LTE SAR TEST REPORT

No. 2012SAR00007

For

Sierra Wireless Inc.

Mobile Hotspot

AirCard 763S

With

FCC ID : N7NAC763S

Issued Date: 2012-02-09

No. **DGA-PL-114/01-02**

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of MIIT

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Revision Version

Report Number	Revision	Date	Memo
2012SAR00007	00	2012/01/17	Initial creation of test report
2012SAR00007	01	2012/01/31	Add annex H
2012SAR00007	02	2012/02/09	Replace the SAR plots and Add the explain of test reduction

TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
Address:	No 52, Huayuan beilu, Haidian District, Beijing,P.R.China
Postal Code:	100191
Telephone:	+86-10-62304633
Fax:	+86-10-62304793

1.2 Testing Environment

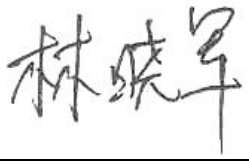
Temperature:	18°C~25 °C,
Relative humidity:	30%~ 70%
Ground system resistance:	< 0.5 Ω

Ambient noise is checked and found very low and in compliance with requirement of standards.
Reflection of surrounding objects is minimized and in compliance with requirement of standards.

1.3 Project Data

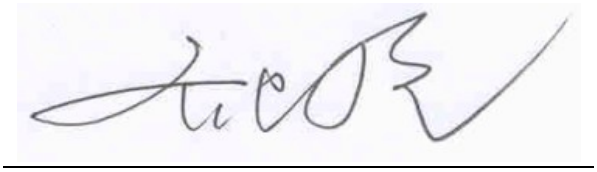
Project Leader:	Qi Dianyuan
Test Engineer:	Lin Xiaojun
Testing Start Date:	December 26, 2011
Testing End Date:	December 27, 2011

1.4 Signature



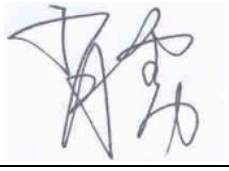
Lin Xiaojun

(Prepared this test report)



Qi Dianyuan

(Reviewed this test report)



Xiao Li

Deputy Director of the laboratory

(Approved this test report)

2 Client Information

2.1 Applicant Information

Company Name:	Sierra Wireless Inc.
Address /Post:	13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.
City:	/
Postal Code:	/
Country:	Canada
Contact:	Ying Wang
Email:	ywang@sierrawireless.com
Telephone:	+ 1 604 232 1440
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2.2 Manufacturer Information

Company Name:	Sierra Wireless Inc.
Address /Post:	13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.
City:	/
Postal Code:	/
Country:	Canada
Contact:	Ying Wang
Email:	ywang@sierrawireless.com
Telephone:	+ 1 604 232 1440
Fax:	/

3 Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1 About EUT

Description:	Mobile Hotspot
Model Name:	AirCard 763S
Frequency Band:	GSM850MHz, PCS1900MHz, WCDMA Band II, WCDMA Band V, LTE Band4, LTE Band7, 802.11b/g/n

3.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	013080000000007	DV1	SWI9200H2_00.00.02.02AP

*EUT ID: is used to identify the test sample in the lab internally.

4 CHARACTERISTICS OF THE TEST

4.1 Applicable Limit Regulations

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

4.2 Applicable Measurement Standards

KDB 447498 D01: Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies v03r02

KDB 447498 D02: SAR Measurement Procedures for USB Dongle Transmitters

KDB 941225 D05: SAR Test Considerations for LTE Handsets and Data Modems

KDB941225 D06 Hot Spot SAR v01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities.

KDB 450824 D01: SAR Probe Calibration and System Verification considerations for measurements from 150 MHz to 3 GHz

KDB 450824 D02: Dipole Requirements for SAR System Validation and Verification

5 OPERATIONAL CONDITIONS DURING TEST

5.1 Schematic Test Configuration

During SAR test of the EUT, it is in continuous emission Mode (Channel Allocated) at normal voltage condition and maximum transmitting power.

5.1.1 Power Measurement

The maximum average conducted output power is measured for the uplink burst in the different modulations. The same setup and device operating configurations used for SAR measurement are also used for the power measurements. Power is measured with a spectrum analyzer (model & specifics etc.) and the device is connected to the vector signal generator through a directional coupler. The average power is measured for the uplink bursts through triggering and gating. A resolution bandwidth of 100 kHz and a sweep time of ms are used to ensure power is measured correctly.

Maximum Power Reduction (MPR) is allowed due to higher order modulation and transmit bandwidth configurations. These MPR levels reduce the lower limit of each output power by the either 1 or 2dB. The limits for these power levels can be found in Table 6.2.3.5-1 of 3GPP 36.521.

Modulation	Channel Bandwidth / Transmission Bandwidth Configuration (RB)						MPR (dB)
	1.4MHz	3.0MHz	5.0MHz	10 MHz	15MHz	20MHz	
QPSK	＞5	＞4	＞8	＞12	＞16	＞18	≤1
16QAM	≤5	≤4	≤8	≤12	≤16	≤18	≤1
16QAM	＞5	＞4	＞8	＞12	＞16	＞18	≤2

The conducted power measurement results for QPSK

Band 4				
Bandwidth (MHz)	RB	Frequency (MHz)	Actual output power (dBm)	MPR (dB)
10MHz	1RB-Low	1750	22.17	0
		1732.5	22.02	0
		1715	21.86	0
	1RB-High	1750	22.12	0
		1732.5	22.05	0
		1715	21.90	0
	25RB	1750	20.96	1
		1732.5	21.02	1
		1715	20.72	1
	50RB	1750	20.98	1
		1732.5	21.09	1
		1715	20.68	1
20MHz	1RB-Low	1745	21.92	0
		1732.5	21.90	0
		1720	21.87	0

	1RB-High	1745	22.13	0
		1732.5	22.21	0
		1720	22.16	0
	50RB	1745	21.18	1
		1732.5	21.16	1
		1720	20.95	1
	100RB	1745	21.16	1
		1732.5	21.19	1
		1720	20.84	1
Band 7				
Bandwidth (MHz)	RB	Frequency (MHz)	Actual output power (dBm)	MPR (dB)
10MHz	1RB-Low	2565	22.33	0
		2535	22.34	0
		2505	22.37	0
	1RB-High	2565	22.25	0
		2535	22.48	0
		2505	22.17	0
	25RB	2565	21.22	1
		2535	21.34	1
		2505	21.23	1
	50RB	2565	21.16	1
		2535	21.45	1
		2505	21.23	1
20MHz	1RB-Low	2560	22.26	0
		2535	22.11	0
		2510	22.24	0
	1RB-High	2560	22.30	0
		2535	22.58	0
		2510	22.21	0
	50RB	2560	21.37	1
		2535	21.54	1
		2510	21.17	1
	100RB	2560	21.27	1
		2535	21.46	1
		2510	21.08	1

The conducted power measurement results for 16QAM

Band 4				
Bandwidth (MHz)	RB	Frequency (MHz)	Actual output power (dBm)	MPR (dB)
10MHz	1RB-Low	1750	21.05	1
		1732.5	20.88	1
		1715	20.73	1

	1RB-High	1750	21.00	1
		1732.5	20.83	1
		1715	20.73	1
	25RB	1750	19.94	2
		1732.5	19.99	2
		1715	19.75	2
	50RB	1750	20.29	2
		1732.5	20.33	2
		1715	19.85	2
20MHz	1RB-Low	1745	21.00	1
		1732.5	21.09	1
		1720	21.18	1
	1RB-High	1745	21.01	1
		1732.5	21.05	1
		1720	21.01	1
	50RB	1745	20.17	2
		1732.5	20.35	2
		1720	20.29	2
	100RB	1745	20.06	2
		1732.5	20.11	2
		1720	20.16	2
Band 7				
Bandwidth (MHz)	RB	Frequency (MHz)	Actual output power (dBm)	MPR (dB)
10MHz	1RB-Low	2565	21.18	1
		2535	21.22	1
		2505	21.26	1
	1RB-High	2565	21.05	1
		2535	21.34	1
		2505	21.05	1
	25RB	2565	20.22	2
		2535	20.45	2
		2505	20.25	2
	50RB	2565	20.34	2
		2535	20.58	2
		2505	20.32	2
20MHz	1RB-Low	2560	21.29	1
		2535	21.10	1
		2510	21.29	1
	1RB-High	2560	21.10	1
		2535	21.59	1
		2510	21.17	1
	50RB	2560	20.51	2
		2535	20.69	2

		2510	20.37	2
	100RB	2560	20.35	2
		2535	20.51	2
		2510	20.18	2

According to the conducted power and antenna placement, it is performed for LTE in the position 1 to 6 (except position 5) by KDB 941225 D05 and D06. Please check the antenna placement and the description of position in the document of 'The photos of LTE SAR test'.

5.1.2 Test Positions

According to the KDB 447498 D01 and KDB 941225 D06, the EUT is tested at the following 6 test positions all with the distance =10mm between the EUT and the phantom bottom (See the document 'The photos of LTE SAR test'):
Test position 1: The front side of the hotspot is against the flat phantom.
Test position 2: The back side of the hotspot is against the flat phantom.
Test position 3: The top edge of the hotspot is against the flat phantom.
Test position 4: The bottom edge of the hotspot is against the flat phantom.
Test position 5: The left edge of the hotspot is against the flat phantom.
Test position 6: The right edge of the hotspot is against the flat phantom.

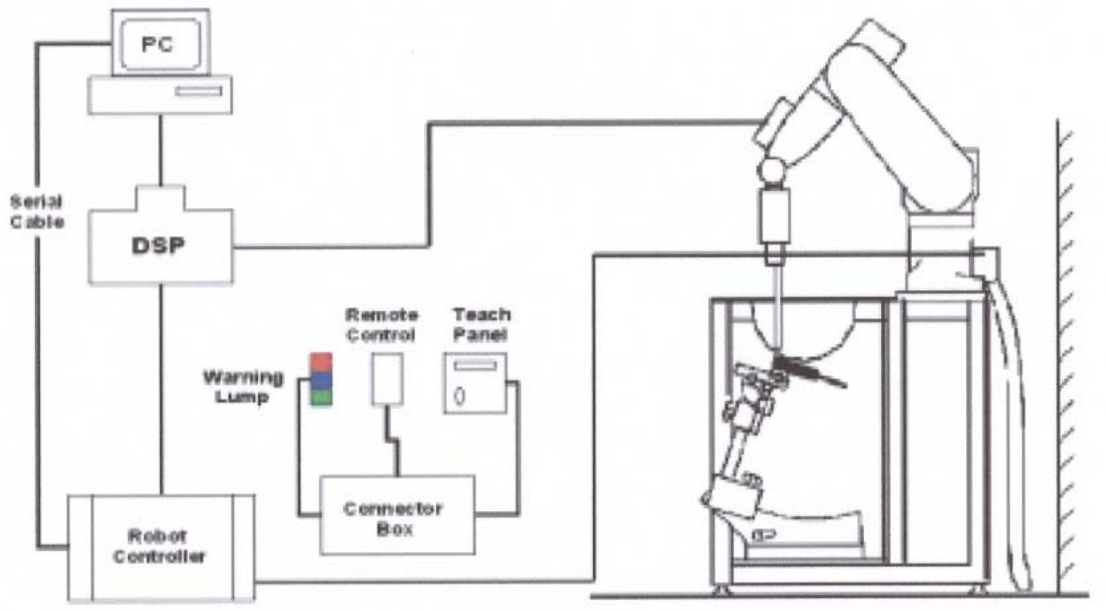
According to KDB 941225 D06 and the antenna placement of EUT," SAR must be measured for all sides and surfaces with a transmitting antenna located within 25 mm from that surface or edge, for the data modes, wireless technologies and frequency bands supporting hotspot mode."
The left edge of the hotspot (position 5 to the phantom) is 77mm from the main antenna location, so position 5 does not need to evaluate for main antenna.
SAR must be measured for test position 1,2,3,4 and 6 for LTE frequency band.

5.2 SAR Measurement Set-up

These measurements were performed with the automated near-field scanning system DASY4 Professional from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m), which positions the probes with a positional repeatability of better than ± 0.02mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit.

A cell controller system contains the power supply, robot controller, teaches pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the Micron Pentium III 800 MHz computer with Windows 2000 system and SAR Measurement Software DASY4 Professional, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements,

mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.



Picture 1: SAR Lab Test Measurement Set-up

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

5.3 Dasy4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the standard procedure with an accuracy of better than ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB.

EX3DV4 Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 2300 Additional CF for other liquids and frequencies upon request

Picture 2: EX3DV4 E-field

Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones

Picture3:EX3DV4 E-field probe

5.4 E-field Probe Calibration

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

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.
E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

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

Where: Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
ΔT = Temperature increase due to RF exposure.

Or

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

Where:
σ = Simulated tissue conductivity,
ρ = Tissue density (kg/m^3).

Picture 4: Device Holder

5.5 Other Test Equipment

5.5.1 Device Holder for Transmitters

In combination with the Generic Twin Phantom V3.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatable positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

5.5.2 Phantom

The Generic Twin Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90% of all users. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

Shell Thickness	2±0. l mm
Filling Volume	Approx. 20 liters
Dimensions	810 x l000 x 500 mm (H x L x W)
Available	Special

Picture 5: Generic Twin Phantom

5.6 Equivalent Tissues

The liquid used for the frequency range of 800-3000 MHz consisted of water, Glycol monobutyl, and salt. The liquid has been previously proven to be suited for worst-case. The Table 1 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528.

Table 1: Composition of the Body Tissue Equivalent Matter

1800 MHz	
MIXTURE%	FREQUENCY 1800 MHz
Water	69.91
Glycol monobutyl	29.96
Salt	0.13
Dielectric Parameters Target Value	f=1800 MHz ε=53.3 σ=1.52
2550 MHz	
MIXTURE %	FREQUENCY 2550MHz
Water	72.37
Tween 20	27.55
Salt	0.08
Dielectric Parameters Target Value	f=2550MHz ε=52.6 σ=2.09

5.7 System Specifications

Specifications

Positioner: Stäubli Unimation Corp. Robot Model: RX90L
Repeatability: ±0.02 mm
No. of Axis: 6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor: Pentium III
Clock Speed: 800 MHz
Operating System: Windows 2000

Data Converter

Features: Signal Amplifier, multiplexer, A/D converter, and control logic
Software Version: DASY4.7 build 80
Connecting Lines: Optical downlink for data and status info.
Optical uplink for commands and clock

6 TEST RESULTS

6.1 Dielectric Performance

Table 2: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 23.0 °C and relative humidity 35%. Liquid temperature during the test: 22.5°C Measurement Date : 1800 MHz **December 26, 2011**, 2550 MHz **December 27, 2011**			
/	**Frequency**	**Permittivity ε**	**Conductivity σ (S/m)**
Target value	1750 MHz	53.4	1.49
	1800 MHz	53.3	1.52
	2550 MHz	52.6	2.09
Measurement value (Average of 10 tests)	1750 MHz	52.9	1.47
	1800 MHz	52.6	1.50
	2550 MHz	51.9	2.06
Deviation	1750 MHz	-0.94%	-1.34%
	1800 MHz	-1.31%	-1.32%
	2550 MHz	-1.33%	-1.44%

6.2 System Validation

Table 3: System Validation of Body

Measurement is made at temperature 23.0 °C and relative humidity 35%. Liquid temperature during the test: 22.5°C Measurement Date : 1800 MHz **December 26, 2011**, 2550 MHz **December 27, 2011**							
Liquid parameters	Dipole calibration Target value	**Frequency**		**Permittivity ε**		**Conductivity σ(S/m)**	
		1800 MHz		52.3		1.50	
		2550 MHz		52.3		2.04	
	Actual Measurement value	1800 MHz		52.6		1.50	
		2550 MHz		51.9		2.06	
	Deviation	1800 MHz		0.57%		0.00%	
		2550 MHz		-0.76%		0.98%	
Verification results	**Frequency**	**Target value(W/kg)**		**Measured value(W/kg)**		**Deviation**	
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**	**10 g Average**	**1 g Average**
	1800 MHz	20.7	40.3	20.56	40.4	-0.68%	0.25%
	2550 MHz	24.8	55.3	25.12	55.6	1.29%	0.54%

Note：Target values are the data of the dipole validation results, please check Annex F for the Dipole Calibration Certificate.

6.3 Test Selection and Reduction

H = High edge, L = Low edge; fn = footnote

○ = the channel need to test depending on power or SAR

	Power	Band 4 20MHz			Band 4 10MHz			Band 7 20MHz			Band 7 10MHz			941225
qpsk	1RB, L	21.92	21.90	21.87	22.17	22.02	21.86	22.26	22.11	22.24	22.33	22.34	22.37	
qpsk	1RB, H	22.13	22.21	22.16	22.12	22.05	21.90	22.30	22.58	22.21	22.25	22.48	22.17	
qpsk	50%RB	21.18	21.16	20.95	20.96	21.02	20.72	21.37	21.54	21.17	21.22	21.34	21.23	
qpsk	100%RB	21.16	21.19	20.84	20.98	21.09	20.68	21.27	21.46	21.08	21.16	21.45	21.23	
16qam	1RB, L	21.00	21.09	21.18	21.05	20.88	20.73	21.29	21.10	21.29	21.18	21.22	21.26	
16qam	1RB, H	21.01	21.05	21.01	21.00	20.83	20.73	21.10	21.59	21.17	21.05	21.34	21.05	
16qam	50%RB	20.17	20.35	20.29	19.94	19.99	19.75	20.51	20.69	20.37	20.22	20.45	20.25	
16qam	100%RB	20.06	20.11	20.16	20.29	20.33	19.85	20.35	20.51	20.18	20.34	20.58	20.32	
Pos	Frequence	1745	1732.5	1720	1750	1732.5	1715	2560	2535	2510	2565	2535	2505	
1	qpsk,50%RB		○						○					3)A) fn2
1	qpsk,100%RB													3)A)I)
1	qpsk,1RB, H		○						○					3)B) fn6
1	qpsk,1RB, L	○						○						3)B) fn6
1	16qam,50%RB		○						○					4)A)
1	16qam,100%RB													4)A)I)b)
1	16qam,1RB, H		○						○					4)B) fn9
1	16qam,1RB, L			○				○		○				4)B) fn9

2	qpsk,50%RB		○						○					3)A) fn2
2	qpsk,100%RB													3)A)I)
2	qpsk,1RB, H		○						○					3)B) fn6
2	qpsk,1RB, L	○						○						3)B) fn6
2	16qam,50%RB		○						○					4)A)
2	16qam,100%RB													4)A)I)b)
2	16qam,1RB, H		○						○					4)B) fn9
2	16qam,1RB, L			○				○		○				4)B) fn9
3	qpsk,50%RB		○						○					3)A) fn2
3	qpsk,100%RB													3)A)I)
3	qpsk,1RB, H		○						○					3)B) fn6
3	qpsk,1RB, L	○						○						3)B) fn6
3	16qam,50%RB		○						○					4)A)
3	16qam,100%RB													4)A)I)b)
3	16qam,1RB, H		○						○					4)B) fn9
3	16qam,1RB, L			○				○		○				4)B) fn9
4	qpsk,50%RB		○						○					3)A) fn2
4	qpsk,100%RB													3)A)I)
4	qpsk,1RB, H		○						○					3)B) fn6
4	qpsk,1RB, L	○						○						3)B) fn6
4	16qam,50%RB		○						○					4)A)
4	16qam,100%RB													4)A)I)b)
4	16qam,1RB, H		○						○					4)B) fn9
4	16qam,1RB, L			○				○		○				4)B) fn9
6	qpsk,50%RB	○	○	○					○					3)A) fn2
6	qpsk,100%RB													3)A)I)
6	qpsk,1RB, H		○						○					3)B) fn6
6	qpsk,1RB, L	○						○						3)B) fn6
6	16qam,50%RB		○						○					4)A)
6	16qam,100%RB													4)A)I)b)
6	16qam,1RB, H		○						○					4)B) fn9
6	16qam,1RB, L			○				○		○				4)B) fn9

According to the KDB 941225 D05 5) B) I) and the output power, it is only performed with 20MHz bandwidth for LTE band 4 and 7.

6.4 Summary of Measurement Results

Table 4: SAR Values – LTE BAND 4

Limit of SAR (W/kg)		10 g Average	1 g Average	Power Drift (dB)
		2.0	1.6	
Test Case		Measurement Result (W/kg)		
		10 g Average	1 g Average	
Position 1	QPSK_20MHz_50RB, Mid frequency (See Figure 1)	0.271	0.459	0.061
	QPSK_20MHz_1RB_High, Mid frequency (See Figure 2)	0.479	0.816	0.001
	QPSK_20MHz_1RB_Low, High frequency (See Figure 3)	0.450	0.767	0.047
	16QAM_20MHz_50RB, Mid frequency (See Figure 4)	0.231	0.396	0.050
	16QAM _20MHz_1RB_High, Mid frequency (See Figure 5)	0.345	0.588	-0.008
	16QAM _20MHz_1RB_Low, Low frequency (See Figure 6)	0.263	0.468	0.163
Position 2	QPSK_20MHz_50RB, Mid frequency (See Figure 7)	0.273	0.436	0.032
	QPSK_20MHz_1RB_High, Mid frequency (See Figure 8)	0.404	0.630	-0.072
	QPSK_20MHz_1RB_Low, High frequency (See Figure 9)	0.439	0.699	0.038
	16QAM_20MHz_50RB, Mid frequency (See Figure 10)	0.208	0.323	0.055
	16QAM _20MHz_1RB_High, Mid frequency (See Figure 11)	0.291	0.454	-0.006
	16QAM _20MHz_1RB_Low, Low frequency (See Figure 12)	0.225	0.361	0.024
Position 3	QPSK_20MHz_50RB, Mid frequency (See Figure 13)	0.162	0.262	-0.061
	QPSK_20MHz_1RB_High, Mid frequency (See Figure 14)	0.285	0.461	0.053
	QPSK_20MHz_1RB_Low, High frequency (See Figure 15)	0.271	0.438	-0.061
	16QAM_20MHz_50RB, Mid frequency (See Figure 16)	0.129	0.209	0.041
	16QAM _20MHz_1RB_High, Mid frequency (See Figure 17)	0.237	0.382	0.145
	16QAM _20MHz_1RB_Low, Low frequency (See Figure 18)	0.196	0.318	-0.006
Position 4	QPSK_20MHz_50RB, Mid frequency (See Figure 19)	0.098	0.162	-0.024
	QPSK_20MHz_1RB_High, Mid frequency (See Figure 20)	0.213	0.351	0.060
	QPSK_20MHz_1RB_Low, High frequency (See Figure 21)	0.199	0.327	0.077
	16QAM_20MHz_50RB, Mid frequency (See Figure 22)	0.083	0.138	0.096
	16QAM _20MHz_1RB_High, Mid frequency (See Figure 23)	0.178	0.296	-0.030
	16QAM _20MHz_1RB_Low, Low frequency (See Figure 24)	0.100	0.166	-0.028
Position 6	QPSK_20MHz_50RB, Mid frequency (See Figure 25)	0.489	0.866	-0.001
	QPSK_20MHz_50RB, High frequency (See Figure 26)	0.556	0.971	-0.069
	QPSK_20MHz_50RB, Low frequency (See Figure 27)	0.523	0.930	-0.103
	QPSK_20MHz_1RB_High, Mid frequency (See Figure 28)	0.702	1.22	-0.012
	QPSK_20MHz_1RB_Low, High frequency (See Figure 29)	0.670	1.17	0.029
	16QAM_20MHz_50RB, High frequency (See Figure 30)	0.432	0.758	-0.018
	16QAM _20MHz_1RB_High, Mid frequency (See Figure 31)	0.578	1.02	-0.108
	16QAM _20MHz_1RB_Low, Low frequency (See Figure 32)	0.586	1.04	0.101

Table 5: SAR Values – LTE BAND 7

Limit of SAR (W/kg)		10 g Average	1 g Average	Power Drift (dB)
		2.0	1.6	
Test Case		Measurement Result(W/kg)		
		10 g Average	1 g Average	
Position 1	QPSK_20MHz_50RB, Mid frequency (See Figure 33)	0.217	0.402	-0.110
	QPSK_20MHz_1RB_High, Mid frequency (See Figure 34)	0.269	0.528	0.066
	QPSK_20MHz_1RB_Low, High frequency (See Figure 35)	0.297	0.585	-0.052
	16QAM_20MHz_50RB, Mid frequency (See Figure 36)	0.160	0.306	0.079
	16QAM _20MHz_1RB_High, Mid frequency (See Figure 37)	0.217	0.426	-0.069
	16QAM _20MHz_1RB_Low, High frequency (See Figure 38)	0.233	0.463	0.170
	16QAM _20MHz_1RB_Low, Low frequency (See Figure 39)	0.321	0.608	0.045
Position 2	QPSK_20MHz_50RB, Mid frequency (See Figure 40)	0.384	0.653	-0.051
	QPSK_20MHz_1RB_High, Mid frequency (See Figure 41)	0.436	0.755	-0.187
	QPSK_20MHz_1RB_Low, High frequency (See Figure 42)	0.494	0.862	-0.124
	16QAM_20MHz_50RB, Mid frequency (See Figure 43)	0.286	0.484	0.019
	16QAM _20MHz_1RB_High, Mid frequency (See Figure 44)	0.353	0.600	0.043
	16QAM _20MHz_1RB_Low, High frequency (See Figure 45)	0.414	0.723	-0.079
	16QAM _20MHz_1RB_Low, Low frequency (See Figure 46)	0.438	0.740	0.134
Position 3	QPSK_20MHz_50RB, Mid frequency (See Figure 47)	0.095	0.168	0.007
	QPSK_20MHz_1RB_High, Mid frequency (See Figure 48)	0.112	0.198	0.055
	QPSK_20MHz_1RB_Low, High frequency (See Figure 49)	0.115	0.202	0.023
	16QAM_20MHz_50RB, Mid frequency (See Figure 50)	0.070	0.124	0.155
	16QAM _20MHz_1RB_High, Mid frequency (See Figure 51)	0.092	0.163	0.166
	16QAM _20MHz_1RB_Low, High frequency (See Figure 52)	0.098	0.176	0.115
	16QAM _20MHz_1RB_Low, Low frequency (See Figure 53)	0.085	0.144	0.066
Position 4	QPSK_20MHz_50RB, Mid frequency (See Figure 54)	0.237	0.434	0.084
	QPSK_20MHz_1RB_High, Mid frequency (See Figure 55)	0.326	0.598	0.098
	QPSK_20MHz_1RB_Low, High frequency (See Figure 56)	0.339	0.617	-0.178
	16QAM_20MHz_50RB, Mid frequency (See Figure 57)	0.199	0.365	0.002
	16QAM _20MHz_1RB_High, Mid frequency (See Figure 58)	0.266	0.486	-0.038
	16QAM _20MHz_1RB_Low, High frequency (See Figure 59)	0.280	0.510	-0.070
	16QAM _20MHz_1RB_Low, Low frequency (See Figure 60)	0.316	0.578	-0.043
Position 6	QPSK_20MHz_50RB, Mid frequency (See Figure 61)	0.265	0.508	-0.029
	QPSK_20MHz_1RB_High, Mid frequency (See Figure 62)	0.337	0.644	0.005
	QPSK_20MHz_1RB_Low, High frequency (See Figure 63)	0.343	0.658	-0.001
	16QAM_20MHz_50RB, Mid frequency (See Figure 64)	0.212	0.408	0.143
	16QAM _20MHz_1RB_High, Mid frequency (See Figure 65)	0.281	0.540	0.036
	16QAM _20MHz_1RB_Low, High frequency (See Figure 66)	0.289	0.555	0.006
	16QAM _20MHz_1RB_Low, Low frequency (See Figure 67)	0.311	0.586	-0.143

6.5 Conclusion

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 4.2 of this report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 4.1 of this test report.

The maximum SAR values are obtained at the case of **LTE BAND 4**, **Position 6**, **QPSK_20MHz_1RB_High, Mid frequency (Table 4)**, and the value is: **0.702(10g), 1.22(1g).**

7 Measurement Uncertainty

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	5.5	N	1	1	1	5.5	5.5	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
4	Probe modulation response	B	2.4	R	$\sqrt{3}$	1	1	1.4	1.4	∞
5	Detection limit	B	1	N	1	1	1	0.6	0.6	∞
6	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
7	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
8	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
9	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
10	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
12	Probe positioned mech. restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
13	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
14	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test sample related										
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
17	Power scaling	B	0	R	$\sqrt{3}$	1	1	0	0	∞
18	Drift of output	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞

	power									
Phantom and set-up										
19	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
20	Algorithm for correcting SAR for deviations in permittivity and conductivity	B	1.9	R	$\sqrt{3}$	1	0.84	1.1	0.9	∞
21	Liquid conductivity (meas.)	A	2.06	N	1	0.78	0.71	1.61	1.46	43
22	Liquid permittivity (meas.)	A	1.6	N	1	0.26	0.26	0.4	0.4	521
23	Liquid conductivity -temperature uncertainty	B	1.42	R	$\sqrt{3}$	0.78	0.71	0.64	0.58	∞
24	Liquid permittivity - temperature uncertainty	B	0.55	R	$\sqrt{3}$	0.23	0.26	0.07	0.08	∞
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{24} c_i^2 u_i^2}$						9.33	9.27	265
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						18.7	18.5	

8 MAIN TEST INSTRUMENTS

Table 6: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	February 15, 2011	One year
02	Power meter	NRVD	102083	September 11, 2011	One year
03	Power sensor	NRV-Z5	100595		
04	Signal Generator	E4438C	MY49070393	November 12, 2011	One Year
05	Amplifier	VTL5400	0505	No Calibration Requested	
06	E-field Probe	SPEAG EX3DV4	3617	July 8, 2011	One year
07	E-field Probe	SPEAG ES3DV3	3149	September 24, 2011	One year
08	DAE	SPEAG DAE4	771	November 20, 2011	One year
09	Dipole Validation Kit	SPEAG D1800V2	2d145	January 25, 2010	Three years
10	Dipole Validation Kit	SPEAG D2550V2	1002	September 27,2010	Three years

END OF REPORT BODY

ANNEX A MEASUREMENT PROCESS

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the reference point was measured and was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of the phantom was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the flat phantom and the horizontal grid spacing was 10 mm x 10 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

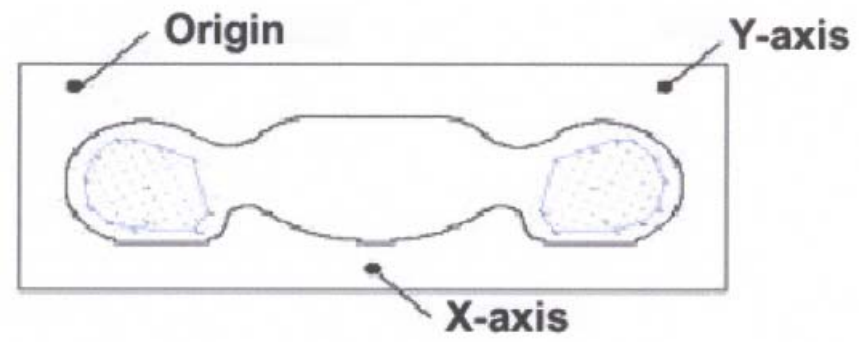
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

b. The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot"-condition (in x ~ y and z-directions). The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

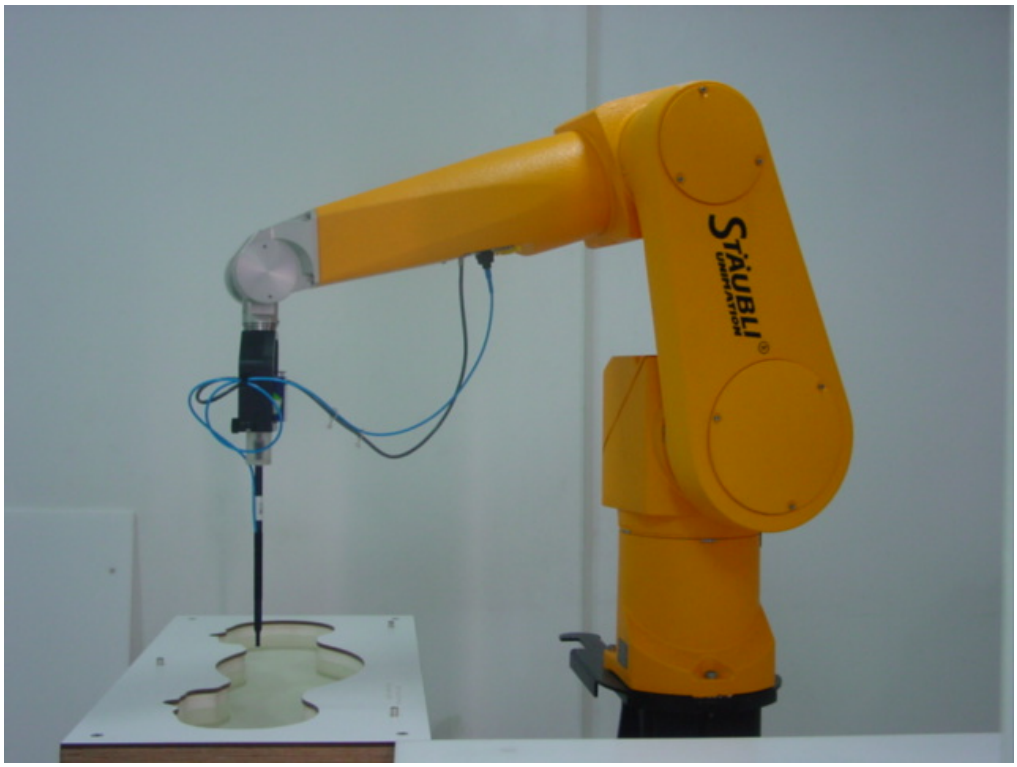
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation is repeated.



