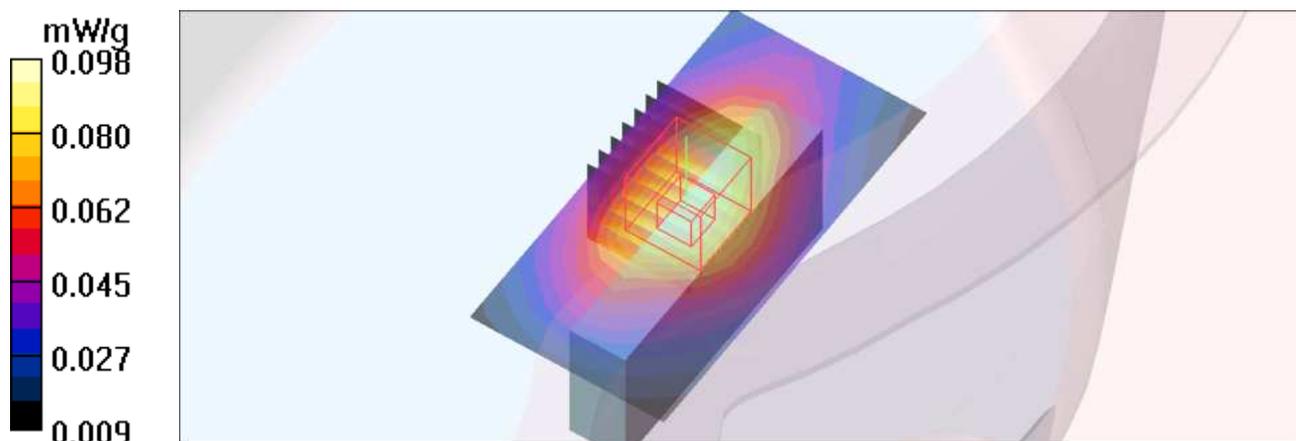
Body Position - Ch23305 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.88 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.127 W/kg

SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.057 mW/g

Maximum value of SAR (measured) = 0.098 mW/g



M13-Tip edge-LTE700-Ch23305 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 55.10$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x9x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$

Maximum value of SAR (measured) = 0.105 mW/g

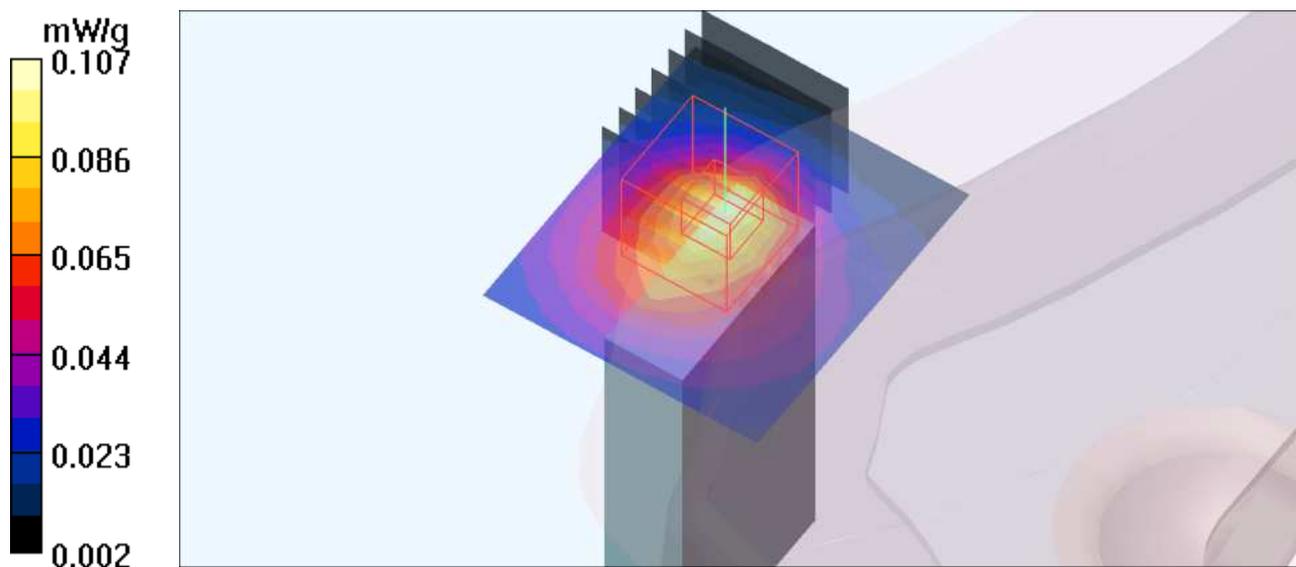
Body Position - Ch23305/Zoom Scan(7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.1 V/m; Power Drift = -0.146 dB

Peak SAR (extrapolated) = 0.198 W/kg

SAR(1 g) = 0.083 mW/g; SAR(10 g) = 0.045 mW/g

Maximum value of SAR (measured) = 0.107 mW/g



M14-Tip edge-LTE700-Ch23305 (1RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 55.10$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (8x9x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$

Maximum value of SAR (measured) = 0.159 mW/g

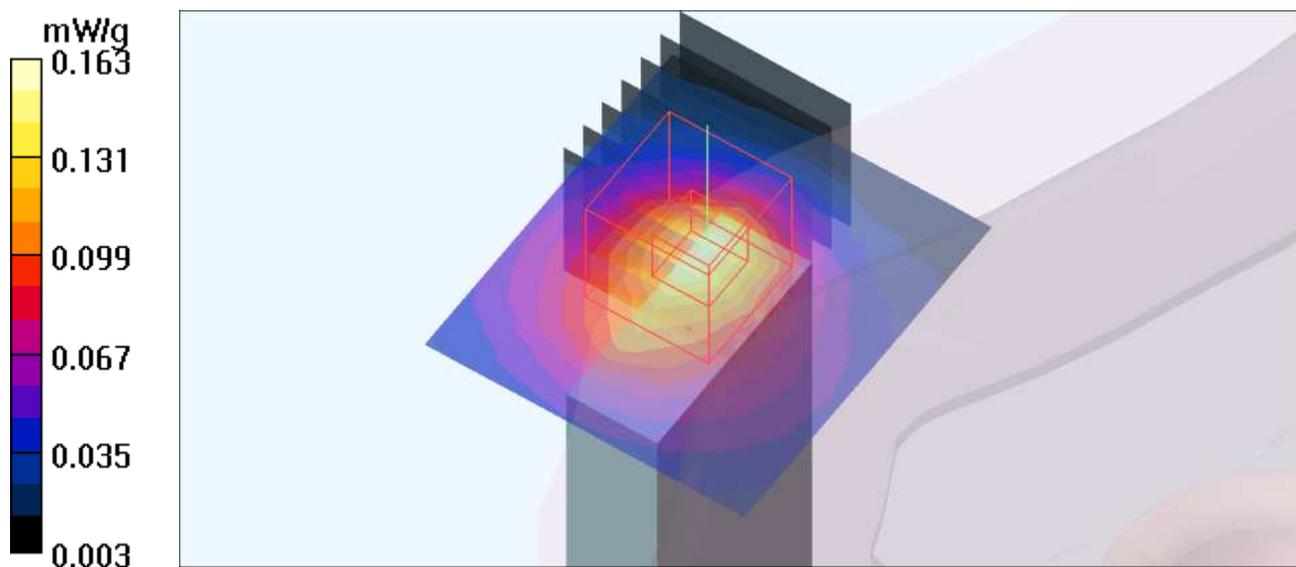
Body Position - Ch23305 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.4 V/m; Power Drift = -0.126 dB

Peak SAR (extrapolated) = 0.298 W/kg

SAR(1 g) = 0.126 mW/g; SAR(10 g) = 0.069 mW/g

Maximum value of SAR (measured) = 0.163 mW/g



M15-Tip edge-LTE700-Ch23305 (1RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 790.5 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 55.10$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (8x9x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$

Maximum value of SAR (measured) = 0.127 mW/g

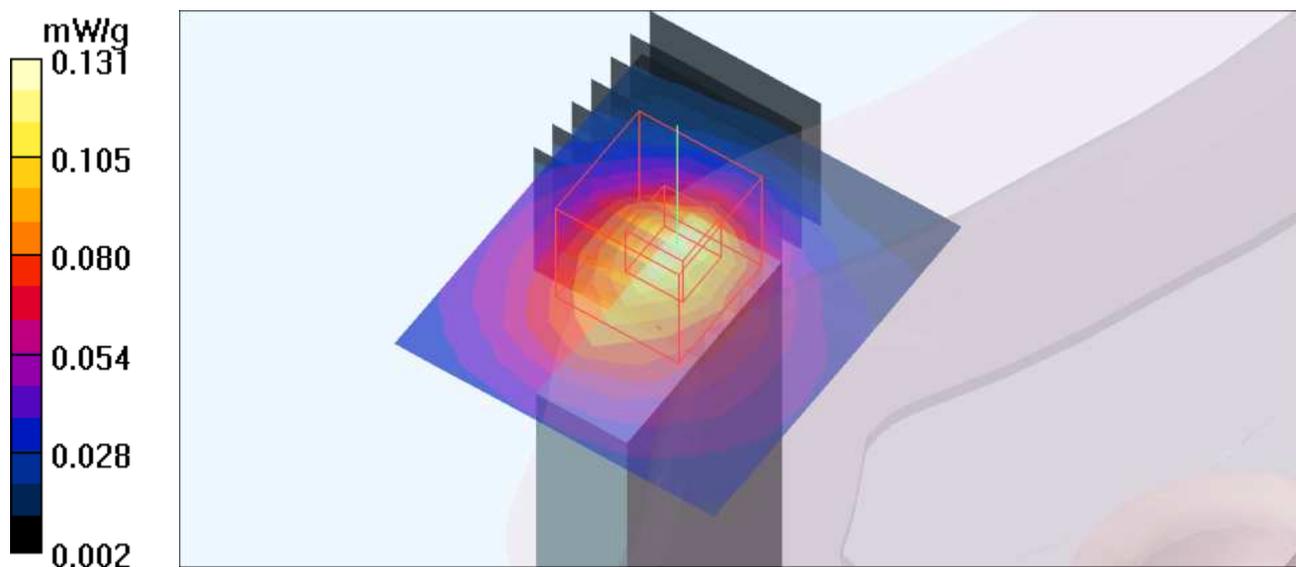
Body Position - Ch23305 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.1 V/m; Power Drift = -0.078 dB

Peak SAR (extrapolated) = 0.242 W/kg

SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.055 mW/g

Maximum value of SAR (measured) = 0.131 mW/g



M16-LTE700-Ch23355 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 55.09$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$
Maximum value of SAR (measured) = 0.646 mW/g

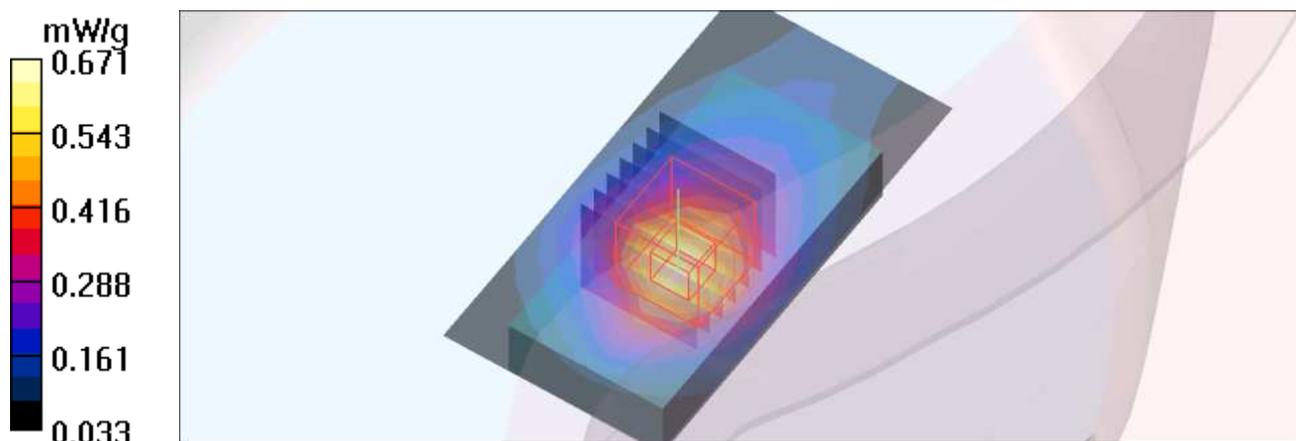
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.6 V/m; Power Drift = -0.191 dB

Peak SAR (extrapolated) = 0.931 W/kg

SAR(1 g) = 0.542 mW/g; SAR(10 g) = 0.323 mW/g

Maximum value of SAR (measured) = 0.671 mW/g



M17-LTE700-Ch23355 (1RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.09$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.725 mW/g

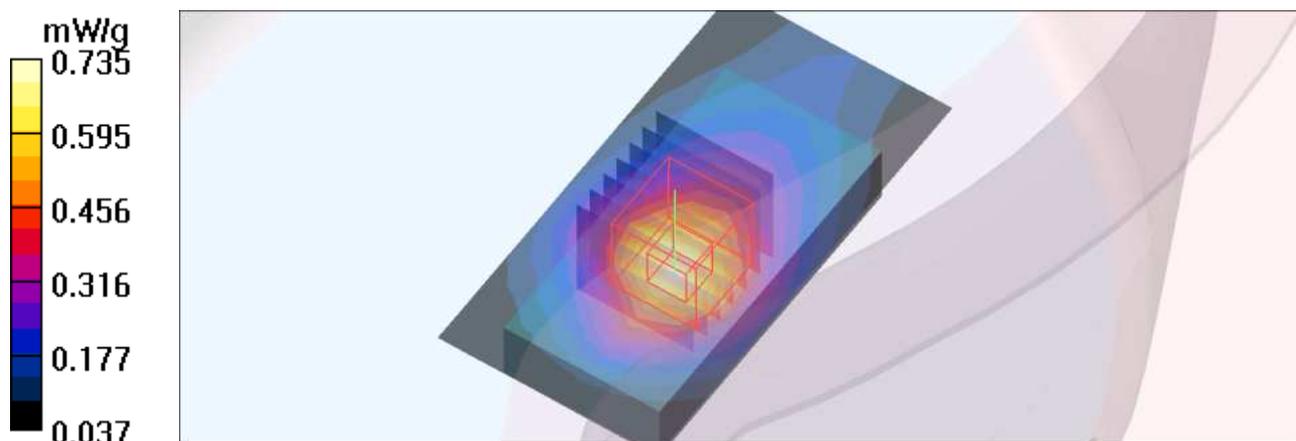
Body Position - Ch23355 /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.4 V/m; Power Drift = -0.113 dB

Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.601 mW/g; SAR(10 g) = 0.363 mW/g

Maximum value of SAR (measured) = 0.735 mW/g



M18-LTE700-Ch23355 (1RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.09$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.918 mW/g

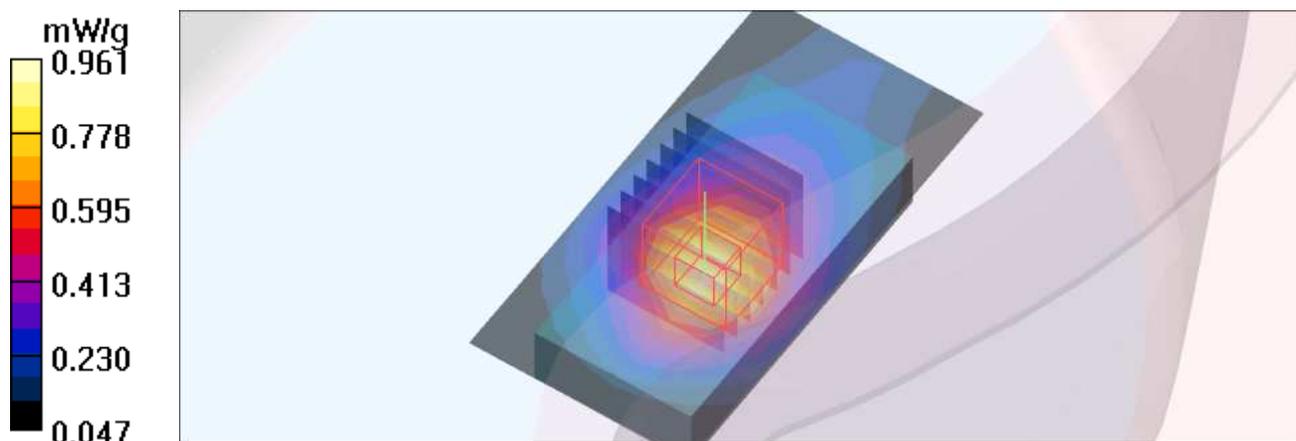
Body Position - Ch23355 /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

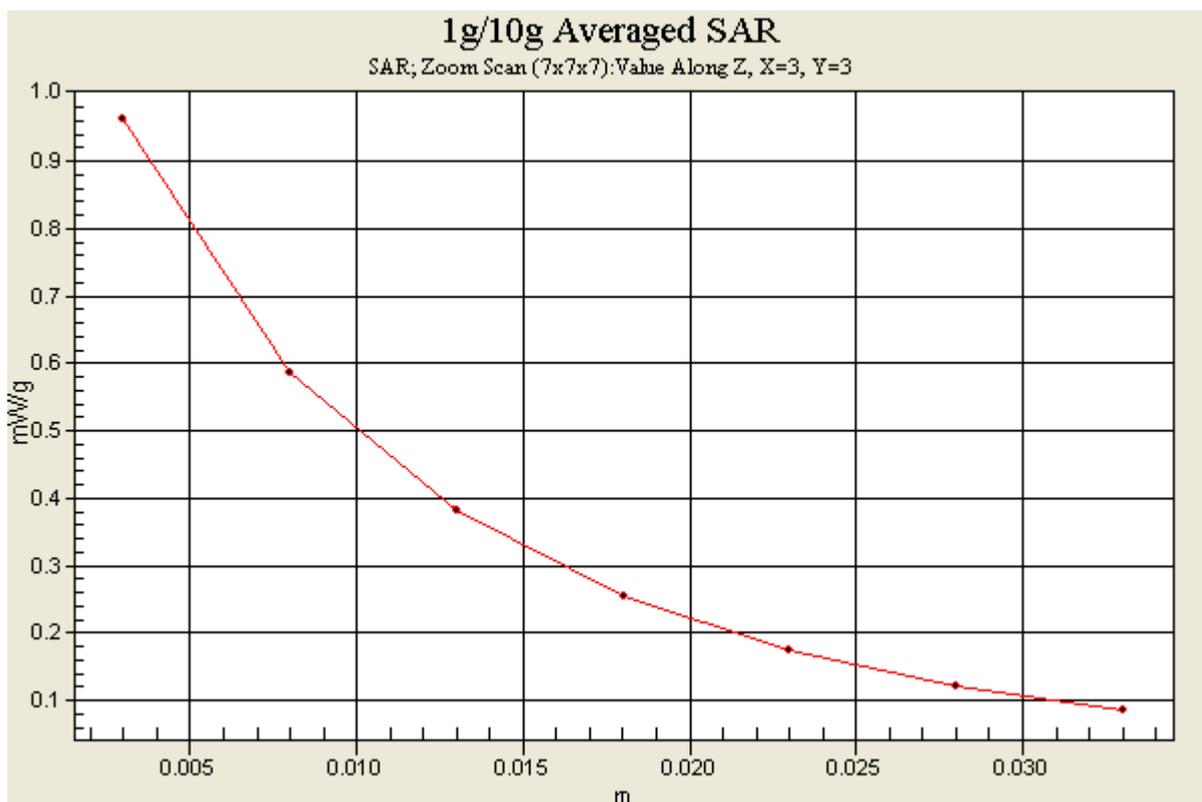
Reference Value = 16.3 V/m; Power Drift = -0.153 dB

Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 0.787 mW/g; SAR(10 g) = 0.476 mW/g