Picture A: SAR Measurement Points in Area Scan

ANNEX B TEST LAYOUT



Picture B1: Specific Absorption Rate Test Layout

ANNEX C GRAPH RESULTS

LTE BAND 4, Position 1 Middle Frequency QPSK_20MHz_50RB

Date/Time: 2011-12-26 8:04:22
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.537 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.3 V/m; Power Drift = 0.061 dB
Peak SAR (extrapolated) = 0.762 W/kg
SAR(1 g) = 0.459 mW/g; SAR(10 g) = 0.271 mW/g
Maximum value of SAR (measured) = 0.505 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.3 V/m; Power Drift = 0.061 dB
Peak SAR (extrapolated) = 0.566 W/kg
SAR(1 g) = 0.353 mW/g; SAR(10 g) = 0.224 mW/g
Maximum value of SAR (measured) = 0.387 mW/g

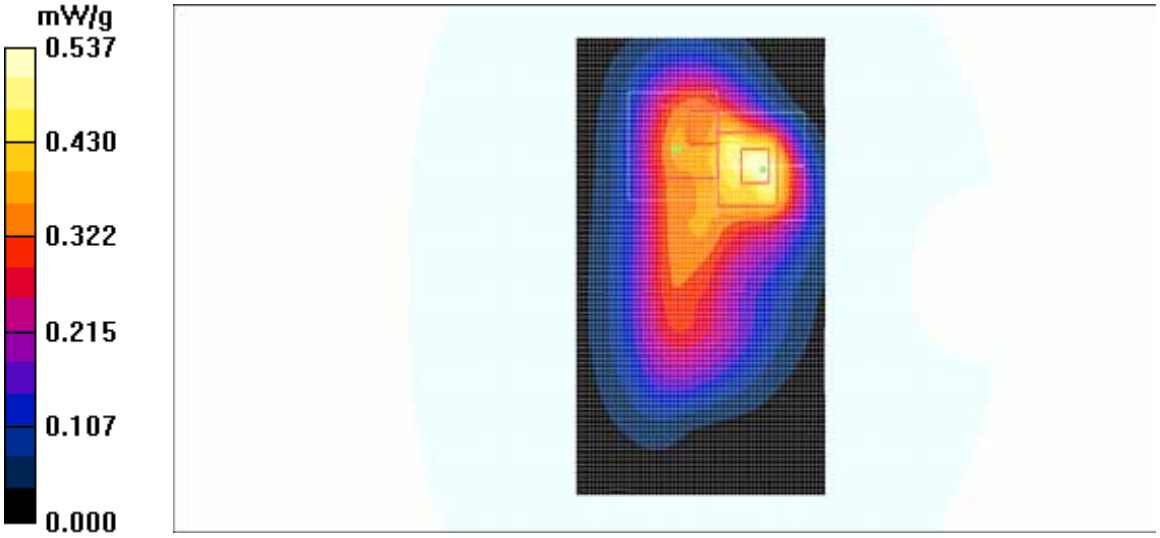


Fig.1 LTE BAND 4 Middle

LTE BAND 4, Position 1 Middle Frequency QPSK_20MHz_1RB_High
Date/Time: 2011-12-26 8:19:45
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.969 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.0 V/m; Power Drift = 0.001 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.816 mW/g; SAR(10 g) = 0.479 mW/g
Maximum value of SAR (measured) = 0.902 mW/g

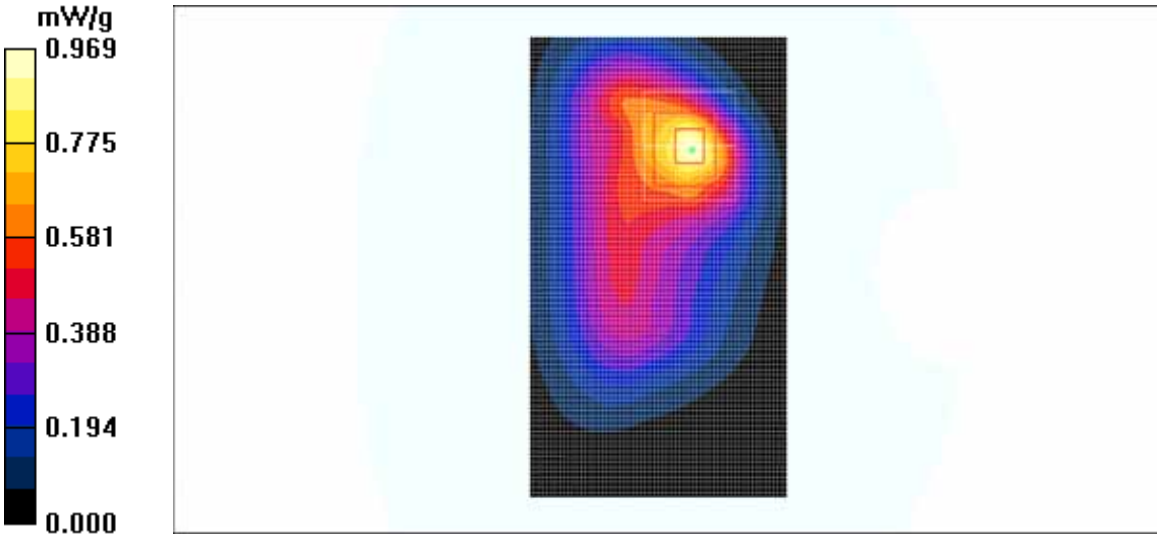


Fig.2 LTE BAND 4 Middle

LTE BAND 4, Position 1 High Frequency QPSK_20MHz_1RB_Low
Date/Time: 2011-12-26 8:35:13
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1745 MHz; σ = 1.47 mho/m; εr = 52.9; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1745 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.890 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.0 V/m; Power Drift = 0.047 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.767 mW/g; SAR(10 g) = 0.450 mW/g
Maximum value of SAR (measured) = 0.828 mW/g

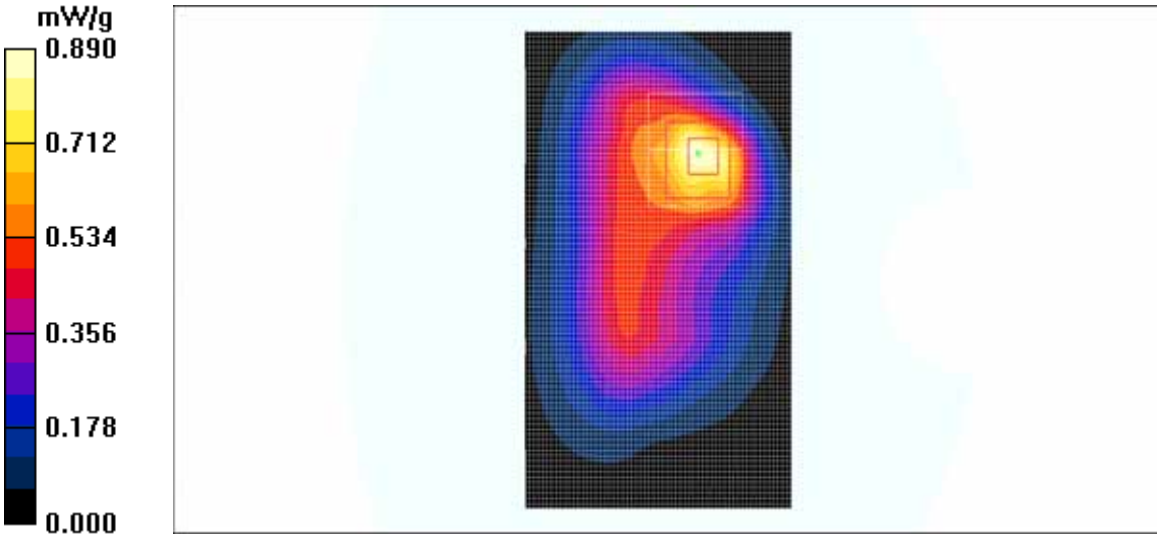


Fig.3 LTE BAND 4 High

LTE BAND 4, Position 1 Middle Frequency 16QAM_20MHz_50RB
Date/Time: 2011-12-26 8:50:38
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.471 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = 0.050 dB
Peak SAR (extrapolated) = 0.651 W/kg
SAR(1 g) = 0.396 mW/g; SAR(10 g) = 0.231 mW/g
Maximum value of SAR (measured) = 0.440 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = 0.050 dB
Peak SAR (extrapolated) = 0.602 W/kg
SAR(1 g) = 0.338 mW/g; SAR(10 g) = 0.203 mW/g
Maximum value of SAR (measured) = 0.402 mW/g

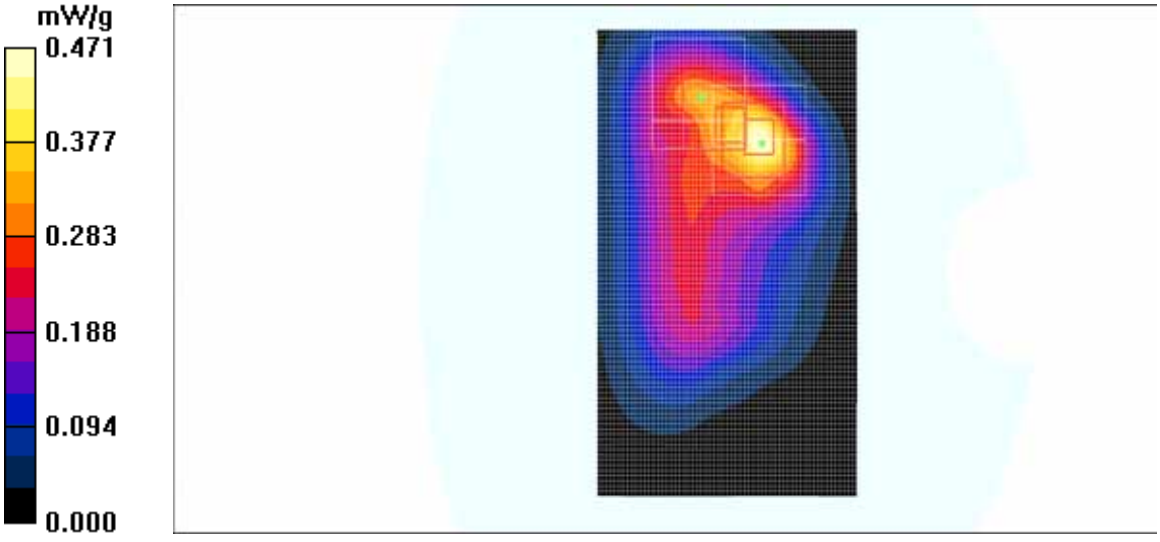


Fig.4 LTE BAND 4 Middle

LTE BAND 4, Position 1 Middle Frequency 16QAM_20MHz_1RB_High
Date/Time: 2011-12-26 9:06:05
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.707 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = -0.008 dB
Peak SAR (extrapolated) = 0.964 W/kg
SAR(1 g) = 0.588 mW/g; SAR(10 g) = 0.345 mW/g
Maximum value of SAR (measured) = 0.653 mW/g

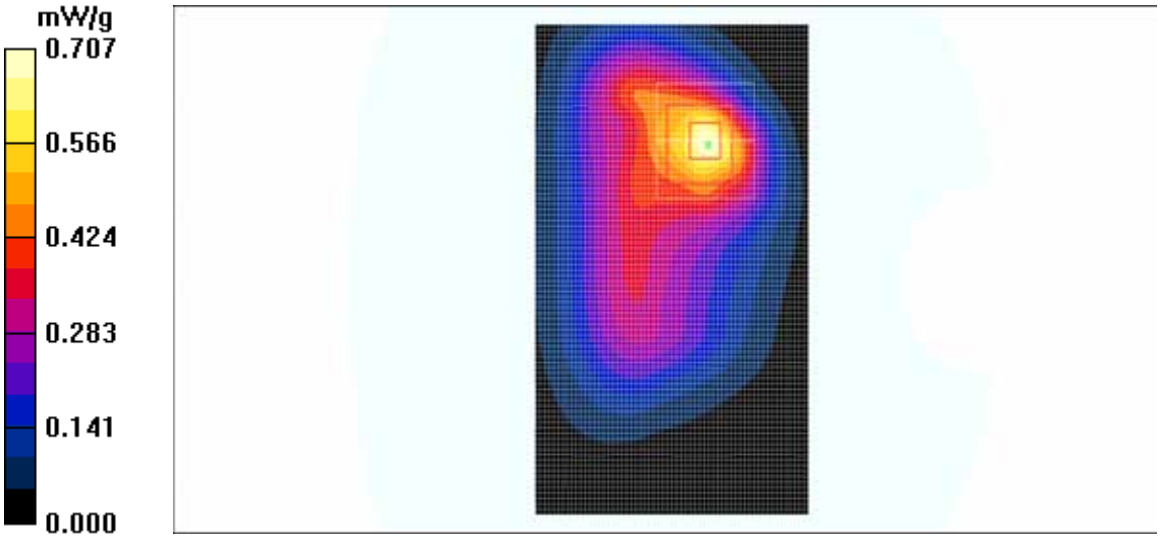


Fig.5 LTE BAND 4 Middle

LTE BAND 4, Position 1 Low Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-26 9:21:29
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1720 MHz; σ = 1.45 mho/m; εr = 53.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1720 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.540 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = 0.163 dB
Peak SAR (extrapolated) = 0.821 W/kg
SAR(1 g) = 0.468 mW/g; SAR(10 g) = 0.263 mW/g
Maximum value of SAR (measured) = 0.521 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = 0.163 dB
Peak SAR (extrapolated) = 0.681 W/kg
SAR(1 g) = 0.425 mW/g; SAR(10 g) = 0.265 mW/g
Maximum value of SAR (measured) = 0.459 mW/g

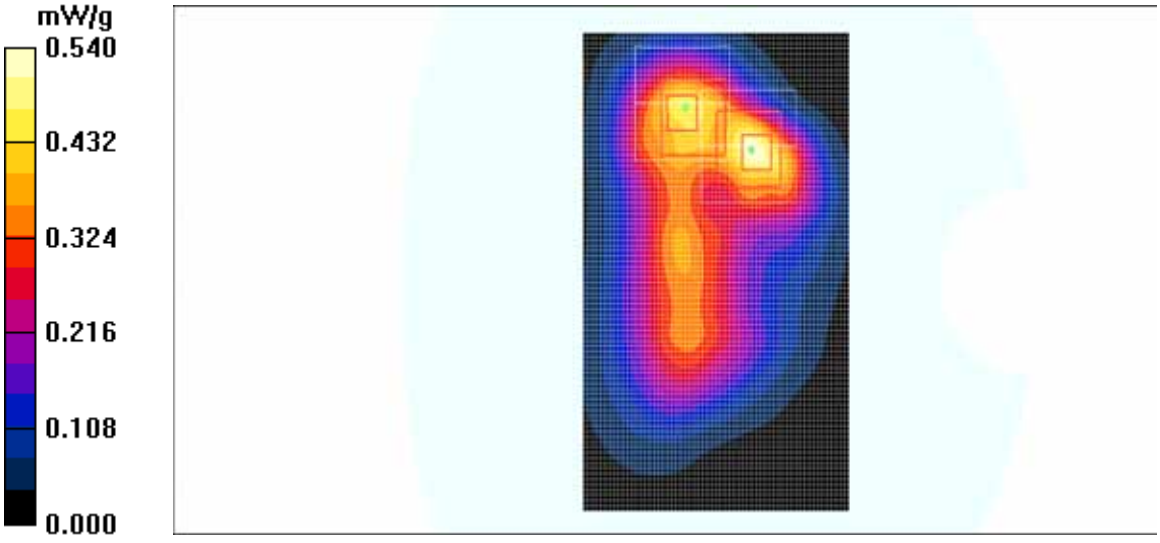


Fig.6 LTE BAND 4 Low

LTE BAND 4, Position 2 Middle Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-26 9:38:17
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.480 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.4 V/m; Power Drift = 0.032 dB
Peak SAR (extrapolated) = 0.686 W/kg
SAR(1 g) = 0.436 mW/g; SAR(10 g) = 0.273 mW/g
Maximum value of SAR (measured) = 0.462 mW/g

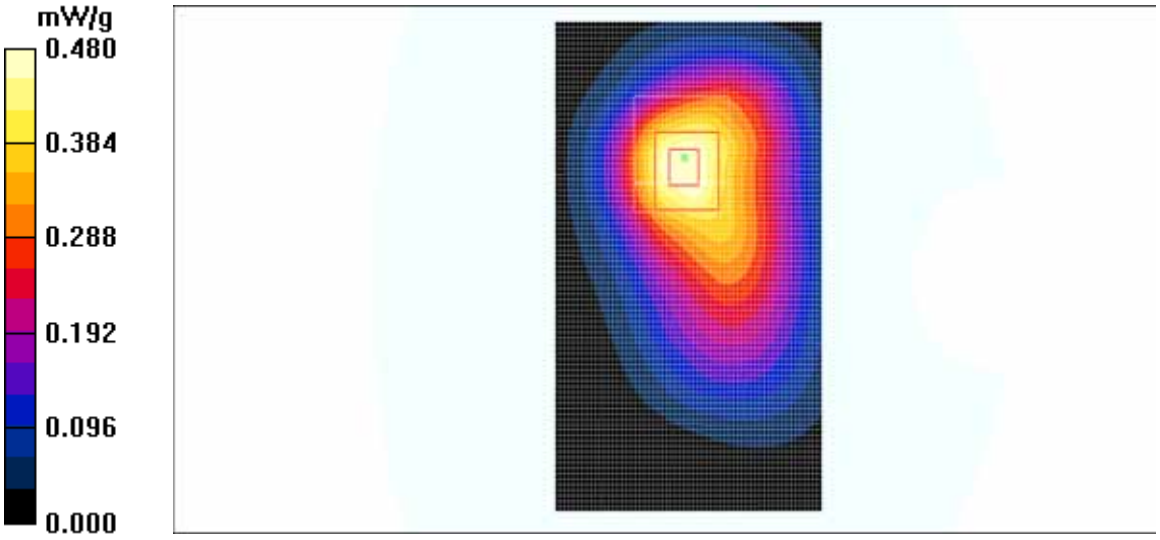


Fig.7 LTE BAND 4 Middle

LTE BAND 4, Position 2 Middle Frequency QPSK_20MHz_1RB_High
Date/Time: 2011-12-26 9:53:40
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.705 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.5 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 0.974 W/kg
SAR(1 g) = 0.630 mW/g; SAR(10 g) = 0.404 mW/g
Maximum value of SAR (measured) = 0.681 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.5 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 0.932 W/kg
SAR(1 g) = 0.581 mW/g; SAR(10 g) = 0.383 mW/g
Maximum value of SAR (measured) = 0.647 mW/g

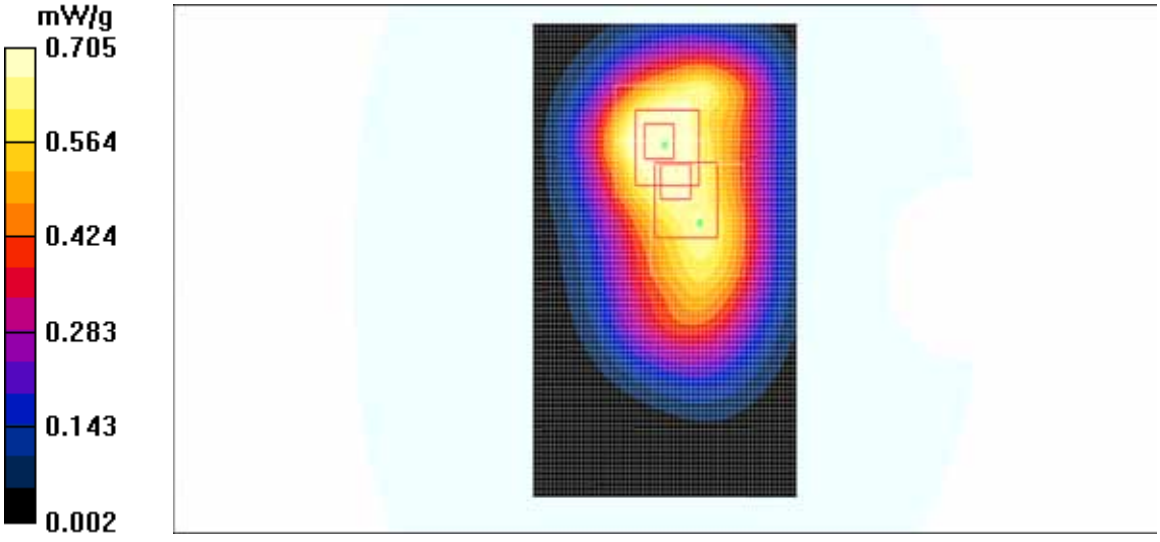


Fig.8 LTE BAND 4 Middle

LTE BAND 4, Position 2 High Frequency QPSK_20MHz_1RB_Low
Date/Time: 2011-12-26 10:09:11
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1745 MHz; σ = 1.47 mho/m; εr = 52.9; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1745 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.768 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.7 V/m; Power Drift = 0.038 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.699 mW/g; SAR(10 g) = 0.439 mW/g
Maximum value of SAR (measured) = 0.742 mW/g

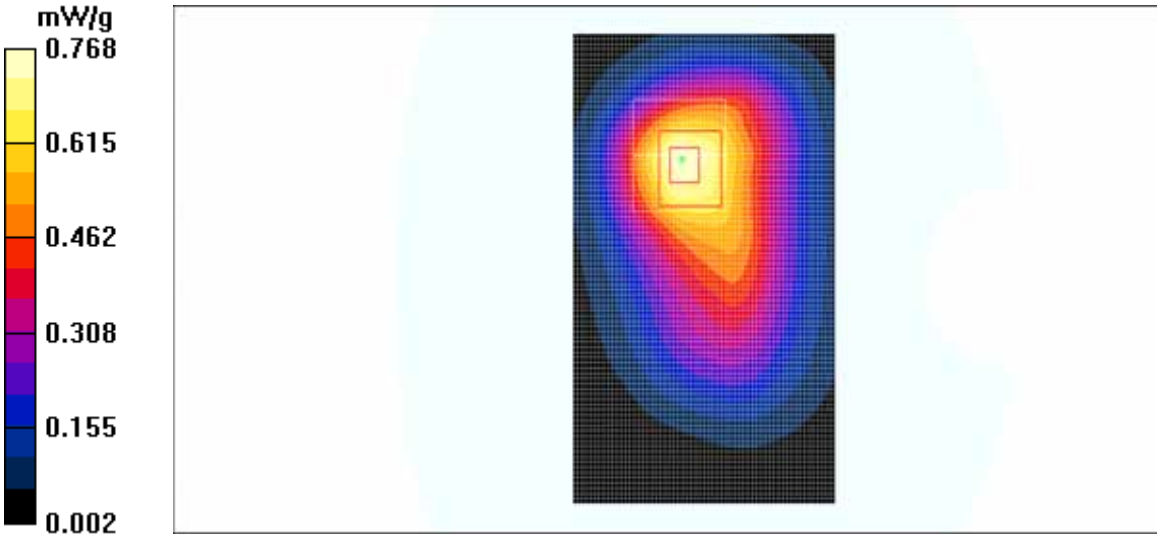


Fig.9 LTE BAND 4 High

LTE BAND 4, Position 2 Middle Frequency 16QAM_20MHz_50RB
Date/Time: 2011-12-26 10:24:36
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.352 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.5 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 0.503 W/kg
SAR(1 g) = 0.323 mW/g; SAR(10 g) = 0.208 mW/g
Maximum value of SAR (measured) = 0.346 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.5 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 0.469 W/kg
SAR(1 g) = 0.294 mW/g; SAR(10 g) = 0.192 mW/g
Maximum value of SAR (measured) = 0.328 mW/g

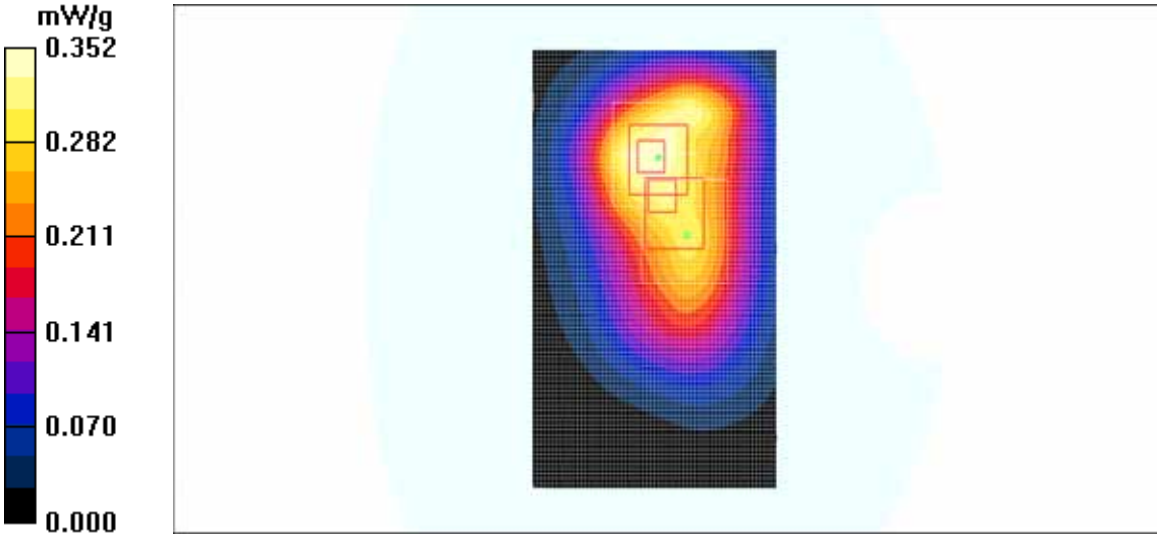


Fig.10 LTE BAND 4 Middle

LTE BAND 4, Position 2 Middle Frequency 16QAM_20MHz_1RB_High
Date/Time: 2011-12-26 10:39:58
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.492 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.7 V/m; Power Drift = -0.006 dB
Peak SAR (extrapolated) = 0.719 W/kg
SAR(1 g) = 0.454 mW/g; SAR(10 g) = 0.291 mW/g
Maximum value of SAR (measured) = 0.489 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.7 V/m; Power Drift = -0.006 dB
Peak SAR (extrapolated) = 0.682 W/kg
SAR(1 g) = 0.429 mW/g; SAR(10 g) = 0.278 mW/g
Maximum value of SAR (measured) = 0.473 mW/g

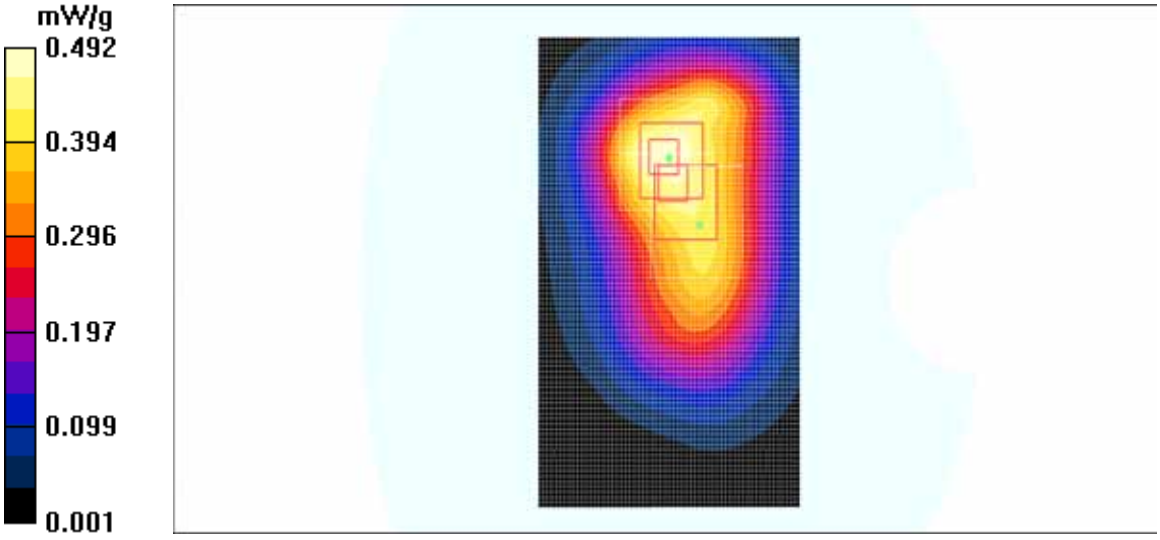


Fig.11 LTE BAND 4 Middle

LTE BAND 4, Position 2 Low Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-26 10:55:30
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1720 MHz; σ = 1.45 mho/m; εr = 53.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1720 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.395 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.6 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 0.589 W/kg
SAR(1 g) = 0.361 mW/g; SAR(10 g) = 0.225 mW/g
Maximum value of SAR (measured) = 0.399 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.6 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 0.584 W/kg
SAR(1 g) = 0.331 mW/g; SAR(10 g) = 0.205 mW/g
Maximum value of SAR (measured) = 0.386 mW/g

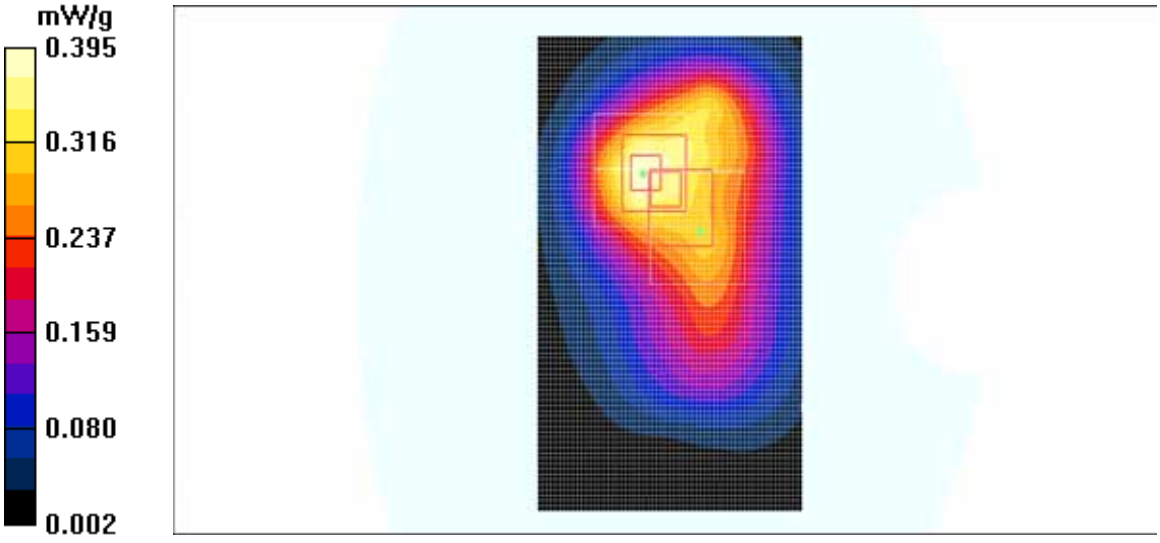


Fig.12 LTE BAND 4 Low

LTE BAND 4, Position 3 Middle Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-26 11:12:19
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.292 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.0 V/m; Power Drift = -0.061 dB
Peak SAR (extrapolated) = 0.408 W/kg
SAR(1 g) = 0.262 mW/g; SAR(10 g) = 0.162 mW/g
Maximum value of SAR (measured) = 0.283 mW/g

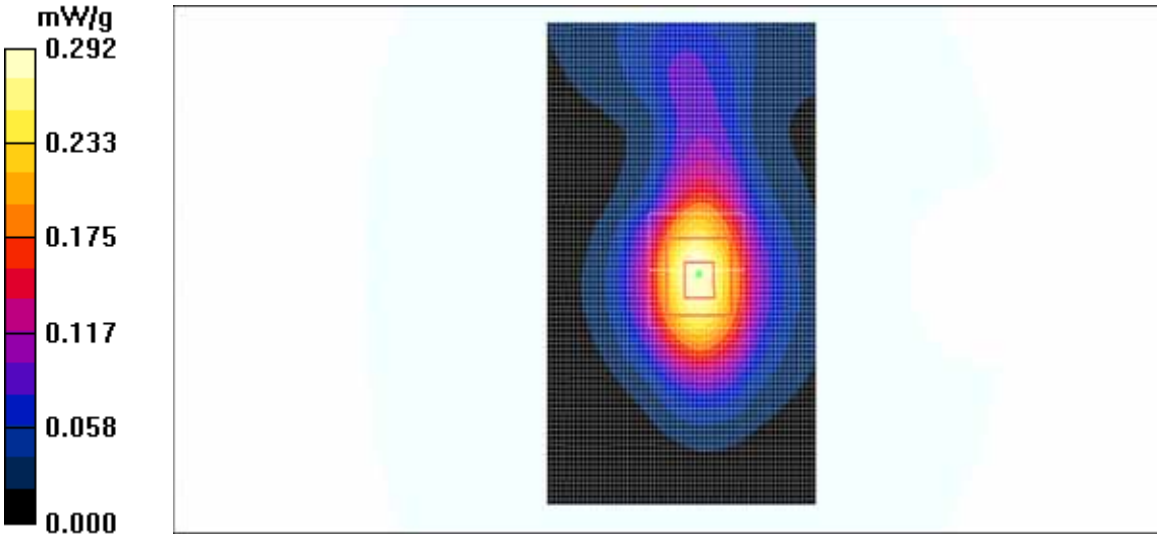


Fig.13 LTE BAND 4 Middle

LTE BAND 4, Position 3 Middle Frequency QPSK_20MHz_1RB_High
Date/Time: 2011-12-26 11:27:44
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.509 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.1 V/m; Power Drift = 0.053 dB
Peak SAR (extrapolated) = 0.698 W/kg
SAR(1 g) = 0.461 mW/g; SAR(10 g) = 0.285 mW/g
Maximum value of SAR (measured) = 0.502 mW/g

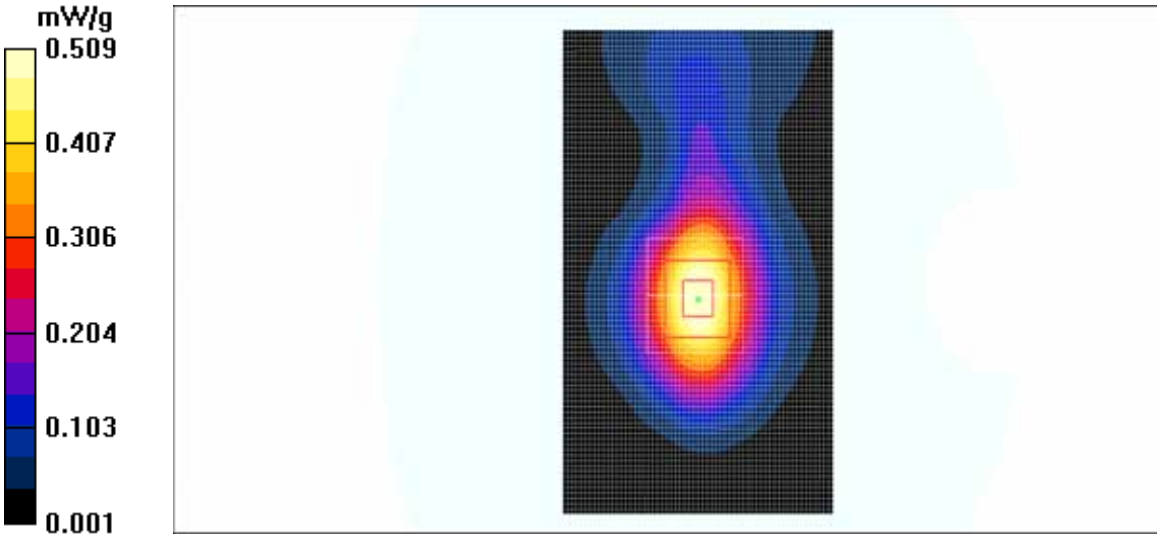


Fig.14 LTE BAND 4 Middle

LTE BAND 4, Position 3 High Frequency QPSK_20MHz_1RB_Low
Date/Time: 2011-12-26 11:43:15
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1745 MHz; σ = 1.47 mho/m; εr = 52.9; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1745 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.488 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.5 V/m; Power Drift = -0.061 dB
Peak SAR (extrapolated) = 0.670 W/kg
SAR(1 g) = 0.438 mW/g; SAR(10 g) = 0.271 mW/g
Maximum value of SAR (measured) = 0.471 mW/g

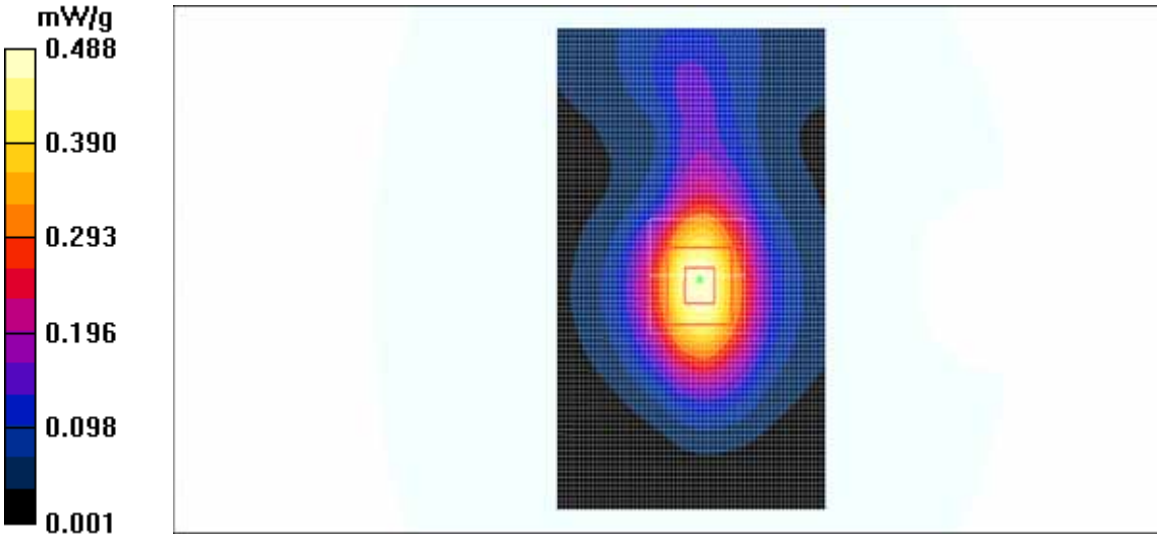


Fig.15 LTE BAND 4 High

LTE BAND 4, Position 3 Middle Frequency 16QAM_20MHz_50RB
Date/Time: 2011-12-26 11:58:38
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.226 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.9 V/m; Power Drift = 0.041 dB
Peak SAR (extrapolated) = 0.321 W/kg
SAR(1 g) = 0.209 mW/g; SAR(10 g) = 0.129 mW/g
Maximum value of SAR (measured) = 0.226 mW/g

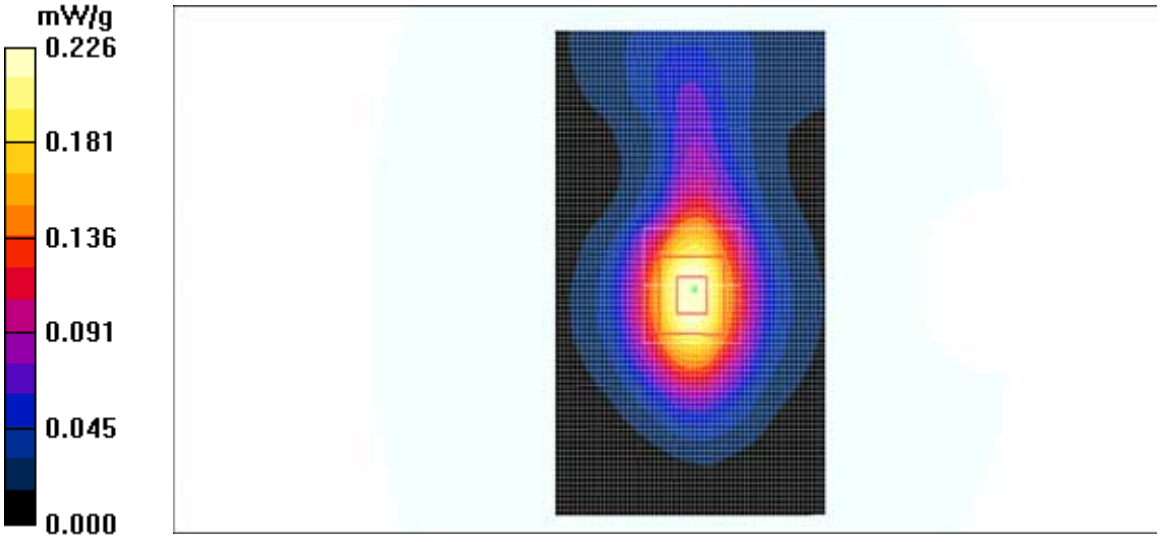


Fig.16 LTE BAND 4 Middle

LTE BAND 4, Position 3 Middle Frequency 16QAM_20MHz_1RB_High
Date/Time: 2011-12-26 12:14:05
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.421 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.9 V/m; Power Drift = 0.145 dB
Peak SAR (extrapolated) = 0.604 W/kg
SAR(1 g) = 0.382 mW/g; SAR(10 g) = 0.237 mW/g
Maximum value of SAR (measured) = 0.411 mW/g

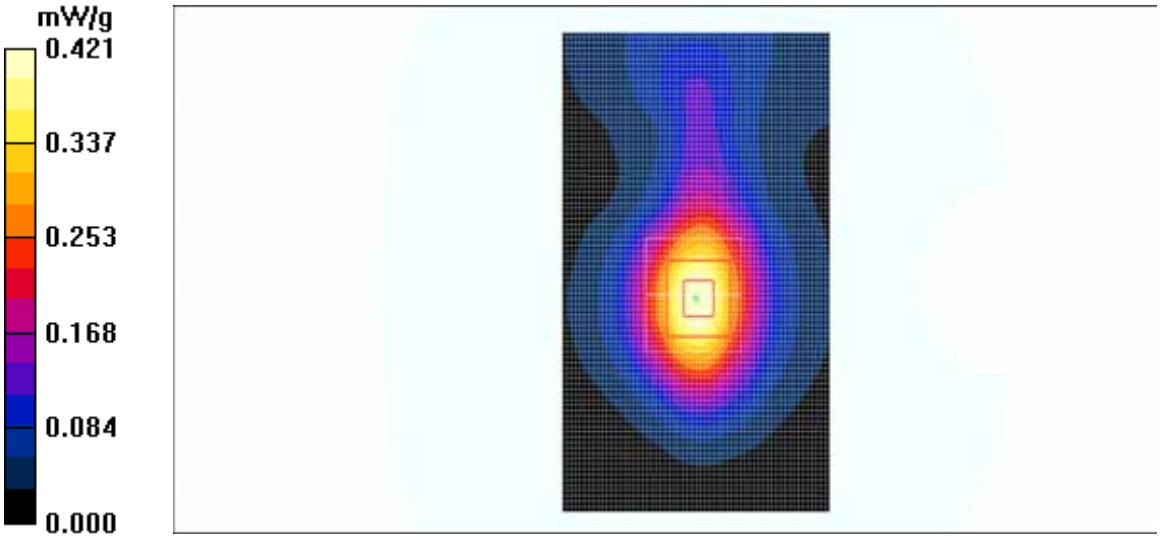


Fig.17 LTE BAND 4 Middle

LTE BAND 4, Position 3 Low Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-26 12:29:30
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1720 MHz; σ = 1.45 mho/m; εr = 53.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1720 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.357 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.8 V/m; Power Drift = -0.006 dB
Peak SAR (extrapolated) = 0.507 W/kg
SAR(1 g) = 0.318 mW/g; SAR(10 g) = 0.196 mW/g
Maximum value of SAR (measured) = 0.348 mW/g