Maximum value of SAR (measured) = 0.961 mW/g





M19-LTE700-Ch23355 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 55.09$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$
Maximum value of SAR (measured) = 0.437 mW/g

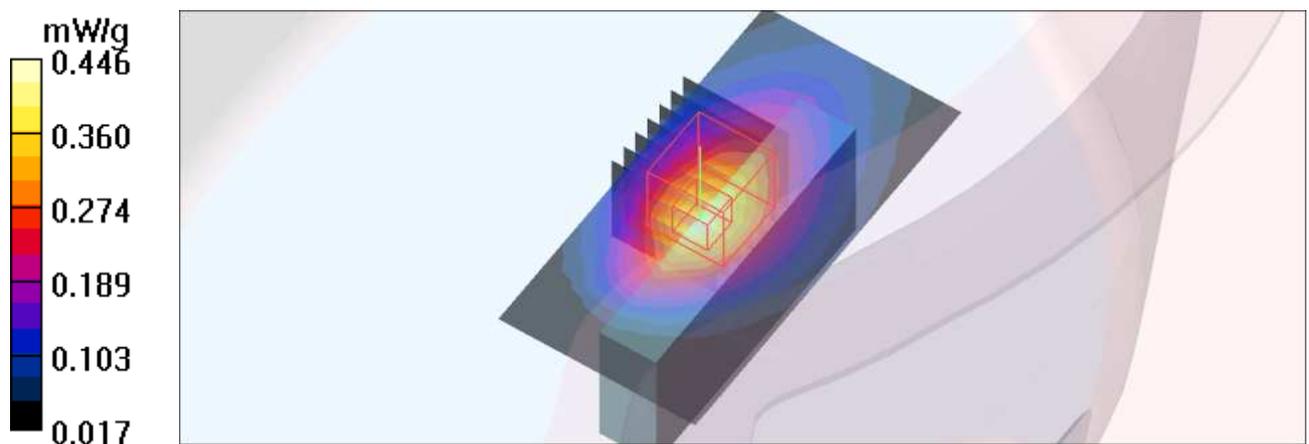
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.55 V/m; Power Drift = -0.052 dB

Peak SAR (extrapolated) = 0.618 W/kg

SAR(1 g) = 0.366 mW/g; SAR(10 g) = 0.221 mW/g

Maximum value of SAR (measured) = 0.446 mW/g



M20-LTE700-Ch23355 (1RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.09$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.475 mW/g

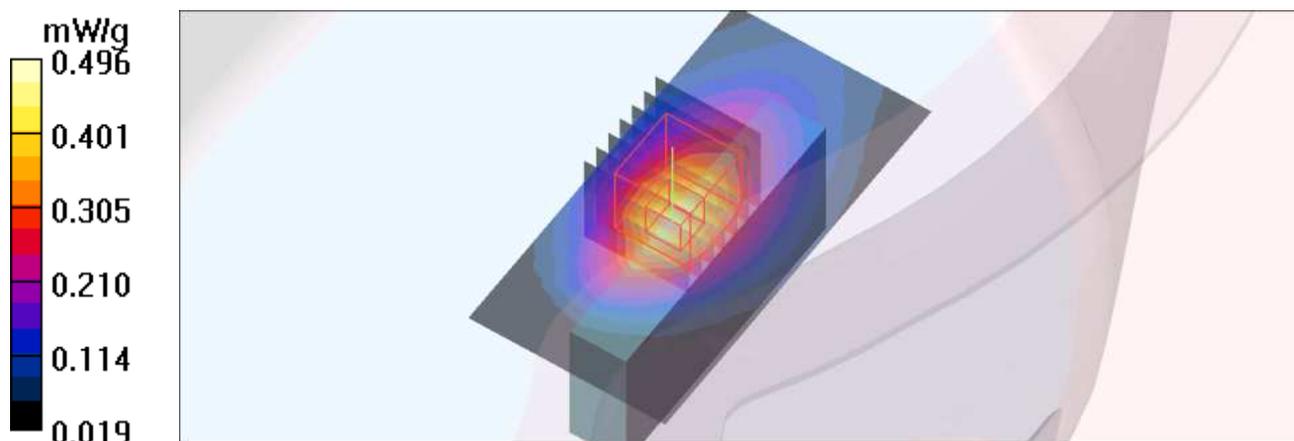
Body Position - Ch23355 /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.70 V/m; Power Drift = 0.076 dB

Peak SAR (extrapolated) = 0.687 W/kg

SAR(1 g) = 0.408 mW/g; SAR(10 g) = 0.247 mW/g

Maximum value of SAR (measured) = 0.496 mW/g



M21-LTE700-Ch23355 (1RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 55.09$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355 /Area Scan (8x15x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$
Maximum value of SAR (measured) = 0.606 mW/g

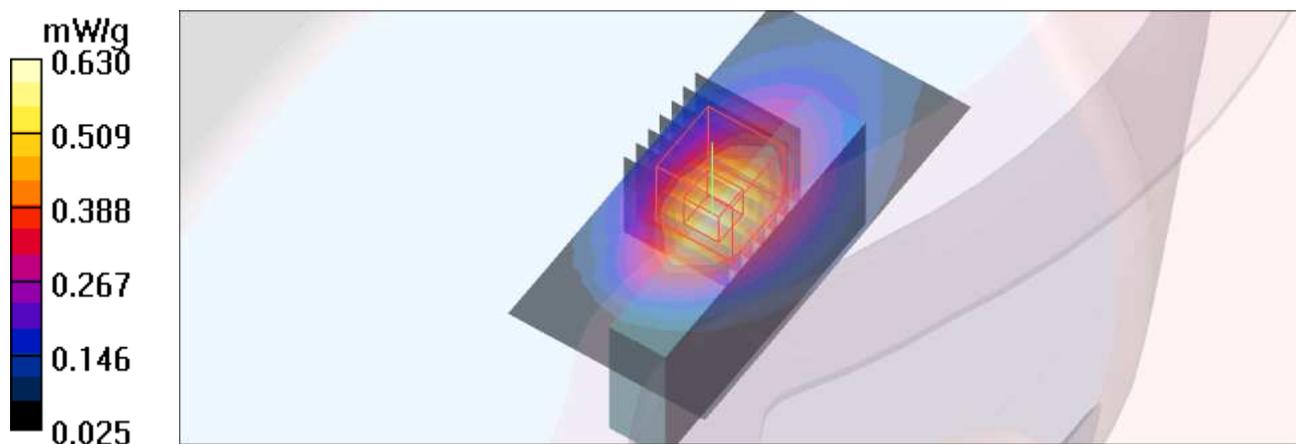
Body Position - Ch23355 /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.90 V/m; Power Drift = -0.053 dB

Peak SAR (extrapolated) = 0.871 W/kg

SAR(1 g) = 0.517 mW/g; SAR(10 g) = 0.313 mW/g

Maximum value of SAR (measured) = 0.630 mW/g



M22-LTE700-Ch23355 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.09$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm

Maximum value of SAR (measured) = 0.556 mW/g

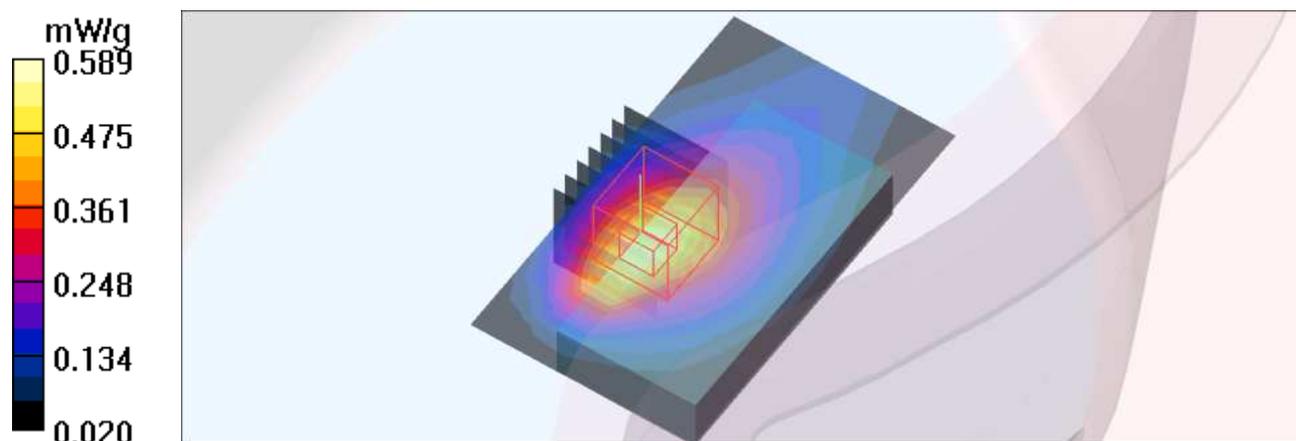
Body Position - Ch23305/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.2 V/m; Power Drift = 0.091 dB

Peak SAR (extrapolated) = 0.836 W/kg

SAR(1 g) = 0.482 mW/g; SAR(10 g) = 0.292 mW/g

Maximum value of SAR (measured) = 0.589 mW/g



M22-LTE700-Ch23355 (1RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.09$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.598 mW/g

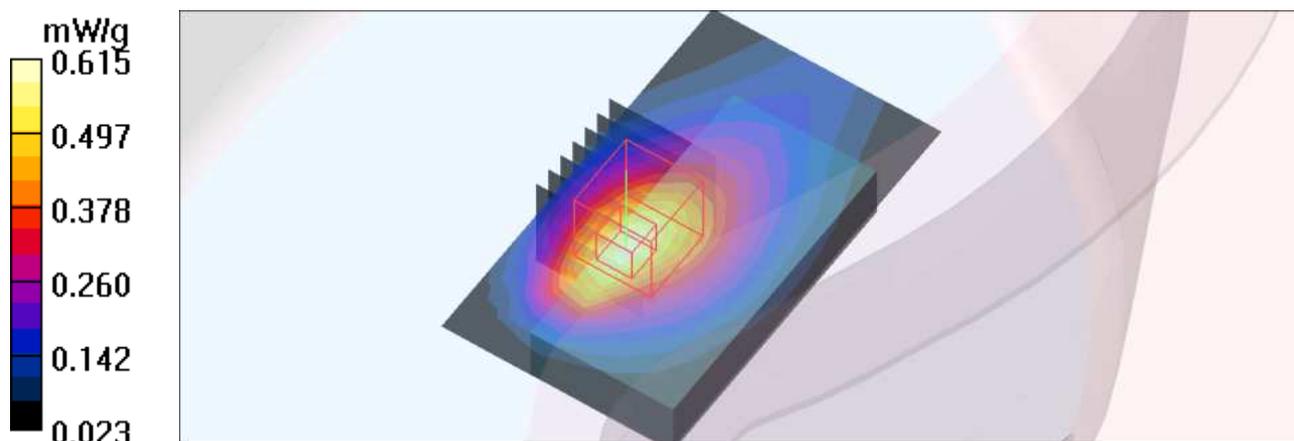
Body Position - Ch23305 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.9 V/m; Power Drift = -0.074 dB

Peak SAR (extrapolated) = 0.877 W/kg

SAR(1 g) = 0.504 mW/g; SAR(10 g) = 0.305 mW/g

Maximum value of SAR (measured) = 0.615 mW/g



M24-LTE700-Ch23355 (1RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.09$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.781 mW/g

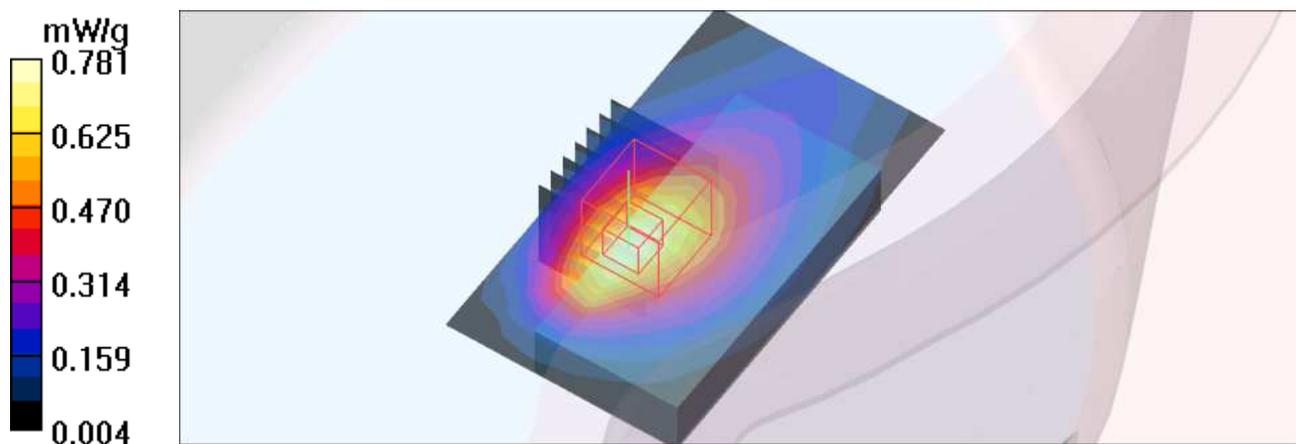
Body Position - Ch23305 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.5 V/m; Power Drift = -0.083 dB

Peak SAR (extrapolated) = 1.07 W/kg

SAR(1 g) = 0.641 mW/g; SAR(10 g) = 0.394 mW/g

Maximum value of SAR (measured) = 0.774 mW/g



M25-LTE700-Ch23355 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.09$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm

Maximum value of SAR (measured) = 0.097 mW/g

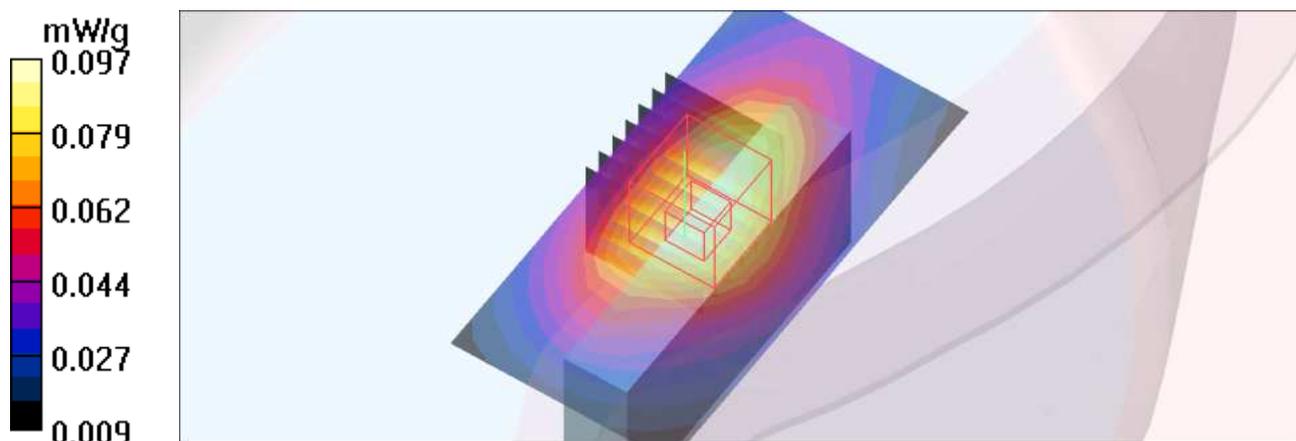
Body Position - Ch23355/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.43 V/m; Power Drift = 0.153 dB

Peak SAR (extrapolated) = 0.122 W/kg

SAR(1 g) = 0.081 mW/g; SAR(10 g) = 0.054 mW/g

Maximum value of SAR (measured) = 0.094 mW/g



M26-LTE700-Ch23355 (1RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.09$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.097 mW/g

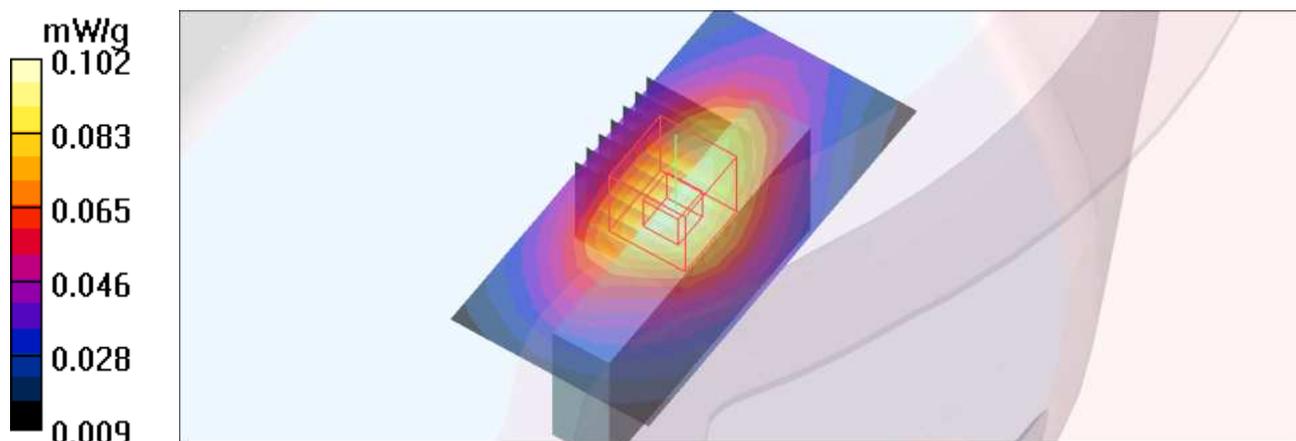
Body Position - Ch23355 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.82 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 0.130 W/kg

SAR(1 g) = 0.088 mW/g; SAR(10 g) = 0.059 mW/g

Maximum value of SAR (measured) = 0.102 mW/g



M27-LTE700-Ch23355 (1RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.09$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355 /Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.132 mW/g

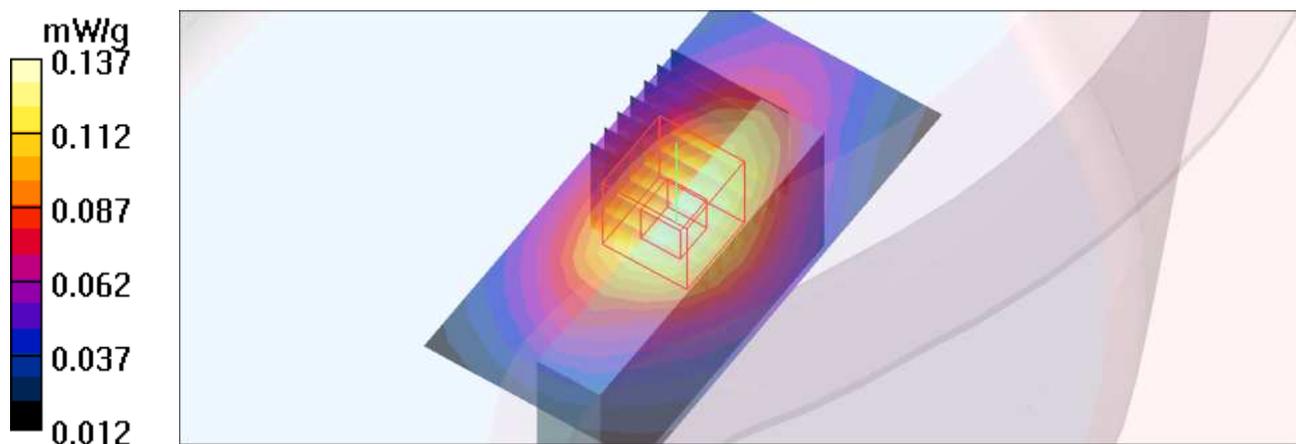
Body Position - Ch23355 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.83 V/m; Power Drift = -0.091 dB

Peak SAR (extrapolated) = 0.179 W/kg

SAR(1 g) = 0.118 mW/g; SAR(10 g) = 0.078 mW/g

Maximum value of SAR (measured) = 0.137 mW/g



M28-Tip edge-LTE700-Ch23355 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 55.09$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x9x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$