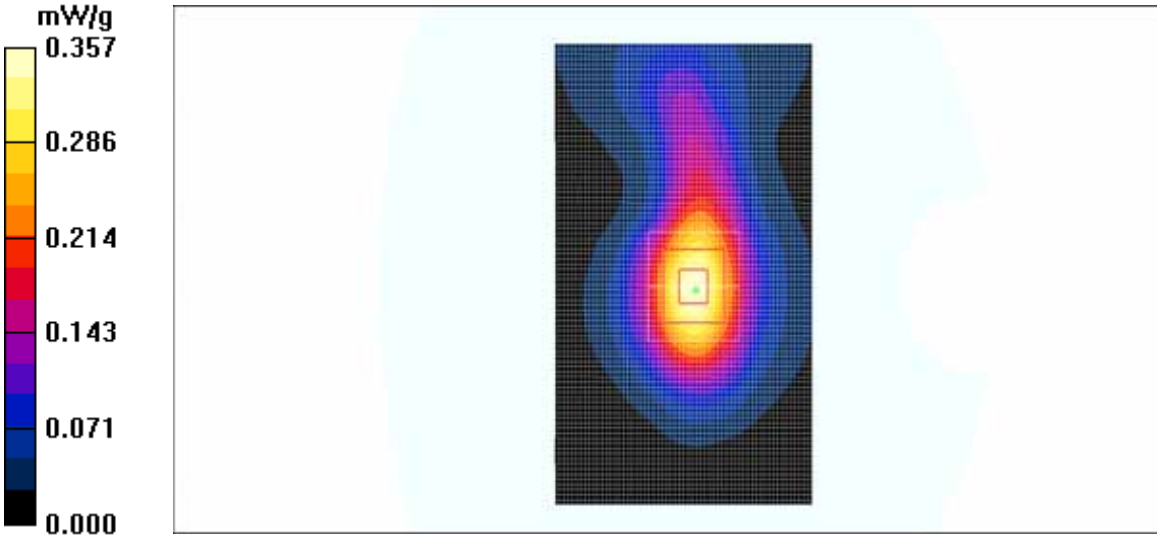


Fig.18 LTE BAND 4 Low

LTE BAND 4, Position 4 Middle Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-26 12:46:02
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.190 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.8 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 0.256 W/kg
SAR(1 g) = 0.162 mW/g; SAR(10 g) = 0.098 mW/g
Maximum value of SAR (measured) = 0.172 mW/g

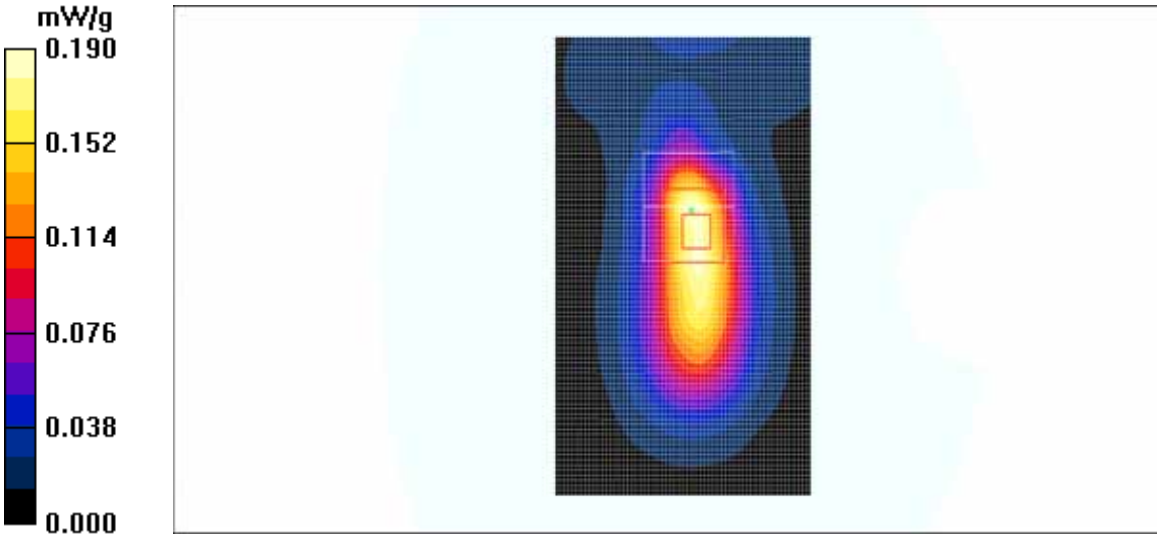


Fig.19 LTE BAND 4 Middle

LTE BAND 4, Position 4 Middle Frequency QPSK_20MHz_1RB_High
Date/Time: 2011-12-26 13:01:27
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.421 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.8 V/m; Power Drift = 0.060 dB
Peak SAR (extrapolated) = 0.569 W/kg
SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.213 mW/g
Maximum value of SAR (measured) = 0.381 mW/g

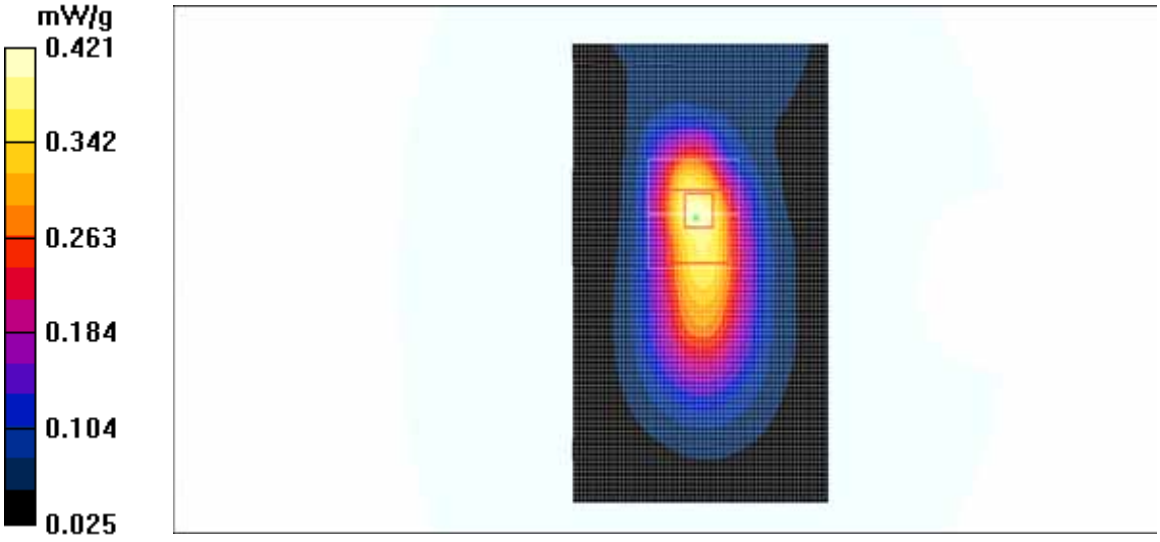


Fig.20 LTE BAND 4 Middle

LTE BAND 4, Position 4 High Frequency QPSK_20MHz_1RB_Low
Date/Time: 2011-12-26 13:16:50
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1745 MHz; σ = 1.47 mho/m; εr = 52.9; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1745 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.388 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.7 V/m; Power Drift = 0.077 dB
Peak SAR (extrapolated) = 0.523 W/kg
SAR(1 g) = 0.327 mW/g; SAR(10 g) = 0.199 mW/g
Maximum value of SAR (measured) = 0.358 mW/g

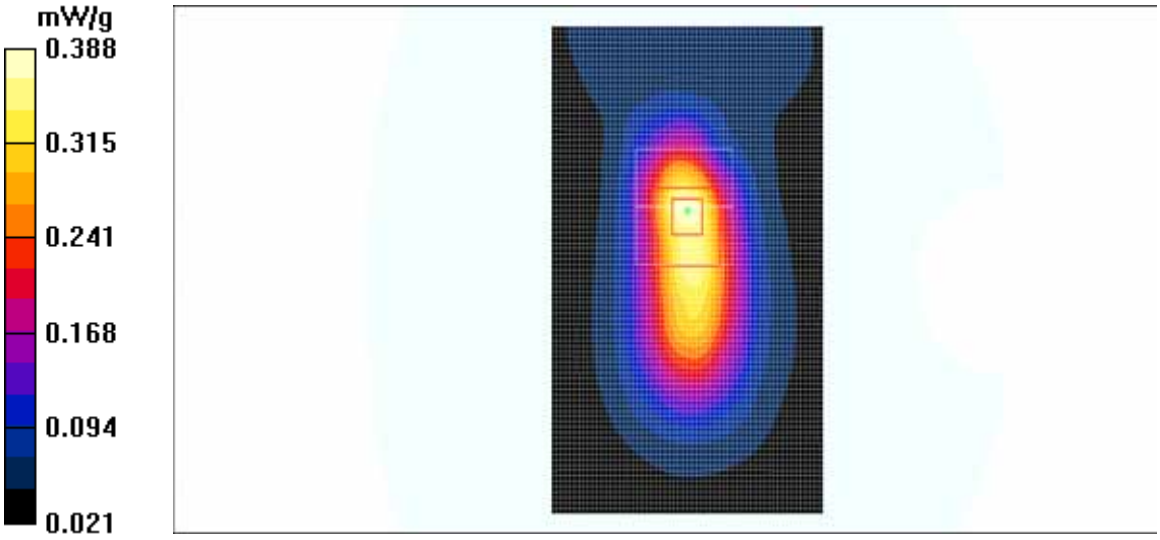


Fig.21 LTE BAND 4 High

LTE BAND 4, Position 4 Middle Frequency 16QAM_20MHz_50RB
Date/Time: 2011-12-26 13:32:19
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.162 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.80 V/m; Power Drift = 0.096 dB
Peak SAR (extrapolated) = 0.217 W/kg
SAR(1 g) = 0.138 mW/g; SAR(10 g) = 0.083 mW/g
Maximum value of SAR (measured) = 0.150 mW/g

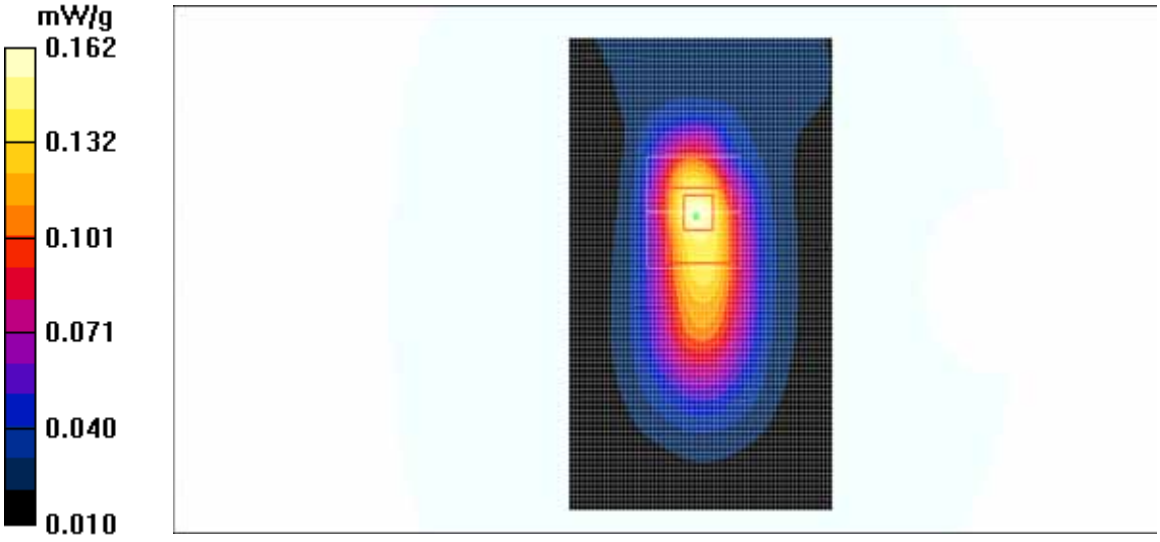


Fig.22 LTE BAND 4 Middle

LTE BAND 4, Position 4 Middle Frequency 16QAM_20MHz_1RB_High
Date/Time: 2011-12-26 13:47:41
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.332 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 0.503 W/kg
SAR(1 g) = 0.296 mW/g; SAR(10 g) = 0.178 mW/g
Maximum value of SAR (measured) = 0.317 mW/g

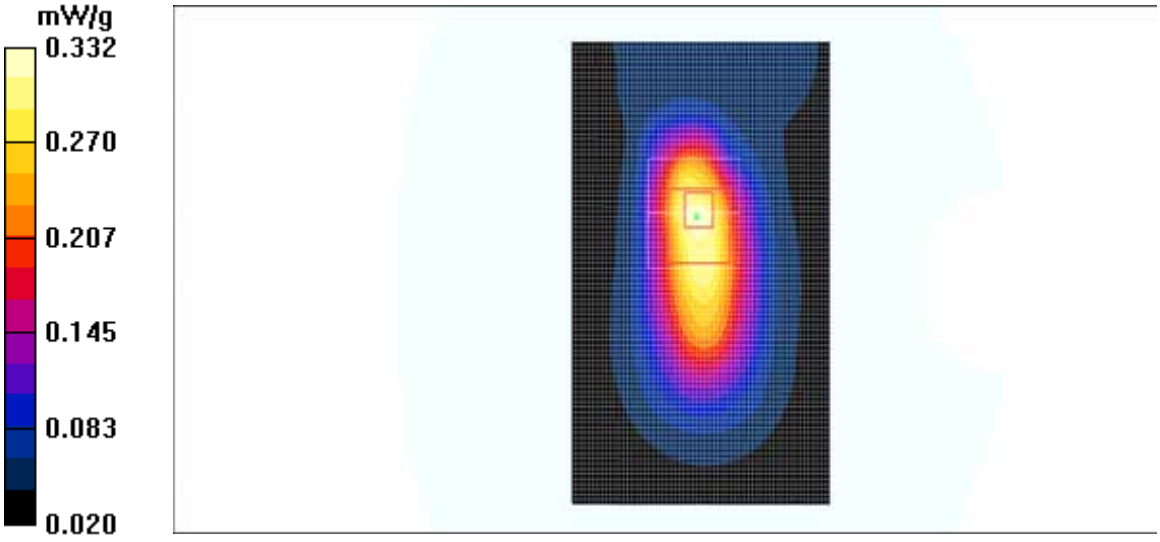


Fig.23 LTE BAND 4 Middle

LTE BAND 4, Position 4 Low Frequency 16QAM_20MHz_1RB_Low

Date/Time: 2011-12-26 14:03:11
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1720 MHz; σ = 1.45 mho/m; εr = 53.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1720 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.192 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.7 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 0.273 W/kg
SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.100 mW/g
Maximum value of SAR (measured) = 0.184 mW/g

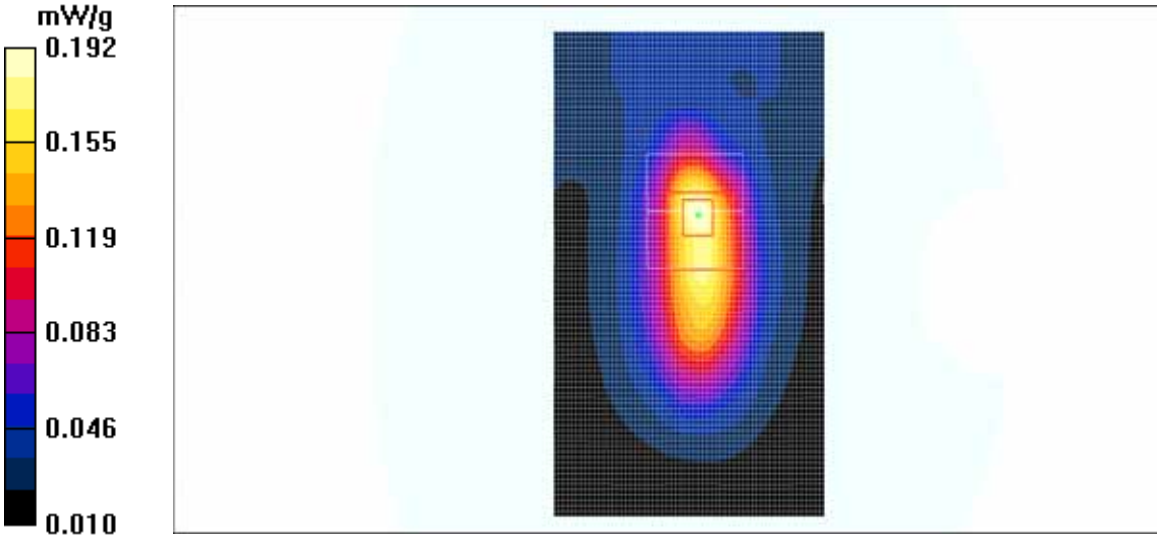


Fig.24 LTE BAND 4 Low

LTE BAND 4, Position 6 Middle Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-26 14:20:13
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.964 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.7 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 1.40 W/kg
SAR(1 g) = 0.866 mW/g; SAR(10 g) = 0.489 mW/g
Maximum value of SAR (measured) = 0.952 mW/g

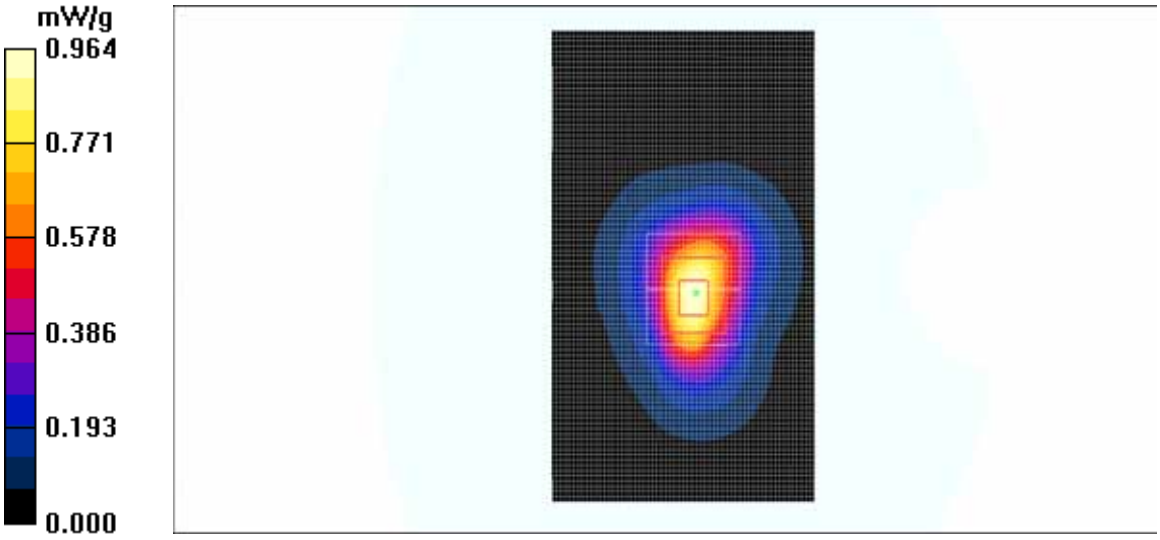


Fig.25 LTE BAND 4 Middle

LTE BAND 4, Position 6 High Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-26 14:35:39
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1745 MHz; σ = 1.47 mho/m; εr = 52.9; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1745 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.08 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.3 V/m; Power Drift = -0.069 dB
Peak SAR (extrapolated) = 1.56 W/kg
SAR(1 g) = 0.971 mW/g; SAR(10 g) = 0.556 mW/g
Maximum value of SAR (measured) = 1.06 mW/g

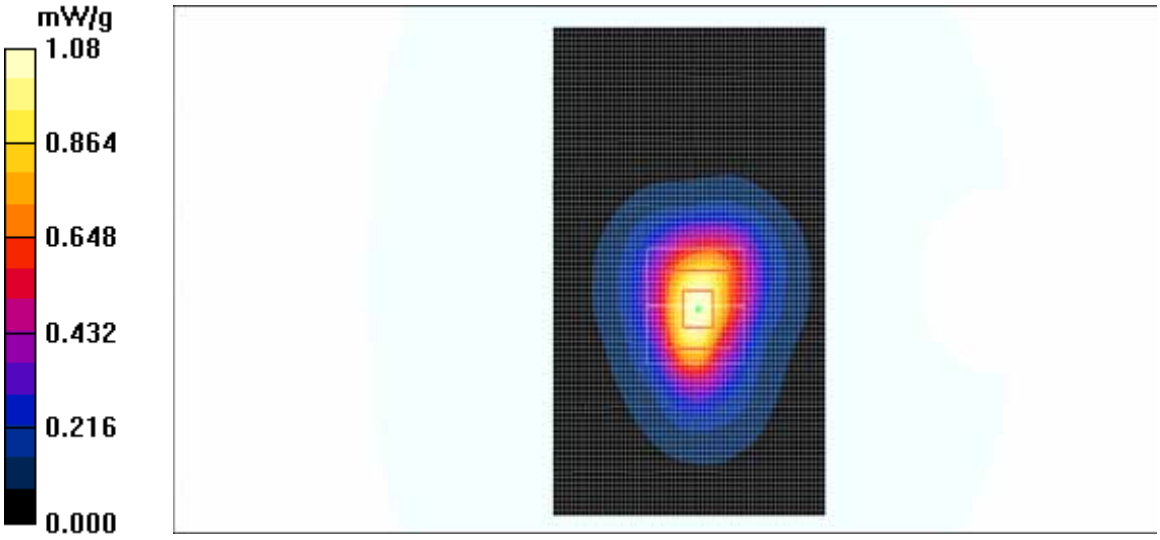


Fig.26 LTE BAND 4 High

LTE BAND 4, Position 6 Low Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-26 14:51:08
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1720 MHz; σ = 1.45 mho/m; εr = 53.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1720 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.03 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.2 V/m; Power Drift = -0.103 dB
Peak SAR (extrapolated) = 1.51 W/kg
SAR(1 g) = 0.930 mW/g; SAR(10 g) = 0.523 mW/g
Maximum value of SAR (measured) = 1.03 mW/g

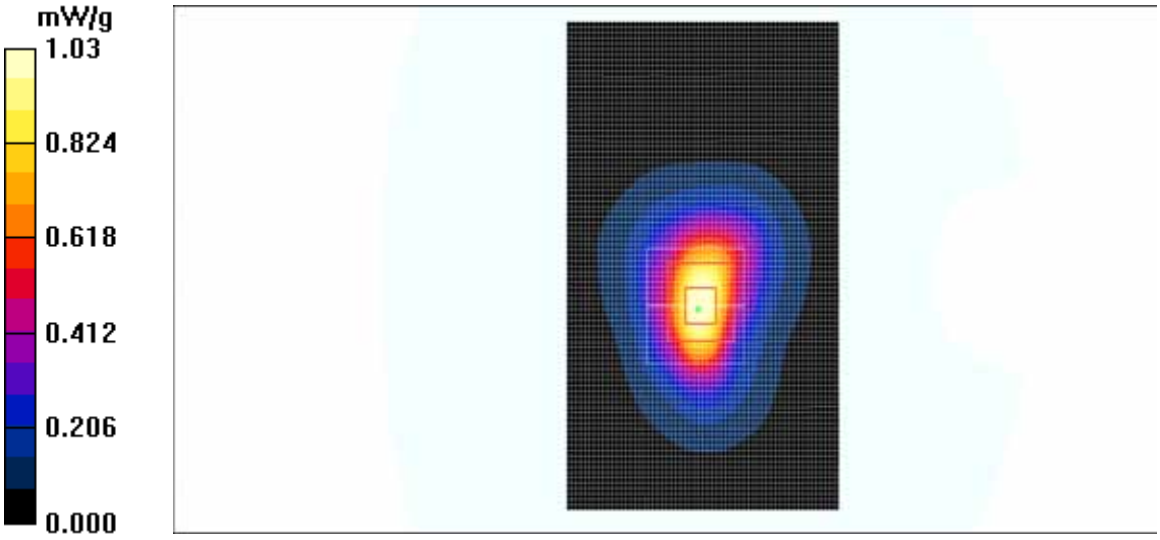


Fig.27 LTE BAND 4 Low

LTE BAND 4, Position 6 Middle Frequency QPSK_20MHz_1RB_High
Date/Time: 2011-12-26 15:06:33
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.37 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.4 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 1.95 W/kg
SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.702 mW/g
Maximum value of SAR (measured) = 1.33 mW/g

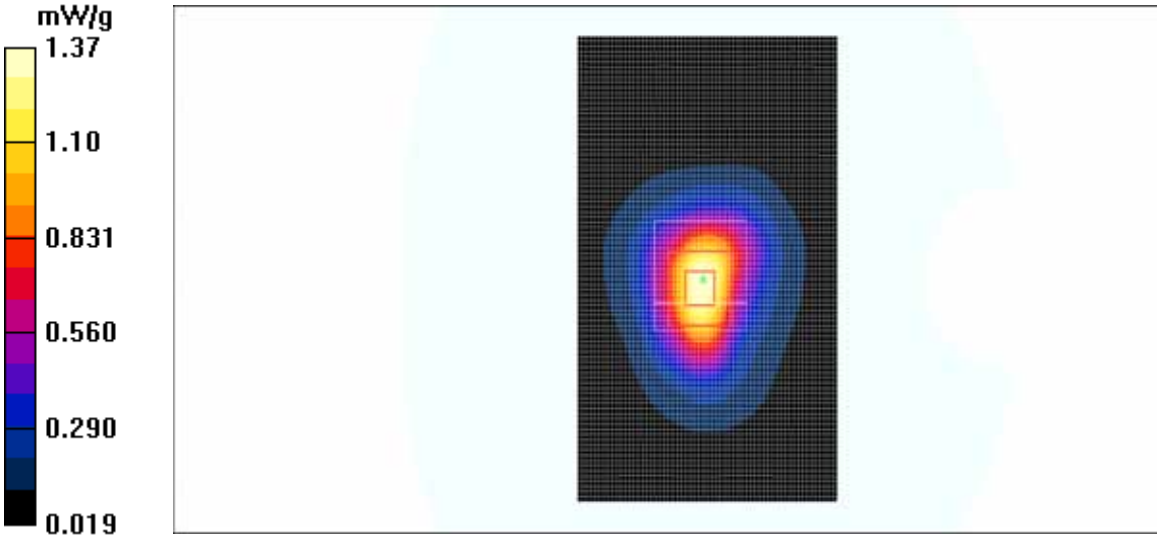


Fig.28 LTE BAND 4 Middle

Fig. 28-1 Z-Scan at power reference point (LTE BAND 4 Middle)

LTE BAND 4, Position 6 High Frequency QPSK_20MHz_1RB_Low
Date/Time: 2011-12-26 15:21:59
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1745 MHz; σ = 1.47 mho/m; εr = 52.9; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1745 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.29 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.8 V/m; Power Drift = 0.029 dB
Peak SAR (extrapolated) = 1.86 W/kg
SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.670 mW/g
Maximum value of SAR (measured) = 1.27 mW/g

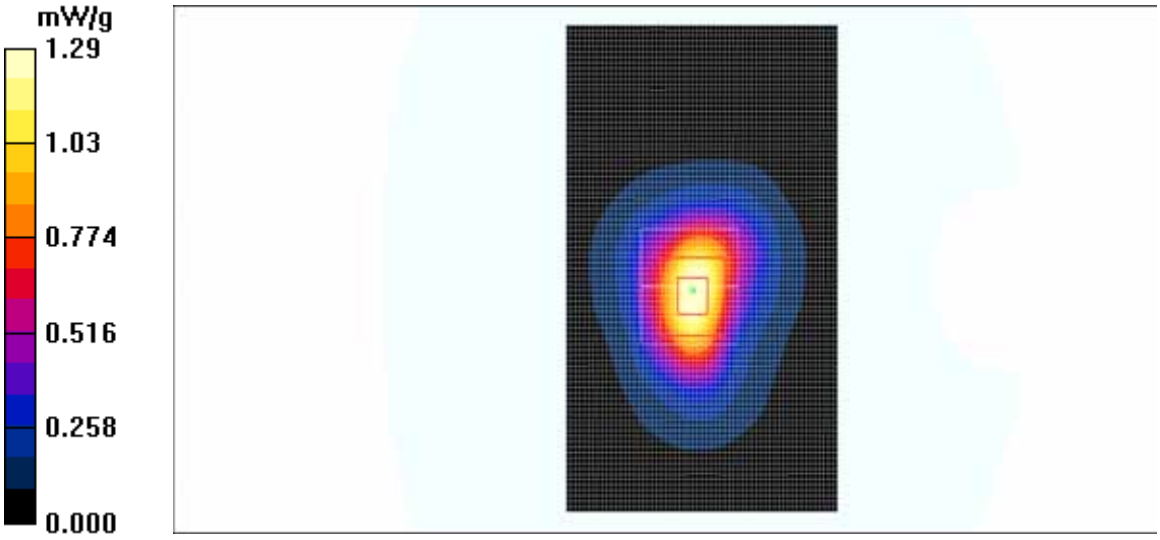


Fig.29 LTE BAND 4 High

LTE BAND 4, Position 6 High Frequency 16QAM_20MHz_50RB
Date/Time: 2011-12-26 15:37:31
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1745 MHz; σ = 1.47 mho/m; εr = 52.9; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1745 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 6 High 20M-50RB 16QAM/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.851 mW/g

Test Position 6 High 20M-50RB 16QAM/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.9 V/m; Power Drift = -0.018 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.758 mW/g; SAR(10 g) = 0.432 mW/g
Maximum value of SAR (measured) = 0.835 mW/g

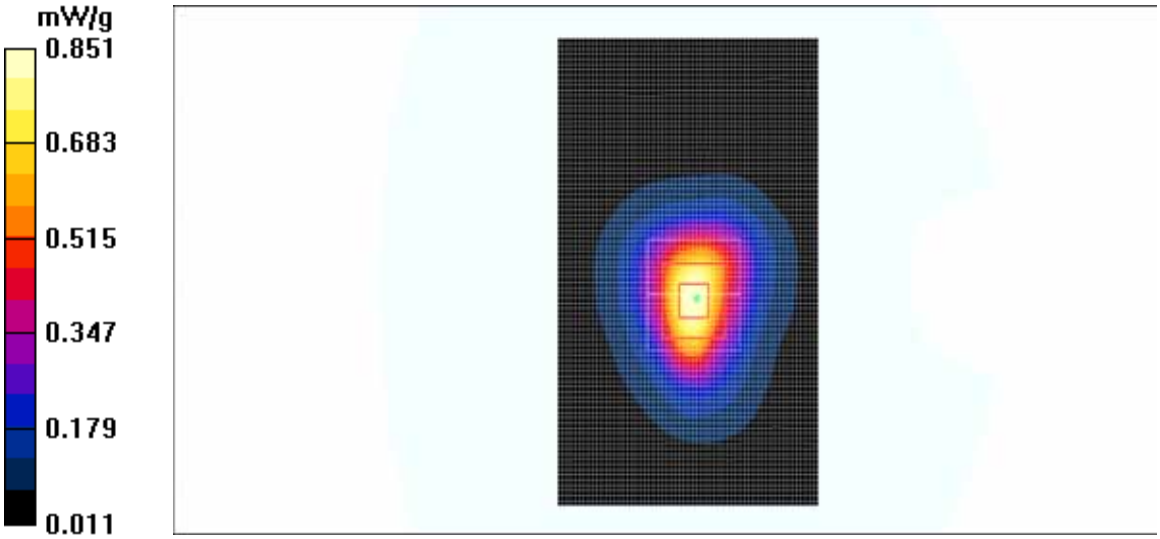


Fig.30 LTE BAND 4 High

LTE BAND 4, Position 6 Middle Frequency 16QAM_20MHz_1RB_High
Date/Time: 2011-12-26 15:52:57
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1732.5 MHz; σ = 1.46 mho/m; εr = 53; ρ = 1000 kg/m3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1732.5 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.04 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.6 V/m; Power Drift = -0.108 dB
Peak SAR (extrapolated) = 1.76 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.578 mW/g
Maximum value of SAR (measured) = 1.11 mW/g

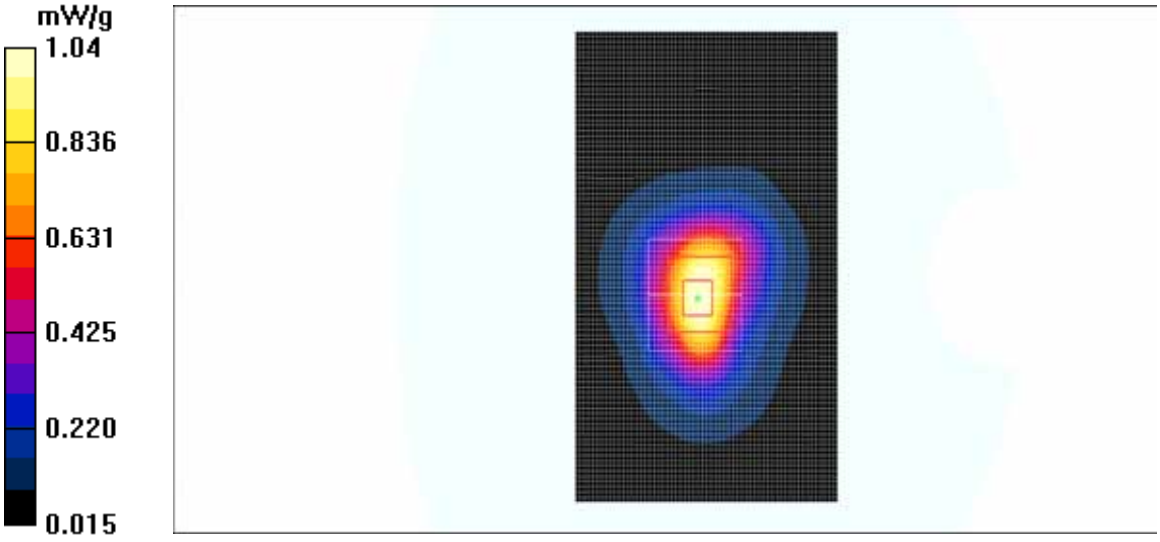


Fig.31 LTE BAND 4 Middle

LTE BAND 4, Position 6 Low Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-26 16:08:26
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f = 1720 MHz; σ = 1.45 mho/m; εr = 53.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band4 Frequency: 1720 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.18 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.4 V/m; Power Drift = 0.101 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.586 mW/g
Maximum value of SAR (measured) = 1.13 mW/g

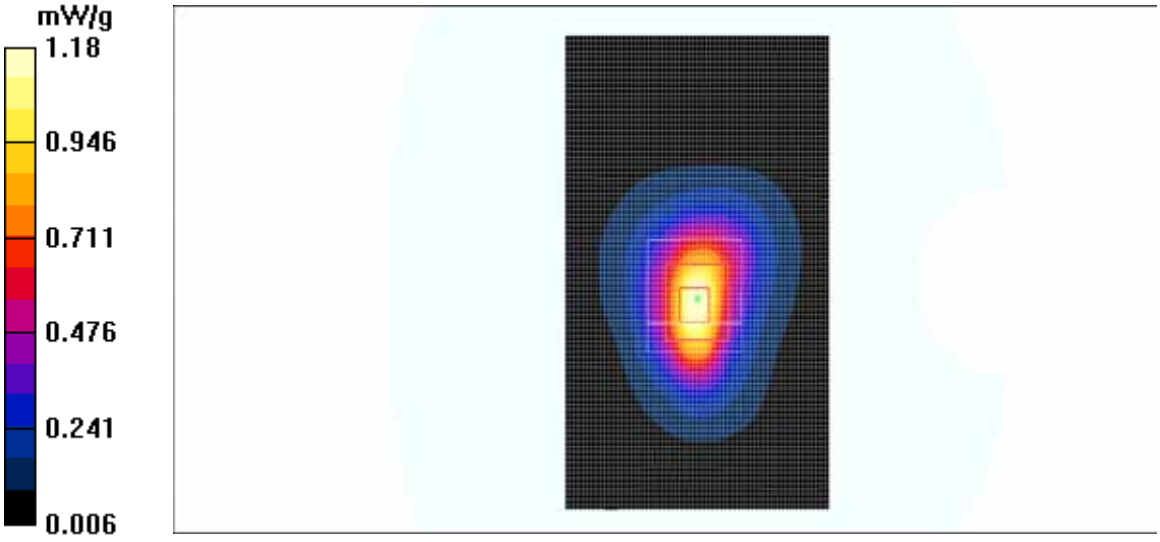


Fig.32 LTE BAND 4 Low

LTE BAND 7, Position 1 Middle Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-27 8:05:12
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.466 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.0 V/m; Power Drift = -0.110 dB
Peak SAR (extrapolated) = 0.793 W/kg
SAR(1 g) = 0.402 mW/g; SAR(10 g) = 0.217 mW/g
Maximum value of SAR (measured) = 0.446 mW/g

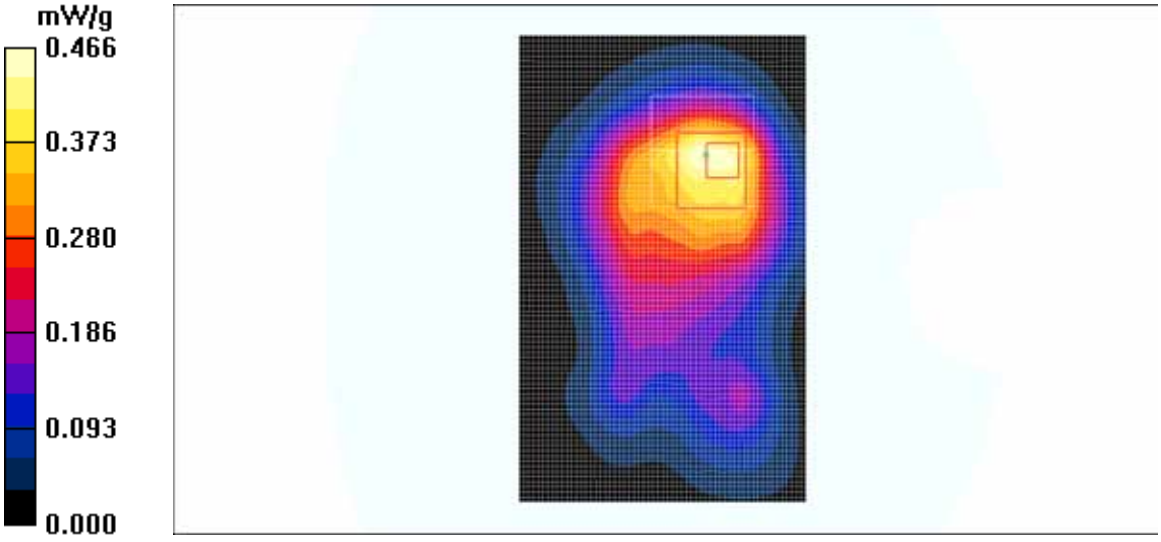


Fig.33 LTE BAND 7 Middle

LTE BAND 7, Position 1 Middle Frequency QPSK_20MHz_1RB_High
Date/Time: 2011-12-27 8:20:37
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.537 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.2 V/m; Power Drift = 0.066 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.528 mW/g; SAR(10 g) = 0.269 mW/g
Maximum value of SAR (measured) = 0.593 mW/g

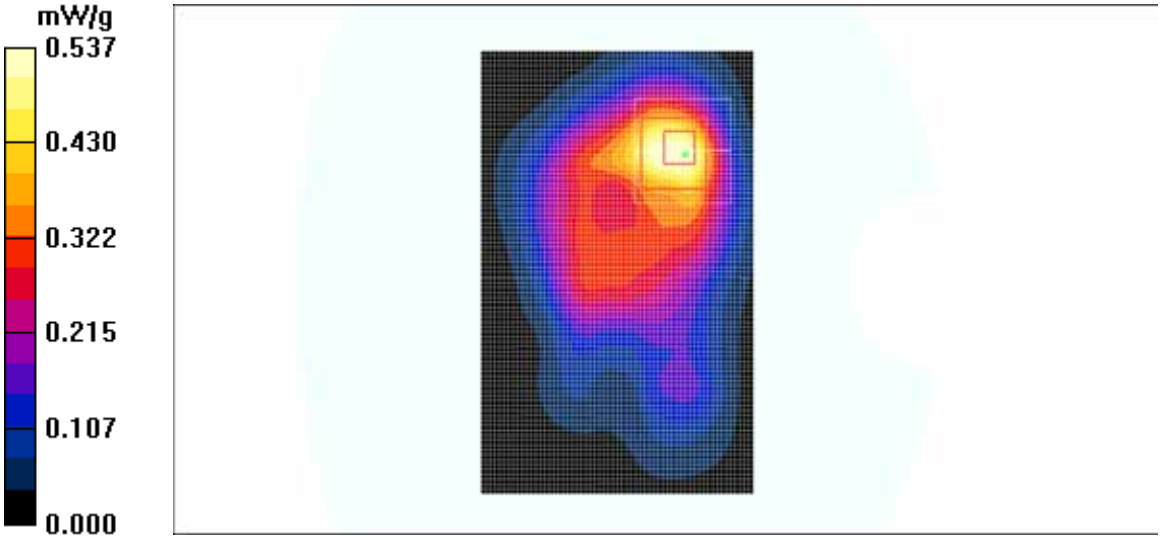


Fig.34 LTE BAND 7 Middle

LTE BAND 7, Position 1 High Frequency QPSK_20MHz_1RB_Low
Date/Time: 2011-12-27 8:36:02
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2560 MHz; σ = 2.08 mho/m; εr = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.619 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.4 V/m; Power Drift = -0.052 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.585 mW/g; SAR(10 g) = 0.297 mW/g
Maximum value of SAR (measured) = 0.665 mW/g

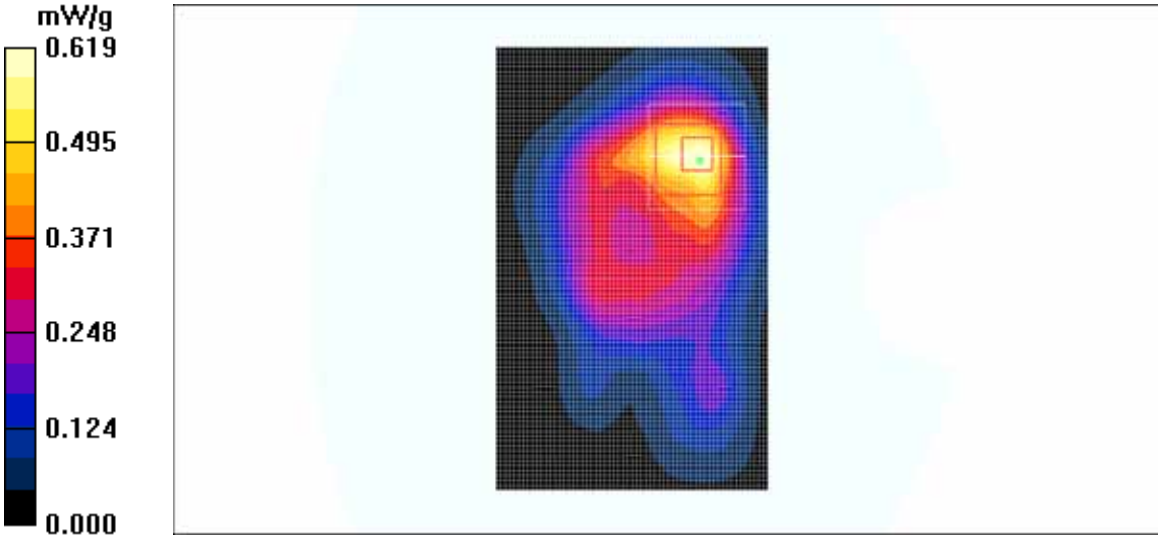


Fig.35 LTE BAND 7 High

LTE BAND 7, Position 1 Middle Frequency 16QAM_20MHz_50RB
Date/Time: 2011-12-27 8:51:26
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.328 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.93 V/m; Power Drift = 0.079 dB
Peak SAR (extrapolated) = 0.612 W/kg
SAR(1 g) = 0.306 mW/g; SAR(10 g) = 0.160 mW/g
Maximum value of SAR (measured) = 0.331 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.93 V/m; Power Drift = 0.079 dB
Peak SAR (extrapolated) = 0.384 W/kg
SAR(1 g) = 0.213 mW/g; SAR(10 g) = 0.123 mW/g
Maximum value of SAR (measured) = 0.236 mW/g

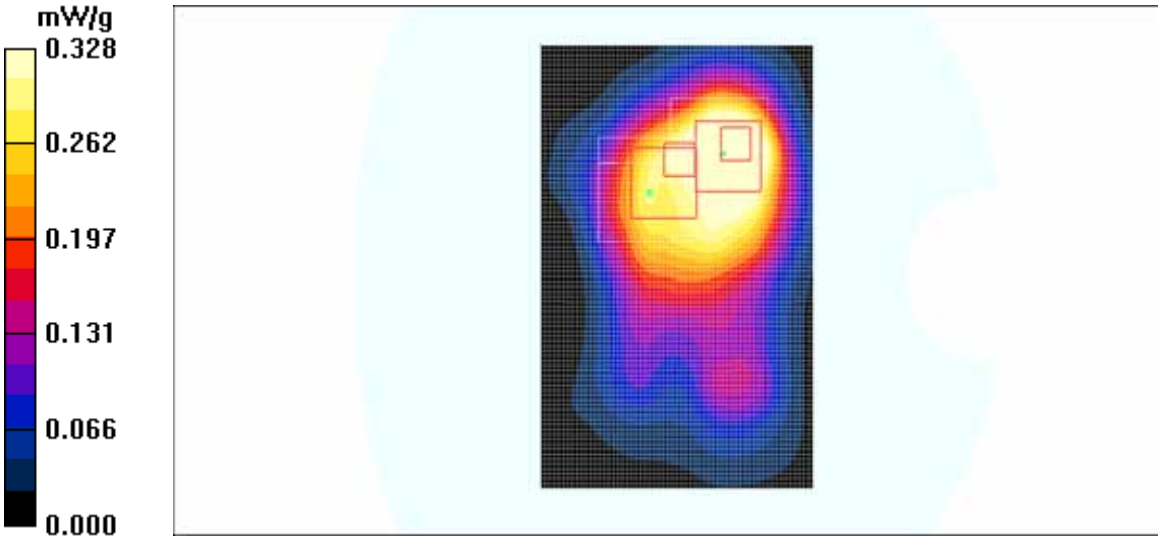


Fig.36 LTE BAND 7 Middle

LTE BAND 7, Position 1 Middle Frequency 16QAM_20MHz_1RB_High
Date/Time: 2011-12-27 9:06:55
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.441 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = -0.069 dB
Peak SAR (extrapolated) = 0.829 W/kg
SAR(1 g) = 0.426 mW/g; SAR(10 g) = 0.217 mW/g
Maximum value of SAR (measured) = 0.479 mW/g

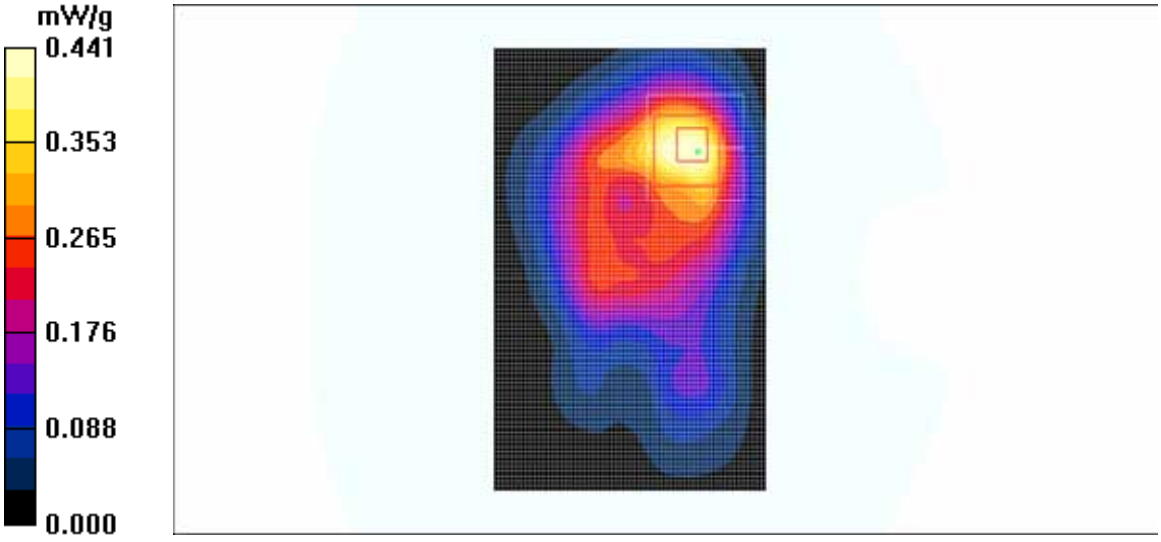


Fig.37 LTE BAND 7 Middle

LTE BAND 7, Position 1 High Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-27 9:22:21
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2560 MHz; σ = 2.08 mho/m; εr = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.506 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.0 V/m; Power Drift = 0.170 dB
Peak SAR (extrapolated) = 0.980 W/kg
SAR(1 g) = 0.463 mW/g; SAR(10 g) = 0.233 mW/g
Maximum value of SAR (measured) = 0.534 mW/g

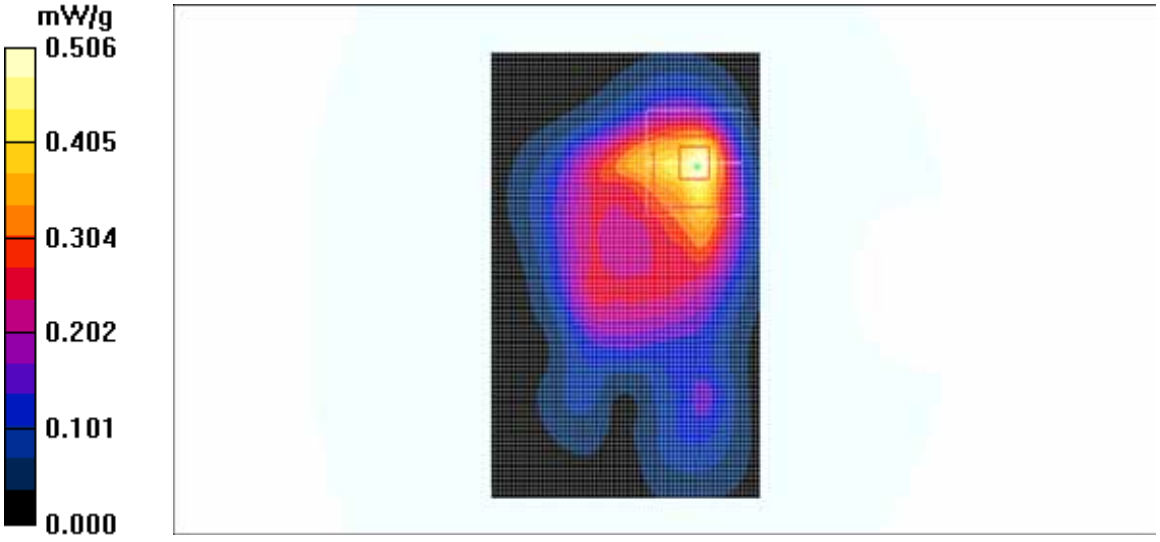


Fig.38 LTE BAND 7 High

LTE BAND 7, Position 1 Low Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-27 9:37:45
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2510 MHz; σ = 2.01 mho/m; εr = 52.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 1/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.669 mW/g

Test Position 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.5 V/m; Power Drift = 0.045 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.608 mW/g; SAR(10 g) = 0.321 mW/g
Maximum value of SAR (measured) = 0.677 mW/g

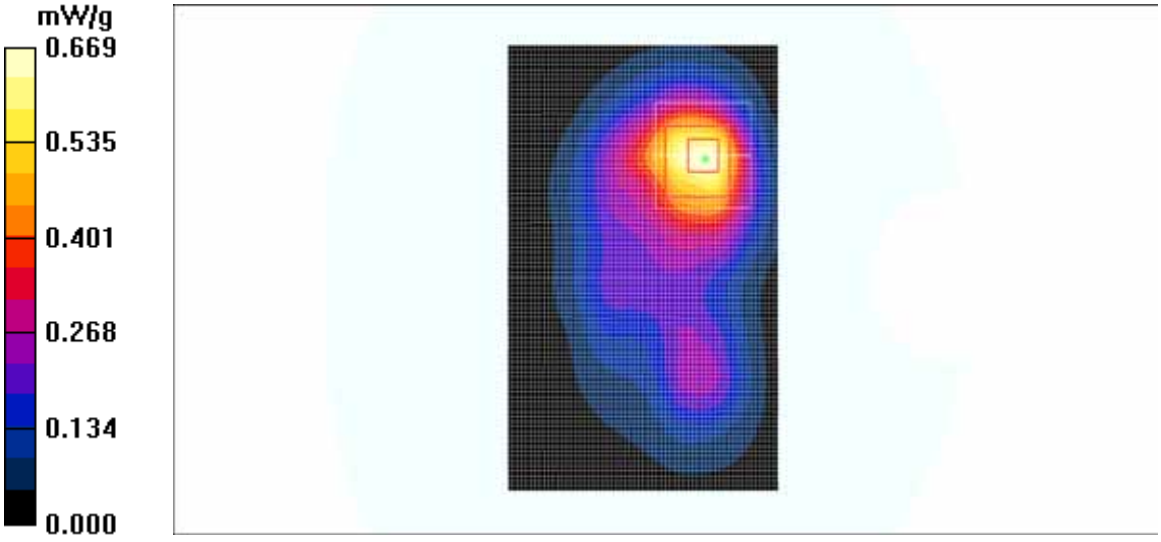


Fig.39 LTE BAND 7 Low

LTE BAND 7, Position 2 Middle Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-27 9:54:17
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.740 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.8 V/m; Power Drift = -0.051 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.653 mW/g; SAR(10 g) = 0.384 mW/g
Maximum value of SAR (measured) = 0.702 mW/g

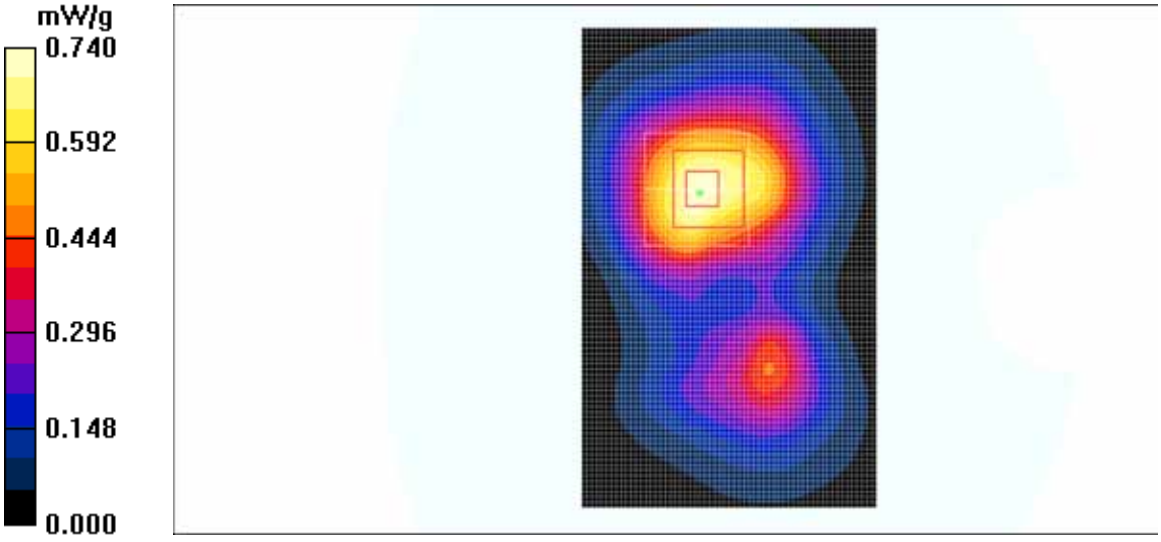


Fig.40 LTE BAND 7 Middle

LTE BAND 7, Position 2 Middle Frequency QPSK_20MHz_1RB_High
Date/Time: 2011-12-27 10:09:42
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.794 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.9 V/m; Power Drift = -0.187 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.755 mW/g; SAR(10 g) = 0.436 mW/g
Maximum value of SAR (measured) = 0.809 mW/g

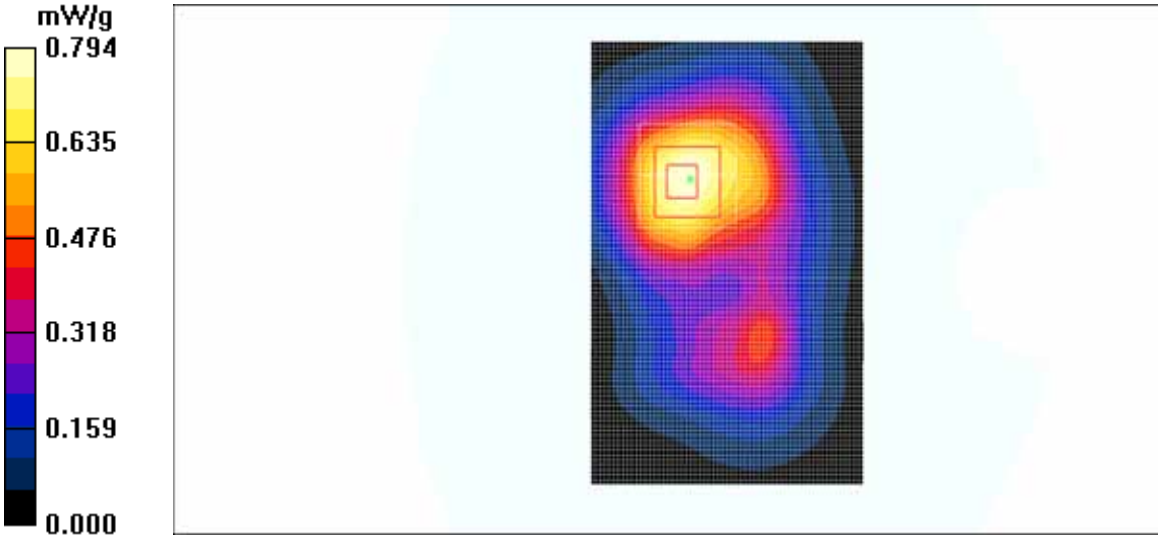


Fig.41 LTE BAND 7 Middle

LTE BAND 7, Position 2 High Frequency QPSK_20MHz_1RB_Low
Date/Time: 2011-12-27 10:25:10
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2560 MHz; σ = 2.08 mho/m; εr = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.937 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = -0.124 dB
Peak SAR (extrapolated) = 1.53 W/kg
SAR(1 g) = 0.862 mW/g; SAR(10 g) = 0.494 mW/g
Maximum value of SAR (measured) = 0.912 mW/g

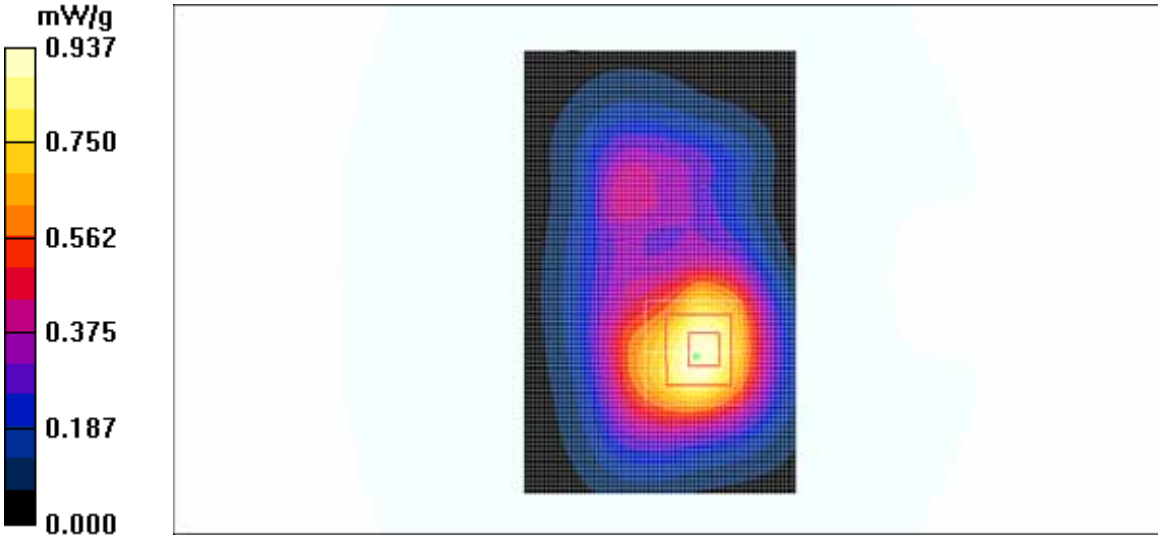


Fig.42 LTE BAND 7 High

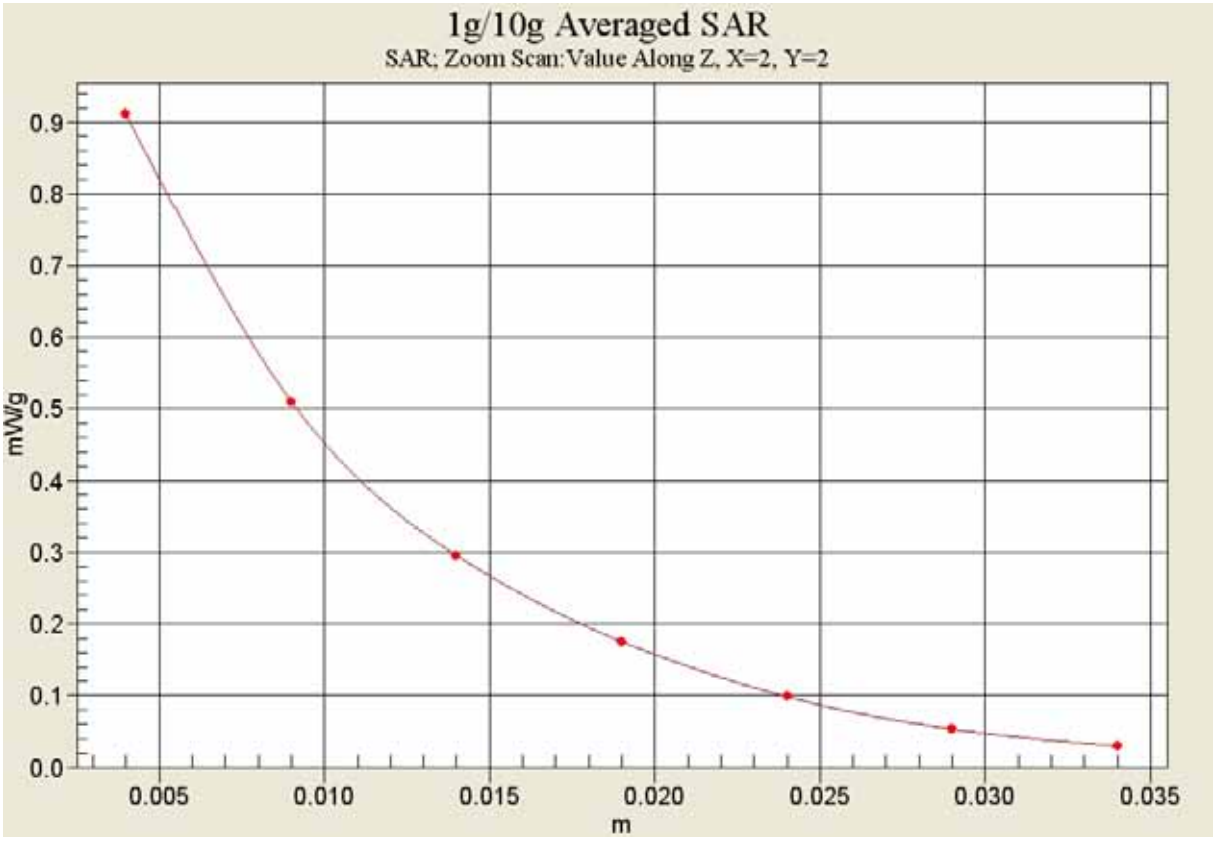


Fig. 42-1 Z-Scan at power reference point (LTE BAND 7 High)

LTE BAND 7, Position 2 Middle Frequency 16QAM_20MHz_50RB
Date/Time: 2011-12-27 10:40:34
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.538 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.87 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 0.817 W/kg
SAR(1 g) = 0.484 mW/g; SAR(10 g) = 0.286 mW/g
Maximum value of SAR (measured) = 0.514 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.87 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 0.548 W/kg
SAR(1 g) = 0.307 mW/g; SAR(10 g) = 0.168 mW/g
Maximum value of SAR (measured) = 0.332 mW/g

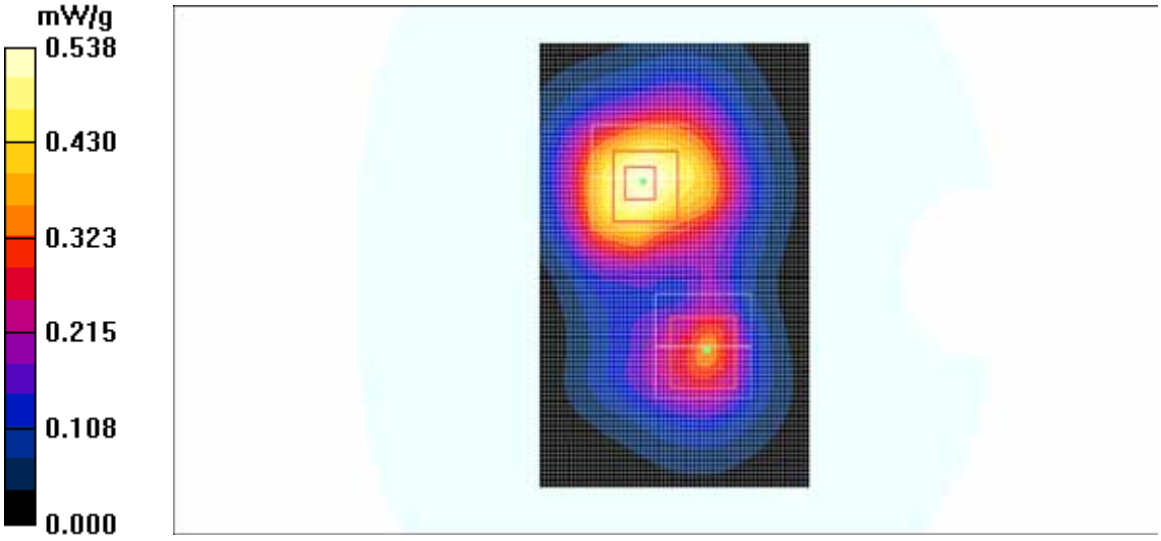


Fig.43 LTE BAND 7 Middle

LTE BAND 7, Position 2 Middle Frequency 16QAM_20MHz_1RB_High
Date/Time: 2011-12-27 10:56:03
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.672 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.7 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.600 mW/g; SAR(10 g) = 0.353 mW/g
Maximum value of SAR (measured) = 0.636 mW/g

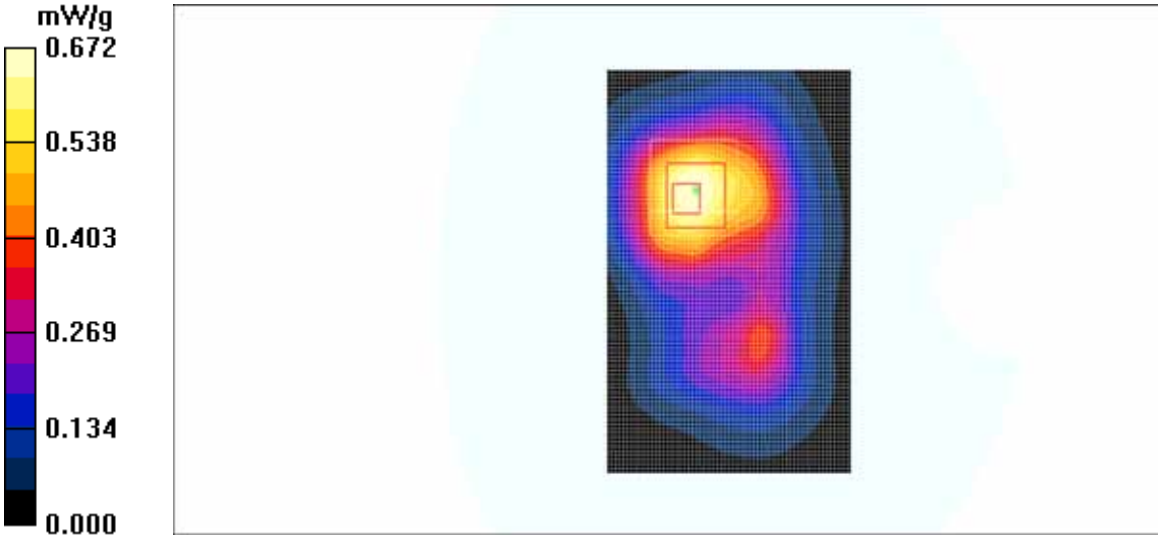


Fig.44 LTE BAND 7 Middle

LTE BAND 7, Position 2 High Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-27 11:11:25
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2560 MHz; σ = 2.08 mho/m; εr = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.766 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.2 V/m; Power Drift = -0.079 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.723 mW/g; SAR(10 g) = 0.414 mW/g
Maximum value of SAR (measured) = 0.770 mW/g

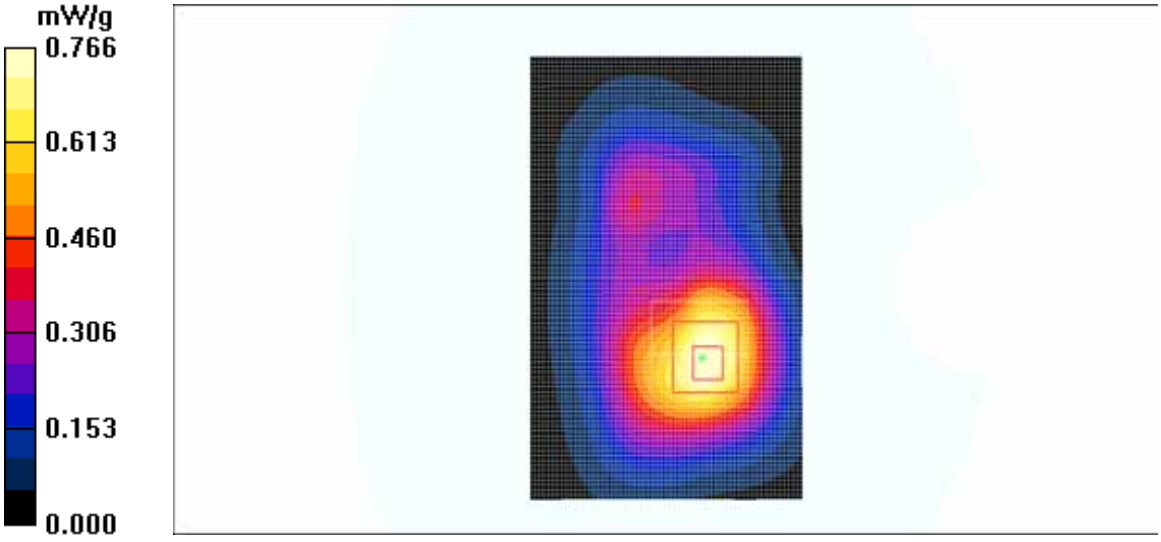


Fig.45 LTE BAND 7 High

LTE BAND 7, Position 2 Low Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-27 11:26:50
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2510 MHz; σ = 2.01 mho/m; εr = 52.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 2/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.862 mW/g

Test Position 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.4 V/m; Power Drift = 0.134 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.740 mW/g; SAR(10 g) = 0.438 mW/g
Maximum value of SAR (measured) = 0.783 mW/g

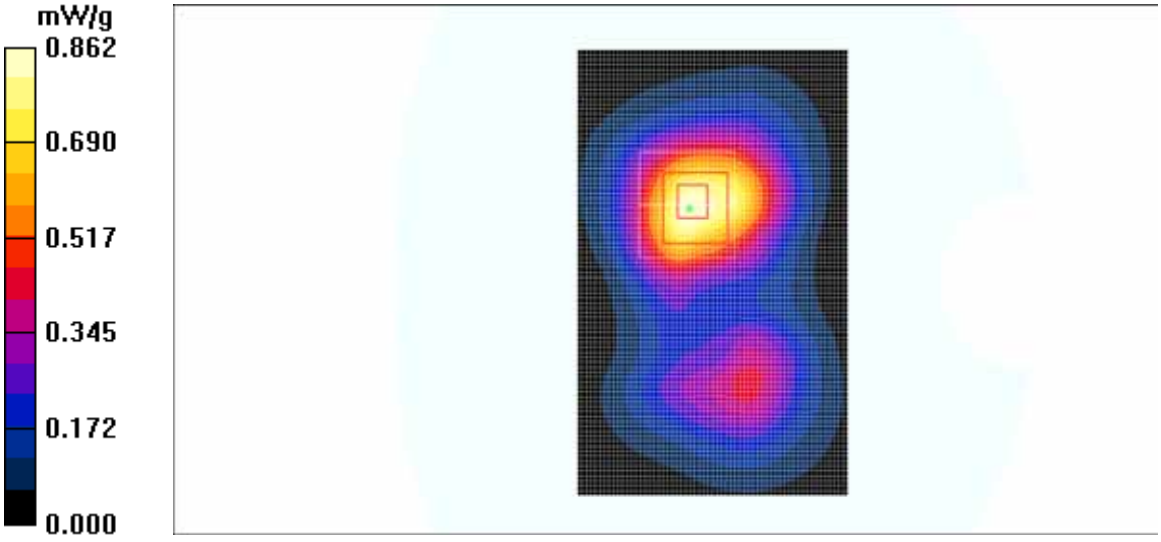


Fig.46 LTE BAND 7 Low

LTE BAND 7, Position 3 Middle Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-27 11:43:05
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.182 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.24 V/m; Power Drift = 0.007 dB
Peak SAR (extrapolated) = 0.291 W/kg
SAR(1 g) = 0.168 mW/g; SAR(10 g) = 0.095 mW/g
Maximum value of SAR (measured) = 0.183 mW/g

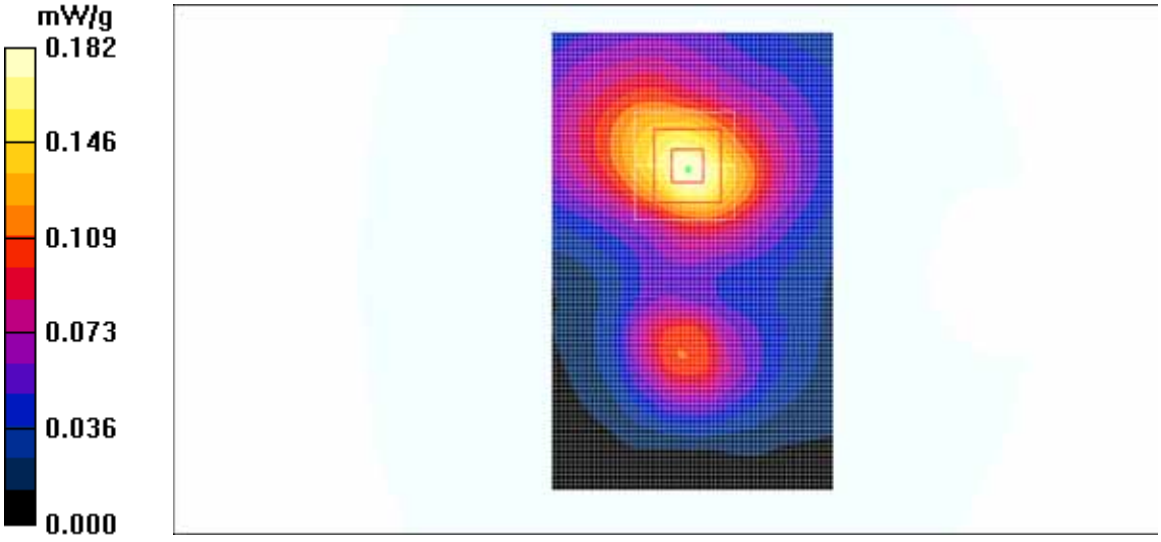


Fig.47 LTE BAND 7 Middle

LTE BAND 7, Position 3 Middle Frequency QPSK_20MHz_1RB_High
Date/Time: 2011-12-27 11:58:29
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.214 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.38 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 0.345 W/kg
SAR(1 g) = 0.198 mW/g; SAR(10 g) = 0.112 mW/g
Maximum value of SAR (measured) = 0.215 mW/g