Maximum value of SAR (measured) = 0.105 mW/g

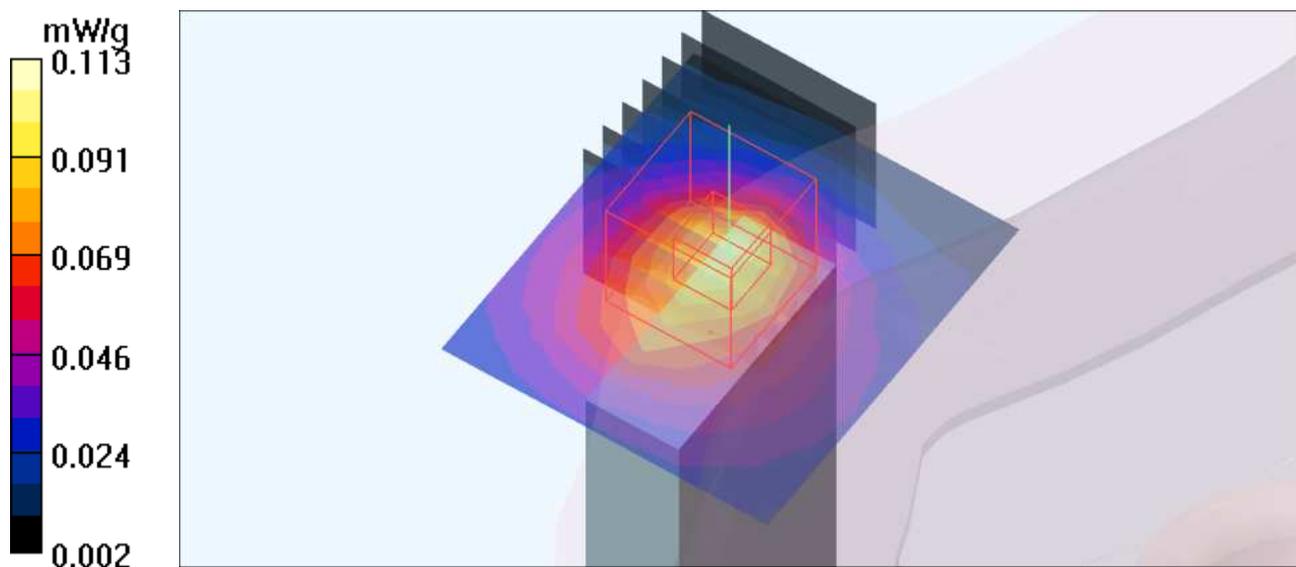
Body Position - Ch23305/Zoom Scan(7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.95 V/m; Power Drift = 0.125 dB

Peak SAR (extrapolated) = 0.206 W/kg

SAR(1 g) = 0.087 mW/g; SAR(10 g) = 0.048 mW/g

Maximum value of SAR (measured) = 0.113 mW/g



M29-Tip edge-LTE700-Ch23355 (1RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 55.09$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (8x9x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$

Maximum value of SAR (measured) = 0.125 mW/g

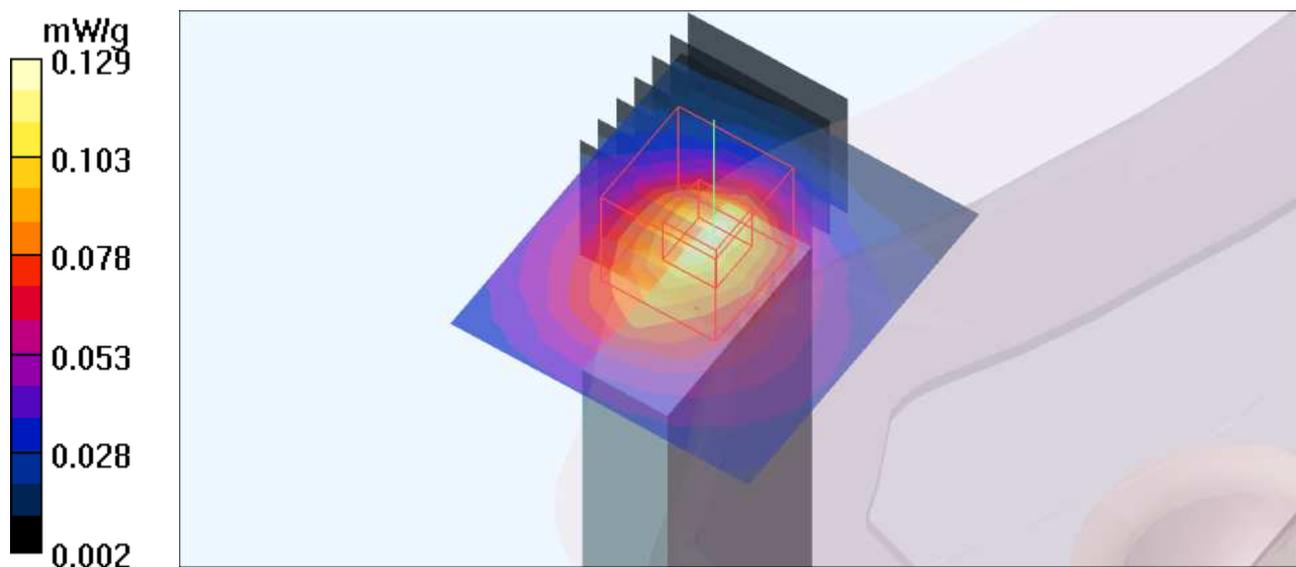
Body Position - Ch23305 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.8 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 0.235 W/kg

SAR(1 g) = 0.099 mW/g; SAR(10 g) = 0.055 mW/g

Maximum value of SAR (measured) = 0.129 mW/g



M30-Tip edge-LTE700-Ch23355 (1RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: QPSK

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.09$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305 /Area Scan (8x9x1): Measurement grid: dx=8mm, dy=8mm

Maximum value of SAR (measured) = 0.141 mW/g

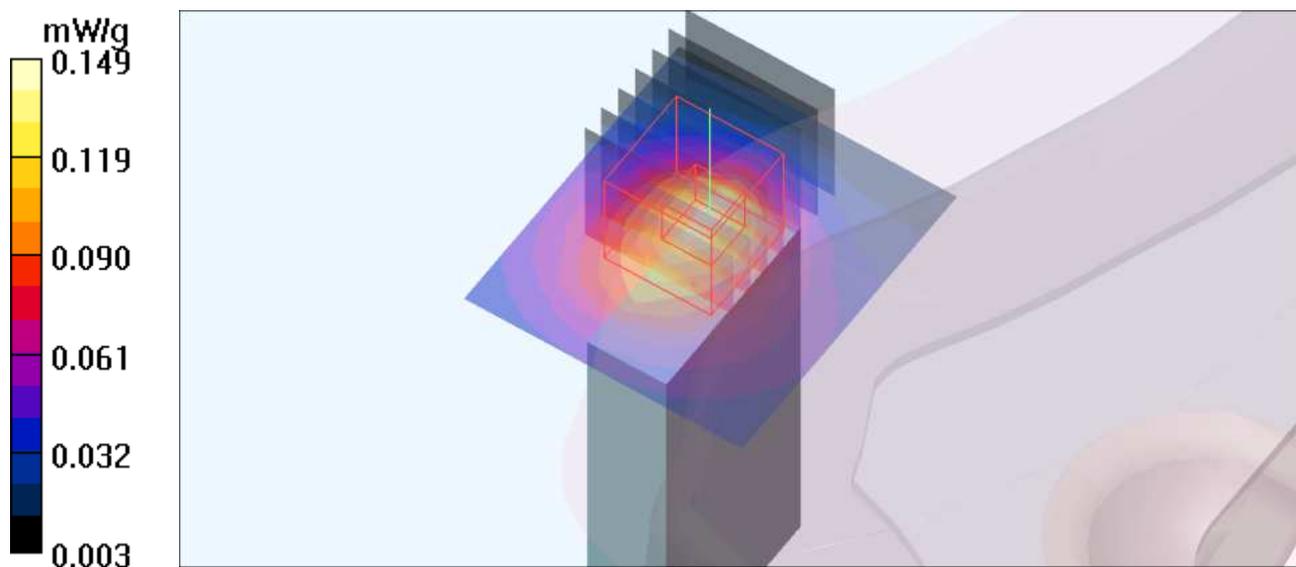
Body Position - Ch23305 /Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.6 V/m; Power Drift = 0.044 dB

Peak SAR (extrapolated) = 0.274 W/kg

SAR(1 g) = 0.115 mW/g; SAR(10 g) = 0.063 mW/g

Maximum value of SAR (measured) = 0.149 mW/g



M31-Back-LTE700-Ch23305 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.508 mW/g

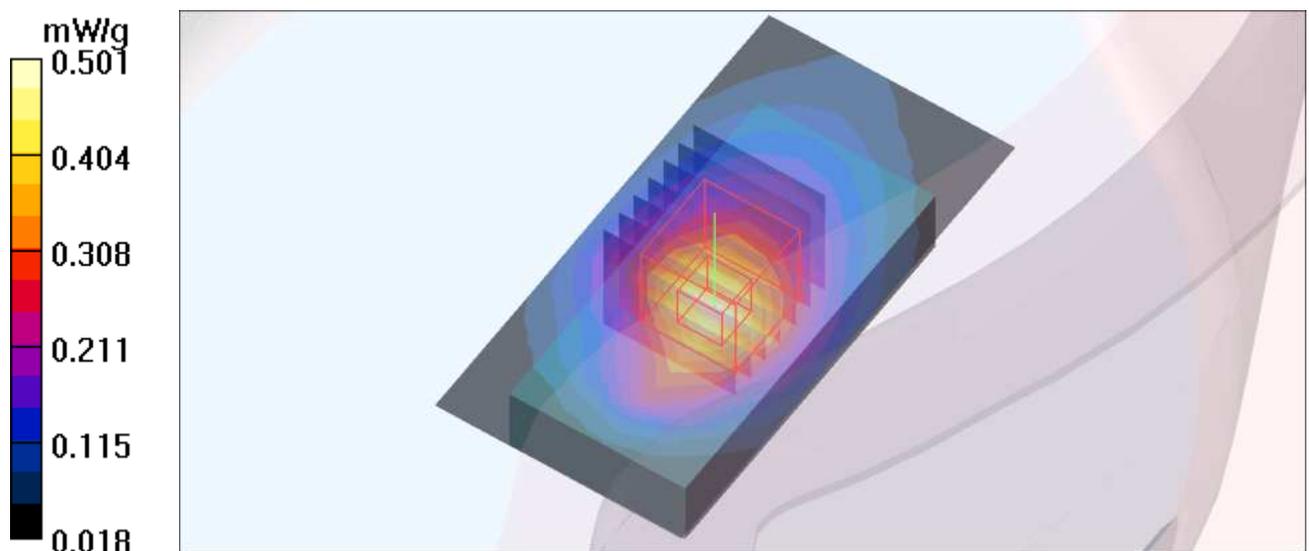
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.7 V/m; Power Drift = -0.178 dB

Peak SAR (extrapolated) = 0.707 W/kg

SAR(1 g) = 0.405 mW/g; SAR(10 g) = 0.239 mW/g

Maximum value of SAR (measured) = 0.501 mW/g



M32-Back-LTE700-Ch23305 (1 RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.703 mW/g

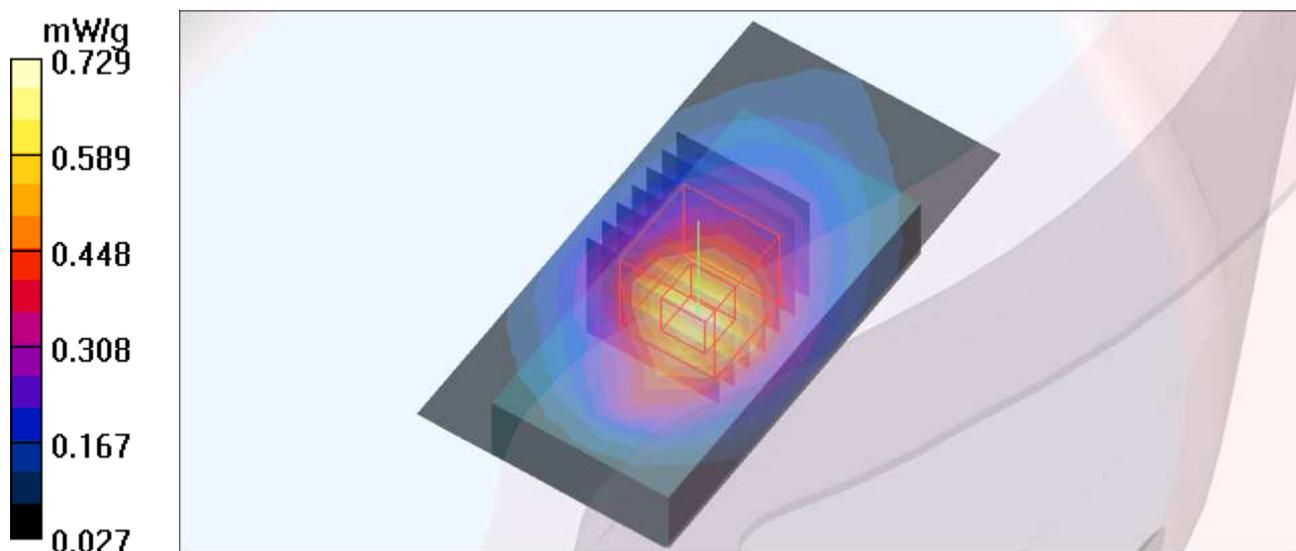
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.8 V/m; Power Drift = -0.120 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.591 mW/g; SAR(10 g) = 0.349 mW/g

Maximum value of SAR (measured) = 0.729 mW/g



M33-Back-LTE700-Ch23305 (1 RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 55.58$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

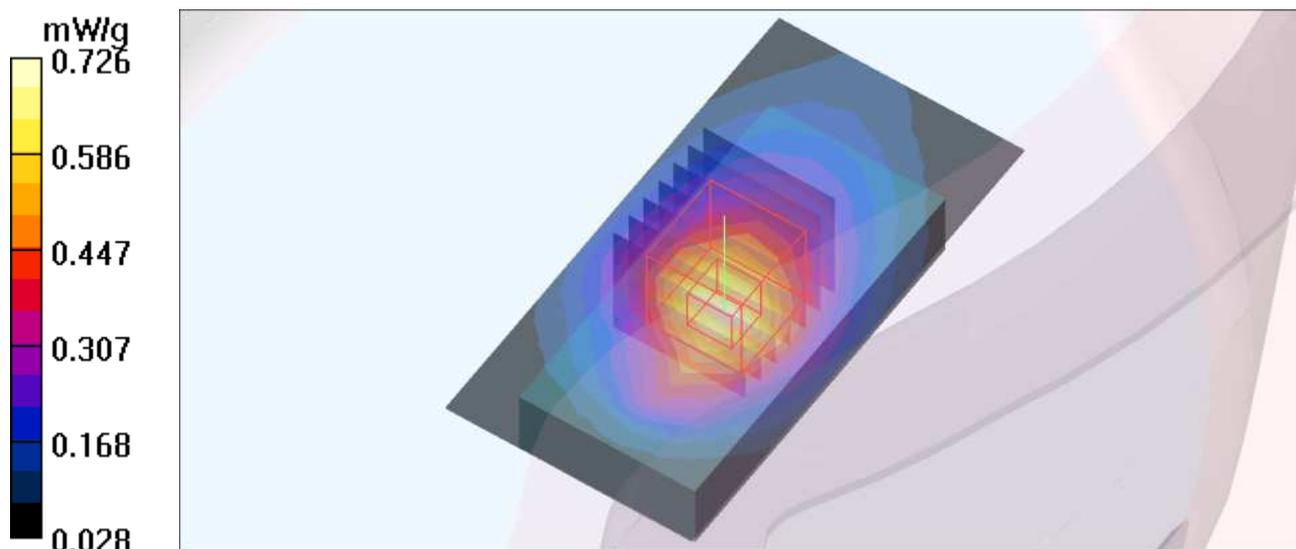
Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$
Maximum value of SAR (measured) = 0.726 mW/g

Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.8 V/m; Power Drift = 0.038 dB

Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.593 mW/g; SAR(10 g) = 0.353 mW/g



M34-Right edge-LTE700-Ch23305 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.319 mW/g

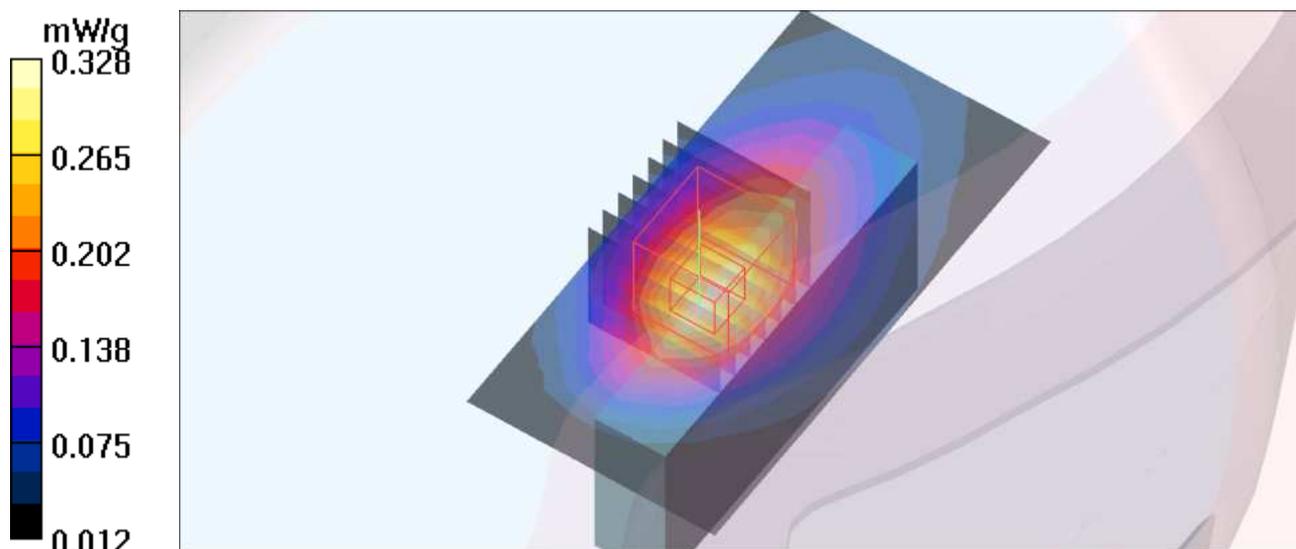
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.0 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 0.460 W/kg

SAR(1 g) = 0.269 mW/g; SAR(10 g) = 0.163 mW/g

Maximum value of SAR (measured) = 0.328 mW/g



M35-Right edge-LTE700-Ch23305 (1 RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.516 mW/g