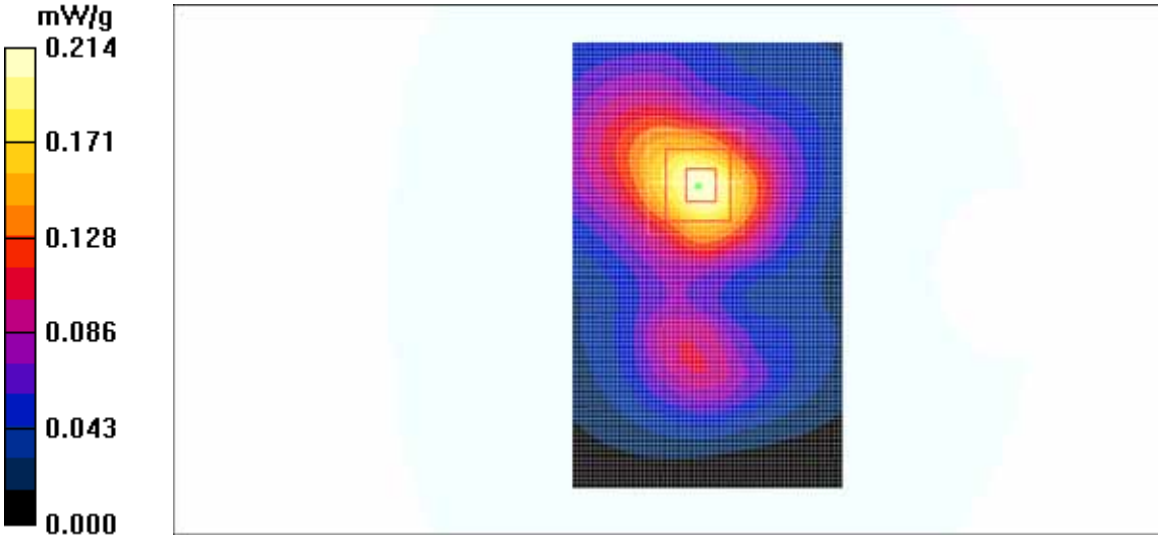


Fig.48 LTE BAND 7 Middle

LTE BAND 7, Position 3 High Frequency QPSK_20MHz_1RB_Low
Date/Time: 2011-12-27 12:13:54
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2560 MHz; σ = 2.08 mho/m; εr = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.226 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.54 V/m; Power Drift = 0.023 dB
Peak SAR (extrapolated) = 0.349 W/kg
SAR(1 g) = 0.202 mW/g; SAR(10 g) = 0.115 mW/g
Maximum value of SAR (measured) = 0.218 mW/g

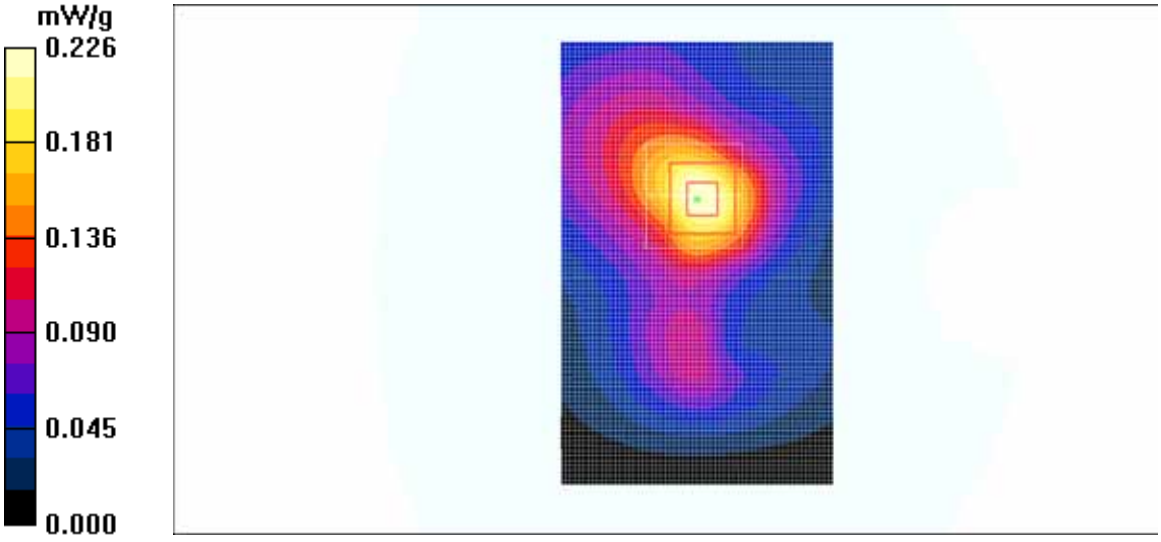


Fig.49 LTE BAND 7 High

LTE BAND 7, Position 3 Middle Frequency 16QAM_20MHz_50RB
Date/Time: 2011-12-27 12:29:26
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.135 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.44 V/m; Power Drift = 0.155 dB
Peak SAR (extrapolated) = 0.216 W/kg
SAR(1 g) = 0.124 mW/g; SAR(10 g) = 0.070 mW/g
Maximum value of SAR (measured) = 0.135 mW/g

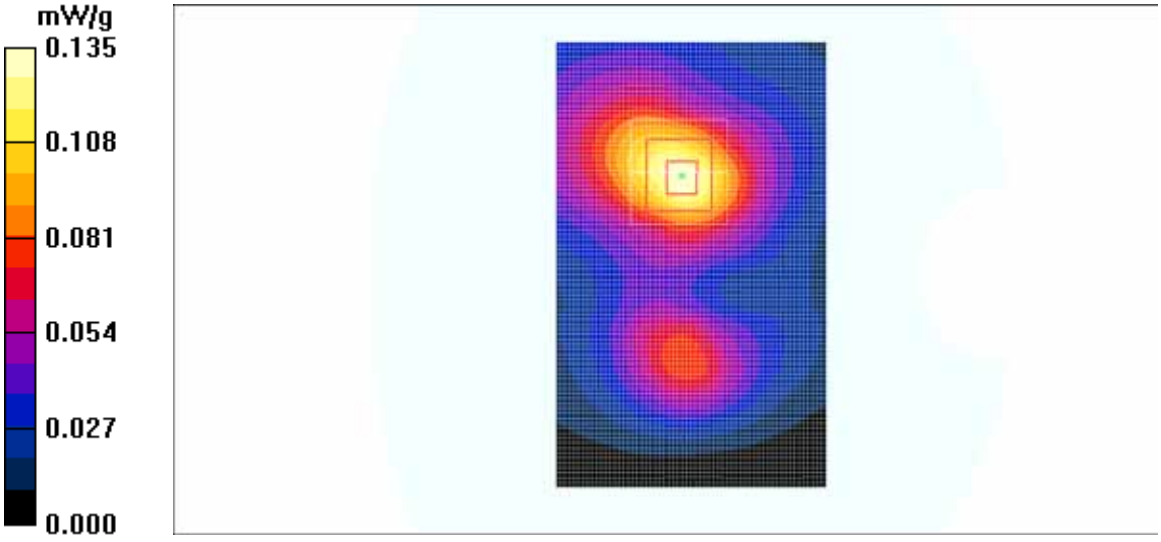


Fig.50 LTE BAND 7 Middle

LTE BAND 7, Position 3 Middle Frequency 16QAM_20MHz_1RB_High
Date/Time: 2011-12-27 12:44:51
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.178 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.69 V/m; Power Drift = 0.166 dB
Peak SAR (extrapolated) = 0.289 W/kg
SAR(1 g) = 0.163 mW/g; SAR(10 g) = 0.092 mW/g
Maximum value of SAR (measured) = 0.176 mW/g

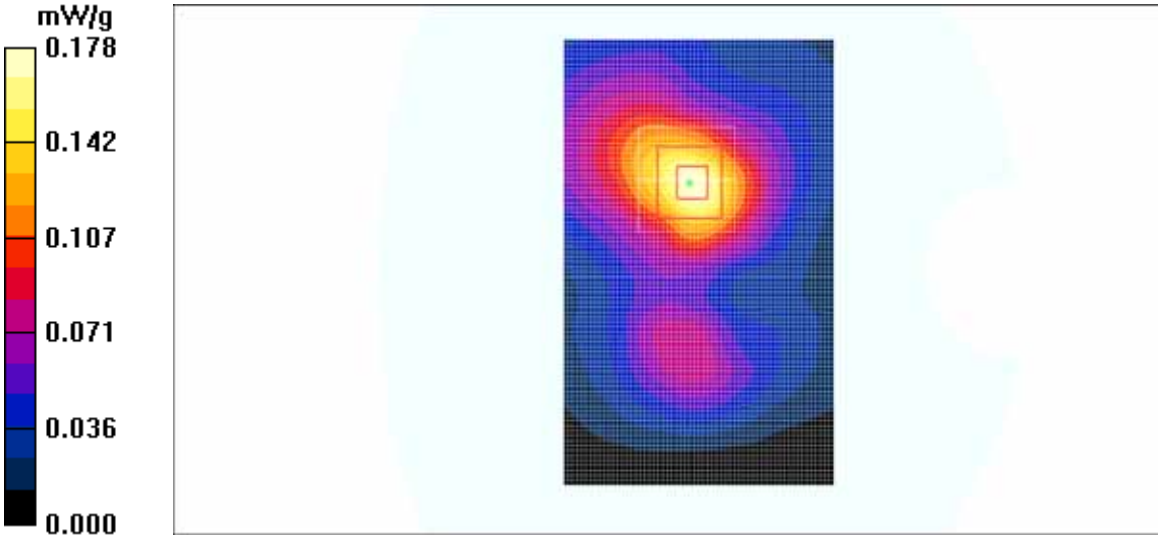


Fig.51 LTE BAND 7 Middle

LTE BAND 7, Position 3 High Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-27 13:00:17
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2560 MHz; σ = 2.08 mho/m; εr = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.187 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.89 V/m; Power Drift = 0.115 dB
Peak SAR (extrapolated) = 0.327 W/kg
SAR(1 g) = 0.176 mW/g; SAR(10 g) = 0.098 mW/g
Maximum value of SAR (measured) = 0.193 mW/g

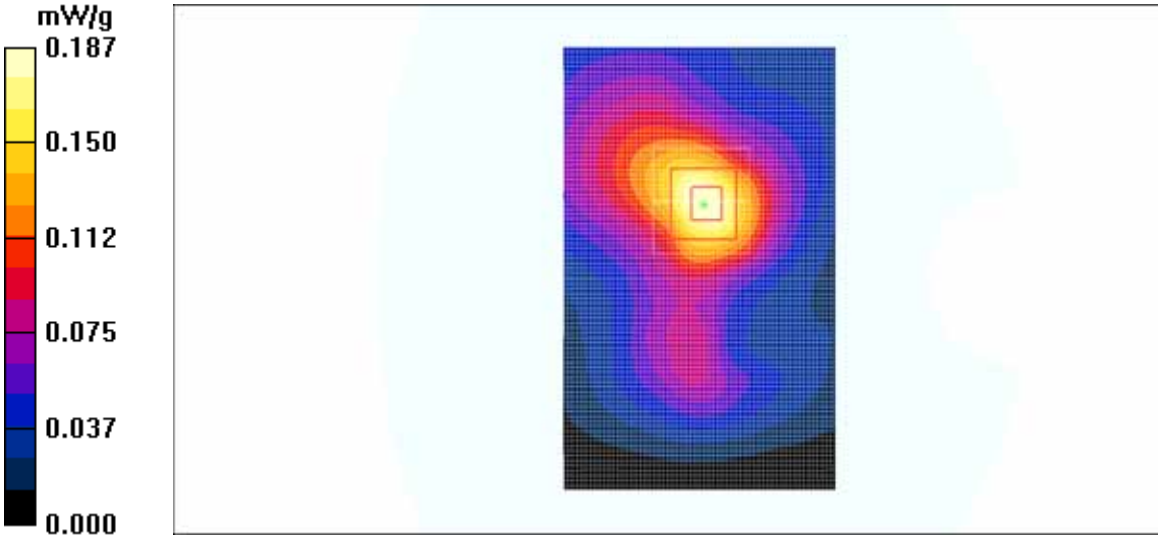


Fig.52 LTE BAND 7 High

LTE BAND 7, Position 3 Low Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-27 13:15:43
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2510 MHz; σ = 2.01 mho/m; εr = 52.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 3/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.155 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.36 V/m; Power Drift = 0.066 dB
Peak SAR (extrapolated) = 0.242 W/kg
SAR(1 g) = 0.144 mW/g; SAR(10 g) = 0.085 mW/g
Maximum value of SAR (measured) = 0.157 mW/g

Test Position 3/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.36 V/m; Power Drift = 0.066 dB
Peak SAR (extrapolated) = 0.196 W/kg
SAR(1 g) = 0.108 mW/g; SAR(10 g) = 0.061 mW/g
Maximum value of SAR (measured) = 0.118 mW/g

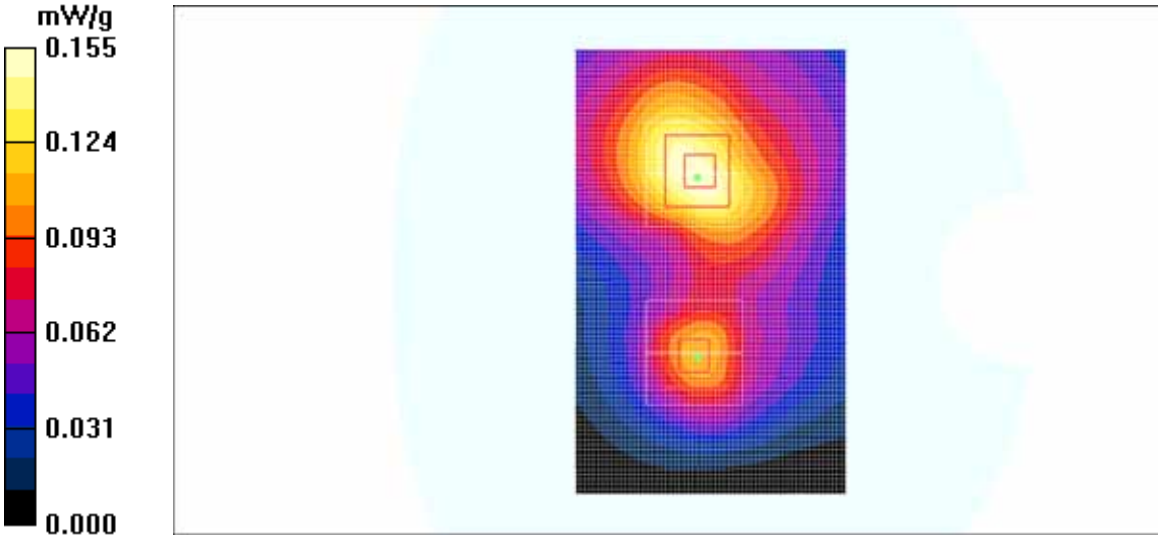


Fig.53 LTE BAND 7 Low

LTE BAND 7, Position 4 Middle Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-27 13:32:00
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.487 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.7 V/m; Power Drift = 0.084 dB
Peak SAR (extrapolated) = 0.777 W/kg
SAR(1 g) = 0.434 mW/g; SAR(10 g) = 0.237 mW/g
Maximum value of SAR (measured) = 0.476 mW/g

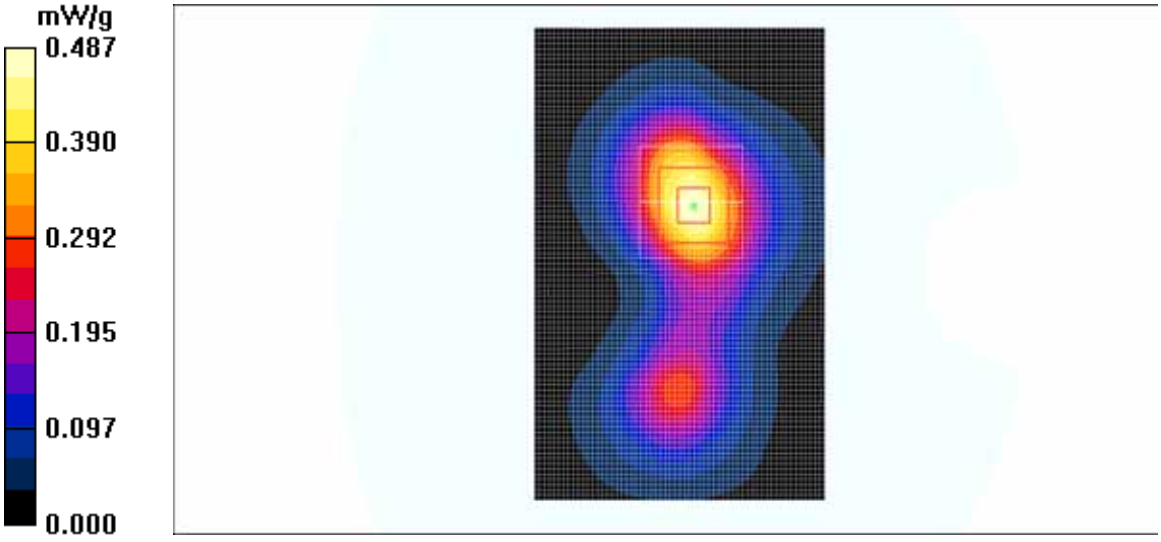


Fig.54 LTE BAND 7 Middle

LTE BAND 7, Position 4 Middle Frequency QPSK_20MHz_1RB_High
Date/Time: 2011-12-27 13:47:25
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.669 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.598 mW/g; SAR(10 g) = 0.326 mW/g
Maximum value of SAR (measured) = 0.657 mW/g

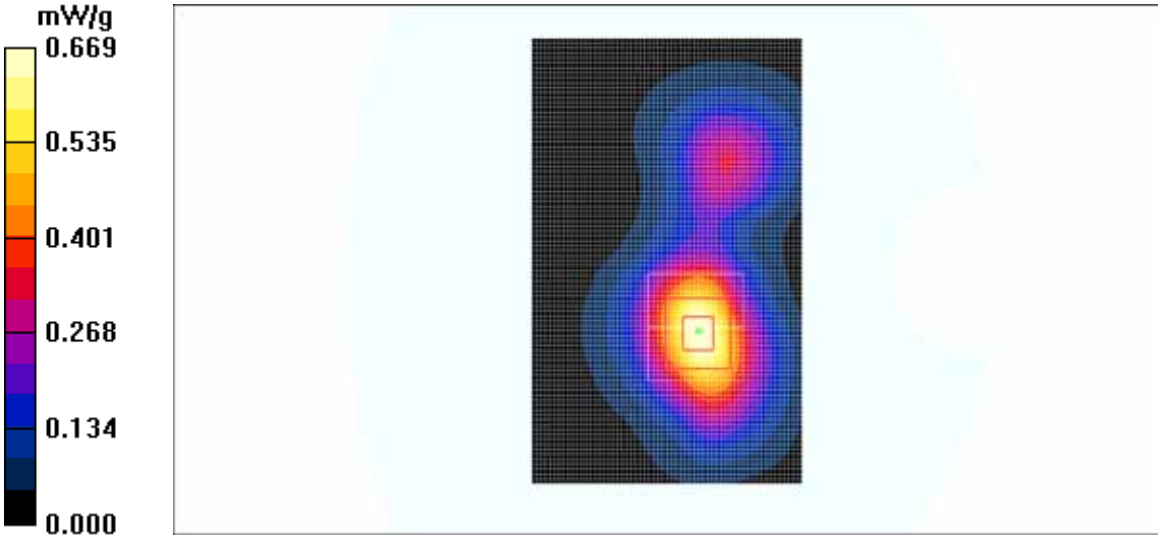


Fig.55 LTE BAND 7 Middle

LTE BAND 7, Position 4 High Frequency QPSK_20MHz_1RB_Low
Date/Time: 2011-12-27 14:02:53
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2560 MHz; σ = 2.08 mho/m; εr = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.729 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.7 V/m; Power Drift = -0.178 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.617 mW/g; SAR(10 g) = 0.339 mW/g
Maximum value of SAR (measured) = 0.676 mW/g

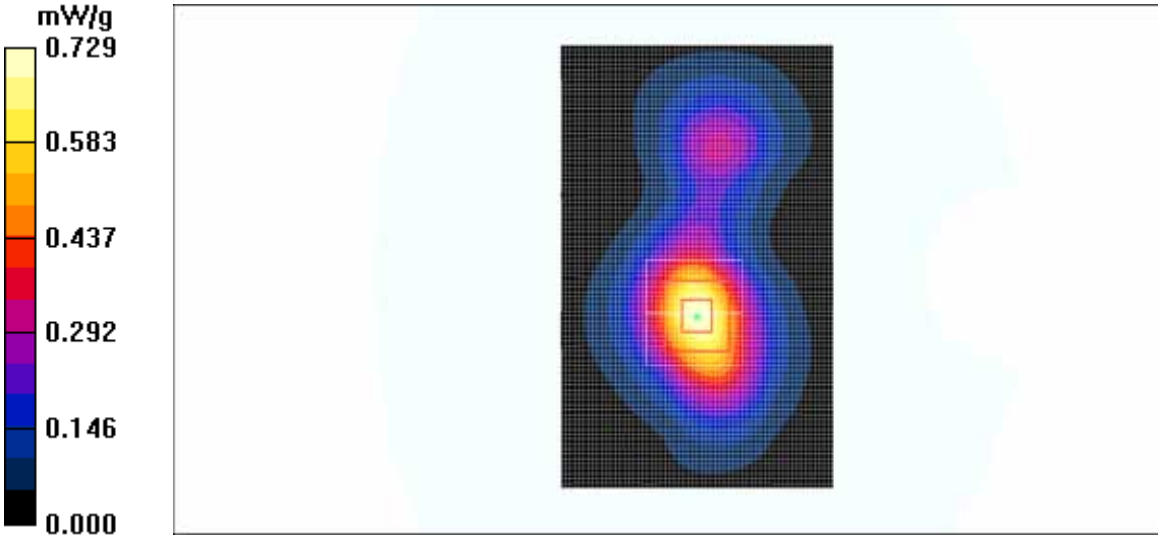


Fig.56 LTE BAND 7 High

LTE BAND 7, Position 4 Middle Frequency 16QAM_20MHz_50RB
Date/Time: 2011-12-27 14:18:22
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.406 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.32 V/m; Power Drift = 0.002 dB
Peak SAR (extrapolated) = 0.645 W/kg
SAR(1 g) = 0.365 mW/g; SAR(10 g) = 0.199 mW/g
Maximum value of SAR (measured) = 0.399 mW/g

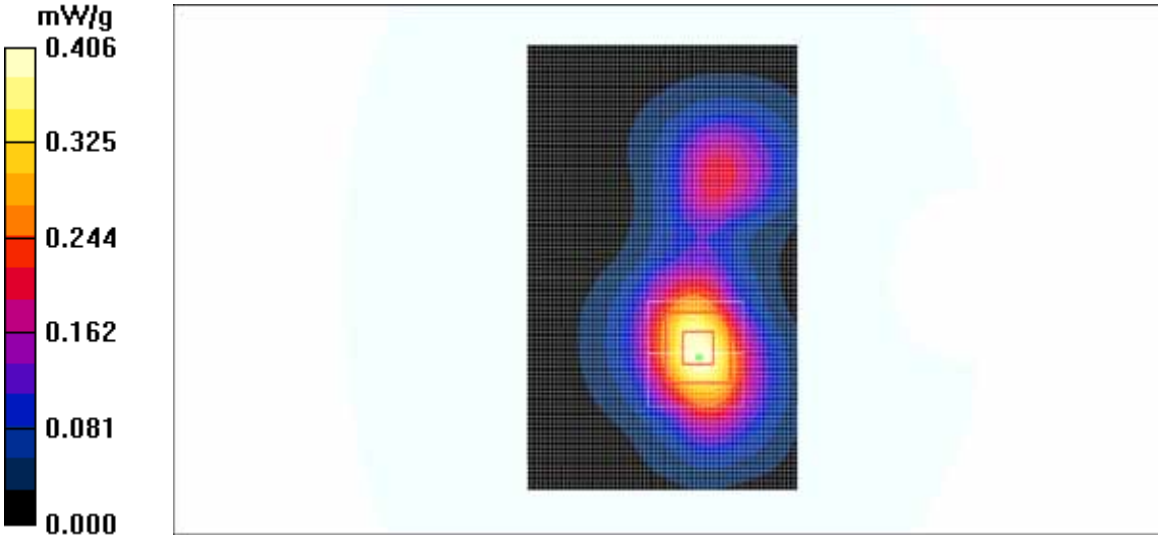


Fig.57 LTE BAND 7 Middle

LTE BAND 7, Position 4 Middle Frequency 16QAM_20MHz_1RB_High
Date/Time: 2011-12-27 14:33:48
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.536 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 0.857 W/kg
SAR(1 g) = 0.486 mW/g; SAR(10 g) = 0.266 mW/g
Maximum value of SAR (measured) = 0.532 mW/g

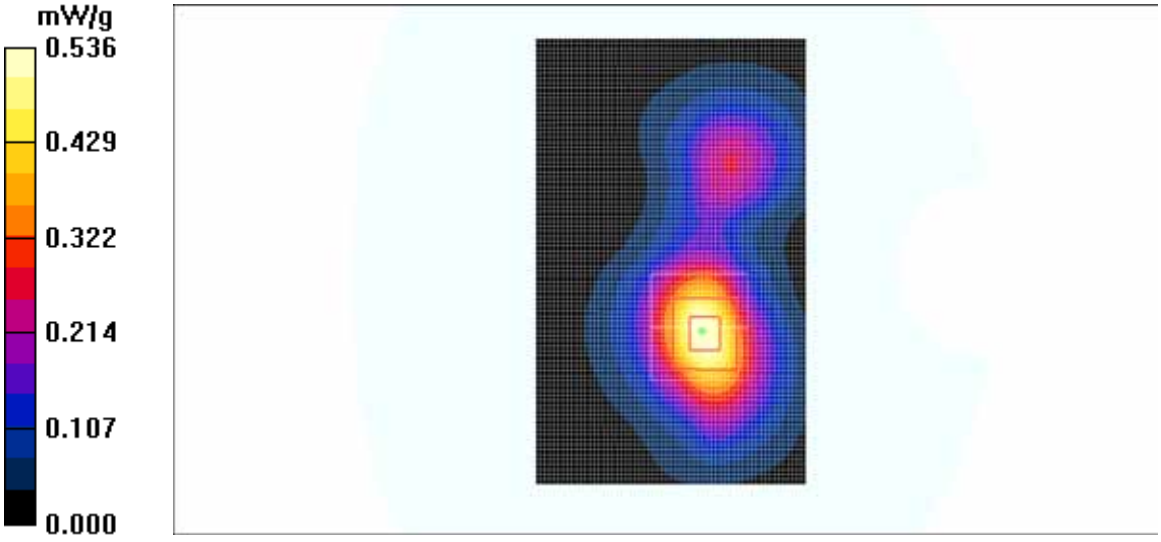


Fig.58 LTE BAND 7 Middle

LTE BAND 7, Position 4 High Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-27 14:49:20
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2560 MHz; σ = 2.08 mho/m; εr = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.578 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.0 V/m; Power Drift = -0.070 dB
Peak SAR (extrapolated) = 0.927 W/kg
SAR(1 g) = 0.510 mW/g; SAR(10 g) = 0.280 mW/g
Maximum value of SAR (measured) = 0.554 mW/g

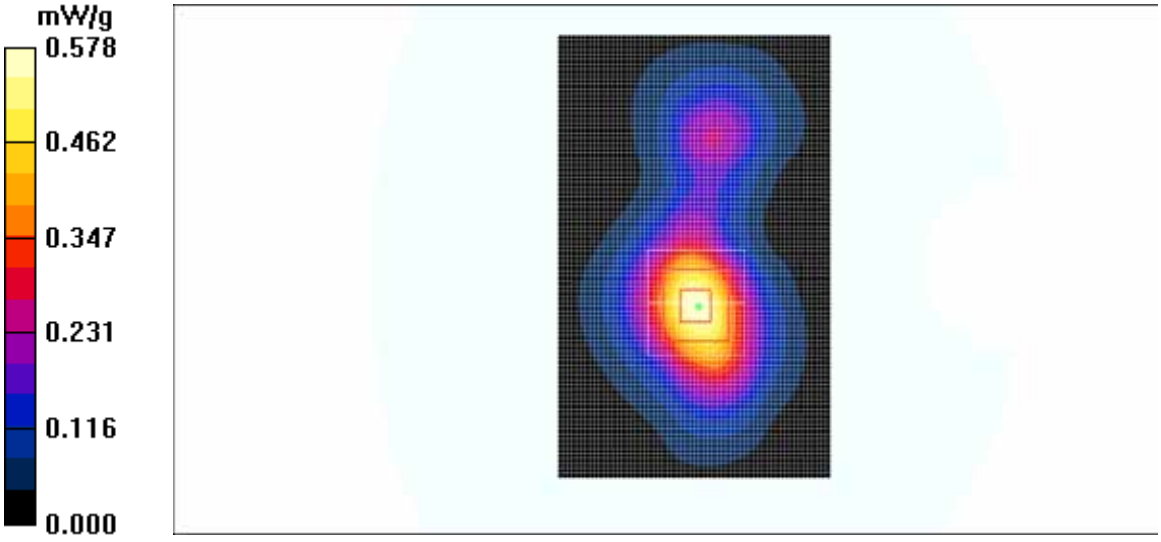


Fig.59 LTE BAND 7 High

LTE BAND 7, Position 4 Low Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-27 15:05:44
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2510 MHz; σ = 2.01 mho/m; εr = 52.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 4/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.686 mW/g

Test Position 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = -0.043 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.578 mW/g; SAR(10 g) = 0.316 mW/g
Maximum value of SAR (measured) = 0.630 mW/g

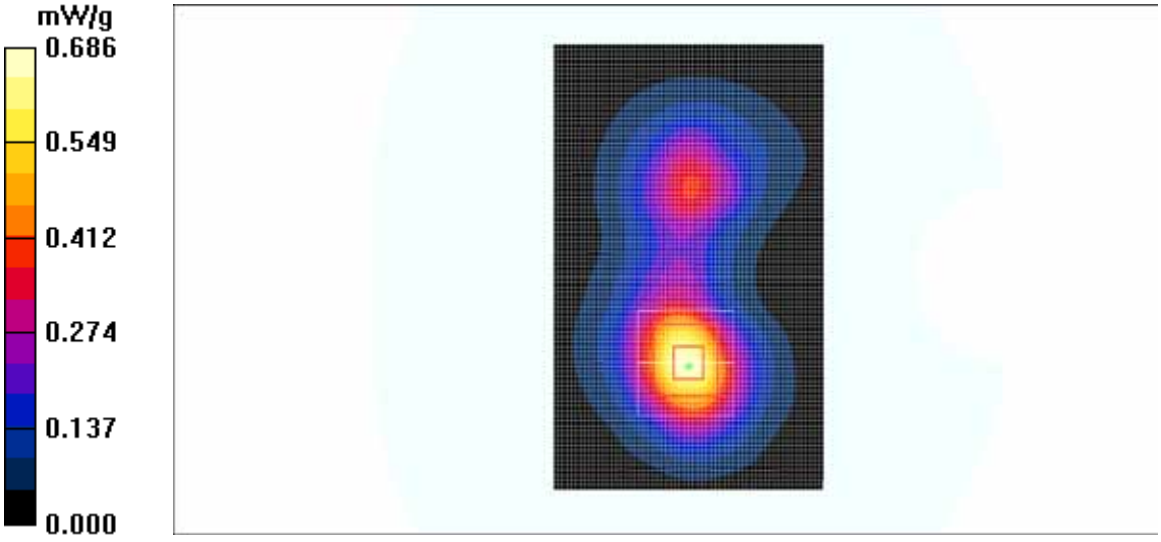


Fig.60 LTE BAND 7 Low

LTE BAND 7, Position 6 Middle Frequency QPSK_20MHz_50RB
Date/Time: 2011-12-27 15:22:14
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.565 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.7 V/m; Power Drift = -0.029 dB
Peak SAR (extrapolated) = 0.949 W/kg
SAR(1 g) = 0.508 mW/g; SAR(10 g) = 0.265 mW/g
Maximum value of SAR (measured) = 0.556 mW/g

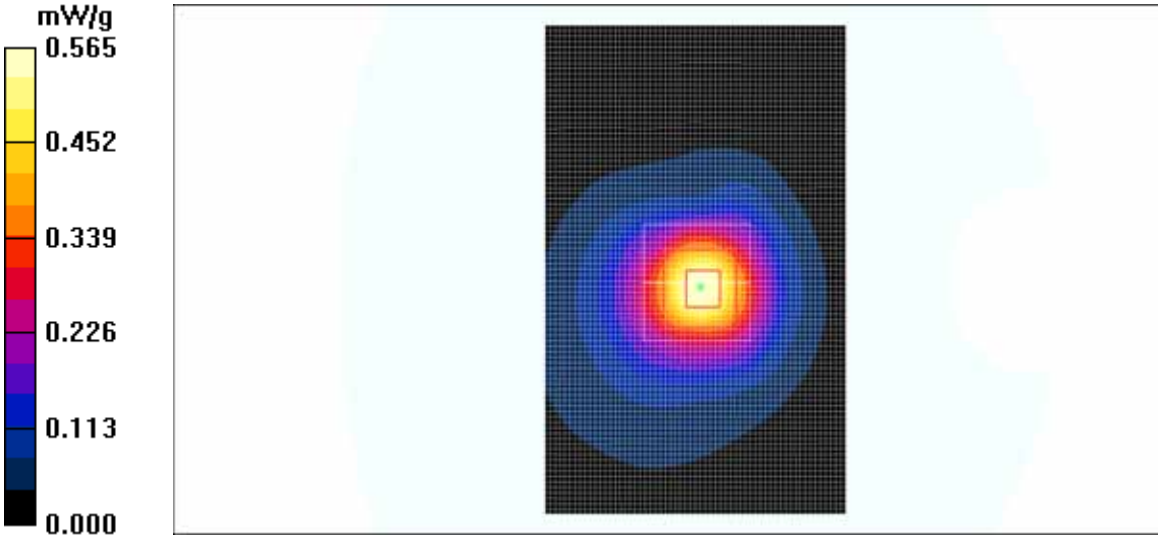


Fig.61 LTE BAND 7 Middle

LTE BAND 7, Position 6 Middle Frequency QPSK_20MHz_1RB_High
Date/Time: 2011-12-27 15:37:39
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.713 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.8 V/m; Power Drift = 0.005 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.644 mW/g; SAR(10 g) = 0.337 mW/g
Maximum value of SAR (measured) = 0.704 mW/g

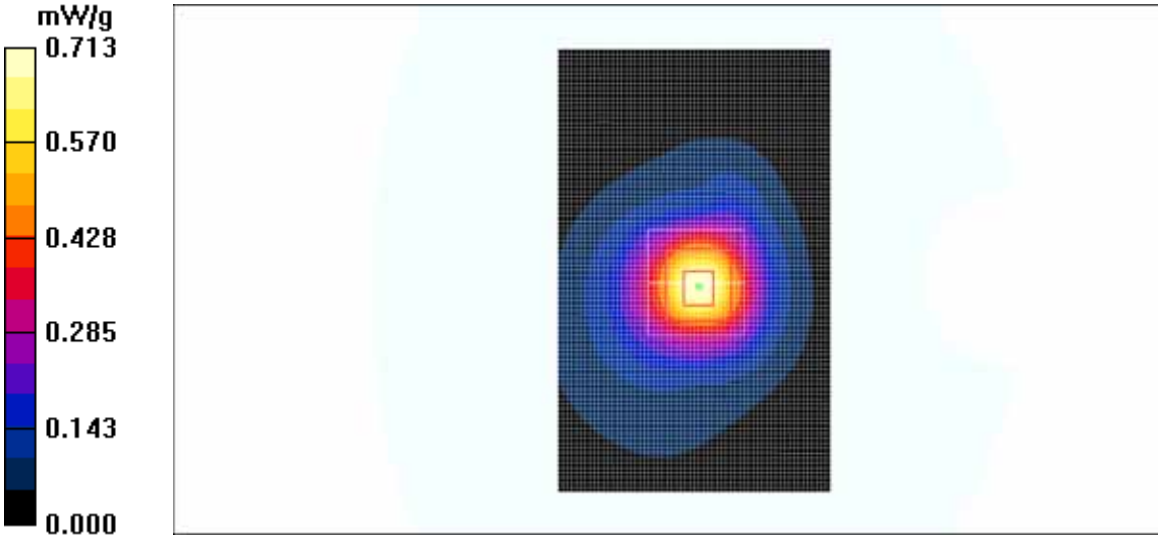


Fig.62 LTE BAND 7 Middle

LTE BAND 7, Position 6 High Frequency QPSK_20MHz_1RB_Low
Date/Time: 2011-12-27 15:53:04
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2560 MHz; σ = 2.08 mho/m; εr = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.730 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.0 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.658 mW/g; SAR(10 g) = 0.343 mW/g
Maximum value of SAR (measured) = 0.716 mW/g

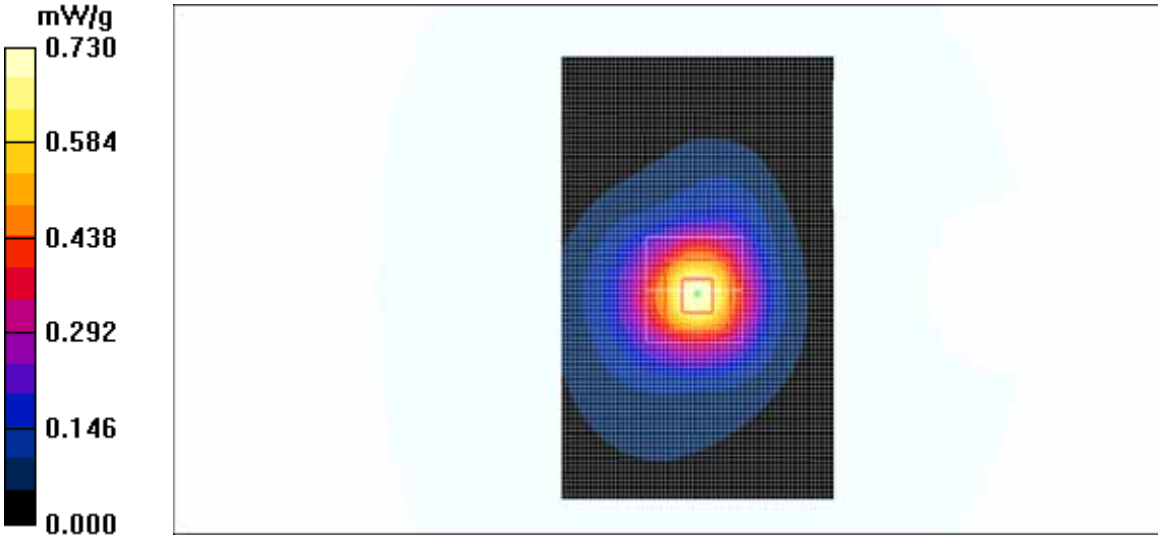


Fig.63 LTE BAND 7 High

LTE BAND 7, Position 6 Middle Frequency 16QAM_20MHz_50RB
Date/Time: 2011-12-27 16:08:28
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.449 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = 0.143 dB
Peak SAR (extrapolated) = 0.767 W/kg
SAR(1 g) = 0.408 mW/g; SAR(10 g) = 0.212 mW/g
Maximum value of SAR (measured) = 0.447 mW/g