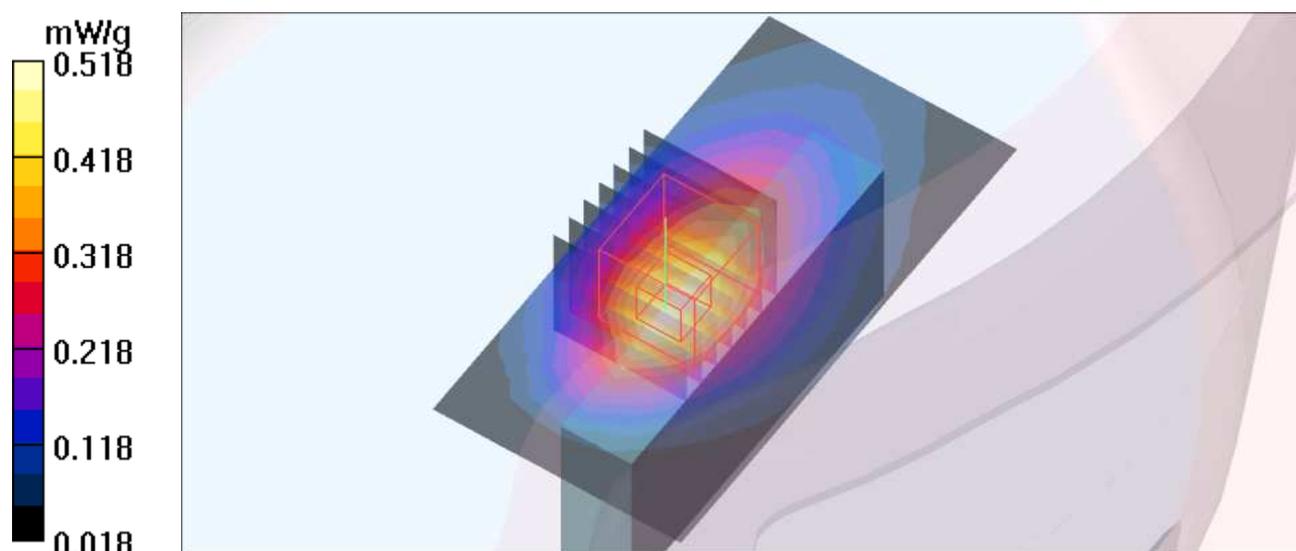
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.0 V/m; Power Drift = -0.106 dB

Peak SAR (extrapolated) = 0.733 W/kg

SAR(1 g) = 0.419 mW/g; SAR(10 g) = 0.252 mW/g

Maximum value of SAR (measured) = 0.518 mW/g



M36-Right edge-LTE700-Ch23305 (1 RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.484 mW/g

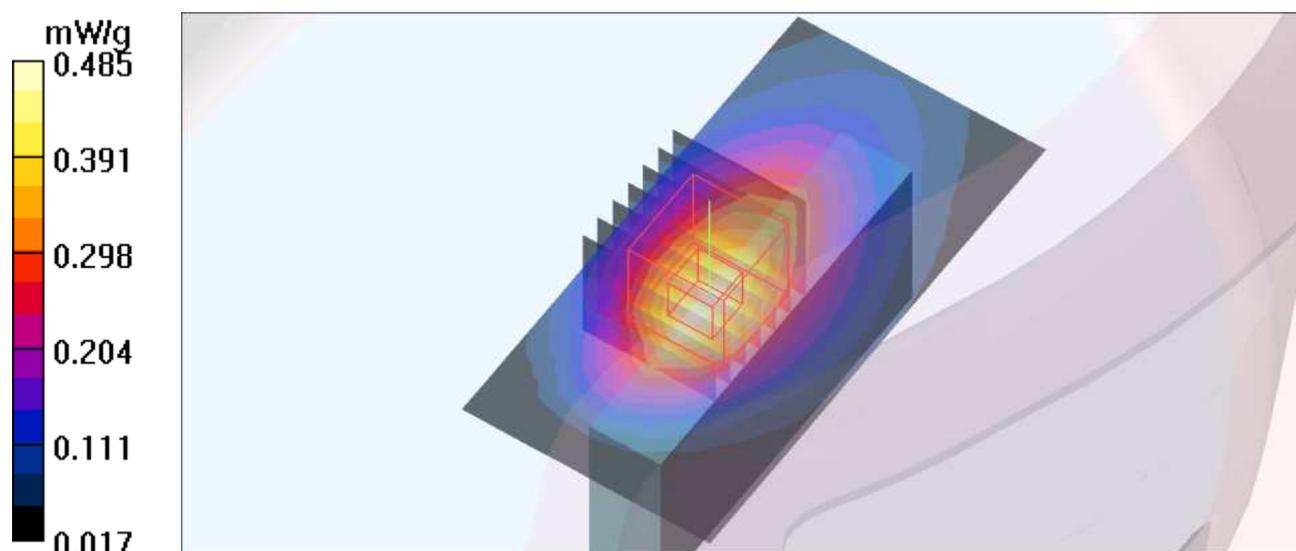
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.3 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 0.677 W/kg

SAR(1 g) = 0.404 mW/g; SAR(10 g) = 0.247 mW/g

Maximum value of SAR (measured) = 0.485 mW/g



M37-Front-LTE700-Ch23305 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm

Maximum value of SAR (measured) = 0.336 mW/g

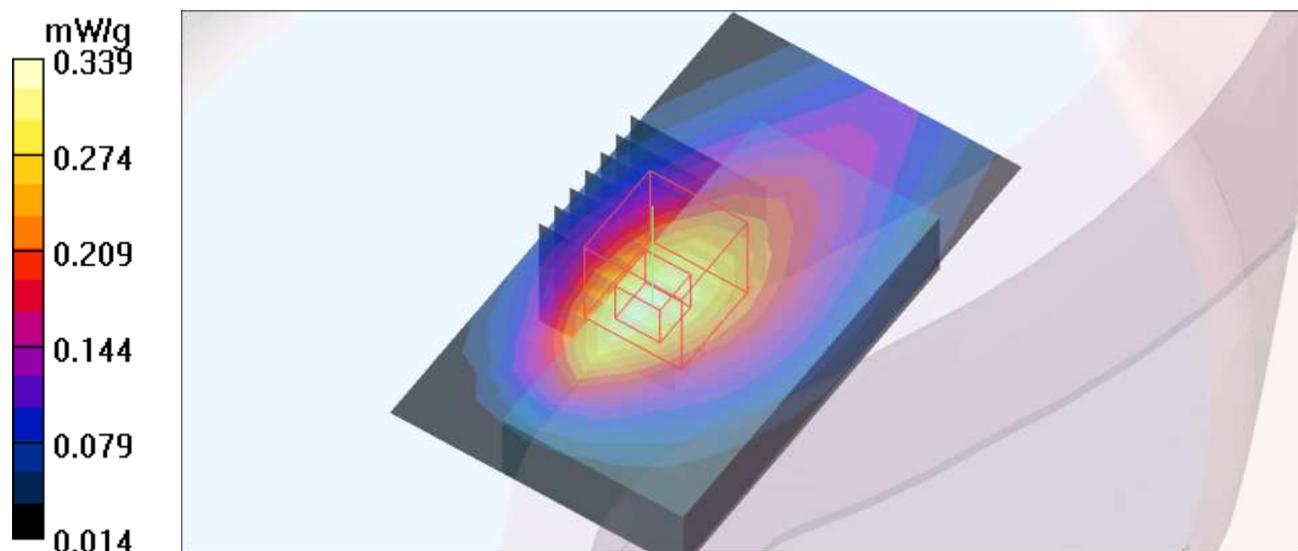
Body Position - Ch23305/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.27 V/m; Power Drift = 0.047 dB

Peak SAR (extrapolated) = 0.475 W/kg

SAR(1 g) = 0.283 mW/g; SAR(10 g) = 0.174 mW/g

Maximum value of SAR (measured) = 0.339 mW/g



M38-Front-LTE700-Ch23305 (1 RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.490 mW/g

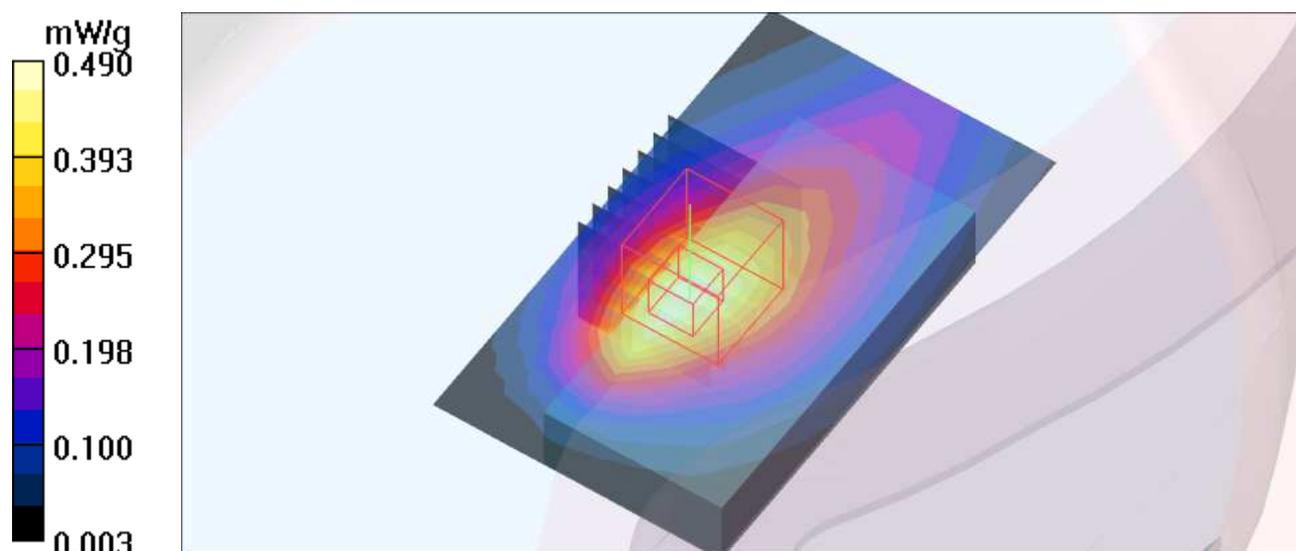
Body Position - Ch23305/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.3 V/m; Power Drift = -0.042 dB

Peak SAR (extrapolated) = 0.682 W/kg

SAR(1 g) = 0.401 mW/g; SAR(10 g) = 0.246 mW/g

Maximum value of SAR (measured) = 0.483 mW/g



M39-Front-LTE700-Ch23305 (1 RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm

Maximum value of SAR (measured) = 0.480 mW/g

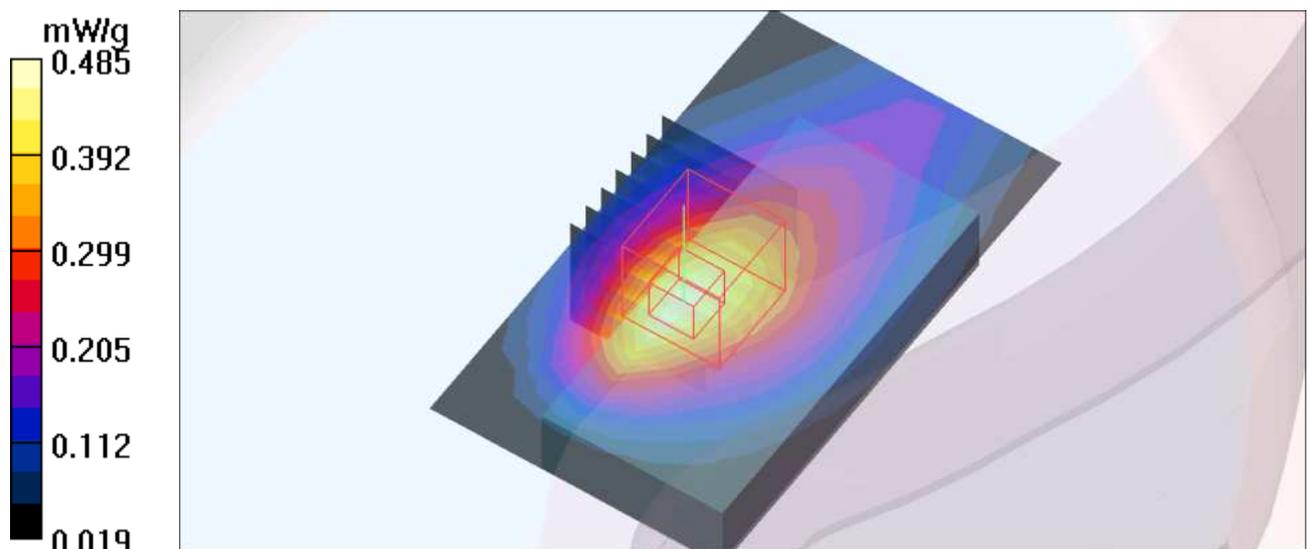
Body Position - Ch23305/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.1 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 0.688 W/kg

SAR(1 g) = 0.402 mW/g; SAR(10 g) = 0.247 mW/g

Maximum value of SAR (measured) = 0.485 mW/g



M40-Left edge-LTE700-Ch23305 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

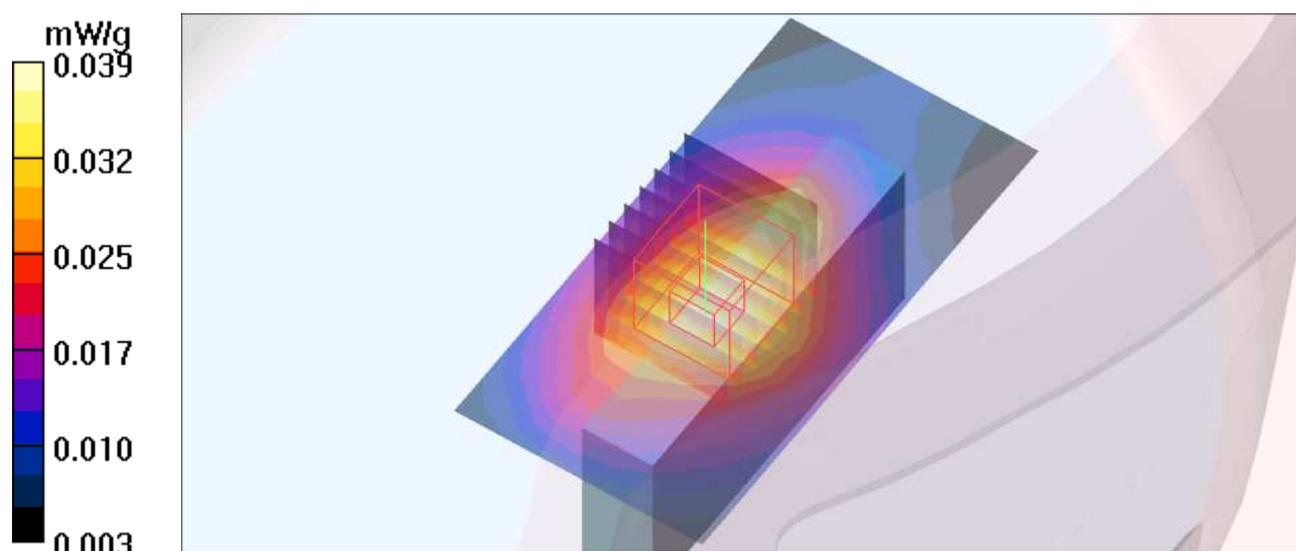
Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.039 mW/g

Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.84 V/m; Power Drift = -0.102 dB

Peak SAR (extrapolated) = 0.051 W/kg

SAR(1 g) = 0.033 mW/g; SAR(10 g) = 0.022 mW/g



M41-Left edge-LTE700-Ch23305 (1 RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.057 mW/g

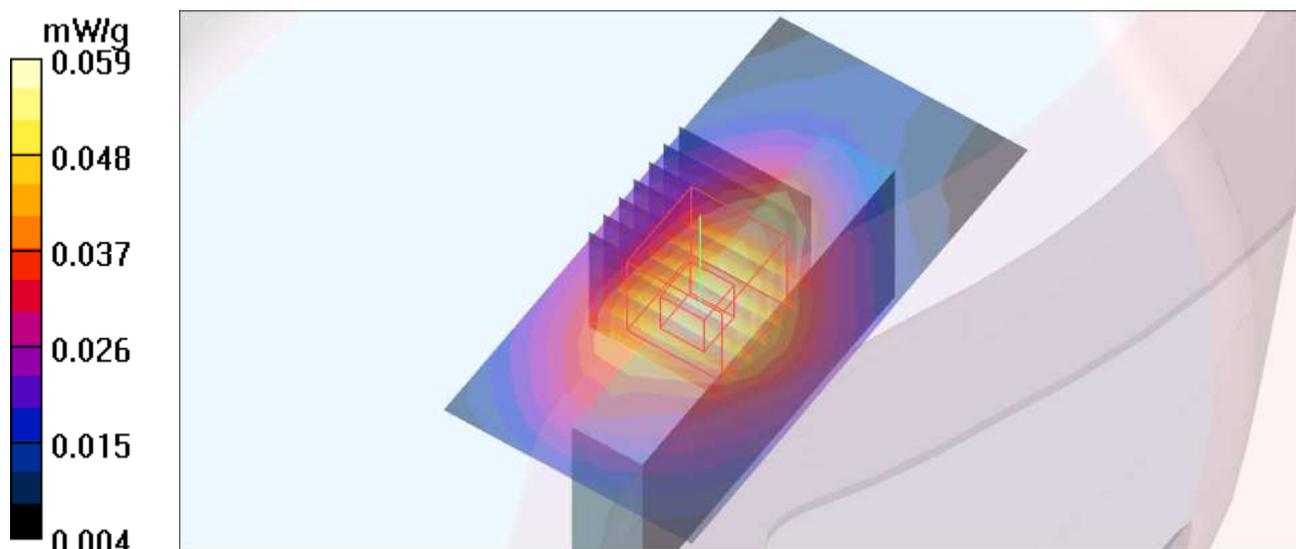
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.88 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 0.077 W/kg

SAR(1 g) = 0.050 mW/g; SAR(10 g) = 0.033 mW/g

Maximum value of SAR (measured) = 0.059 mW/g



M42-Left edge-LTE700-Ch23305 (1 RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.059 mW/g

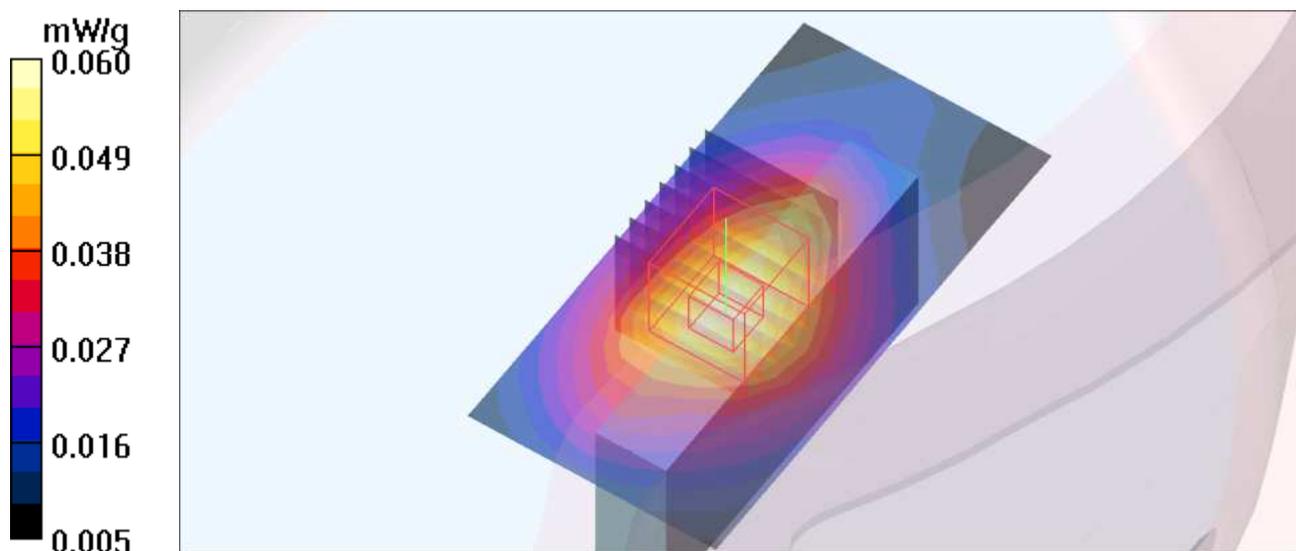
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.77 V/m; Power Drift = 0.083 dB

Peak SAR (extrapolated) = 0.076 W/kg

SAR(1 g) = 0.051 mW/g; SAR(10 g) = 0.034 mW/g

Maximum value of SAR (measured) = 0.060 mW/g



M43-Tip edge-LTE700-Ch23305 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 55.58$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x9x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$

Maximum value of SAR (measured) = 0.065 mW/g

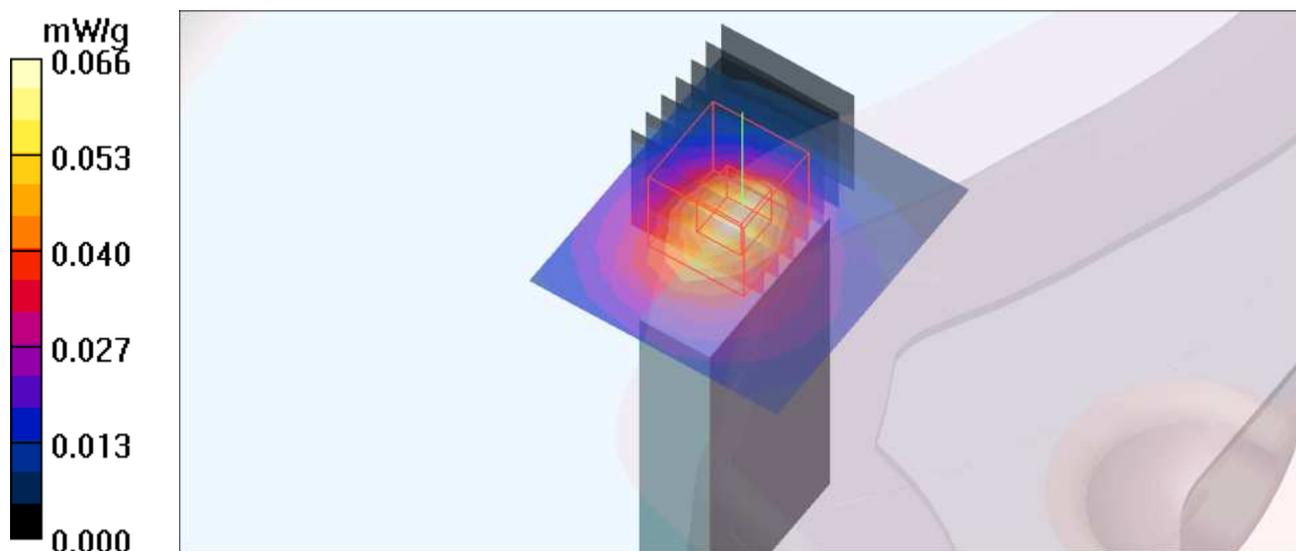
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.12 V/m; Power Drift = -0.055 dB

Peak SAR (extrapolated) = 0.116 W/kg

SAR(1 g) = 0.051 mW/g; SAR(10 g) = 0.027 mW/g

Maximum value of SAR (measured) = 0.066 mW/g



M44-Tip edge-LTE700-Ch23305 (1 RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 55.58$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x9x1): Measurement grid: dx=8mm, dy=8mm

Maximum value of SAR (measured) = 0.100 mW/g

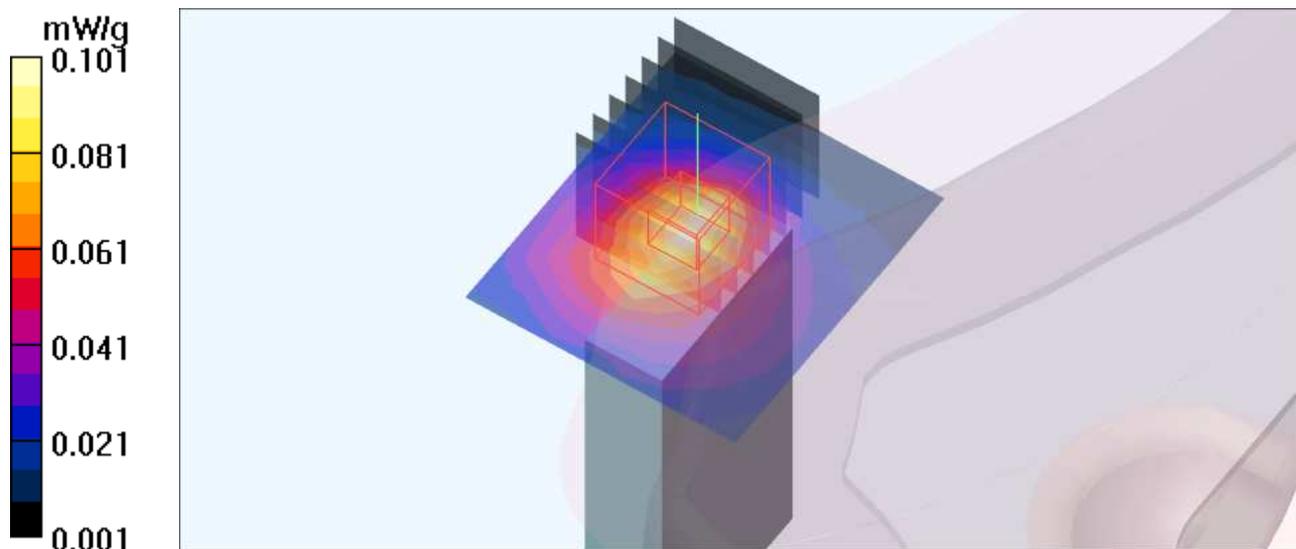
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.95 V/m; Power Drift = 0.019 dB

Peak SAR (extrapolated) = 0.177 W/kg

SAR(1 g) = 0.079 mW/g; SAR(10 g) = 0.042 mW/g

Maximum value of SAR (measured) = 0.101 mW/g



M45-Tip edge-LTE700-Ch23305 (1 RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 790.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 790.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.58$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23305/Area Scan (8x9x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.088 mW/g

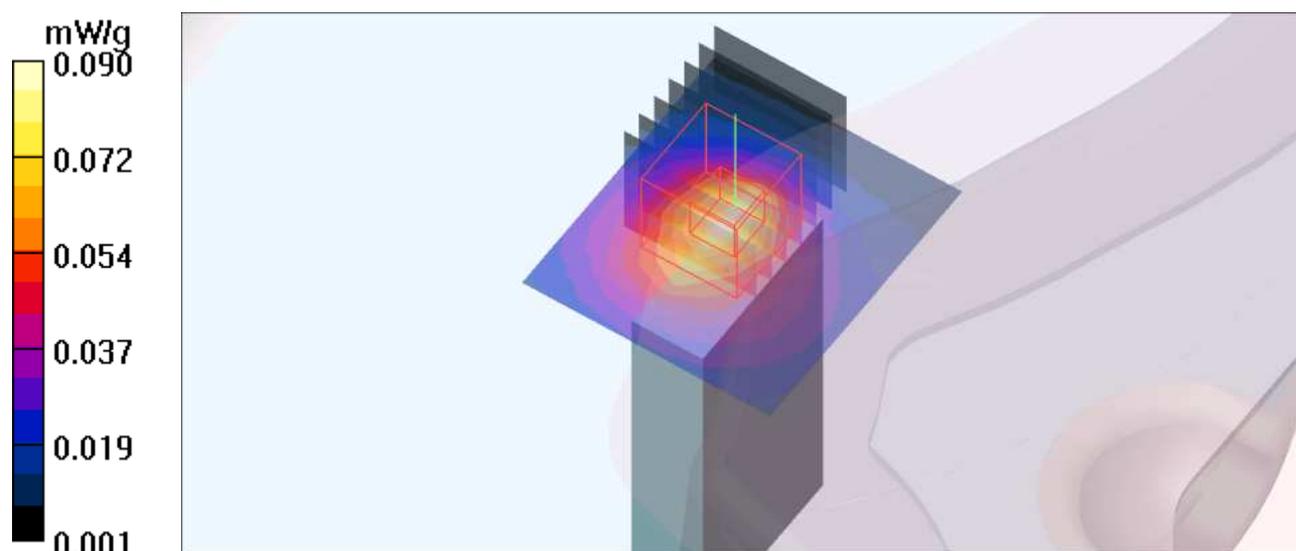
Body Position - Ch23305/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.44 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 0.159 W/kg

SAR(1 g) = 0.070 mW/g; SAR(10 g) = 0.037 mW/g

Maximum value of SAR (measured) = 0.090 mW/g



M46-Back-LTE700-Ch23355 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.634 mW/g

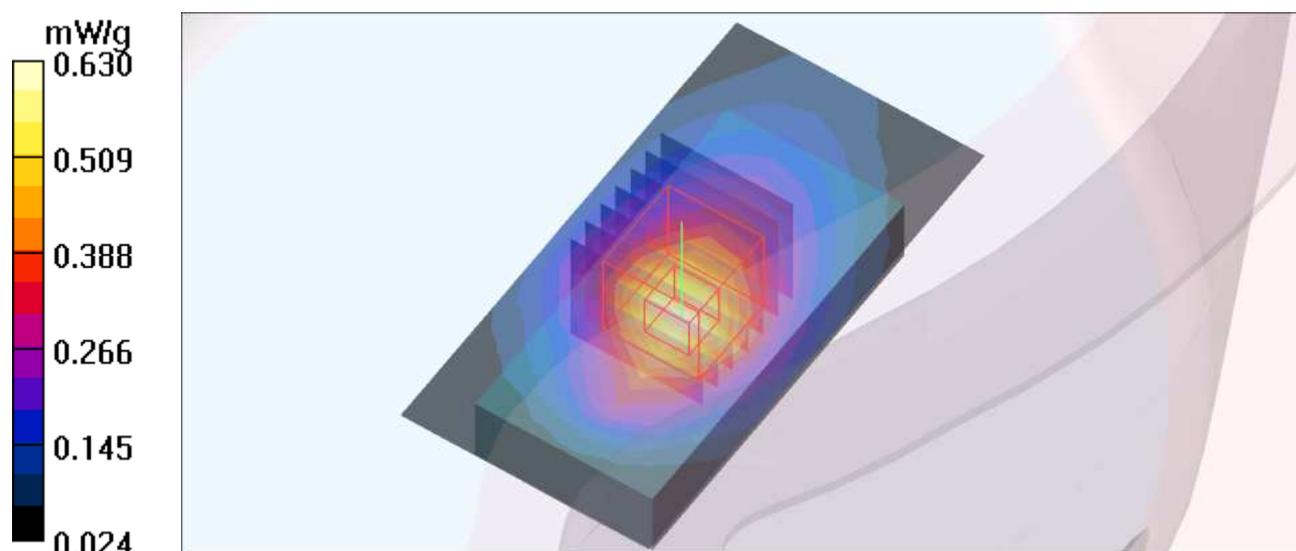
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.5 V/m; Power Drift = -0.136 dB

Peak SAR (extrapolated) = 0.881 W/kg

SAR(1 g) = 0.516 mW/g; SAR(10 g) = 0.306 mW/g

Maximum value of SAR (measured) = 0.630 mW/g



M47-Back-LTE700-Ch23355 (1 RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.693 mW/g

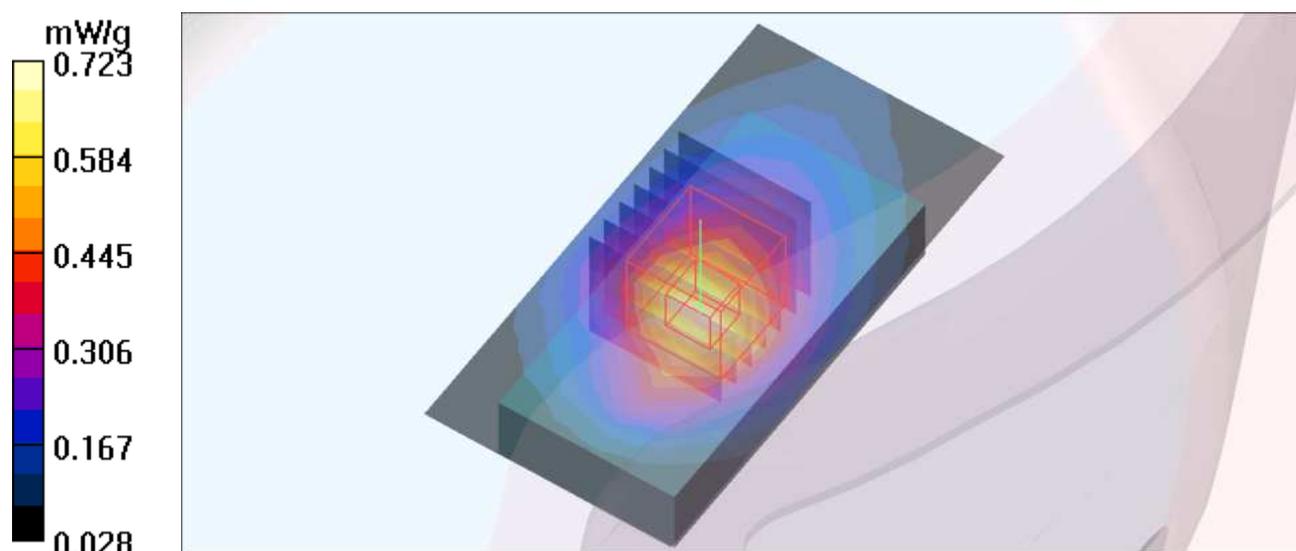
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.4 V/m; Power Drift = -0.159 dB

Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.587 mW/g; SAR(10 g) = 0.349 mW/g

Maximum value of SAR (measured) = 0.723 mW/g



M48-Back-LTE700-Ch23355 (1 RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 55.53$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$
Maximum value of SAR (measured) = 0.946 mW/g

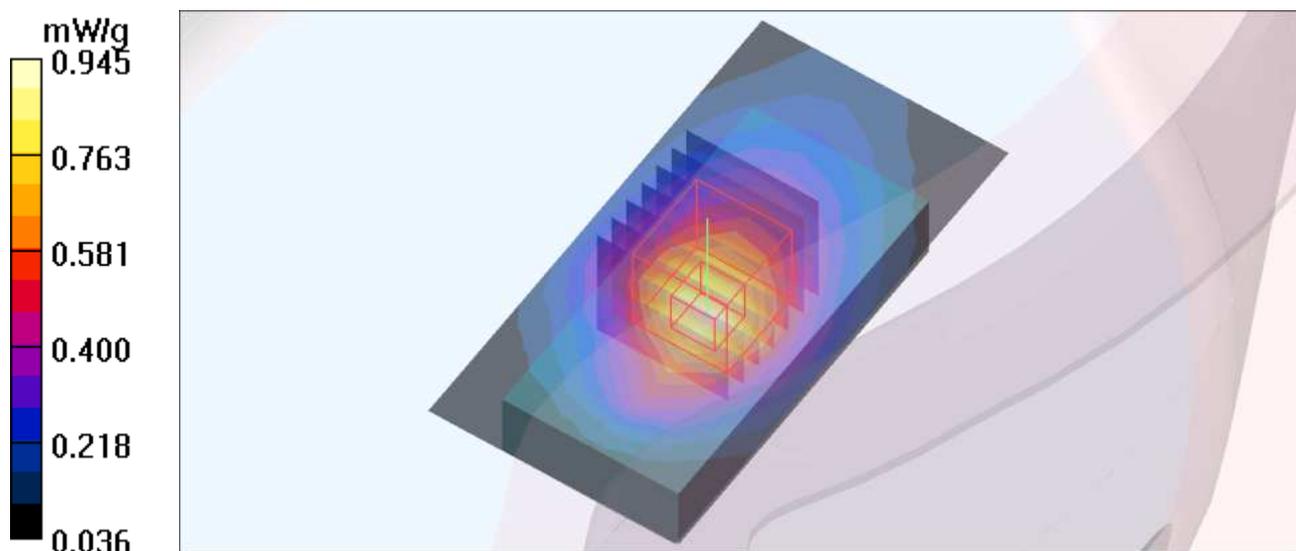
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.7 V/m; Power Drift = -0.170 dB

Peak SAR (extrapolated) = 1.32 W/kg

SAR(1 g) = 0.771 mW/g; SAR(10 g) = 0.462 mW/g

Maximum value of SAR (measured) = 0.945 mW/g



M49-Right edge-LTE700-Ch23355 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.402 mW/g

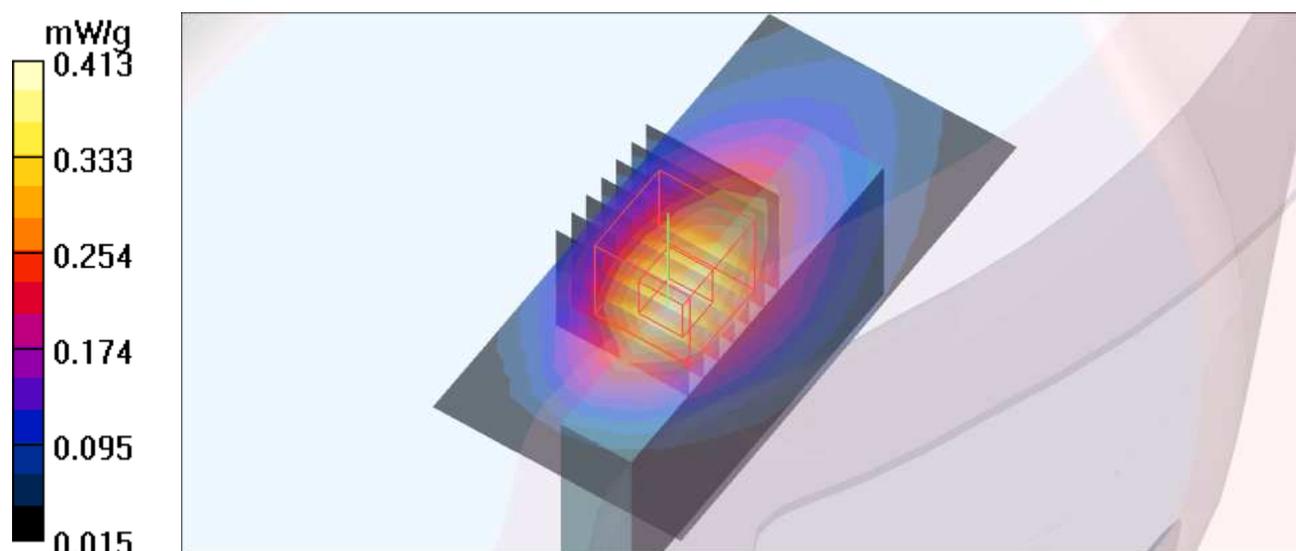
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.8 V/m; Power Drift = 0.112 dB

Peak SAR (extrapolated) = 0.570 W/kg

SAR(1 g) = 0.338 mW/g; SAR(10 g) = 0.207 mW/g

Maximum value of SAR (measured) = 0.413 mW/g



M50-Right edge-LTE700-Ch23355 (1 RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.449 mW/g

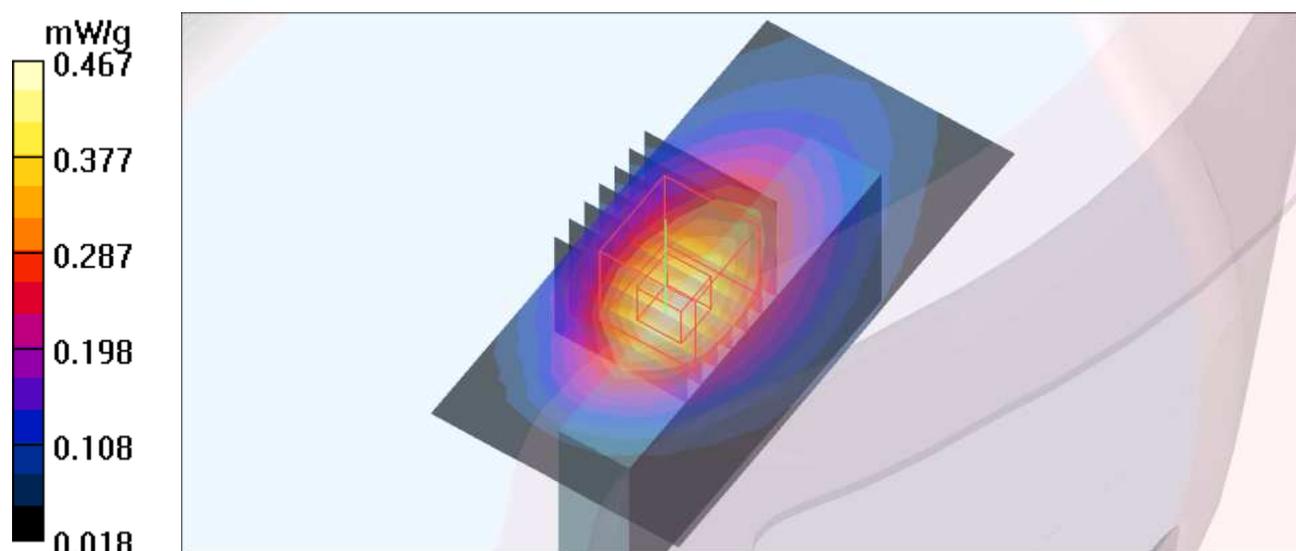
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.7 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 0.645 W/kg