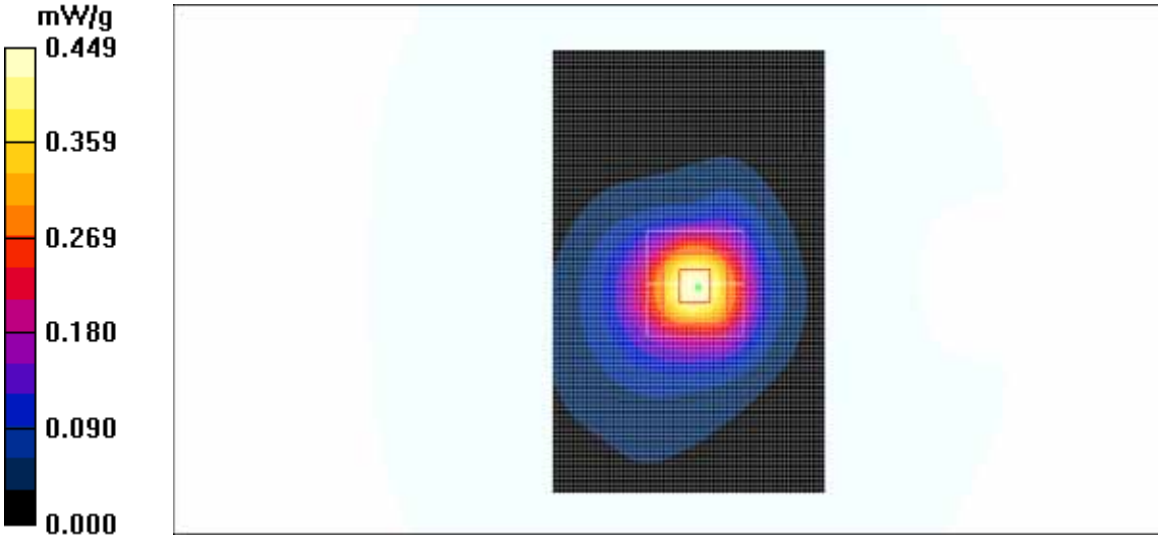


Fig.64 LTE BAND 7 Middle

LTE BAND 7, Position 6 Middle Frequency 16QAM_20MHz_1RB_High
Date/Time: 2011-12-27 16:23:55
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2535 MHz; σ = 2.04 mho/m; εr = 52.0; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.595 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.1 V/m; Power Drift = 0.036 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.540 mW/g; SAR(10 g) = 0.281 mW/g
Maximum value of SAR (measured) = 0.591 mW/g

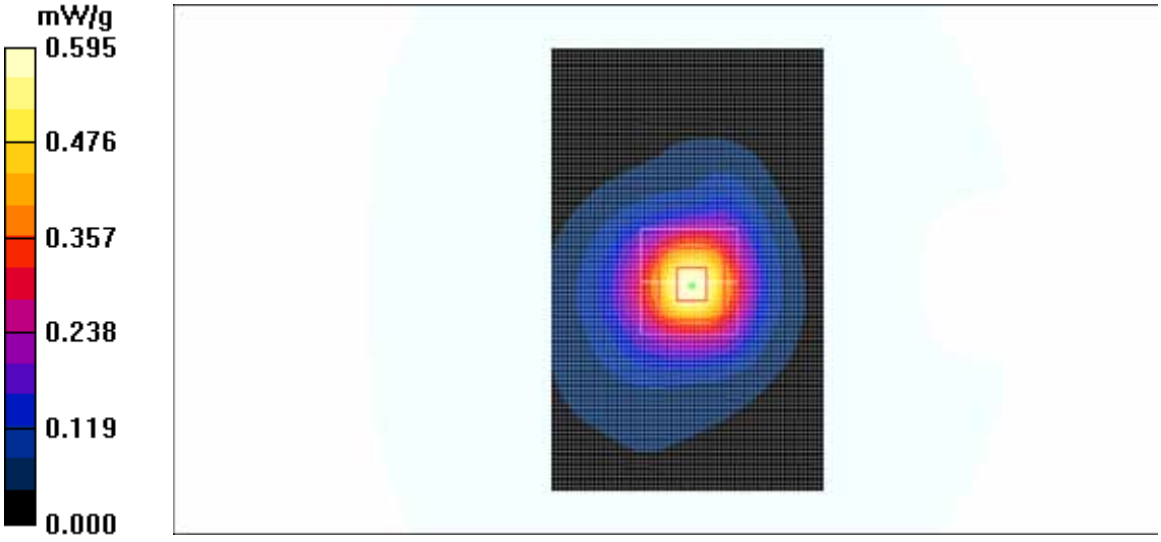


Fig.65 LTE BAND 7 Middle

LTE BAND 7, Position 6 High Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-27 16:39:25
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2560 MHz; σ = 2.08 mho/m; εr = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.628 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.4 V/m; Power Drift = 0.006 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.555 mW/g; SAR(10 g) = 0.289 mW/g
Maximum value of SAR (measured) = 0.599 mW/g

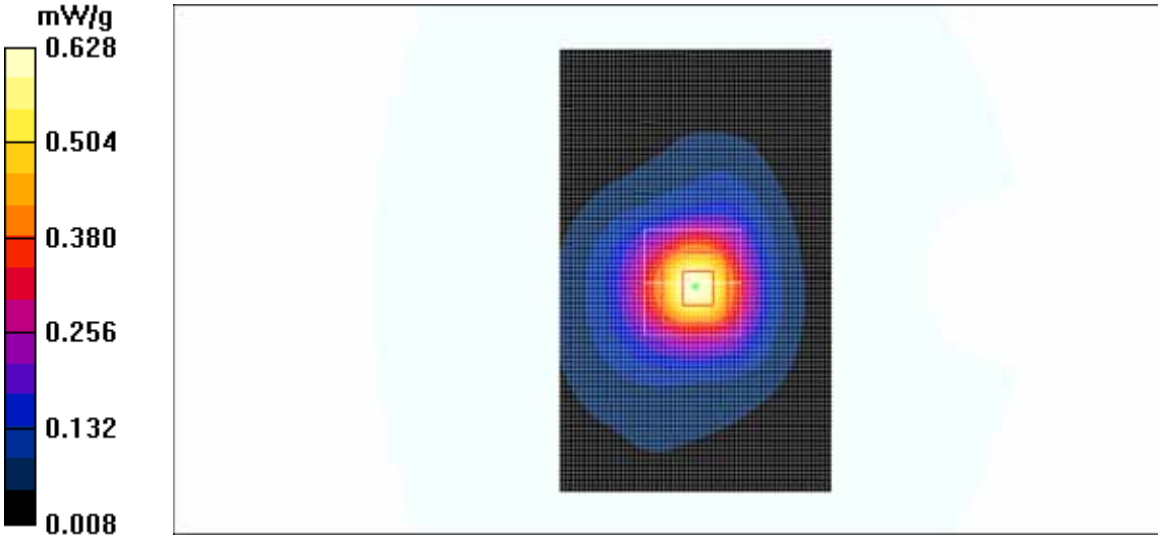


Fig.66 LTE BAND 7 High

LTE BAND 7, Position 6 Low Frequency 16QAM_20MHz_1RB_Low
Date/Time: 2011-12-27 16:54:51
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2510 MHz; σ = 2.01 mho/m; εr = 52.1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: LTE Band7 Frequency: 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

Test Position 6/Area Scan (61x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.656 mW/g

Test Position 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.5 V/m; Power Drift = -0.143 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.586 mW/g; SAR(10 g) = 0.311 mW/g
Maximum value of SAR (measured) = 0.644 mW/g

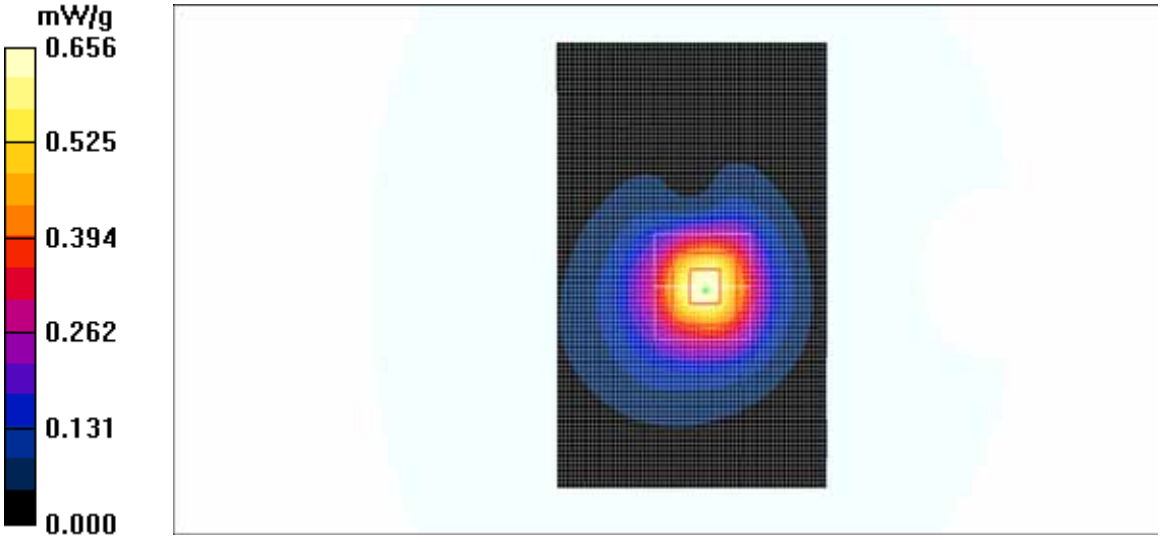


Fig.67 LTE BAND 7 Low

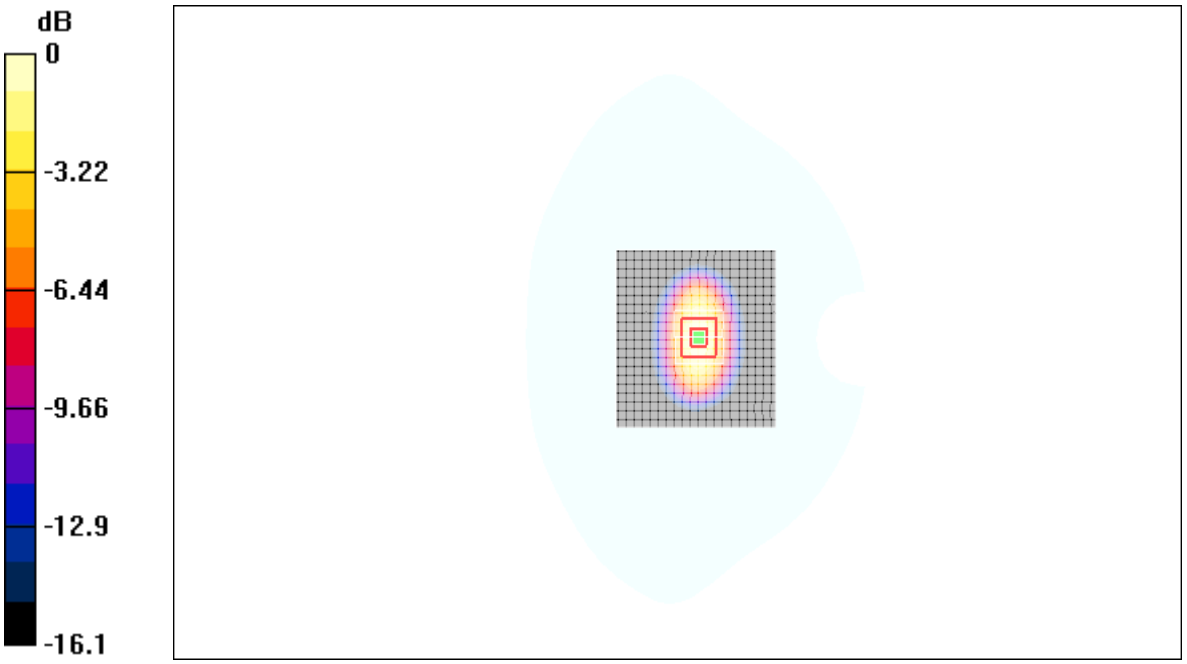
ANNEX D SYSTEM VALIDATION RESULTS

1800MHz

Date/Time: 2011-12-26 7:30:11
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f=1800 MHz; σ = 1.50 mho/m; ε_r = 52. 6; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1800 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 14.4 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.1 V/m; Power Drift = 0.070 dB
Peak SAR (extrapolated) = 16.2 W/kg
SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.14 mW/g
Maximum value of SAR (measured) = 13.5 mW/g



0 dB = 13.5mW/g

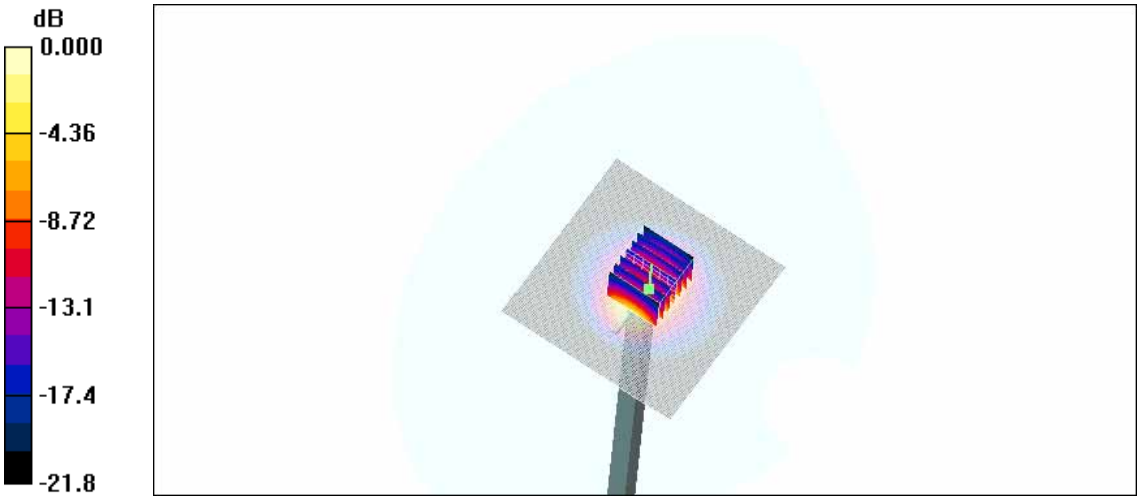
Fig.68 validation 1800MHz 250mW

2550MHz

Date/Time: 2011-12-27 7:32:04
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2550 MHz; σ = 2.06 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 2550 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 22.0 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.5 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 26.3 W/kg
SAR(1 g) = 13.9 mW/g; SAR(10 g) = 6.28 mW/g
Maximum value of SAR (measured) = 18.2 mW/g



0 dB = 18.2mW/g

Fig.69 validation 2550MHz 250mW

ANNEX E PROBE CALIBRATION CERTIFICATE

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

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

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

Accreditation No.: SCS 108

Client TMC China Certificate No: ES3DV3-3149_Sep11

CALIBRATION CERTIFICATE

Object	ES3DV3-SN: 3149
Calibration procedure(s)	QA CAL-01.v6 Calibration procedure for dosimetric E-field probes
Calibration date:	September 24, 2011
Condition of the calibrated item	In Tolerance

This calibration certify 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 at an environment temperature (22±3)°C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-May-11 (METAS, NO. 251-00388)	May-12
Power sensor E4412A	MY41495277	5-May-11 (METAS, NO. 251-00388)	May-12
Reference 3 dB Attenuator	SN:S5054 (3c)	11-Aug-11 (METAS, NO. 251-00403)	Aug-12
Reference 20 dB Attenuator	SN:S5086 (20b)	3-May-11 (METAS, NO. 251-00389)	May-12
Reference 30 dB Attenuator	SN:S5129 (30b)	11-Aug-11 (METAS, NO. 251-00404)	Aug-12
DAE4	SN:617	10-Jun-11 (SPEAG, NO.DAE4-907_Jun11)	Jun-12
Reference Probe ES3DV2	SN: 3013	12-Jan-11 (SPEAG, NO. ES3-3013_Jan11)	Jan-12

Secondary Standards	ID#	Check Data (in house)	Scheduled Calibration
RF generator HP8648C	US3642U01700	4-Aug-99(SPEAG, in house check Oct-10)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01(SPEAG, in house check Nov-10)	In house check: Nov-11

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

Issued: September 24, 2011

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

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

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

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

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

Probe ES3DV3

SN: 3149

Manufactured: June 12, 2007

Calibrated: September 24, 2011

Calibrated for DASY/EASY System

(Note: non-compatible with DASY2 system!)

DASY/EASY – Parameters of Probe: ES3DV3 - SN:3149

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μ V/(V/m)^2)^A	1.14	1.23	1.29	±10.1%
DCP (mV)^B	94	95	91	

Modulation Calibration Parameters

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

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 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:3149

Calibration Parameter Determined in Head Tissue Simulating Media

f[MHz] [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
850	41.5	0.90	6.56	6.56	6.56	0.91	1.13	±12.0%
900	41.5	0.97	6.34	6.34	6.34	0.83	1.26	±12.0%
1800	40.0	1.40	5.18	5.18	5.18	0.69	1.47	±12.0%
1900	40.0	1.40	5.03	5.03	5.03	0.72	1.38	±12.0%
2100	39.8	1.49	4.58	4.58	4.58	0.66	1.34	±12.0%
2450	39.2	1.80	4.35	4.35	4.35	0.67	1.36	±12.0%

[C] Frequency validity of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY – Parameters of Probe: ES3DV3 - SN:3149

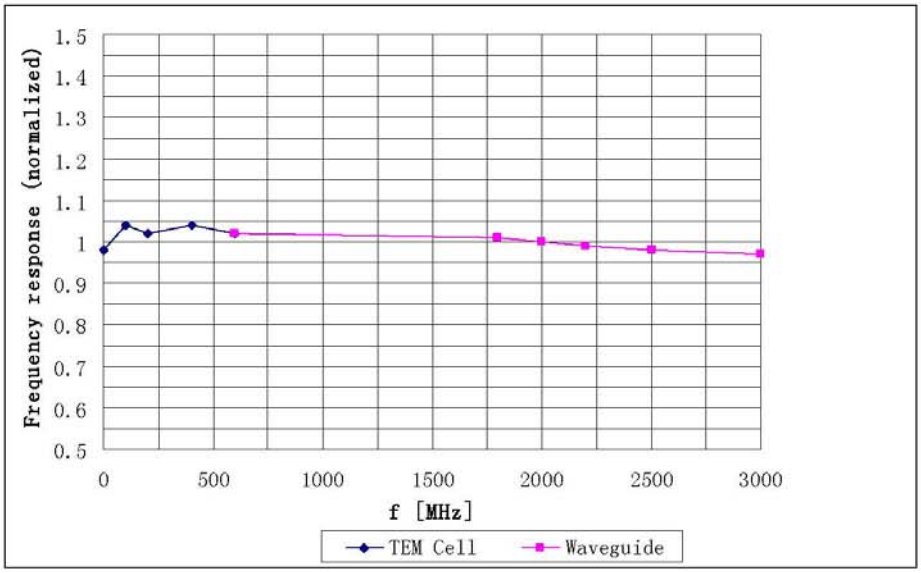
Calibration Parameter Determined in Body Tissue Simulating Media

f[MHz] [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
850	55.2	0.97	6.22	6.22	6.22	0.76	1.26	±12.0%
900	55.0	1.05	6.02	6.02	6.02	0.99	1.06	±12.0%
1800	53.3	1.52	4.97	4.97	4.97	0.75	1.34	±12.0%
1900	53.3	1.52	4.68	4.68	4.68	0.62	1.33	±12.0%
2100	53.5	1.57	4.35	4.35	4.35	0.68	1.34	±12.0%
2450	52.7	1.95	4.13	4.13	4.13	0.71	1.35	±12.0%

[C] Frequency validity of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

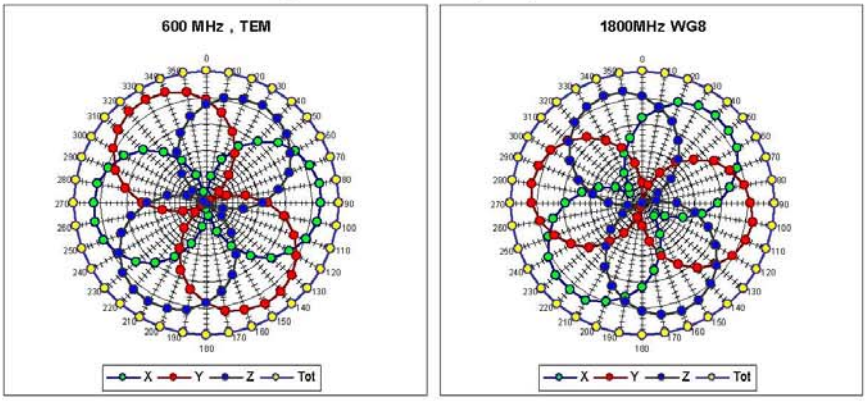
Frequency Response of E-Field

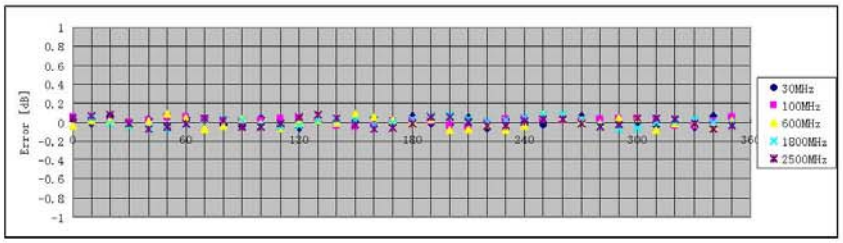
(TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±5.0% (k=2)

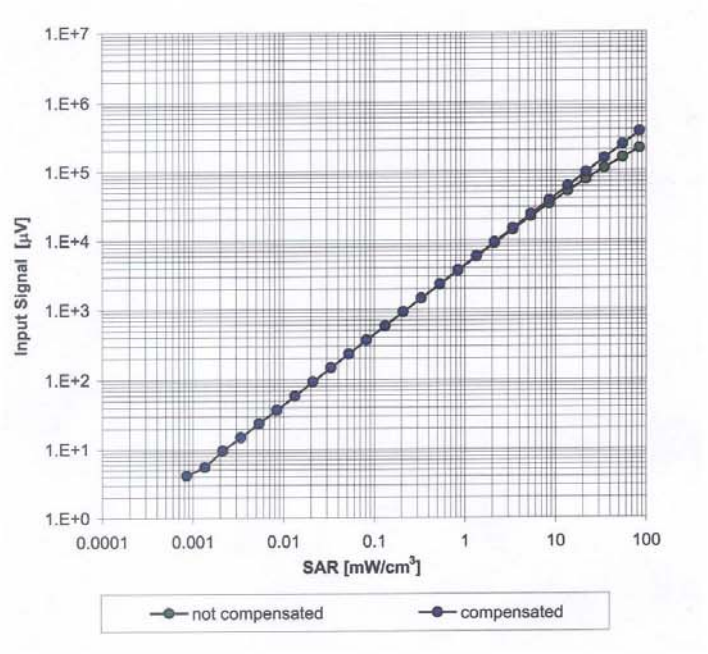
Receiving Pattern (ϕ), θ =0°

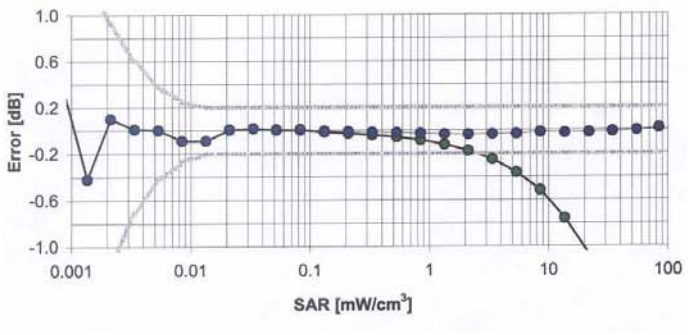




Uncertainty of Axial Isotropy Assessment: ±0.5% (k=2)

Dynamic Range f(SAR_{head})
(Waveguide: WG8, f = 1800 MHz)

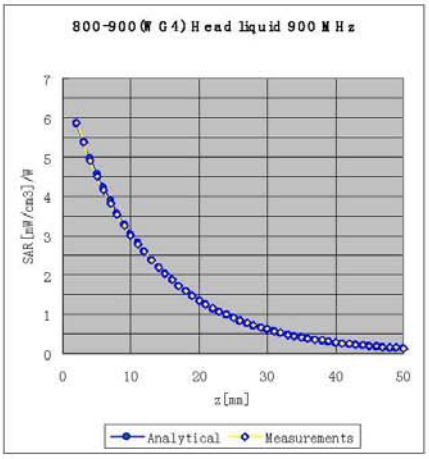


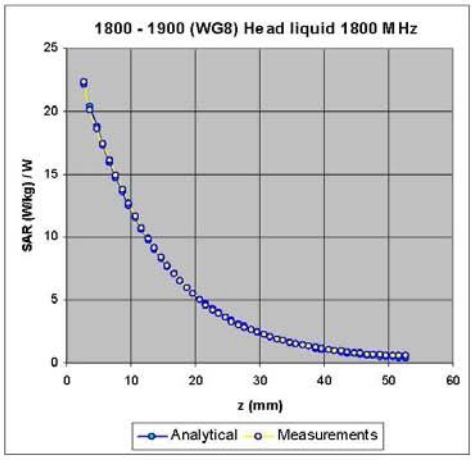


Uncertainty of Linearity Assessment: ±0.5% (k=2)

ES3DV3 SN: 3149 **September 24, 2011**

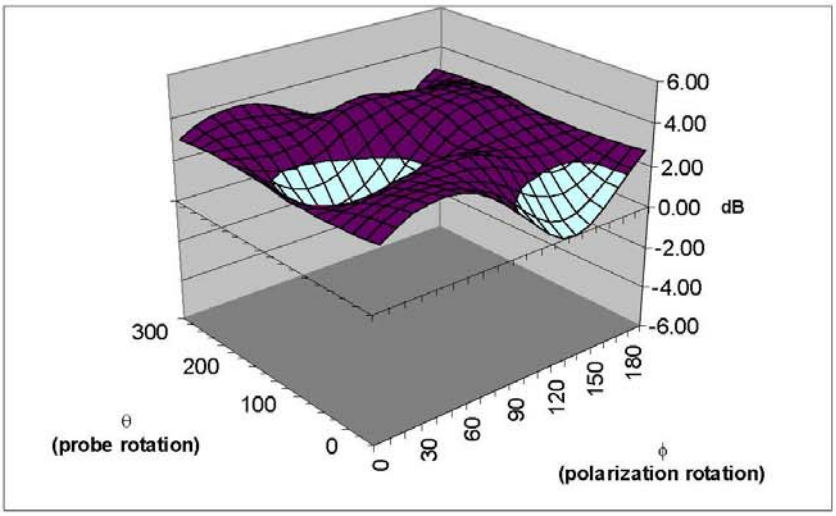
Conversion Factor Assessment





Deviation from Isotropy

Error (Φ , θ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ±2.5% (k=2)

DASY/EASY – Parameters of Probe: ES3DV3 - SN:3149

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 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	2 mm

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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Swiss Calibration Service

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

Accreditation No.: SCS 108

Client TMC China Certificate No: EX3DV4-3617_Jul11

CALIBRATION CERTIFICATE

Object	**EX3DV4-SN: 3617**
Calibration procedure(s)	**QA CAL-01.v6** **Calibration procedure for dosimetric E-field probes**
Calibration date:	**July 8, 2011**
Condition of the calibrated item	**In Tolerance**

This calibration certify 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 at an environment temperature (22±3)°C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-May-11 (METAS, NO. 251-00388)	May-12
Power sensor E4412A	MY41495277	5-May-11 (METAS, NO. 251-00388)	May-12
Reference 3 dB Attenuator	SN:S5054 (3c)	11-Aug-10 (METAS, NO. 251-00403)	Aug-11
Reference 20 dB Attenuator	SN:S5086 (20b)	3-May-11 (METAS, NO. 251-00389)	May-12
Reference 30 dB Attenuator	SN:S5129 (30b)	11-Aug-10 (METAS, NO. 251-00404)	Aug-11
DAE4	SN:617	10-Jun-11 (SPEAG, NO.DAE4-907_Jun11)	Jun-12
Reference Probe ES3DV2	SN: 3013	12-Jan-11 (SPEAG, NO. ES3-3013_Jan11)	Jan-12

Secondary Standards	ID#	Check Data (in house)	Scheduled Calibration
RF generator HP8648C	US3642U01700	4-Aug-99(SPEAG, in house check Oct-10)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01(SPEAG, in house check Nov-10)	In house check: Nov-11

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

Issued: July 8, 2011

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

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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Swiss Calibration Service

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

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

Probe EX3DV4

SN: 3617

Manufactured: May 3, 2007

Calibrated: July 8, 2011

Calibrated for DASY/EASY System

(Note: non-compatible with DASY2 system!)

DASY/EASY – Parameters of Probe: EX3DV4 - SN:3617

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μ V/(V/m)^2)^A	0.42	0.44	0.31	±10.1%
DCP (mV)^B	89	88	91	

Modulation Calibration Parameters

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

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

DASY/EASY – Parameters of Probe: EX3DV4 - SN:3617

Calibration Parameter Determined in Head Tissue Simulating Media

f[MHz] [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
2300	39.5	1.67	7.23	7.23	7.23	0.33	1.02	±12.0%
2450	39.2	1.80	7.19	7.19	7.19	0.33	1.00	±12.0%
2600	39.0	1.96	7.16	7.16	7.16	0.36	1.21	±12.0%
3500	37.9	2.91	6.48	6.48	6.48	0.34	1.35	±12.0%
5200	36.0	4.66	5.33	5.33	5.33	0.35	1.60	±12.0%
5800	35.3	5.27	4.69	4.69	4.69	0.35	1.60	±12.0%

[C] Frequency validity of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY – Parameters of Probe: EX3DV4 - SN:3617

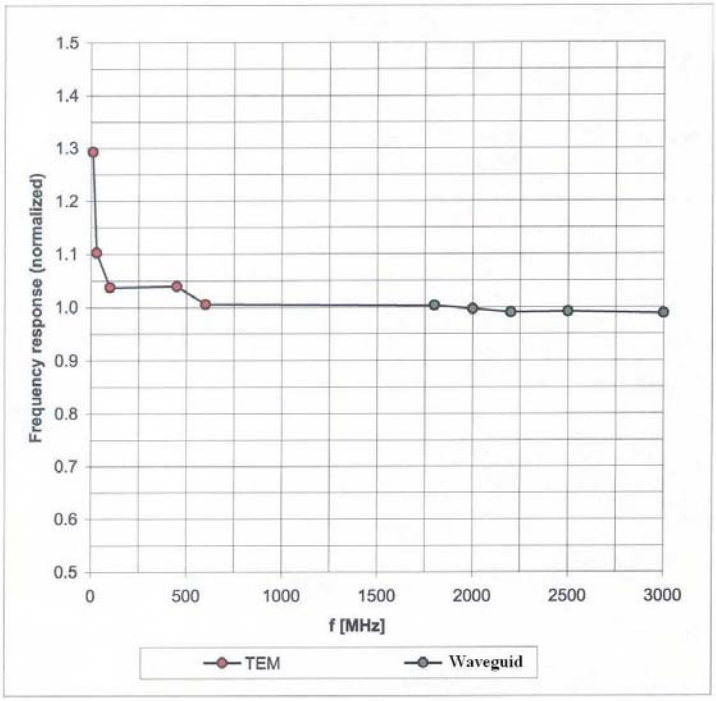
Calibration Parameter Determined in Body Tissue Simulating Media

f[MHz] [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
2300	52.8	1.85	6.95	6.95	6.95	0.30	1.01	±12.0%
2450	52.7	1.95	6.88	6.88	6.88	0.36	1.00	±12.0%
2600	52.5	2.16	6.84	6.84	6.84	0.36	1.05	±12.0%
3500	51.3	3.30	5.02	5.02	5.02	0.33	1.40	±12.0%
5200	49.0	5.30	4.64	4.64	4.64	0.35	1.70	±12.0%
5800	48.2	6.00	4.53	4.53	4.53	0.30	1.70	±12.0%

[C] Frequency validity of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

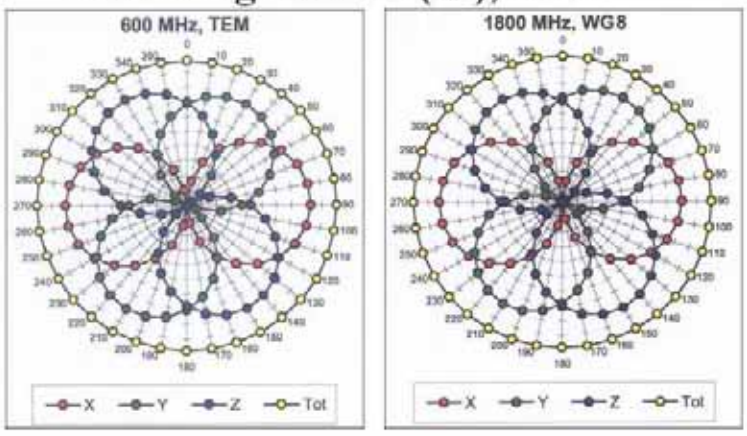
Frequency Response of E-Field

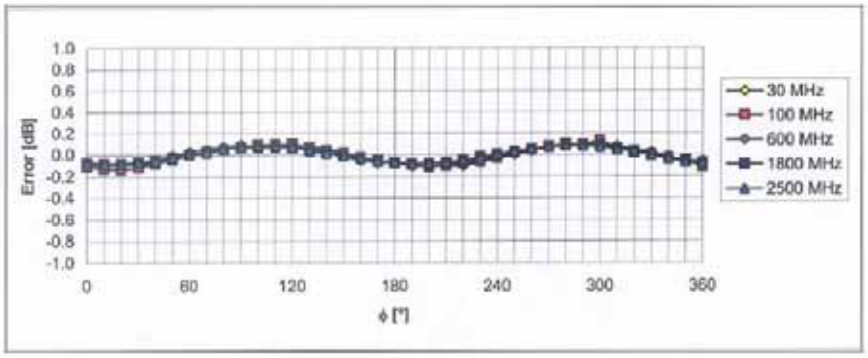
(TEM-Cell: ifi110 EXX, Waveguide: R22)



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

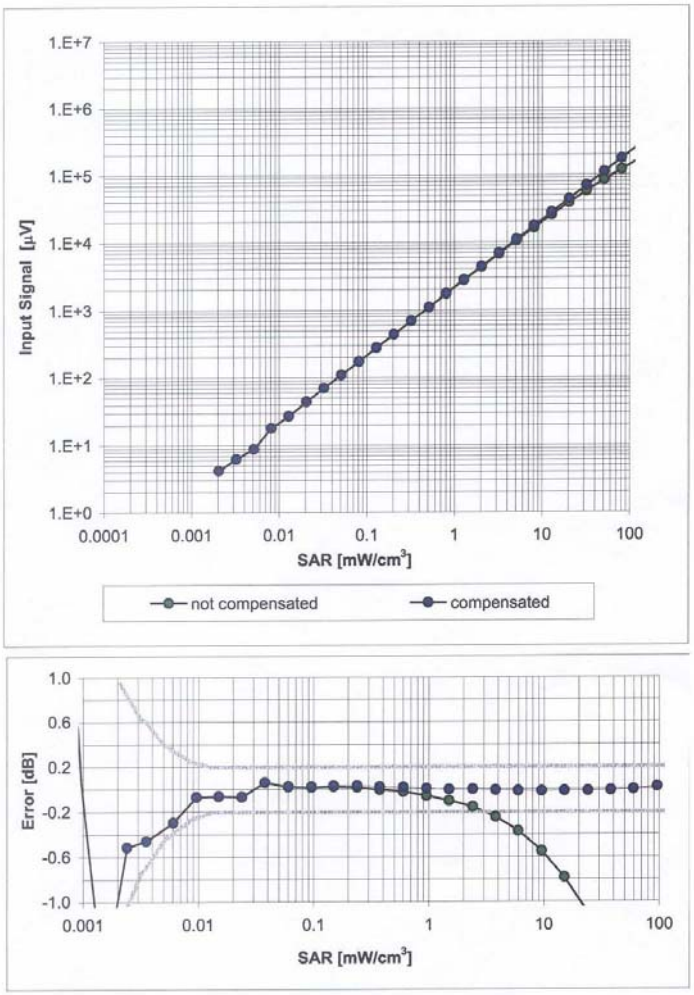
Receiving Pattern (ϕ), $\theta = 0°$





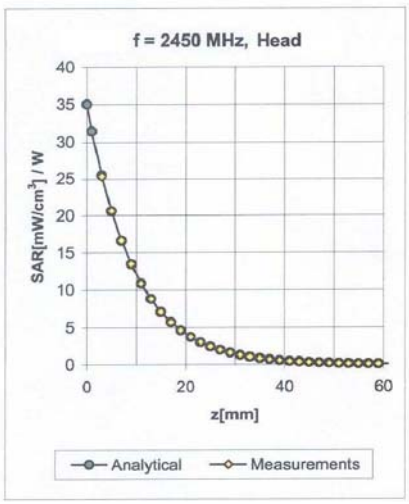
Uncertainty of Axial Isotropy Assessment: ±0.5% (k=2)