SAR(1 g) = 0.383 mW/g; SAR(10 g) = 0.235 mW/g

Maximum value of SAR (measured) = 0.467 mW/g



M51-Right edge-LTE700-Ch23355 (1 RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.585 mW/g

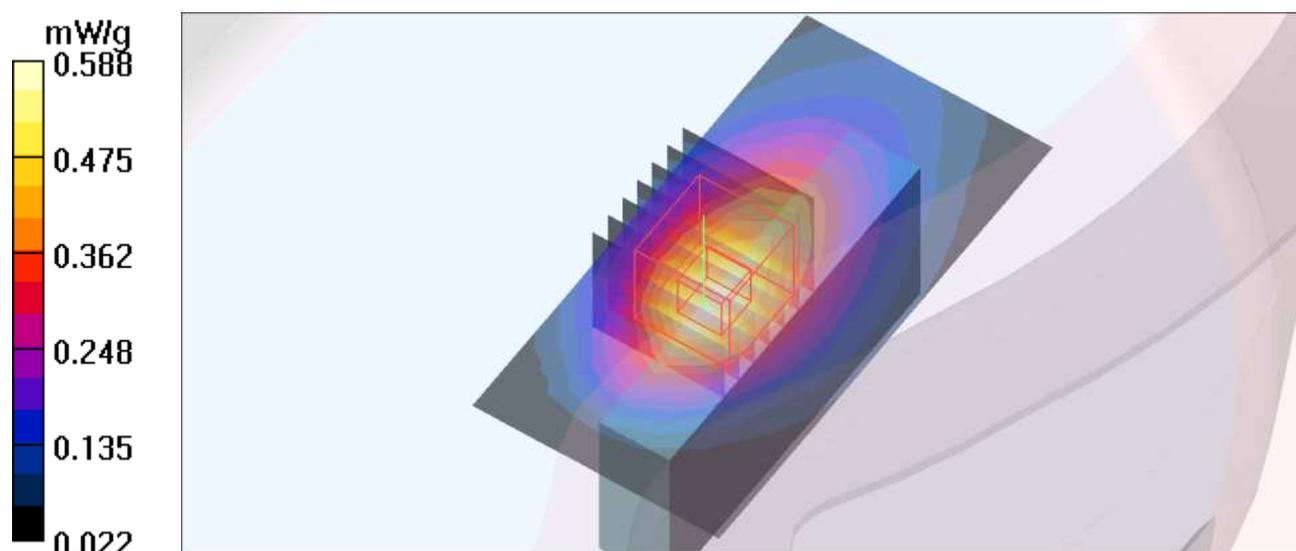
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.3 V/m; Power Drift = -0.144 dB

Peak SAR (extrapolated) = 0.810 W/kg

SAR(1 g) = 0.491 mW/g; SAR(10 g) = 0.300 mW/g

Maximum value of SAR (measured) = 0.588 mW/g



M52-Front-LTE700-Ch23355 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.413 mW/g

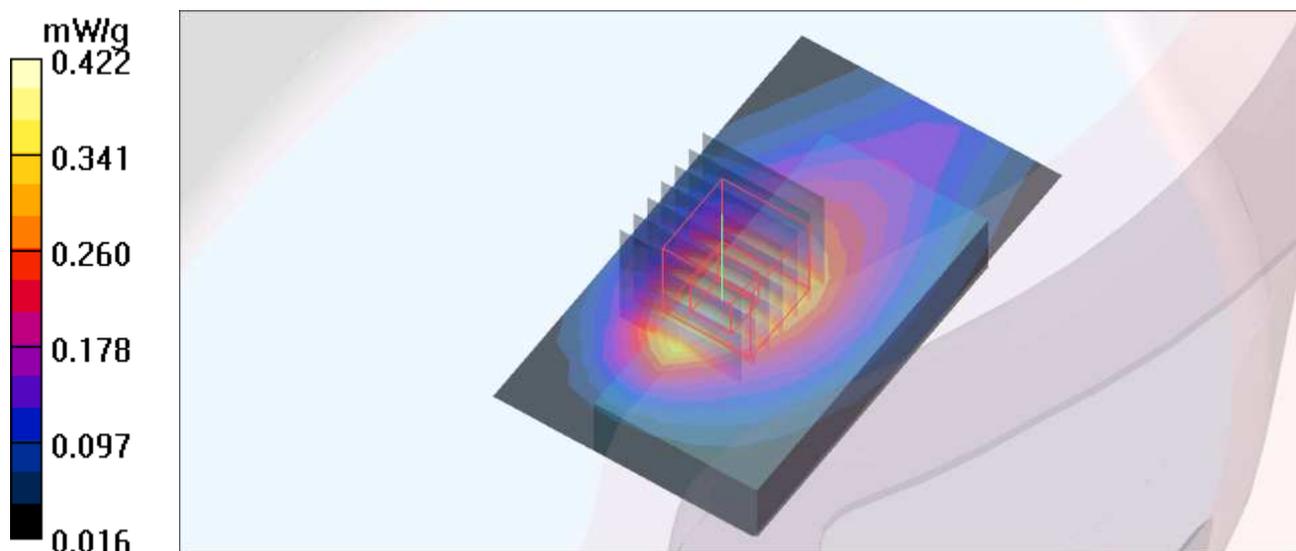
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.20 V/m; Power Drift = 0.155 dB

Peak SAR (extrapolated) = 0.597 W/kg

SAR(1 g) = 0.349 mW/g; SAR(10 g) = 0.213 mW/g

Maximum value of SAR (measured) = 0.422 mW/g



M53-Front-LTE700-Ch23355 (1 RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.344 mW/g

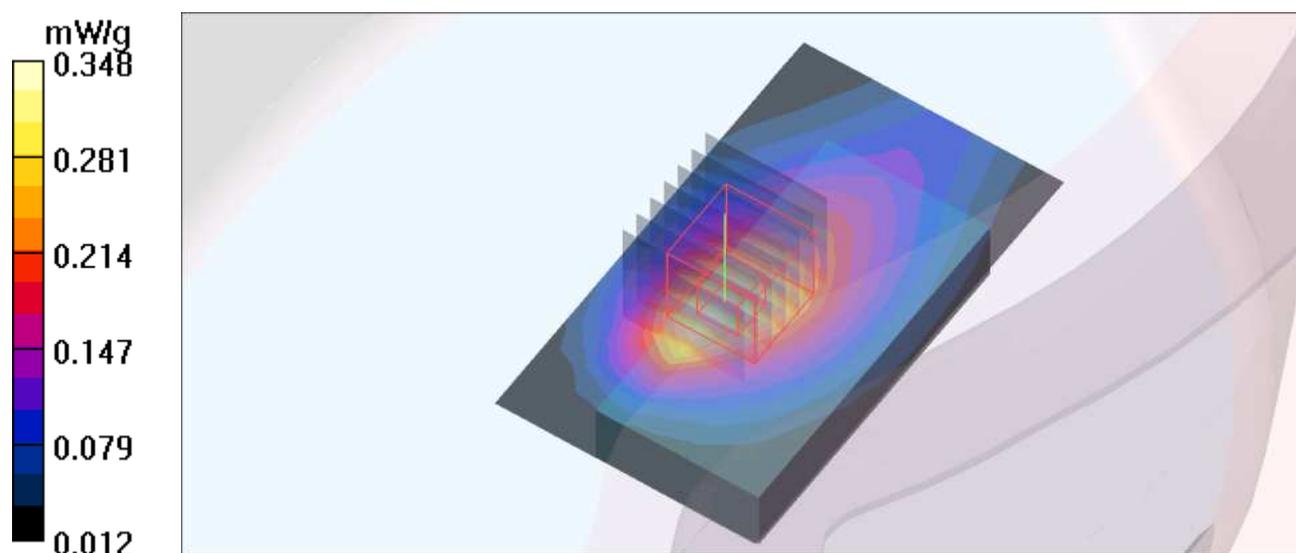
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.25 V/m; Power Drift = 0.173 dB

Peak SAR (extrapolated) = 0.471 W/kg

SAR(1 g) = 0.288 mW/g; SAR(10 g) = 0.175 mW/g

Maximum value of SAR (measured) = 0.348 mW/g



M54-Front-LTE700-Ch23355 (1 RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (9x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.462 mW/g

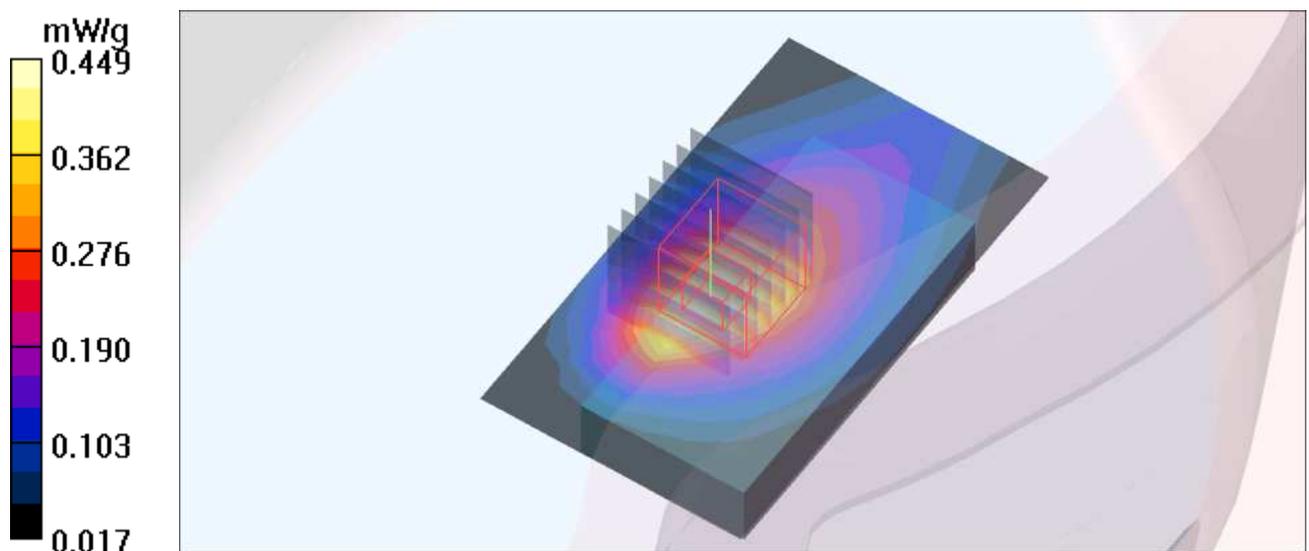
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.45 V/m; Power Drift = 0.081 dB

Peak SAR (extrapolated) = 0.600 W/kg

SAR(1 g) = 0.377 mW/g; SAR(10 g) = 0.233 mW/g

Maximum value of SAR (measured) = 0.449 mW/g



M55-Left edge-LTE700-Ch23355 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 55.53$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$
Maximum value of SAR (measured) = 0.053 mW/g

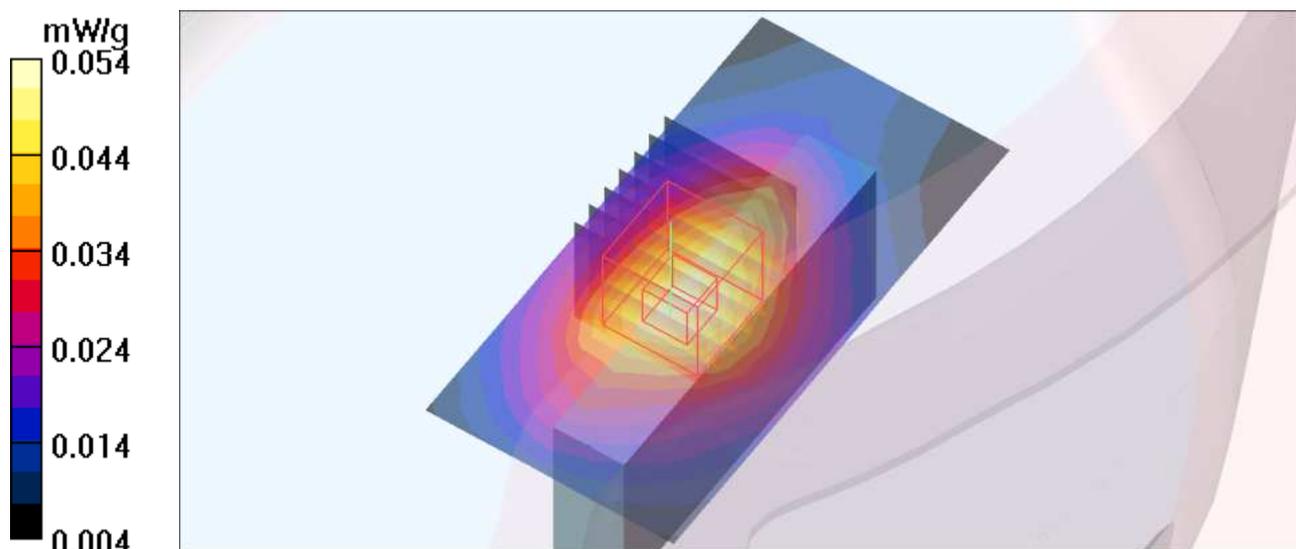
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.33 V/m; Power Drift = 0.090 dB

Peak SAR (extrapolated) = 0.069 W/kg

SAR(1 g) = 0.046 mW/g; SAR(10 g) = 0.030 mW/g

Maximum value of SAR (measured) = 0.054 mW/g



M56-Left edge-LTE700-Ch23355 (1 RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.057 mW/g

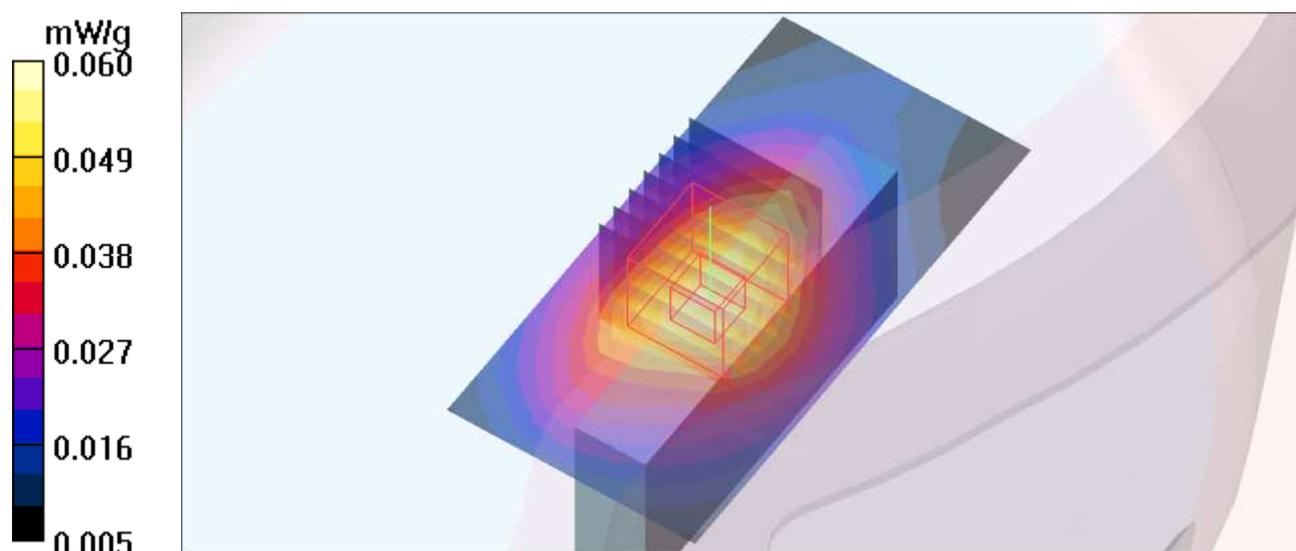
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.64 V/m; Power Drift = 0.198 dB

Peak SAR (extrapolated) = 0.076 W/kg

SAR(1 g) = 0.050 mW/g; SAR(10 g) = 0.033 mW/g

Maximum value of SAR (measured) = 0.060 mW/g



M57-Left edge-LTE700-Ch23355 (1 RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 55.53$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

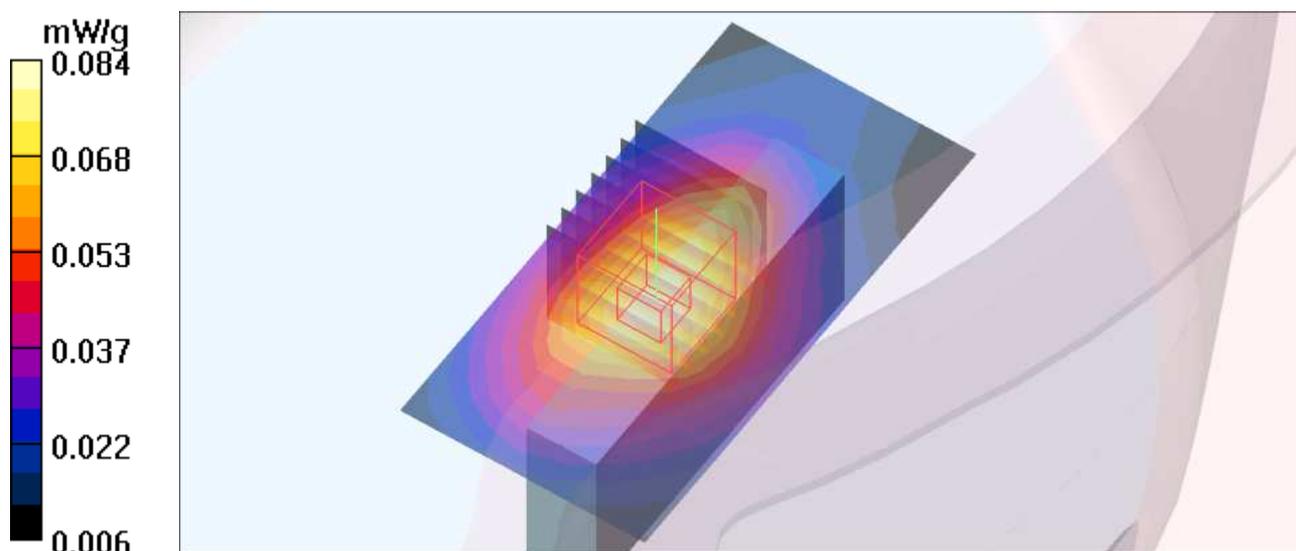
Body Position - Ch23355/Area Scan (8x15x1): Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$
Maximum value of SAR (measured) = 0.084 mW/g

Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 6.65 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.107 W/kg

SAR(1 g) = 0.072 mW/g; SAR(10 g) = 0.048 mW/g



M58-Tip edge-LTE700-Ch23355 (50%RB centered)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x9x1): Measurement grid: dx=8mm, dy=8mm