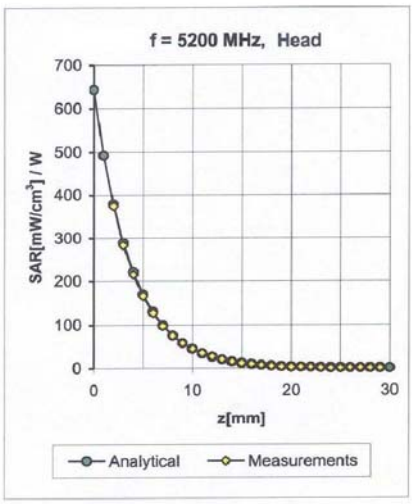
Dynamic Range f(SAR_{head})
(Waveguide: WG8, f = 1800 MHz)



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

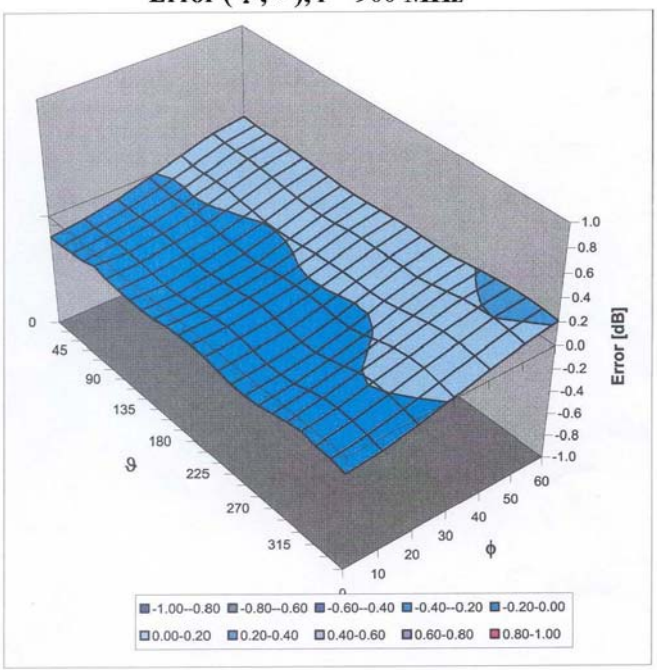
Conversion Factor Assessment





Deviation from Isotropy

Error (φ , θ), f = 900 MHz



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

DASY/EASY – Parameters of Probe: EX3DV4 - SN:3617

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	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

ANNEX F DIPOLE CALIBRATION CERTIFICATE

1800 MHz Dipole Calibration Certificate

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

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Swiss Calibration Service

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Accreditation No.: SCS 108

Client TMC **Certificate No: D1800V2-2d145_Jan10**

CALIBRATION CERTIFICATE

Object	D1800V2-SN: 2d145
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	January 25, 2010
Condition of the calibrated item	In Tolerance

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 at an environment temperature (22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	02-Oct-09 (METAS, NO. 217-00736)	Oct-10
Power sensor 8481A	US37292783	02-Oct-09 (METAS, NO. 217-00736)	Oct-10
Reference 20 dB Attenuator	SN:5086 (20g)	06-Aug-09 (METAS, NO. 217-00718)	Aug-10
Reference 10 dB Attenuator	SN:5047_2 (10r)	06-Aug-09 (METAS, NO. 217-00718)	Aug-10
DAE4	SN:601	28-Jan-09 (SPEAG, NO.DAE4-601_Jan09)	Jan-10
Reference Probe ET3DV6 (HF)	SN: 1507	16-Oct-09 (SPEAG, NO. ET3-1507_Oct09)	Oct-10
Secondary Standards	**ID#**	**Check Data (in house)**	**Scheduled Calibration**
Power sensor HP 8481A	MY41092317	18-Oct-02(SPEAG, in house check Oct-09)	In house check: Oct-11
RF generator Agilent E4421B	MY41000676	11-May-05(SPEAG, in house check Nov-09)	In house check: Nov -11
Network Analyzer HP 8753E	US37390585S4206	18-Oct-01(SPEAG, in house check Oct-09)	In house check: Oct -10

	Name	Function	Signature
Calibrated by:	Marcel Fehr	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Director	

Issued: January 25, 2010

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

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

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S Swiss Calibration Service

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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:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4 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	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.4 ± 6 %	1.41 mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.58 mW / g
SAR normalized	normalized to 1W	38.3 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**38.4 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.01 mW / g
SAR normalized	normalized to 1W	20.0 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**20.0 mW /g ± 16.5 % (k=2)**

[1] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 MHz ± 1 MHz	

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	52.3 ± 6%	1.50mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.1 mW / g
SAR normalized	normalized to 1W	40.4 mW / g
SAR for nominal Head TSL parameters [2]	normalized to 1W	**40.3 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.21 mW / g
SAR normalized	normalized to 1W	20.8 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**20.7 mW /g ± 16.5 % (k=2)**

[2] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.8Ω + 7.8 jΩ
Return Loss	- 25.7dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.4Ω + 11.6 jΩ
Return Loss	- 22.5dB

General Antenna Parameters and Design

Electrical Delay (one direction)	3.915 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 14, 2006

DASY4 Validation Report for Head TSL

Date/Time: 25.1.2010 10:29:34

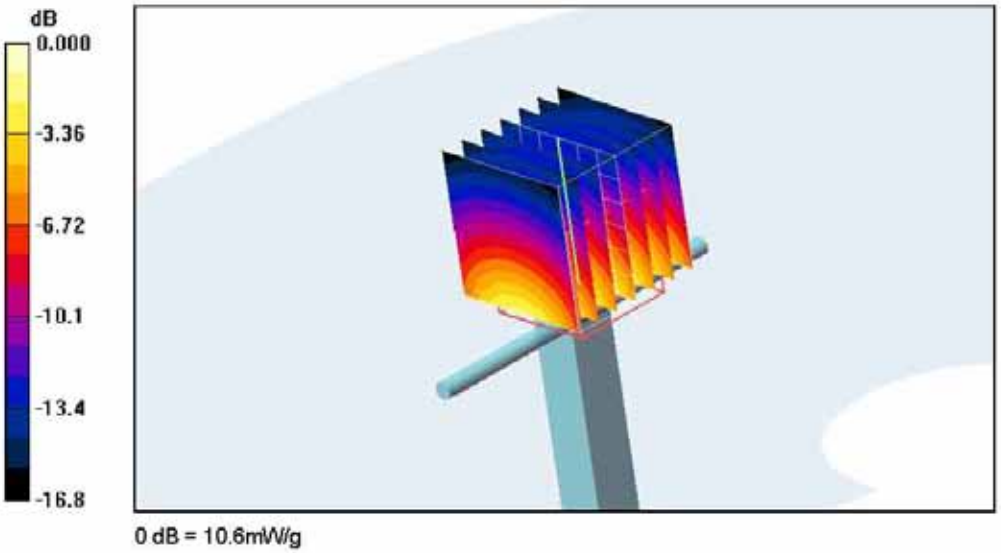
Test laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; serial: D1800V2-SN: 2d145

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1
Medium: HSL 1800 MHz;
Medium parameters used: f=1800 MHz; σ=1.41 mho/m; ε_r=40.4; ρ= 1000kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)
DASY4 Configuration:

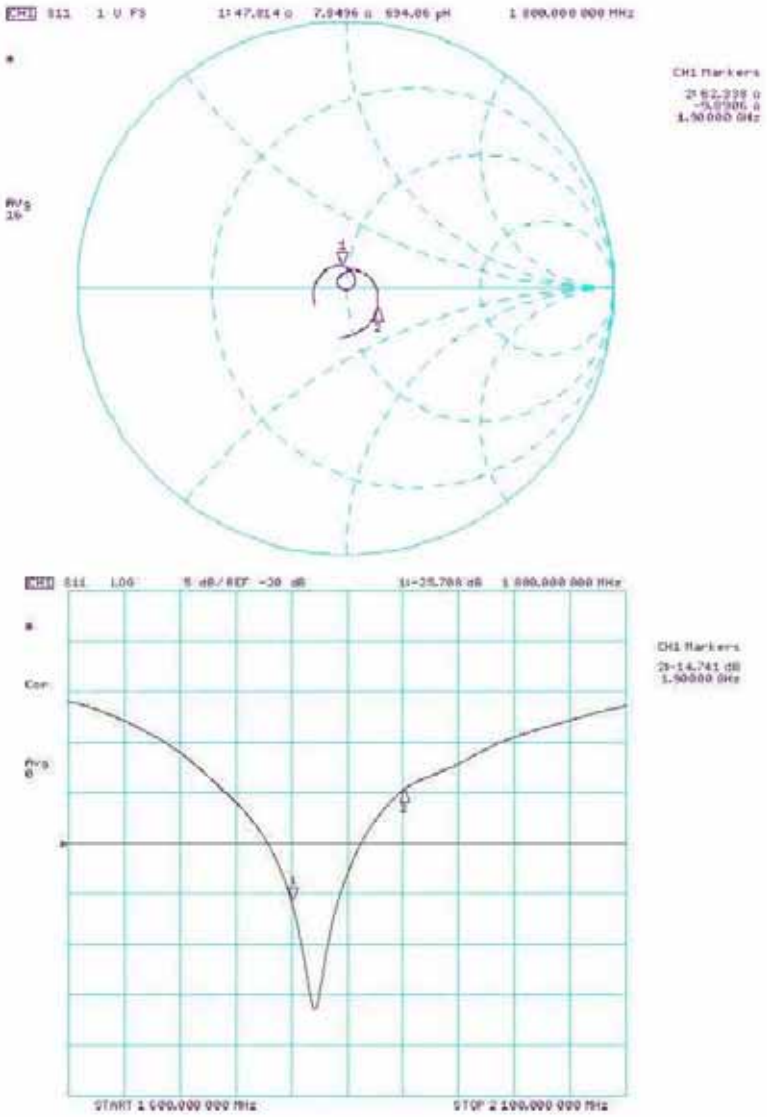
- Probe: ET3DV6-SN1507(HF); ConvF(4.99, 4.99, 4.99); Calibrated: 16.10.2009
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.1_2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA;
- Measurement SW: DASY, V4.7 Build 55; Post processing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.0 V/m; Power Drift = 0.054 dB
Peak SAR (extrapolated) = 16.5 W/kg
SAR(1 g) = 9.58 mW/g; SAR(10 g) = 5.01 mW/g
Maximum value of SAR (measured) = 10.6 mW/g



0 dB = 10.6mW/g

Impedance measurement Plot for Head TSL



DASY4 Validation Report for Body TSL

Date/Time: 25.1.2010 13:36:04

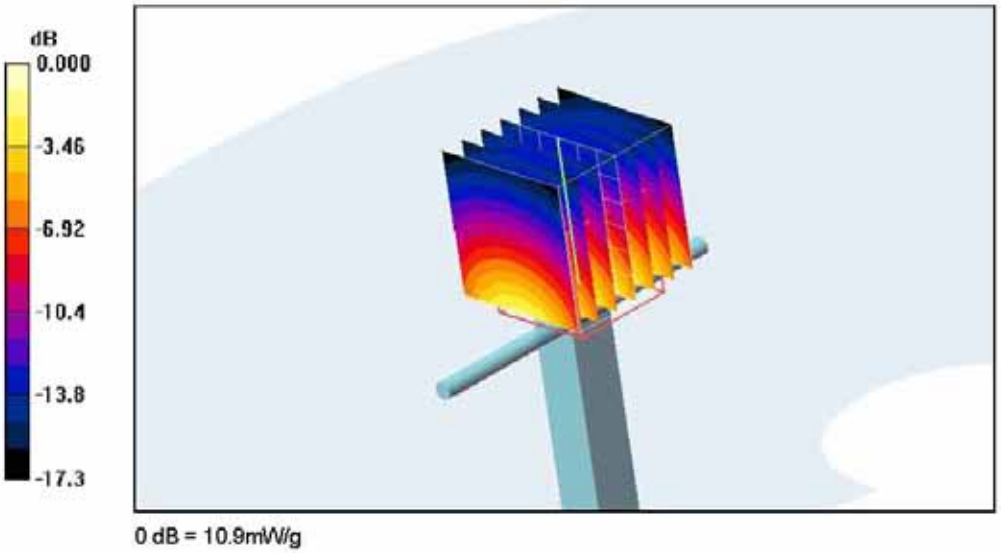
Test laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; serial: D1800V2-SN: 2d145

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1
Medium: MSL 1800 MHz;
Medium parameters used: f=1800 MHz; σ=1.50 mho/m; ε_r=52.3; ρ= 1000kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)
DASY4 Configuration:

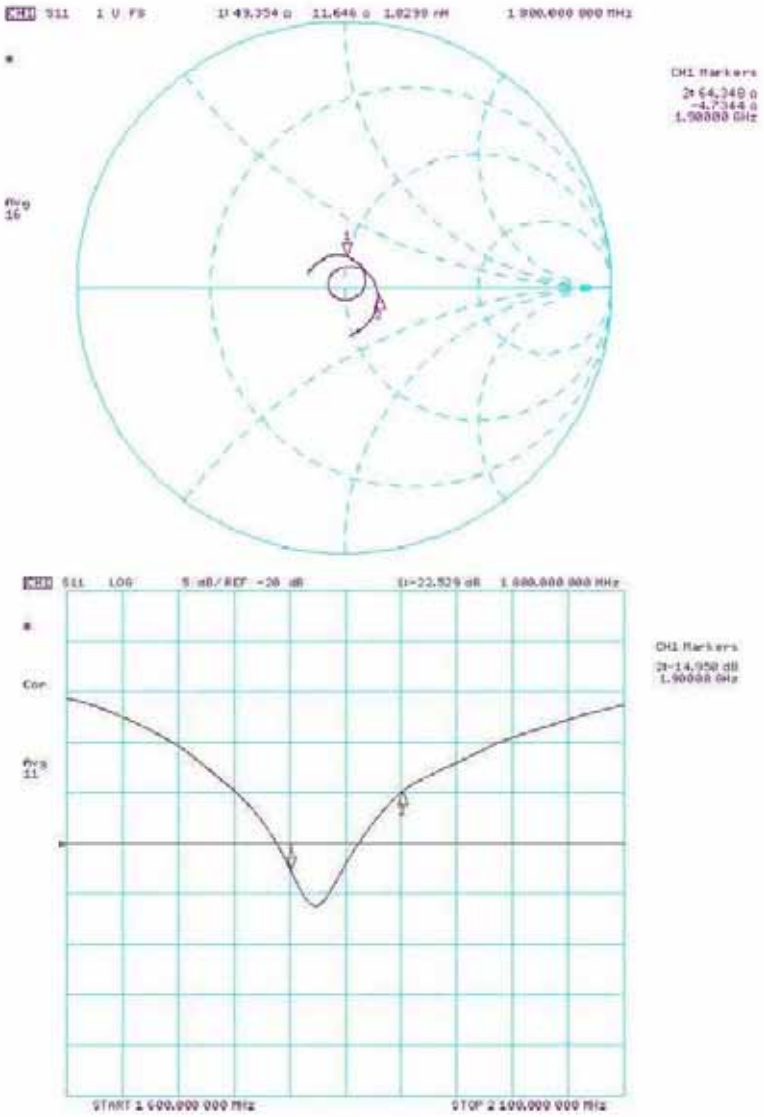
- Probe: ET3DV6-SN1507(HF); ConvF(4.47, 4.47, 4.47); Calibrated: 16.10.2009
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.1_2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA;
- Measurement SW: DASY, V4.7 Build 55; Post processing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.5 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 17.2 W/kg
SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.21 mW/g
Maximum value of SAR (measured) = 10.9 mW/g



0 dB = 10.9mW/g

Impedance measurement Plot for Body TSL



2550 MHz Dipole Calibration Certificate

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

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

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

Accreditation No.: SCS 108

Client TMC (Auden)

Certificate No: D2550V2-1002_Sep10

CALIBRATION CERTIFICATE

Object D2550V2 - SN: 1002

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

Calibration date: September 27, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: October 5, 2010

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

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

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

Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2550 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.1	1.91 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.1 ± 6 %	1.99 mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.3 mW / g
SAR normalized	normalized to 1W	57.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**56.3 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.43 mW / g
SAR normalized	normalized to 1W	25.7 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**25.6 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.6	2.09 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.3 ± 6 %	2.04 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.7 mW / g
SAR normalized	normalized to 1W	54.8 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**55.3 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.18 mW / g
SAR normalized	normalized to 1W	24.7 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**24.8 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.3 Ω - 0.3 jΩ
Return Loss	- 35.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.0 Ω + 0.6 jΩ
Return Loss	- 27.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.156 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 01, 2010

DASY5 Validation Report for Head TSL

Date/Time: 24.09.2010 15:28:28

Test Laboratory: SPEAG, Zurich, Switzerland

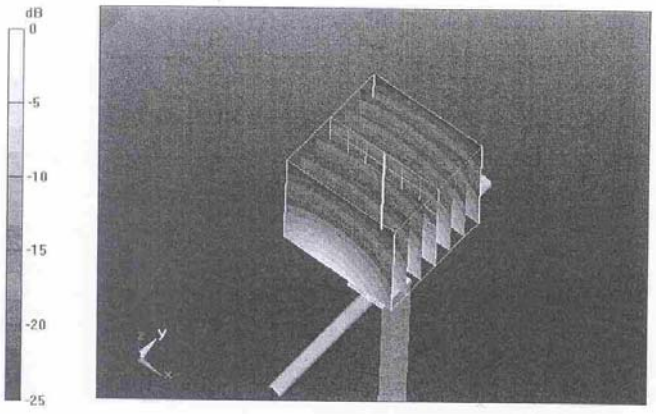
DUT: Dipole 2550 MHz; Type: D2550V2; Serial: D2550V2 - SN:1002

Communication System: CW; Frequency: 2550 MHz; Duty Cycle: 1:1
Medium: HSL BB1.9
Medium parameters used: f = 2550 MHz; σ = 1.99 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

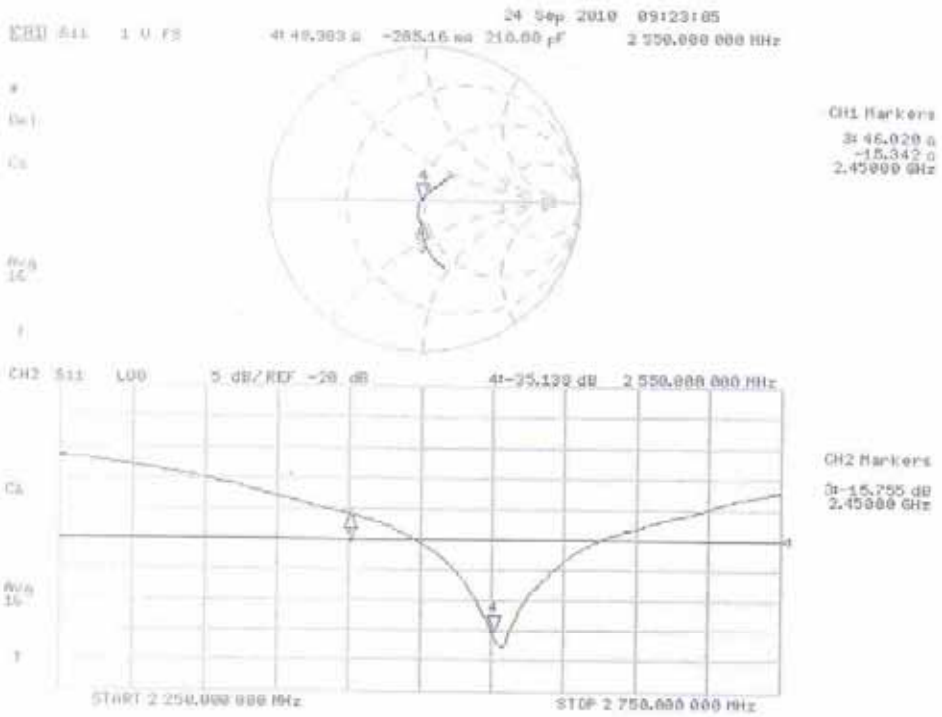
- Probe: ES3DV3 - SN3205; ConvF(4.69, 4.69, 4.69); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW/d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 100.4 V/m; Power Drift = 0.054 dB
Peak SAR (extrapolated) = 30.2 W/kg
SAR(1 g) = 14.3 mW/g; SAR(10 g) = 6.43 mW/g
Maximum value of SAR (measured) = 18.5 mW/g



0 dB = 18.5mW/g

Impedance Measurement Plot for Head TSL



Validation Report for Body

Date/Time: 27.09.2010 15:24:00

Test Laboratory: SPEAG, Zurich, Switzerland

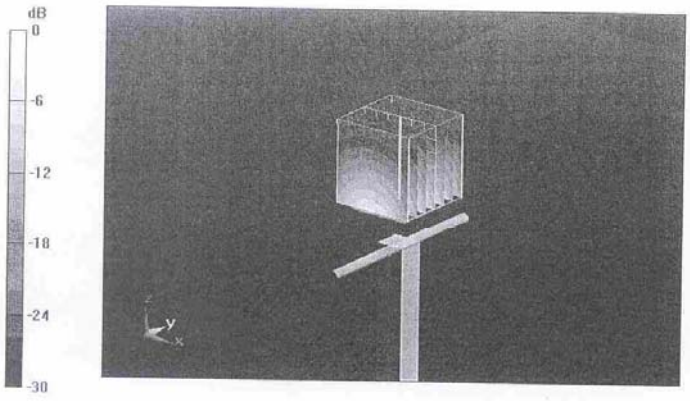
DUT: Dipole 2550 MHz; Type: D2550V2; Serial: D2550V2 - SN:1002

Communication System: CW; Frequency: 2550 MHz; Duty Cycle: 1:1
Medium: MSL U12 BB
Medium parameters used: f = 2550 MHz; σ = 2.04 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.18, 4.18, 4.18); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.4 V/m; Power Drift = -0.019 dB
Peak SAR (extrapolated) = 29.6 W/kg
SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.18 mW/g
Maximum value of SAR (measured) = 18.1 mW/g



0 dB = 18.1mW/g

Validation Report for Body

Date/Time: 27.09.2010 15:24:00

Test Laboratory: SPEAG, Zurich, Switzerland

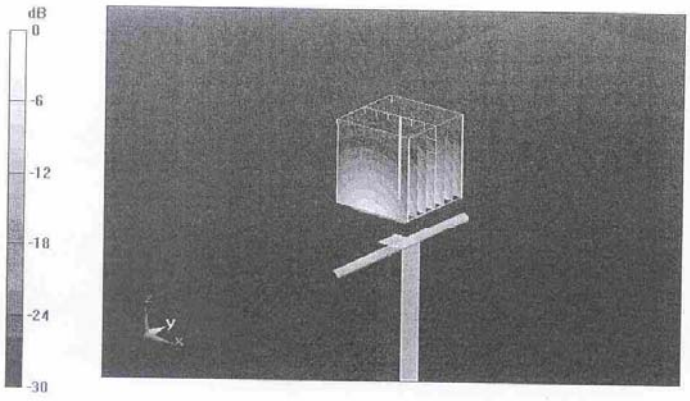
DUT: Dipole 2550 MHz; Type: D2550V2; Serial: D2550V2 - SN:1002

Communication System: CW; Frequency: 2550 MHz; Duty Cycle: 1:1
Medium: MSL U12 BB
Medium parameters used: f = 2550 MHz; σ = 2.04 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

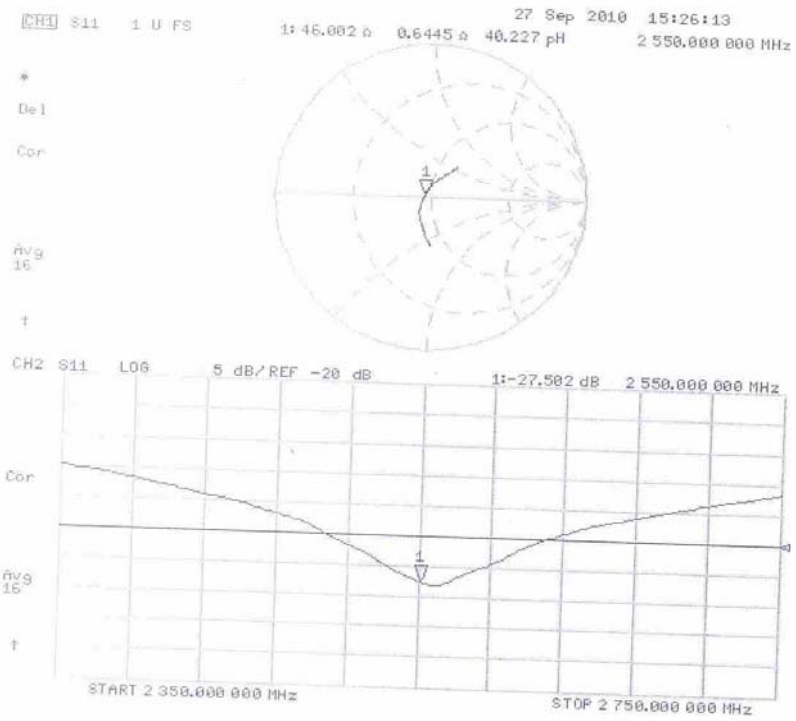
- Probe: ES3DV3 - SN3205; ConvF(4.18, 4.18, 4.18); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.4 V/m; Power Drift = -0.019 dB
Peak SAR (extrapolated) = 29.6 W/kg
SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.18 mW/g
Maximum value of SAR (measured) = 18.1 mW/g



0 dB = 18.1mW/g

Impedance Measurement Plot for Body TSL



ANNEX G DIPOLE QUALIFICATION FOR THE EXTENDED 3-YEAR CALIBRATION INTERVAL

G1 Dipole 1800

The information and documentation below are provided to qualify the extended 3-year calibaration interval of dipole.

G1.1 List of Equipment

No.	Name	Type	Serial Number
01	Network analyzer	E5071C	MY46110673
02	Power meter	NRVD	102083
03	Power sensor	NRV-Z5	100595
04	Signal Generator	E4438C	MY49070393
05	Amplifier	VTL5400	0505
06	E-field Probe	SPEAG ES3DV3	3149
07	DAE	SPEAG DAE4	771
08	Dipole Validation Kit	SPEAG D1800V2	2d145

G1.2 Results of Impedance, Return-loss and System validation

Dipole 1800 - Head

		Year		Deviation	Limit
		2010	2011		
Impedance	Real (Ω)	47.8	49.3	1.5Ω	Deviation＜ 5Ω
	Imaginary (Ω)	7.8	8.3	0.5Ω	Deviation＜ 5Ω
Return-loss (dB)		-25.7	-25.6	0.1dB	Deviate ＜ 0.2dB
System validation	10g	5.01	4.98	0.60%	Deviation＜ 10%
	1g	9.58	9.66	0.84%	Deviation＜ 10%

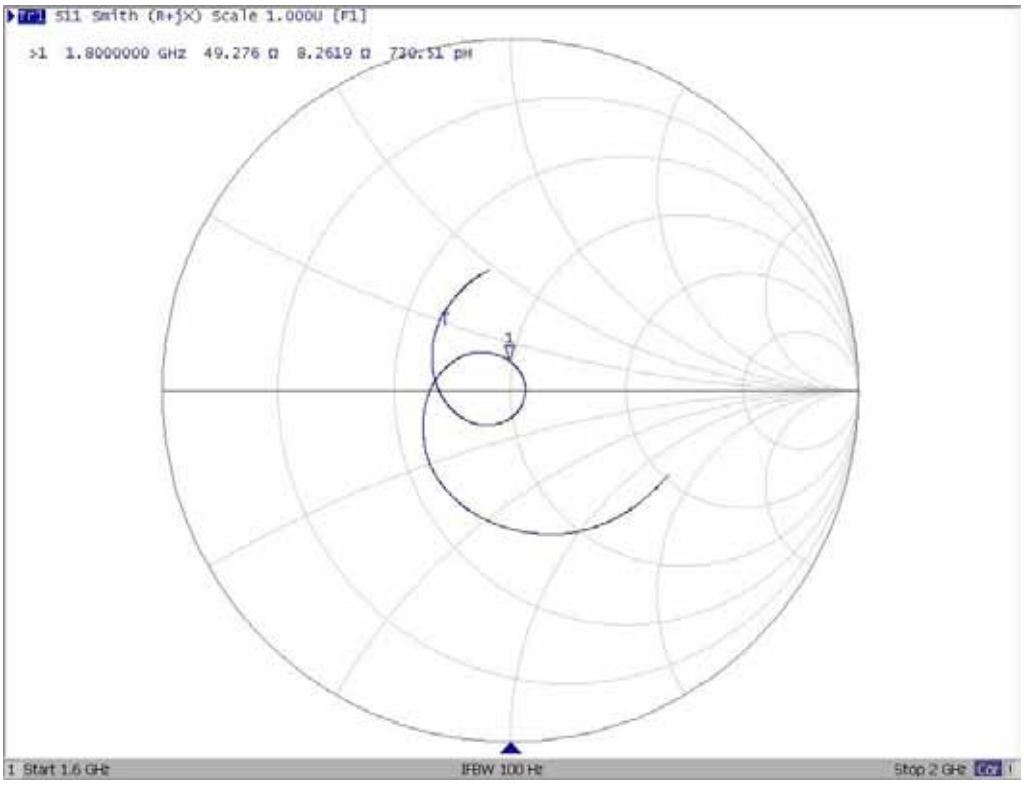
Dipole 1800 - Body

		Year		Deviation	Limit
		2010	2011		
Impedance	Real (Ω)	49.4	50.4	1.0Ω	Deviation＜ 5Ω
	Imaginary (Ω)	11.6	10.2	1.4Ω	Deviation＜ 5Ω
Return-loss (dB)		-22.5	-22.6	0.1dB	Deviate ＜ 0.2dB
System validation	10g	5.21	5.19	0.38%	Deviation＜ 10%
	1g	10.1	10.2	0.99%	Deviation＜ 10%

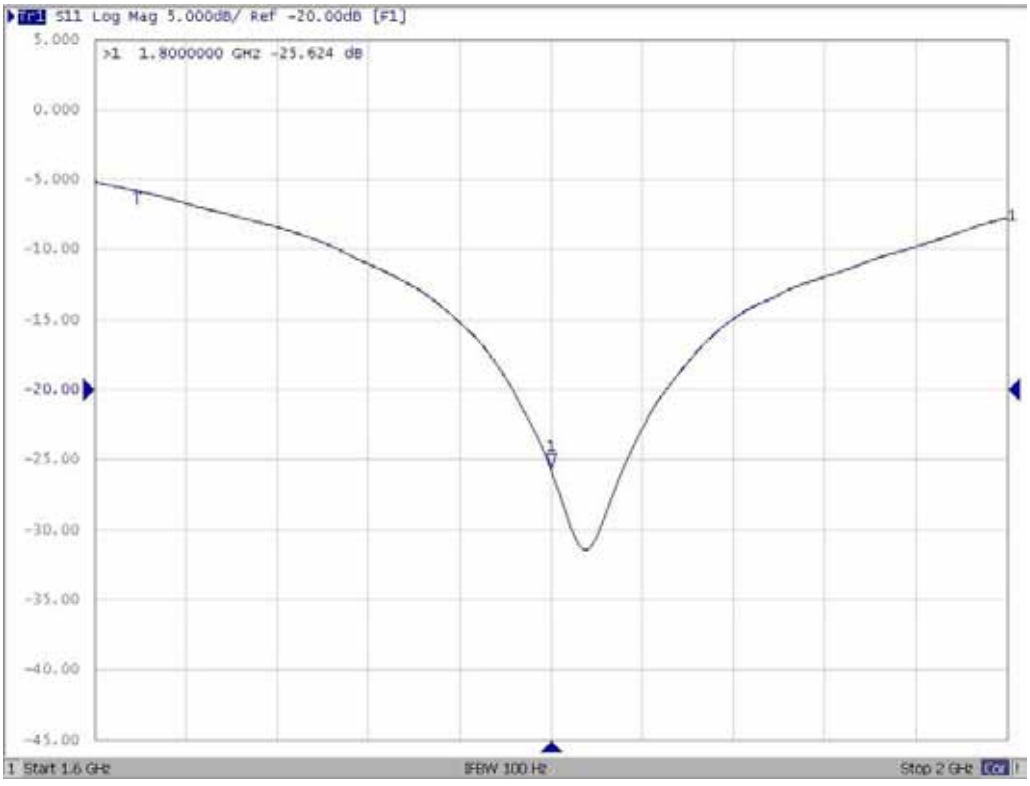
According to the above tables, it is not necessary to recalibration the dipoles in 2011. Please see below for the detail information.

G1.3 Detail Information

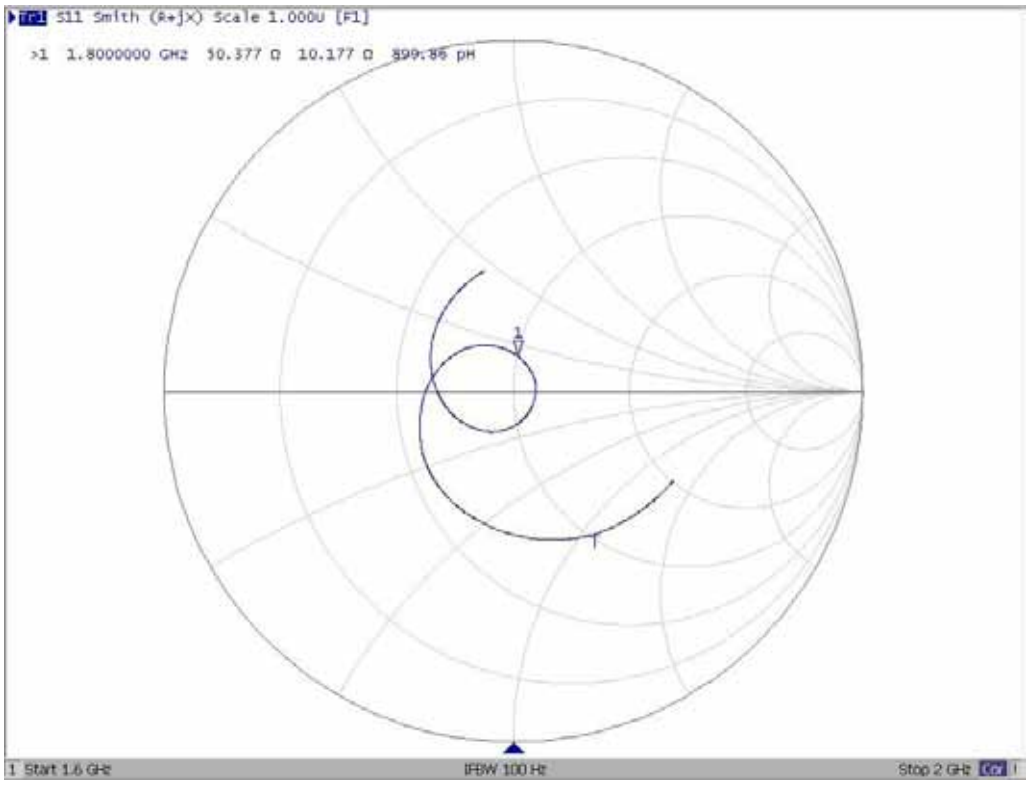
G1.3.1 Impedance Measurement Plot



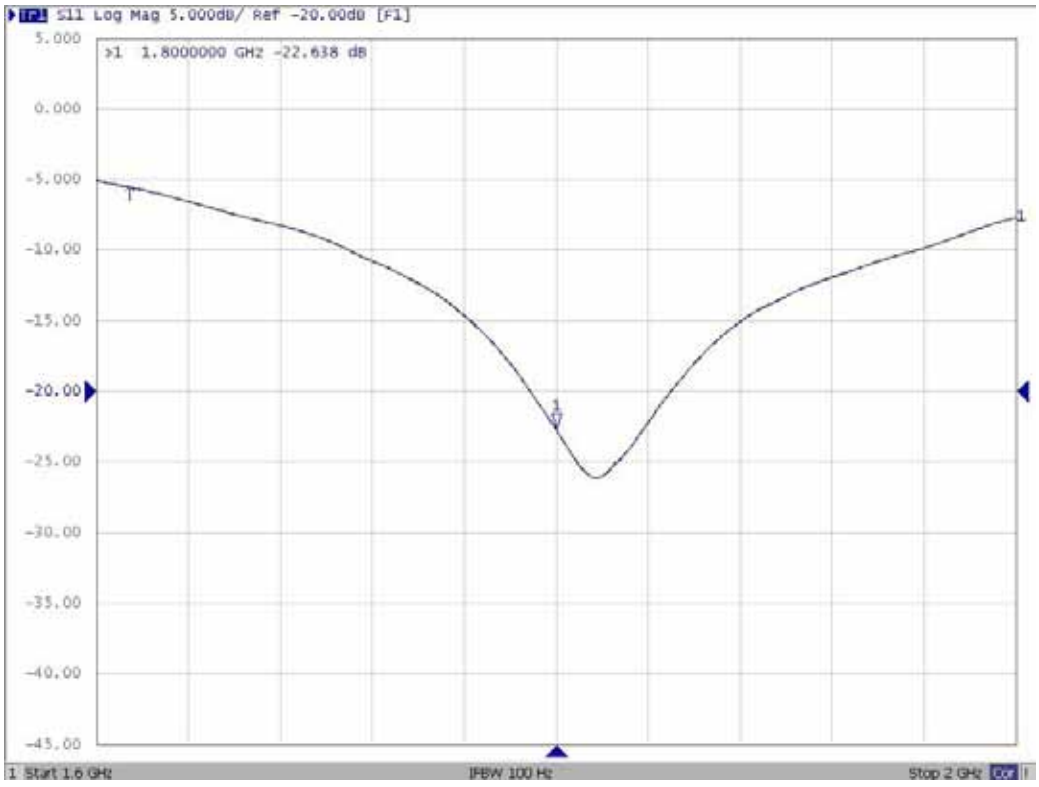
Picture G1: Dipole 1800 Head_Smith



Picture G2: Dipole 1800 Head_Log



Picture G3: Dipole 1800 Body_Smith



Picture G4: Dipole 1800 Body_Log

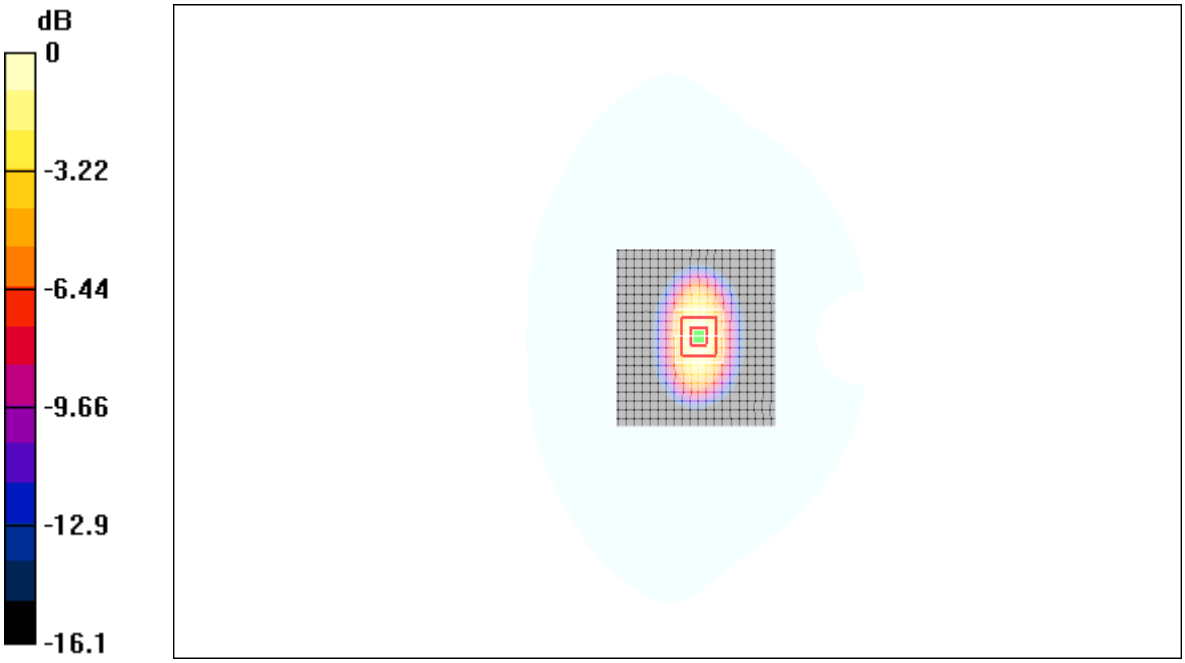
G1.3.2 System Validation Results

1800MHz

Date/Time: 2011-2-24 9:17:25
Electronics: DAE4 Sn771
Medium: Head 1800 MHz
Medium parameters used: f=1800 MHz; σ = 1.42 mho/m; ε_r = 41.2; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1800 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(5.18, 5.18, 5.18)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 13.4 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.3 V/m; Power Drift = 0.124 dB
Peak SAR (extrapolated) = 14.5 W/kg
SAR(1 g) = 9.66 mW/g; SAR(10 g) = 4.98 mW/g
Maximum value of SAR (measured) = 12.5 mW/g



0 dB = 12.5mW/g

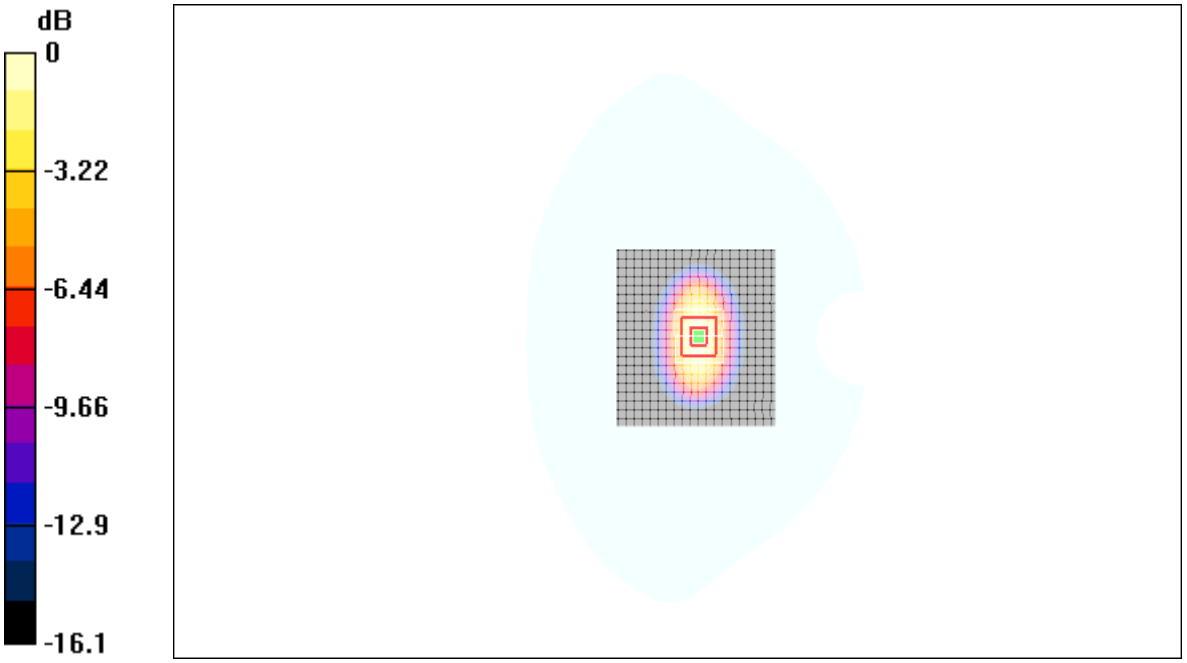
Fig.G1 validation 1800MHz 250mW

1800MHz

Date/Time: 2011-2-24 13:40:18
Electronics: DAE4 Sn771
Medium: Body 1800 MHz
Medium parameters used: f=1800 MHz; σ = 1.49 mho/m; ε_r = 52. 1; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1800 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.97, 4.97, 4.97)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 14.5 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.8 V/m; Power Drift = -0.075 dB
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.19 mW/g
Maximum value of SAR (measured) = 13.6 mW/g



0 dB = 13.6mW/g

Fig.G2 validation 1800MHz 250mW

G2 Dipole2550

The information and documentation below are provided to qualify the extended 3-year calibaration interval of dipole.

G2.1 List of Equipment

No.	Name	Type	Serial Number
01	Network analyzer	E5071C	MY46110673
02	Power meter	NRVD	102083
03	Power sensor	NRV-Z5	100595
04	Signal Generator	E4438C	MY49070393
05	Amplifier	VTL5400	0505
06	E-field Probe	SPEAG EX3DV4	3617
07	DAE	SPEAG DAE4	771
08	Dipole Validation Kit	SPEAG D2550V2	1002

G2.2 Results of Impedance, Return-loss and System validation

Dipole 2550 - Head

		Year		Deviation	Limit
		2010	2011		
Impedance	Real (Ω)	48.3	47.2	1.1Ω	Deviation＜ 5Ω
	Imaginary (Ω)	-0.3	-0.9	0.6Ω	Deviation＜ 5Ω
Return-loss (dB)		-25.7	-35.1	0.1dB	Deviate ＜ 0.2dB
System validation	10g	6.43	6.20	3.58%	Deviation＜ 10%
	1g	14.3	14.1	1.40%	Deviation＜ 10%

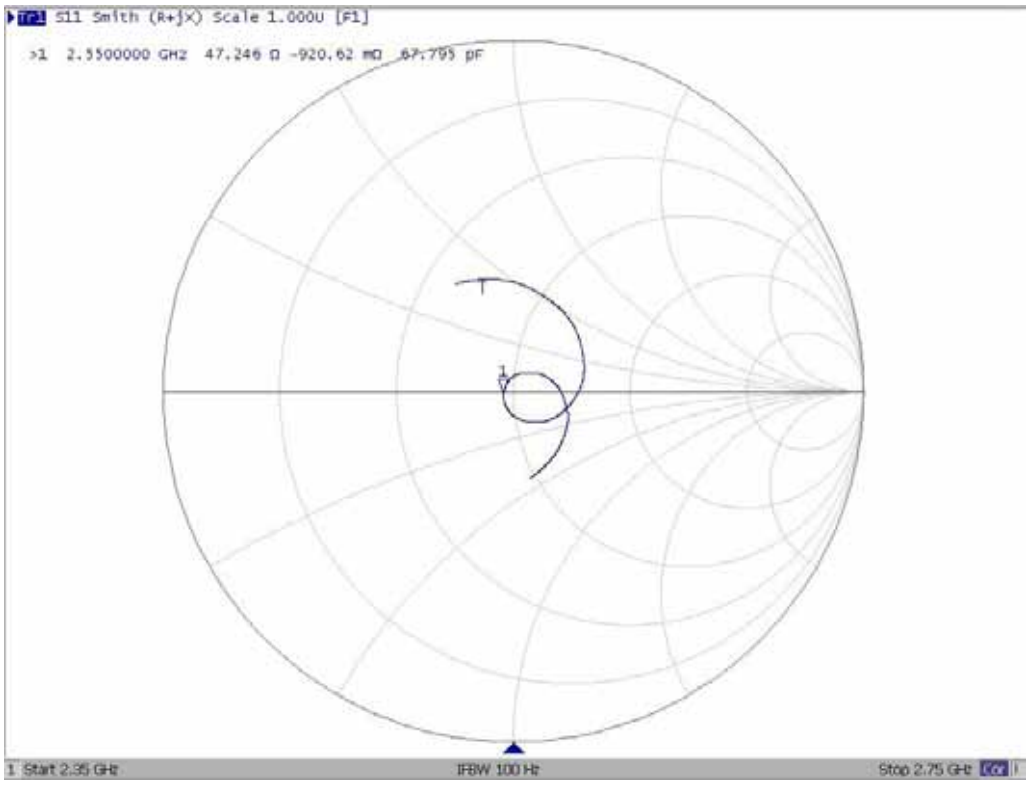
Dipole 2550 - Body

		Year		Deviation	Limit
		2010	2011		
Impedance	Real (Ω)	46.0	46.1	0.1Ω	Deviation＜ 5Ω
	Imaginary (Ω)	0.6	-1.4	2.0Ω	Deviation＜ 5Ω
Return-loss (dB)		-22.6	-27.5	0.1dB	Deviate ＜ 0.2dB
System validation	10g	6.18	6.05	2.10%	Deviation＜ 10%
	1g	13.7	13.7	0.00%	Deviation＜ 10%

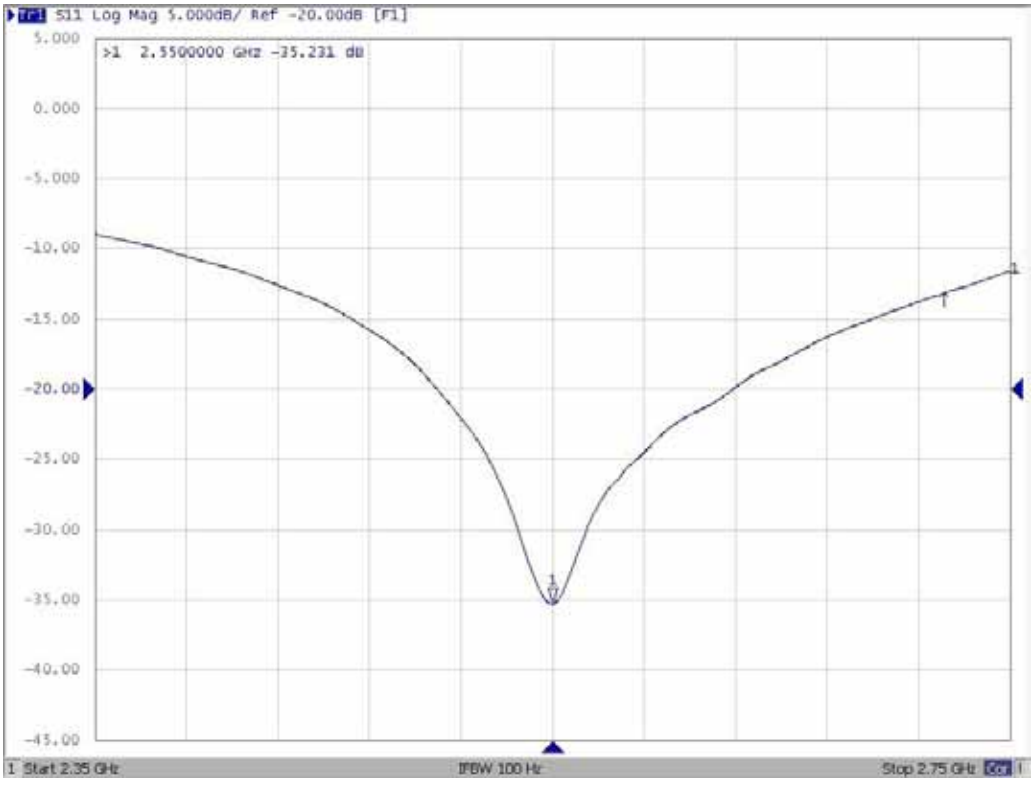
According to the above tables, it is not necessary to recalibration the dipoles in 2011. Please see below for the detail information.

G2.3 Detail Information

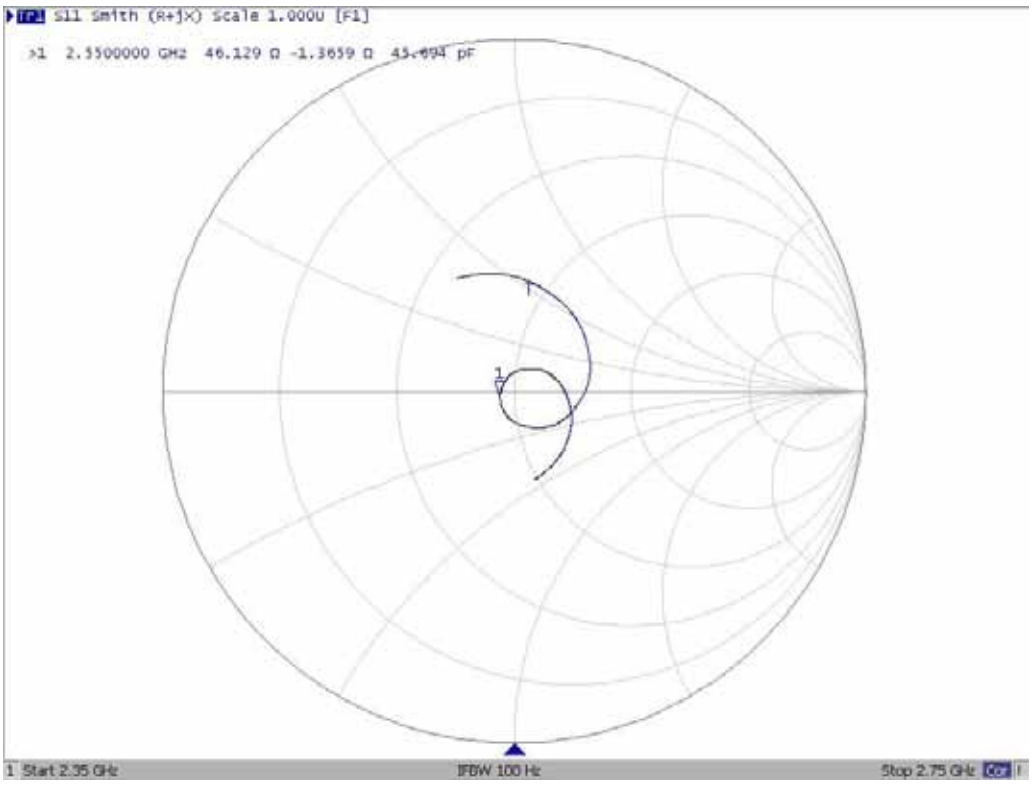
G2.3.1 Impedance Measurement Plot



Picture G5: Dipole 2550 Head_Smith



Picture G6: Dipole 2550 Head_Log



Picture G7: Dipole 2550 Body_Smith

Picture G8: Dipole 2550 Body_Log

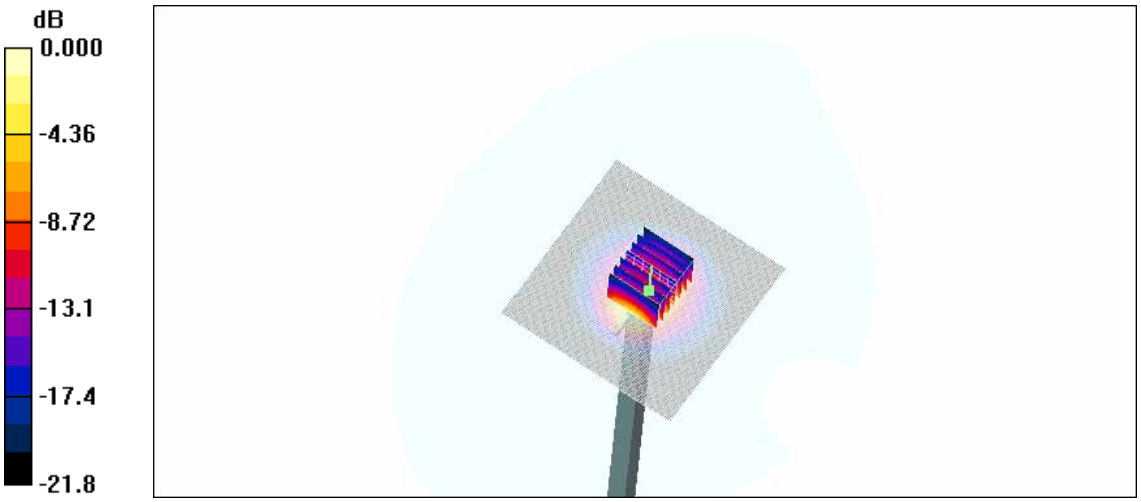
G2.3.2 System Validation Results

2550MHz

Date/Time: 2011-9-26 9:33:02
Electronics: DAE4 Sn771
Medium: Head 2550 MHz
Medium parameters used: f = 2550 MHz; σ = 1.89 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 2550 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(7.16, 7.16, 7.16)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 21.9 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.6 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 26.1 W/kg
SAR(1 g) = 14.1 mW/g; SAR(10 g) = 6.20 mW/g
Maximum value of SAR (measured) = 18.1 mW/g



0 dB = 18.1mW/g

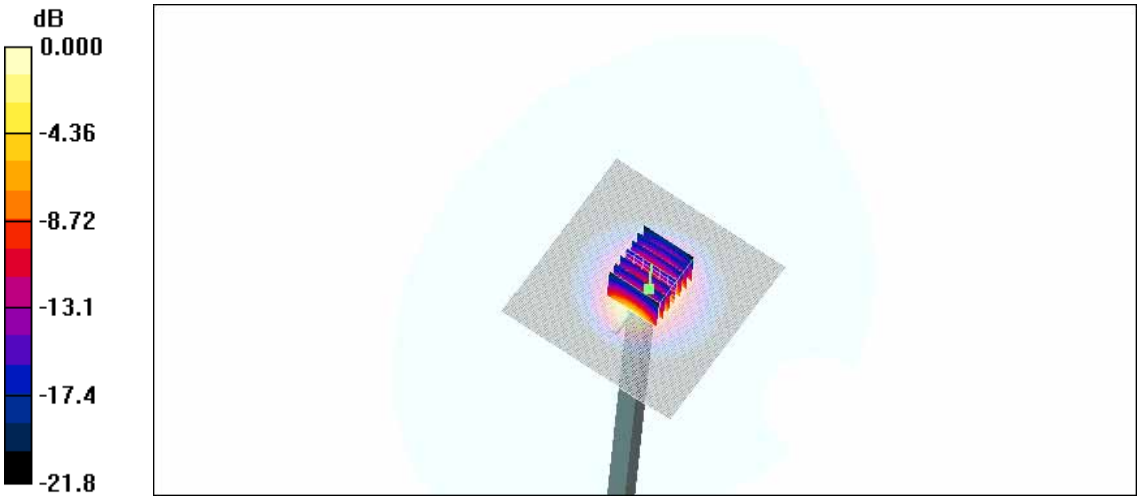
Fig.G3 validation 2550MHz 250mW

2550MHz

Date/Time: 2011-9-26 13:28:46
Electronics: DAE4 Sn771
Medium: Body 2550 MHz
Medium parameters used: f = 2550 MHz; σ = 2.06 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Ambient Temperature:23.0°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 2550 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3617 ConvF(6.84, 6.84, 6.84)

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 21.7 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.3 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 26.0 W/kg
SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.05 mW/g
Maximum value of SAR (measured) = 18.0 mW/g



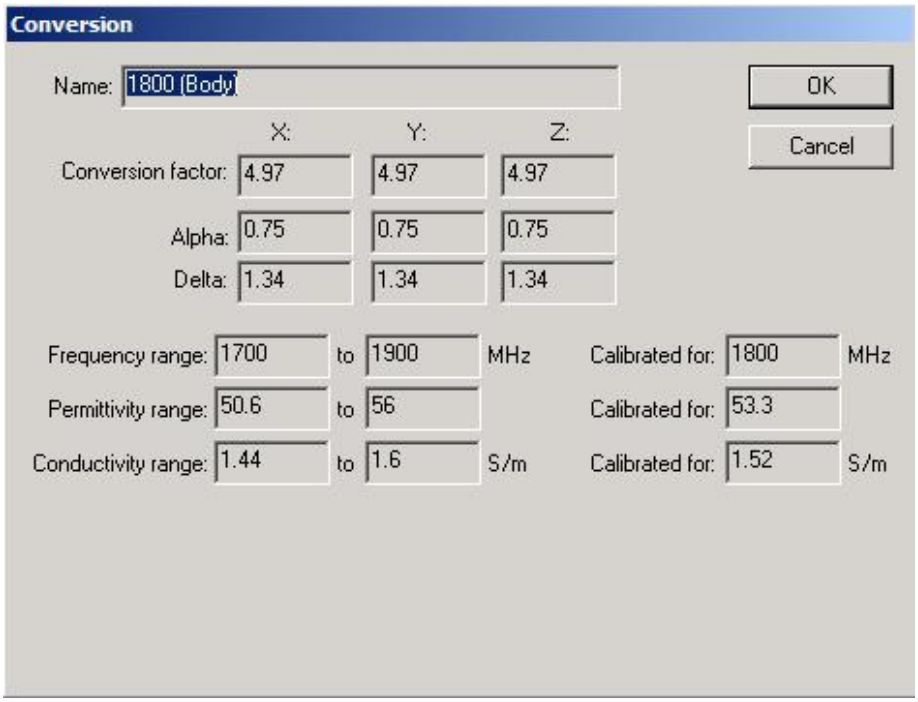
0 dB = 18.0mW/g

Fig.G4 validation 2550MHz 250mW

ANNEX H Analysis of Effective Frequency Interval of Probe

ANNEX H.1 1800 MHz_12/26/2011

The test frequencies are properly matched as this is a LTE band4. The probe calibration for permittivity and conductivity is within ±5%, were the probe calibrated centre frequency at 1800 MHz has permittivity and conductivity of 53.3 and 1.52 respectively. At the probe extreme frequencies the following are true: at 1700 MHz the permittivity and conductivity are 50.6 and 1.44 respectively. At 1900 MHz the permittivity and conductivity are 56 and 1.6 respectively. The probe was calibrated at these parameters in order to cover the frequency range 1700 MHz to 1900 MHz.



The target permittivity and conductivity at 1750 MHz is 53.4 and 1.49 respectively which is within the calibrated range of the probe parameter.

The following parameters are declared in the probe calibration certificate on page 6 :

DASY/EASY – Parameters of Probe: ES3DV3 - SN:3149

Calibration Parameter Determined in Body Tissue Simulating Media

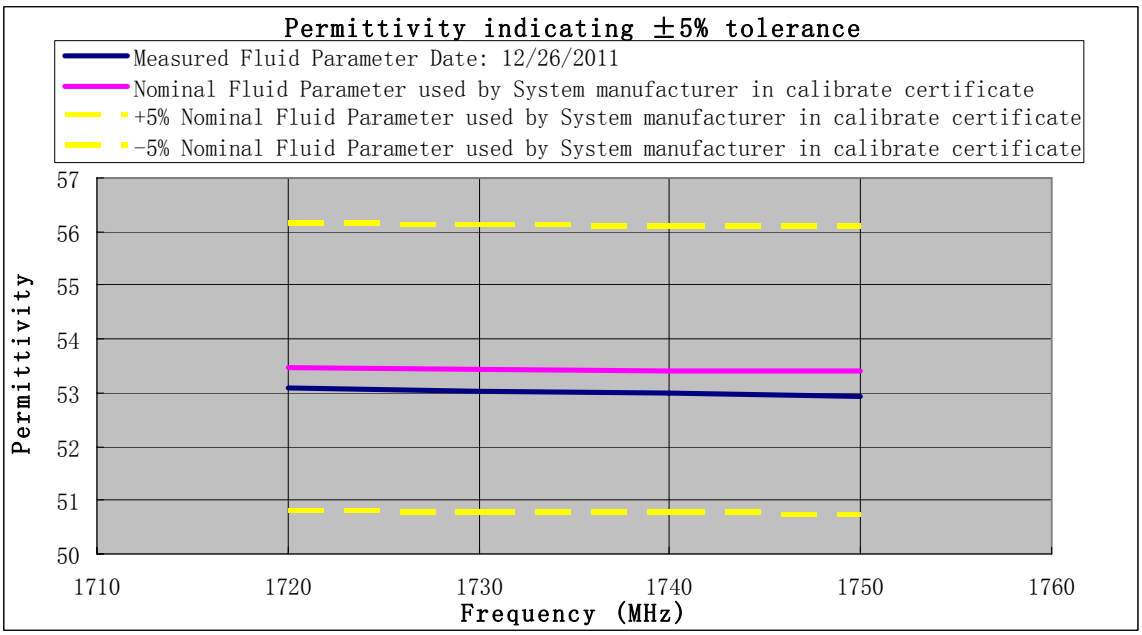
f[MHz]^{C}	Relative Permittivity^{F}	Conductivity (S/m)^{F}	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
850	55.2	0.97	6.22	6.22	6.22	0.76	1.26	±12.0%
900	55.0	1.05	6.02	6.02	6.02	0.99	1.06	±12.0%
1800	53.3	1.52	4.97	4.97	4.97	0.75	1.34	±12.0%
1900	53.3	1.52	4.68	4.68	4.68	0.62	1.33	±12.0%
2100	53.5	1.57	4.35	4.35	4.35	0.68	1.34	±12.0%
2450	52.7	1.95	4.13	4.13	4.13	0.71	1.35	±12.0%

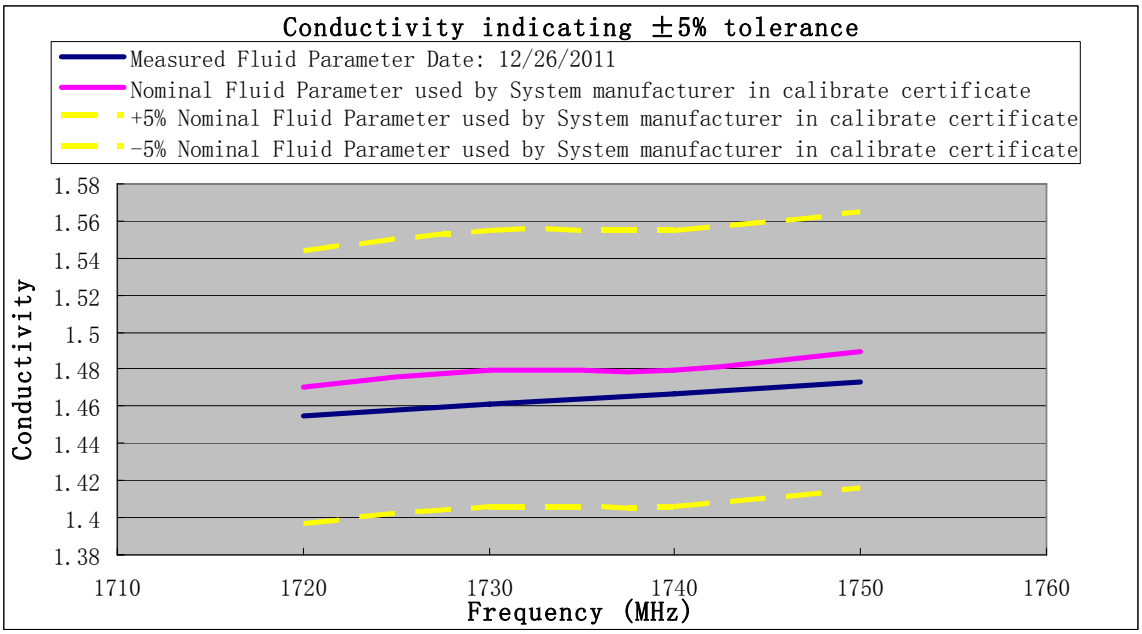
The system manufacturer has carried out addition steps as detailed on page 4 of KDB 450824. This is detailed in the calibration certificates. The measured SAR values in the report are all below 10% of the SAR limit.

The measured fluid dielectric parameters for 1750 MHz, performed during test values were all within ±5% of the 1750 MHz target ralue.

At 1800 MHz, the probe was calibrated and validation performed, the tissue dielectric parameter measured for routine measurements at 1800 MHz was less than the target parameter for 1750 MHz ε_r and higher than the target parameter for 1750 MHz σ.

/	Measured Fluid Parameter Date : 12/26/2011		Nominal Fluid Parameter used by System manufacturer in calibrate certificate	
Frequency (MHz)	ε_r	σ	ε_r	σ
1720	53.10	1.454	53.46	1.47
1730	53.04	1.460	53.44	1.48
1740	52.98	1.466	53.42	1.48
1750	52.92	1.472	53.40	1.49
1800	52.62	1.502	53.30	1.52

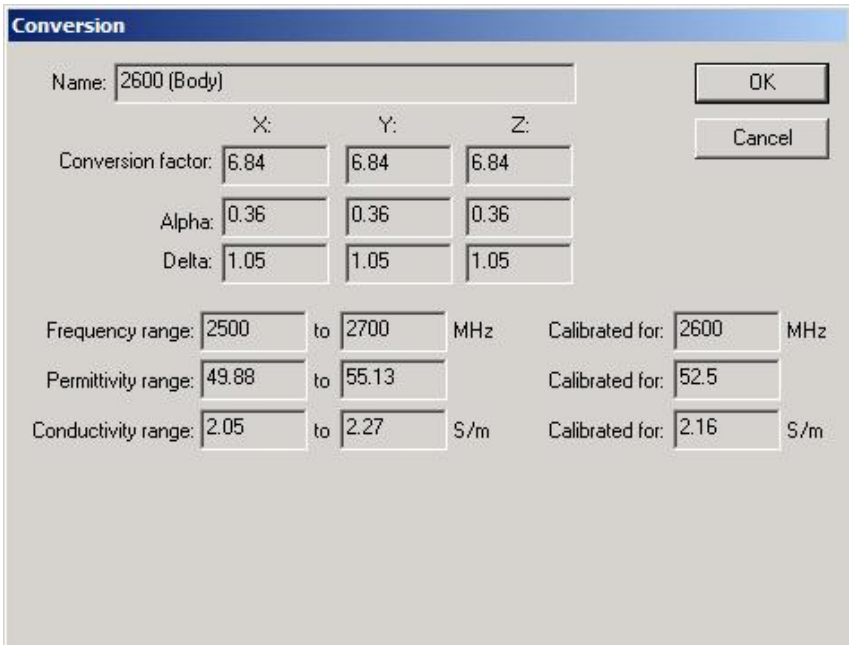




The probe conversion factor and its frequency response, with respect to the tissue dielectric media used during the probe calibration and routine measurements was examined to determine if the effective frequency interval is adequate for the intended measurements to satisfy protocol requirements. The frequency range at which the probe was calibrated for 1800 MHz covered 1700 MHz to 1900 MHz and the dielectric parameters required for 1720 to 1745 MHz were all within the calibrated range of the probe dielectric parameters.

ANNEX H.2 2600 MHz_12/27/2011

The test frequencies are properly matched as this is a LTE band7. The probe calibration for permittivity and conductivity is within ±5%, were the probe calibrated centre frequency at 2600 MHz has permittivity and conductivity of 52.5 and 2.16 respectively. At the probe extreme frequencies the following are true: at 2500 MHz the permittivity and conductivity are 49.88 and 2.05 respectively. At 2700 MHz the permittivity and conductivity are 55.13 and 2.27 respectively. The probe was calibrated at these parameters in order to cover the frequency range 2500 MHz to 2700 MHz.



The target permittivity and conductivity at 2550 MHz is 52.6 and 2.09 respectively which is within the calibrated range of the probe parameter.

The following parameters are declared in the probe calibration certificate on page 6 :

DASY/EASY – Parameters of Probe: EX3DV4 - SN:3617

Calibration Parameter Determined in Body Tissue Simulating Media

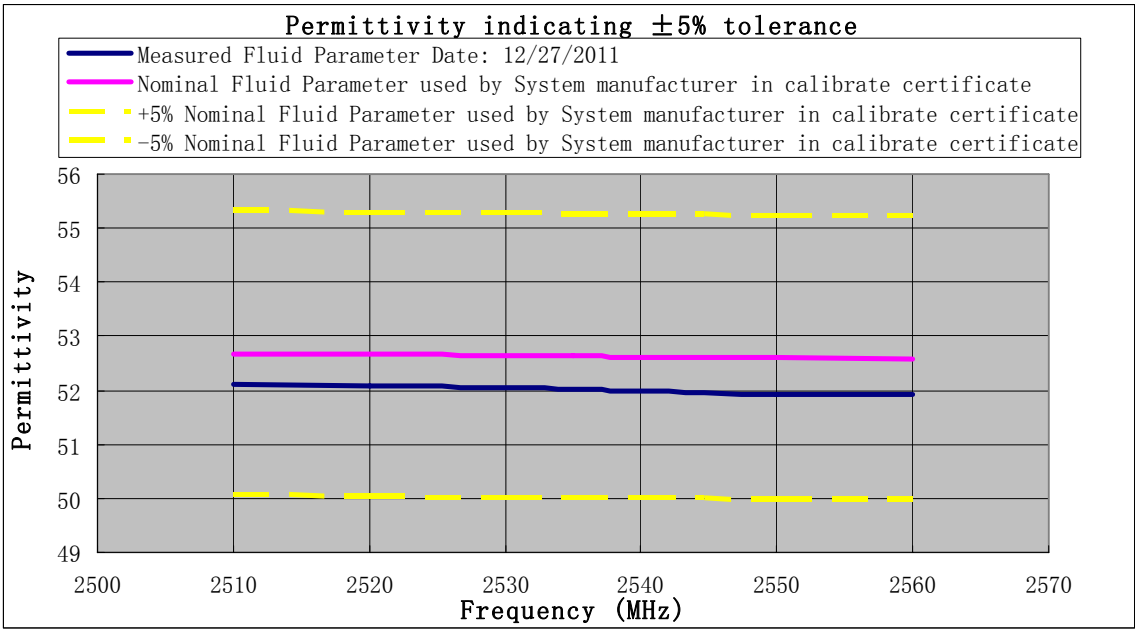
f[MHz][C]	Relative Permittivity[F]	Conductivity (S/m)[F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
2300	52.8	1.85	6.95	6.95	6.95	0.30	1.01	±12.0%
2450	52.7	1.95	6.88	6.88	6.88	0.36	1.00	±12.0%
2600	52.5	2.16	6.84	6.84	6.84	0.36	1.05	±12.0%
3500	51.3	3.30	5.02	5.02	5.02	0.33	1.40	±12.0%
5200	49.0	5.30	4.64	4.64	4.64	0.35	1.70	±12.0%
5800	48.2	6.00	4.53	4.53	4.53	0.30	1.70	±12.0%

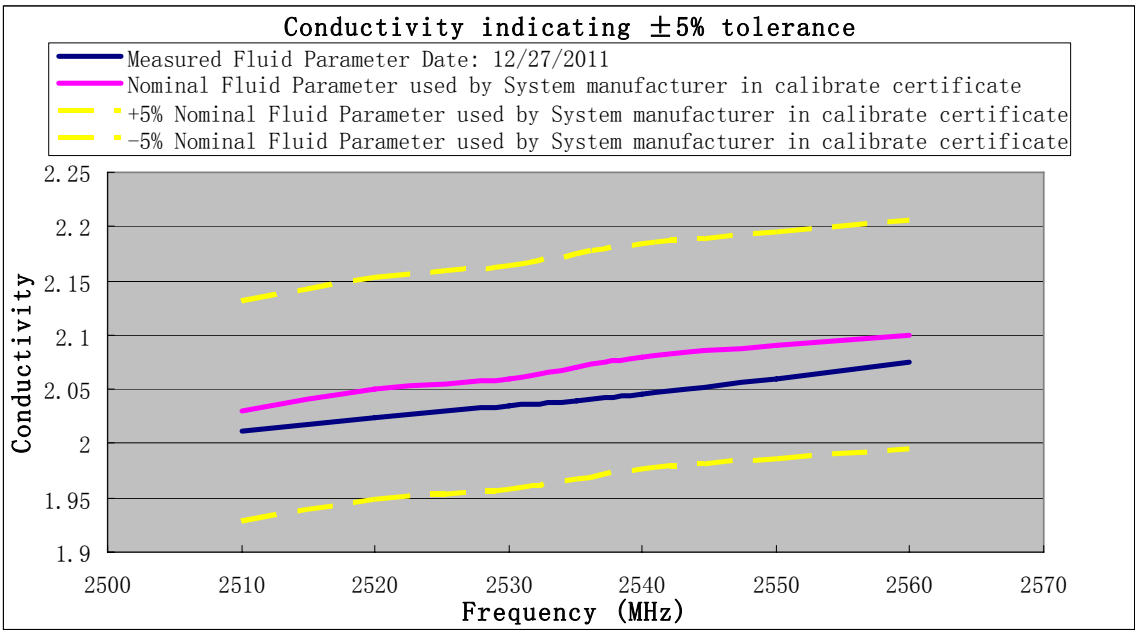
The system manufacturer has carried out addition steps as detailed on page 4 of KDB 450824. This is detailed in the calibration certificates. The measured SAR values in the report are all below 10% of the SAR limit.

The measured fluid dielectric parameters for 2550 MHz, performed during test values were all within ±5% of the 2550 MHz target ralue.

At 2600 MHz, the probe was calibrated and validation performed, the tissue dielectric parameter measured for routine measurements at 2600 MHz was less than the target parameter for 2550 MHz ε_r and higher than the target parameter for 2550 MHz σ.

/	Measured Fluid Parameter Date : 12/27/2011		Nominal Fluid Parameter used by System manufacturer in calibrate certificate	
Frequency (MHz)	ε_r	σ	ε_r	σ
2510	52.11	2.012	52.68	2.03
2520	52.09	2.024	52.66	2.05
2530	52.05	2.034	52.64	2.06
2535	52.02	2.040	52.63	2.07
2540	52.00	2.046	52.62	2.08
2550	51.94	2.060	52.60	2.09
2560	51.91	2.075	52.58	2.10
2600	51.83	2.114	52.50	2.16





The probe conversion factor and its frequency response, with respect to the tissue dielectric media used during the probe calibration and routine measurements was examined to determine if the effective frequency interval is adequate for the intended measurements to satisfy protocol requirements. The frequency range at which the probe was calibrated for 1800 MHz covered 1700 MHz to 1900 MHz and the dielectric parameters required for 1720 to 1745 MHz were all within the calibrated range of the probe dielectric parameters.