Maximum value of SAR (measured) = 0.070 mW/g

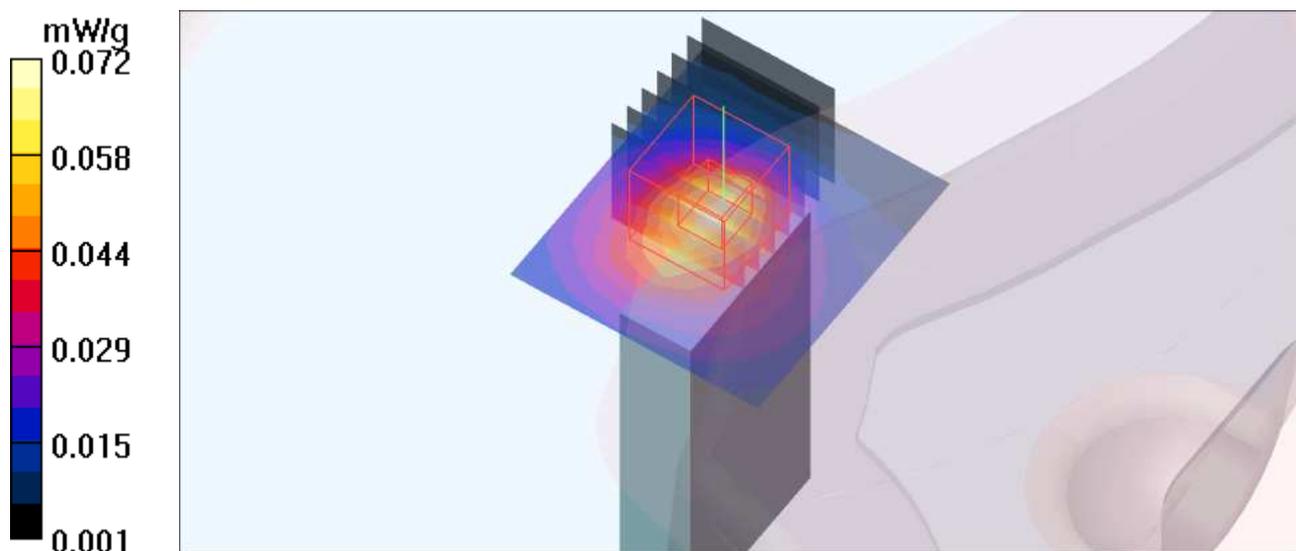
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.44 V/m; Power Drift = 0.120 dB

Peak SAR (extrapolated) = 0.125 W/kg

SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.030 mW/g

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



M59-Tip edge-LTE700-Ch23355 (1 RB, Lower edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 55.53$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x9x1): Measurement grid: dx=8mm, dy=8mm

Maximum value of SAR (measured) = 0.087 mW/g

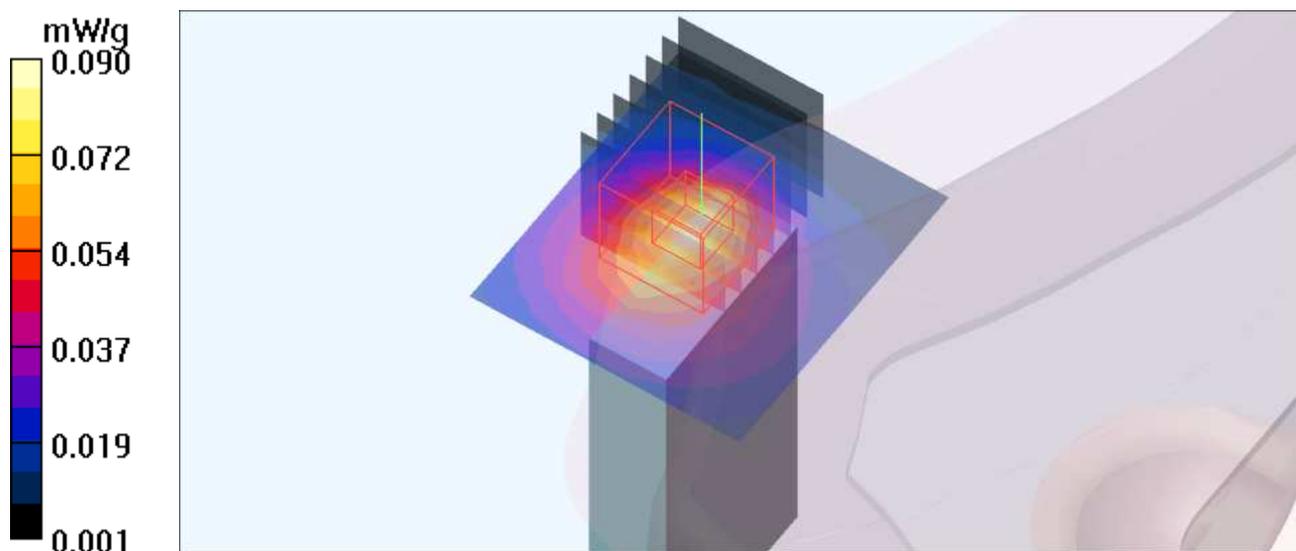
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.19 V/m; Power Drift = 0.130 dB

Peak SAR (extrapolated) = 0.158 W/kg

SAR(1 g) = 0.069 mW/g; SAR(10 g) = 0.037 mW/g

Maximum value of SAR (measured) = 0.090 mW/g



M60-Tip edge-LTE700-Ch23355 (1 RB, Upper edge)

Communication System: LTE band17 (700) ; Frequency: 795.5 MHz ; Duty Cycle: 1:1 ; Modulation type: 16QAM

Medium: MSL750 Medium parameters used: $f = 795.5$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 55.53$; $\rho = 1000$ kg/m³

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - Ch23355/Area Scan (8x9x1): Measurement grid: dx=8mm, dy=8mm
Maximum value of SAR (measured) = 0.106 mW/g

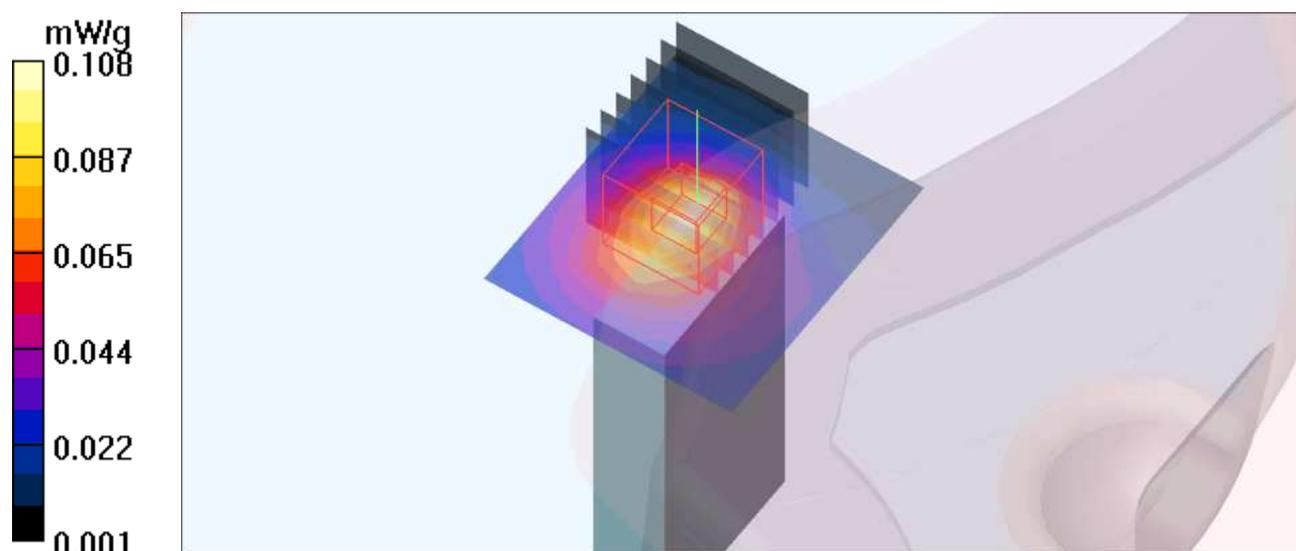
Body Position - Ch23355/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.2 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 0.190 W/kg

SAR(1 g) = 0.084 mW/g; SAR(10 g) = 0.045 mW/g

Maximum value of SAR (measured) = 0.108 mW/g



System Validation Check-MSL 750MHz

DUT: Dipole 750 MHz ; Type: D750V3 ; Serial: 1013 ; Test Frequency: 750 MHz

Communication System: CW ; Frequency: 750 MHz; Duty Cycle: 1:1; Modulation type: CW
 Medium: MSL750; Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 55.16$; $\rho = 1000 \text{ kg/m}^3$; Liquid level : 150 mm

Phantom section: Flat Section ; Separation distance : 10 mm (The feet point of the dipole to the Phantom) Air temp. : 22.3 degrees ; Liquid temp. : 21.2 degrees

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP-1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=15mm, Pin=250mW/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (measured) = 2.16 mW/g

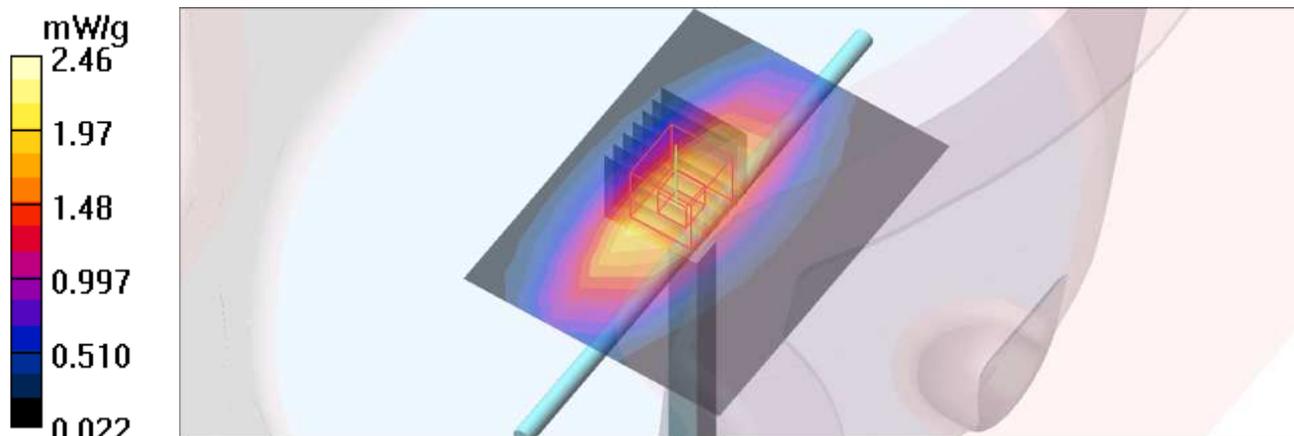
d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.3 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 3.13 W/kg

SAR(1 g) = 2.12 mW/g; SAR(10 g) = 1.42 mW/g

Maximum value of SAR (measured) = 2.46 mW/g



System Validation Check-MSL 750MHz

DUT: Dipole 750 MHz ; Type: D750V3 ; Serial: 1013 ; Test Frequency: 750 MHz

Communication System: CW ; Frequency: 750 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL750; Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.97 \text{ mho/m}$; $\epsilon_r = 55.62$; $\rho = 1000 \text{ kg/m}^3$; Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feet point of the dipole to the Phantom) Air temp. : 22.8 degrees ; Liquid temp. : 21.6 degrees

DASY4 Configuration:

- Probe: ES3DV3 - SN3177; ConvF(6.18, 6.18, 6.18); Calibrated: 2010/8/24
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=15mm, Pin=250mW/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.32 mW/g

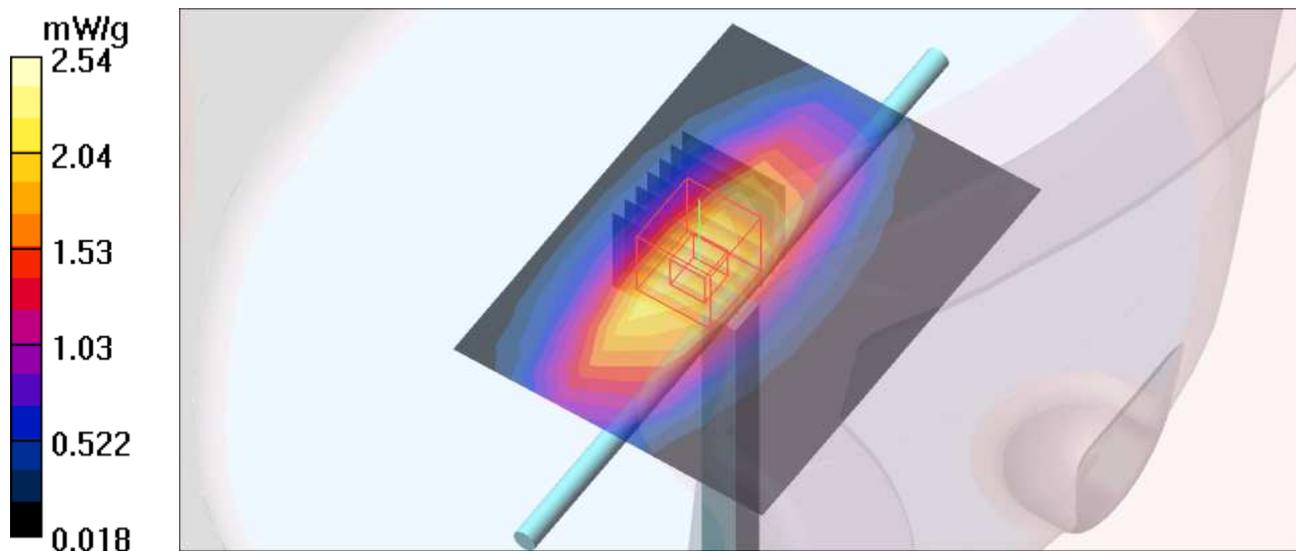
d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.1 V/m; Power Drift = -0.132 dB

Peak SAR (extrapolated) = 3.19 W/kg

SAR(1 g) = 2.18 mW/g; SAR(10 g) = 1.45 mW/g

Maximum value of SAR (measured) = 2.54 mW/g



APPENDIX B: BV ADT SAR MEASUREMENT SYSTEM



APPENDIX C: PHOTOGRAPHS OF SYSTEM VALIDATION





APPENDIX D: SYSTEM CERTIFICATE & CALIBRATION

D1: PHANTOM

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Certificate of conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 CA
Series No	TP-1150 and higher
Manufacturer / Origin	Untersee Composites Hauptstr. 69 CH-8559 Fruthwilen Switzerland

Tests

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

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz - 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

Standards

- [1] CENELEC EN 50361
- [2] IEEE P1528-200x draft 6.5
- [3] IEC PT 62209 draft 0.9

(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

Date

28.02.2002

Signature / Stamp

F. Bumbult

**Schmid & Partner
Engineering AG**

Zeughausstrasse 43, CH-8004 Zurich
Tel. +41 1 245 97 00, Fax +41 1 245 97 79

Volker Kapp



D2: DOSIMETRIC E-FIELD PROBE



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 **ADT (Auden)**

Certificate No: **ES3-3177_Aug10**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3177**

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

Calibration date: **August 24, 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-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

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

Calibrated by: **Jeton Kastrati** Name: **Jeton Kastrati** Function: **Laboratory Technician**

Approved by: **Katja Pokovic** Name: **Katja Pokovic** Function: **Technical Manager**

Signature

Issued: August 24, 2010

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



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

Calibration is Performed According to the Following Standards:

- 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
- 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:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E^2 -field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z}** = NORM_{x,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*.
- DCP_{x,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.
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,y,z}; A, B, C** are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,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:3177

Manufactured:	January 23, 2008
Last calibrated:	July 7, 2008
Recalibrated:	August 24, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 SN:3177**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	1.27	1.31	1.32	$\pm 10.1\%$
DCP (mV) ^B	96.4	93.4	92.0	

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	$\pm 1.5\%$
			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.

DASY/EASY - Parameters of Probe: ES3DV3 SN:3177

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz] ^c	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	6.36	6.36	6.36	0.80	1.09 ± 11.0%
1450	± 50 / ± 100	40.5 ± 5%	1.20 ± 5%	5.49	5.49	5.49	0.74	1.19 ± 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.

DASY/EASY - Parameters of Probe: ES3DV3 SN:3177

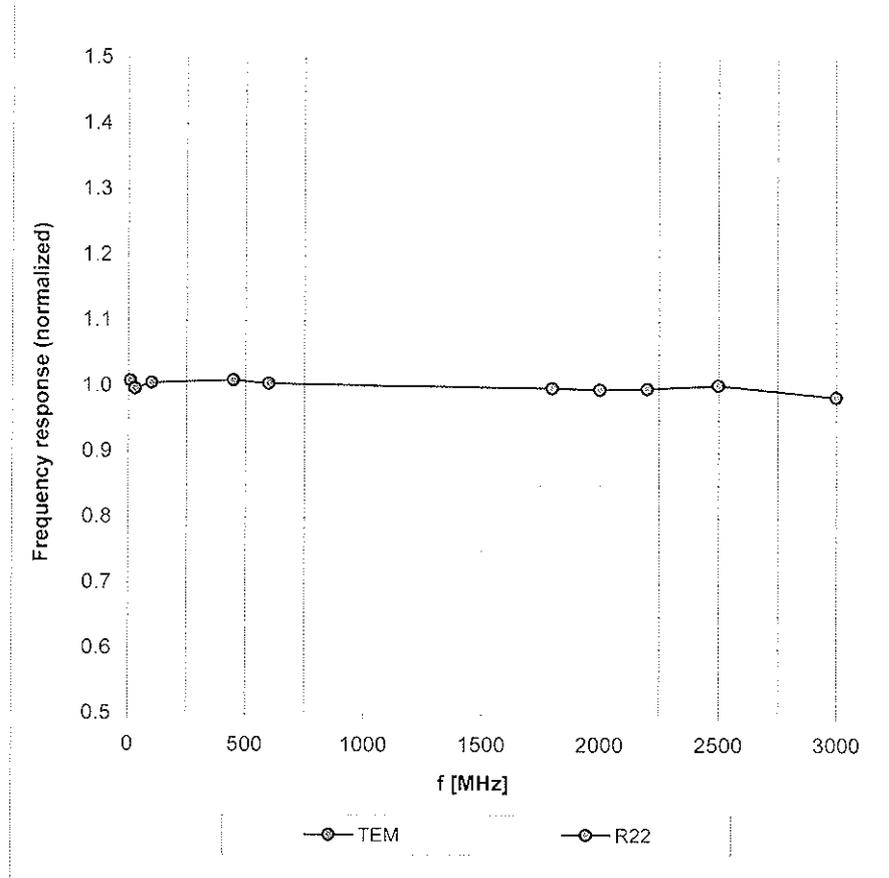
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz] ^c	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	6.18	6.18	6.18	0.87	1.11 ± 11.0%
1450	± 50 / ± 100	54.0 ± 5%	1.30 ± 5%	5.37	5.37	5.37	0.40	1.63 ± 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.

Frequency Response of E-Field

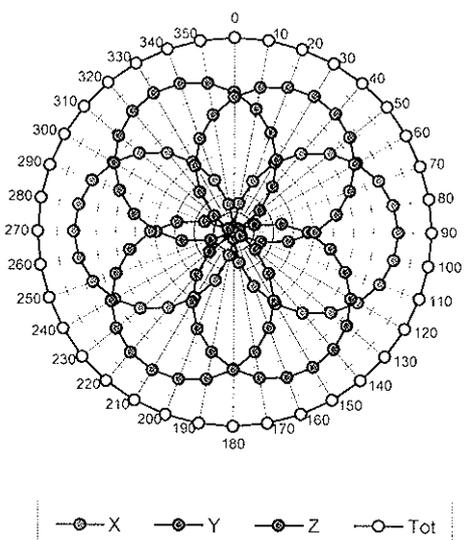
(TEM-Cell: ifi110 EXX, Waveguide: R22)



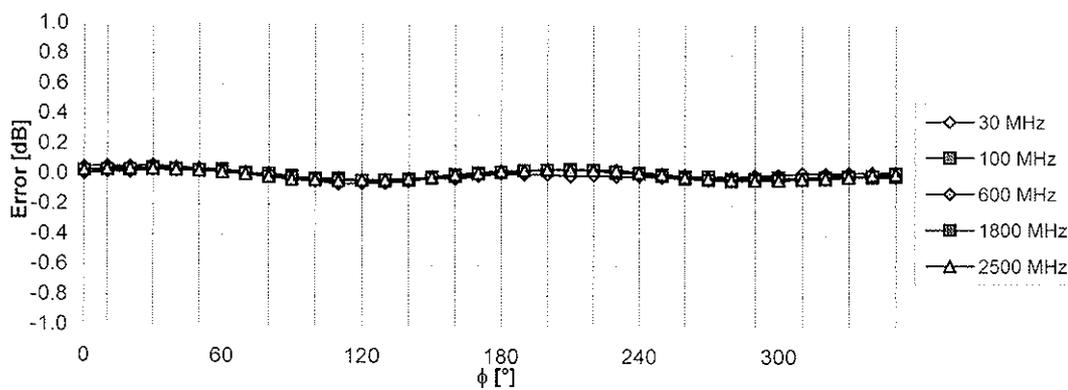
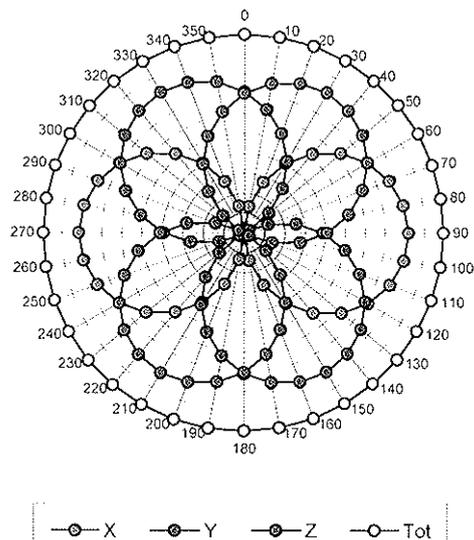
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

Receiving Pattern (ϕ), $\vartheta = 0^\circ$

f = 600 MHz, TEM ifi110EXX

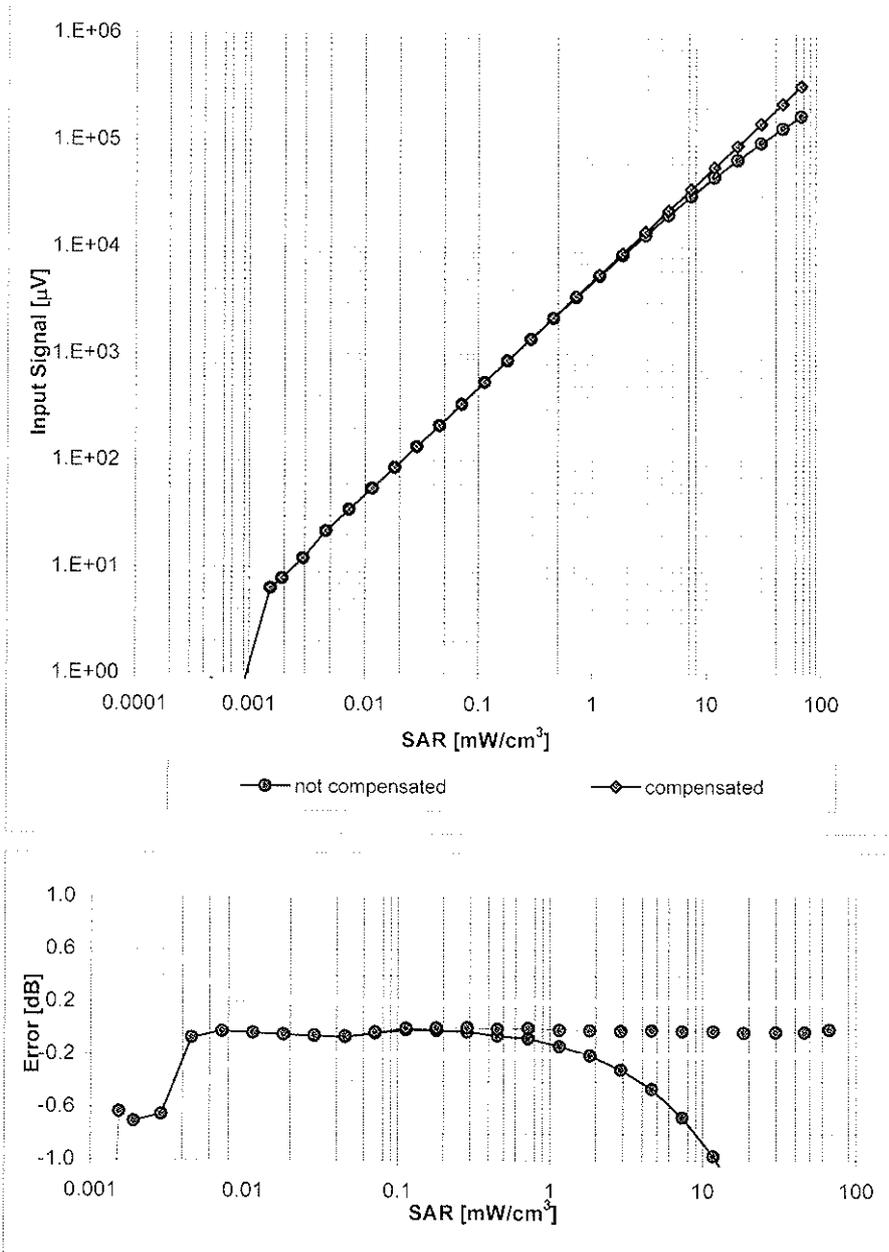


f = 1800 MHz, WG R22



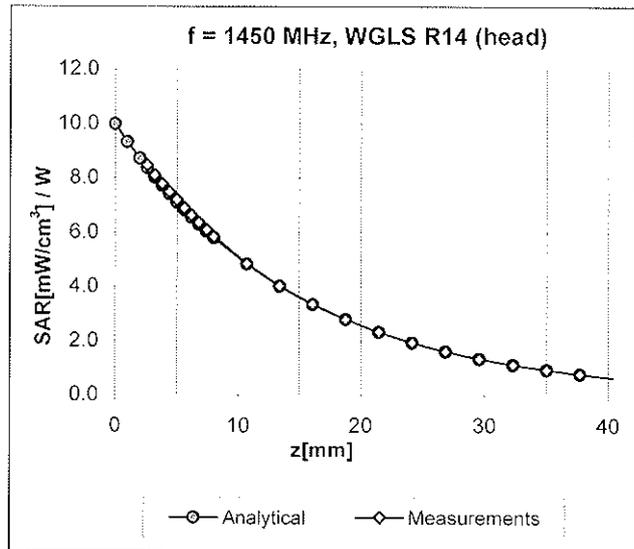
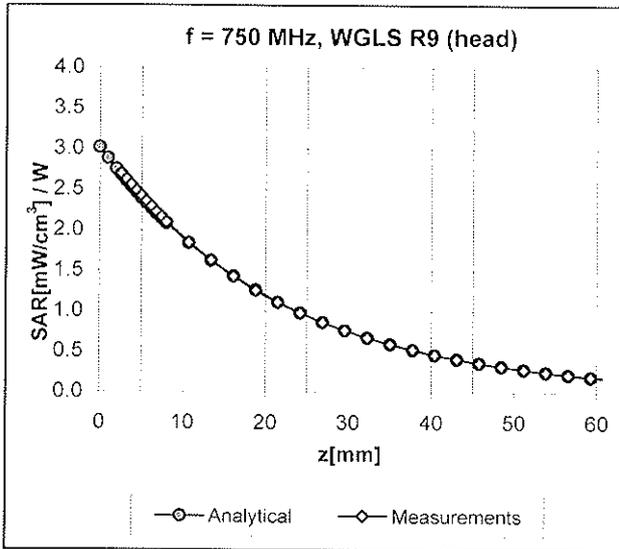
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800 \text{ MHz}$)



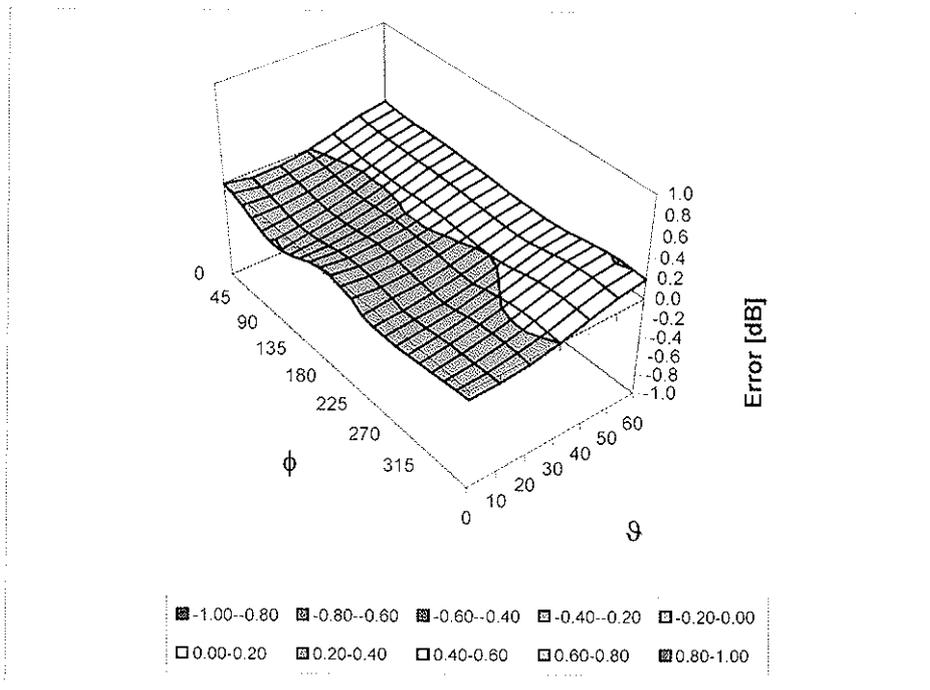
Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ, θ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ (k=2)

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	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



A D T

D3: DAE

IMPORTANT NOTICE

USAGE OF THE DAE 3

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

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

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

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

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

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

Important Note:

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

Important Note:

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

Important Note:

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



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 **BV-ADT (Auden)**

Certificate No: **DAE3-579_Sep10**

CALIBRATION CERTIFICATE

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

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

Calibration date: **September 20, 2010**

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

Issued: September 20, 2010

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Glossary

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

Methods Applied and Interpretation of Parameters

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

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 μ V, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

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

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

Connector Angle

Connector Angle to be used in DASY system	358.0 $^{\circ}$ \pm 1 $^{\circ}$
---	-------------------------------------

Appendix

1. DC Voltage Linearity

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

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

2. Common mode sensitivity

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

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

3. Channel separation

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

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

4. AD-Converter Values with inputs shorted

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

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

5. Input Offset Measurement

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

Input 10M Ω

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

6. Input Offset Current

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

7. Input Resistance (Typical values for information)

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

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

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

9. Power Consumption (Typical values for information)

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



D4: SYSTEM VALIDATION DIPOLE



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

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

Certificate No: **D750V3-1013_May11**

CALIBRATION CERTIFICATE

Object **D750V3 - SN:1013**

Calibration procedure(s) **QA CAL-05.v8**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **May 25, 2011**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

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

Calibrated by: **Claudio Leubler** Name: **Claudio Leubler** Function: **Laboratory Technician**

Approved by: **Katja Pokovic** Name: **Katja Pokovic** Function: **Technical Manager**

Signature

Issued: May 25, 2011

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



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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:

- 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
- 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
- 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:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.3 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.13 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	8.39 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.39 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	5.49 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	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.8 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.23 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	8.93 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.47 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	5.88 mW / g ± 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.9 Ω - 1.4 j Ω
Return Loss	- 30.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.5 Ω - 3.4 j Ω
Return Loss	- 28.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.037 ns
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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	March 22, 2010

DASY5 Validation Report for Head TSL

Date: 25.05.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1013

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: HSL750

Medium parameters used: $f = 750$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 42.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.33, 6.33, 6.33); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Dipole Calibration for Head Tissue/Pin=250mW; dip=15mm; dist=3.0mm/Cube 0:

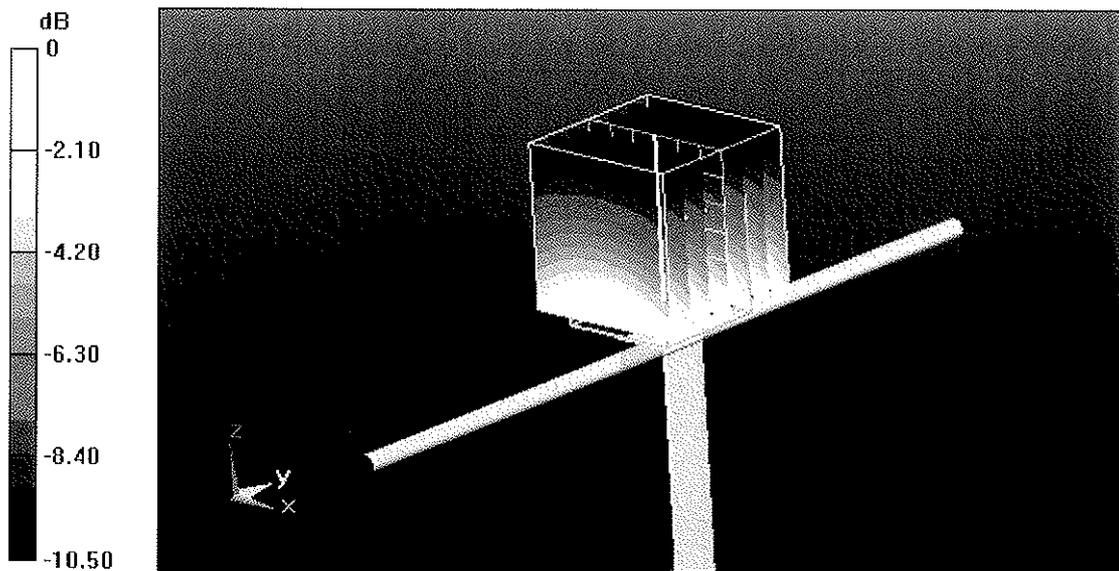
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.548 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 3.252 W/kg

SAR(1 g) = 2.13 mW/g; SAR(10 g) = 1.39 mW/g

Maximum value of SAR (measured) = 2.505 mW/g



0 dB = 2.510mW/g

Impedance Measurement Plot for Head TSL

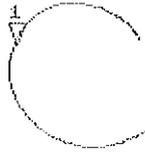
25 May 2011 11:16:16

CH1 S11 1 U FS 1: 52.906 ω -1.4102 ω 150.48 μ F 750.000 000 MHz

*

Del

Cor

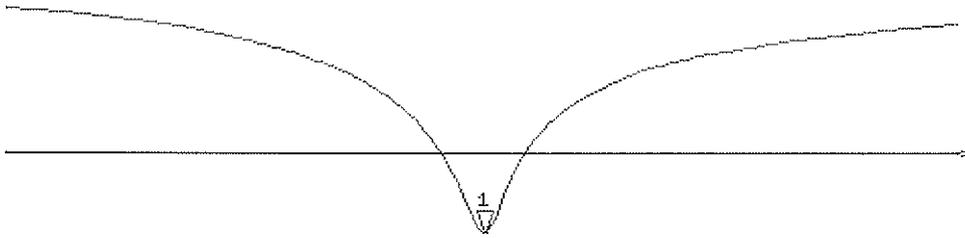


Avg
16

H1 d

CH2 S11 LOG 5 dB/REF -20 dB 1: -30.066 dB 750.000 000 MHz

Cor



Avg
16

H1 d

START 550.000 000 MHz

STOP 950.000 000 MHz

DASY5 Validation Report for Body TSL

Date: 25.05.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1013

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: MSL750

Medium parameters used: $f = 750$ MHz; $\sigma = 0.96$ mho/m; $\epsilon_r = 55.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.12, 6.12, 6.12); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Dipole Calibration for Body Tissue/Pin=250mW; dip=15mm; dist=3.0mm/Cube 0:

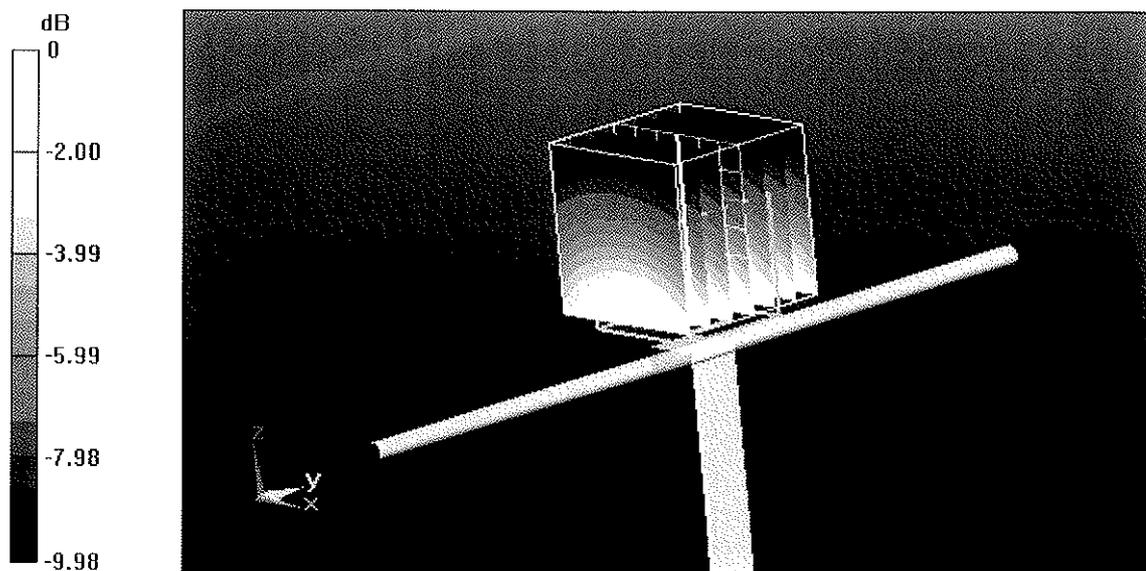
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.178 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 3.333 W/kg

SAR(1 g) = 2.23 mW/g; SAR(10 g) = 1.47 mW/g

Maximum value of SAR (measured) = 2.598 mW/g



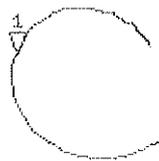
0 dB = 2.600mW/g

Impedance Measurement Plot for Body TSL

25 May 2011 13:34:20

[CH1] S11 1 U FS 1: 48.525 Ω -3.3345 Ω 62.514 pF 750.000 000 MHz

*
De1
Cor

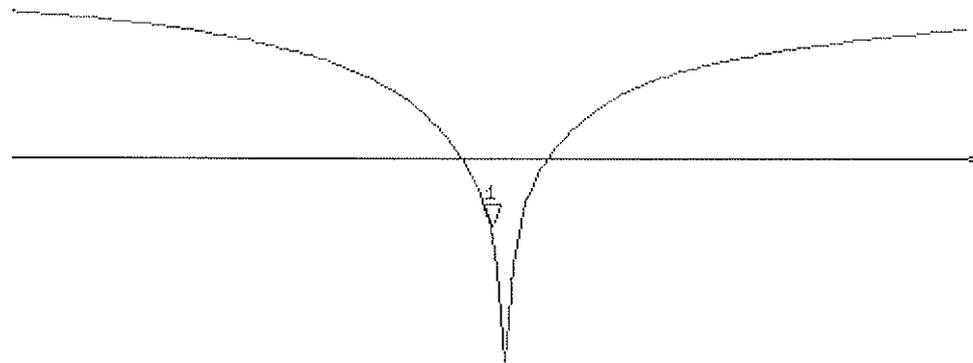


Avg
16

H1d

CH2 S11 L06 5 dB/REF -20 dB 1: -28.508 dB 750.000 000 MHz

Cor



Avg
16

H1d

START 550.000 000 MHz

STOP 950.000 000 MHz