SAR TEST REPORT

for

BYD Precision Manufacture Co., Ltd.

Tablet PC

Brand Name	Model No.
TOSHIBA	AT10-B

FCC ID : ZW9-PDA0L

Prepared for : BYD Precision Manufacture Co., Ltd.
No.3001, Baohe Road, Baolong Industrial, Longgang, Shenzhen, P. R., China

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Ke Feng Rd., 52 Block,
Shenzhen Science & Industrial Park,
Nantou, Shenzhen, Guangdong, China

Tel: (0755) 26639496
Fax: (0755) 26632877

Report Number : ACS-SF14007
Date of Test : Jul.16~Aug.06, 2014
Date of Report : Sep.03, 2014

TABLE OF CONTENTS

SAR TEST REPORT

Applicant	:	BYD Precision Manufacture Co., Ltd.
Manufacturer	:	TOSHIBA CORPORATION
EUT Description	:	Tablet PC
FCC ID	:	ZW9-PDA0L

(A) MODEL NO. & BRAND NAME :

Brand Name	Model No.
TOSHIBA	AT10-B

(B) SERIAL NO. : N/A

(C) TEST VOLTAGE : DC 3.75V

Measurement Standard Used:

- FCC 47 CFR Part 2 (2.1093)
- IEEE C95.1-1999
- IEEE 1528-2003
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v05r01
- FCC KDB 248227 D01 v01r02
- FCC KDB 865664 D01
- FCC KDB 616217 D04
- FCC KDB 865664 D02
- FCC KDB616217 D04 SAR for laptop and tablets v01 r01

The device described above is tested by Audix Technology (Shenzhen) Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Audix Technology (Shenzhen) Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. This report contains data that are not covered by the NVLAP accreditation. Also, this report shows that the EUT is technically compliant with the OET 65 Supplement C.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shenzhen) Co., Ltd.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Jul.16~Aug.06, 2014 Report of date: Sep.03, 2014

Prepared by : Kayli He
Kayli He / Assistant

Reviewed by :
Sunny Lu / Assistant Manager

Audix Technology (Shenzhen) Co., Ltd.
EMC 部門報告專用章
Stamp only for EMC Dept. Report
Signature: David Jin

Approved & Authorized Signer :
David Jin / Manager

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name : Tablet PC

Model Number& Brand Name :

Brand Name	Model No.
TOSHIBA	AT10-B

FCC ID : ZW9-PDA0L

Radio : Bluetooth V2.1+EDR; Bluetooth V4.0; IEEE802.11 a/b/g/n

Operation Frequency : IEEE 802.11a: 5180MHz—5240MHz, 5260MHz—5320MHz, 5500MHz—5700MHz, 5745MHz—5825MHz
IEEE 802.11b: 2412MHz—2462MHz
IEEE 802.11g: 2412MHz—2462MHz
IEEE802.11nHT20: 2412MHz—2462MHz,5180MHz—5240MHz, 5260MHz—5320MHz, 5500MHz—5700MHz, 5745MHz—5825MHz
Bluetooth: 2402-2480MHz

Modulation Technology : IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)
IEEE 802.11a/g: OFDM(64QAM, 16QAM, QPSK, BPSK)
IEEE 802.11n HT20: OFDM (64QAM, 16QAM,QPSK,BPSK)
Bluetooth V2.1+EDR: GFSK, π/4DQPSK,8-DPSK
Bluetooth V4.0: GFSK

Antenna Assembly Gain& type : 2.4G peak Gain : 2.25dBi
5G peak Gain : 3.88dBi
FPC Antenna

USB Cable : Shielded, Detachable, 90cm

Power Adapter 1# : Manufacturer: Meic; Model No.: MN-A208-L120
Input: 100-240V~, 50/60Hz, 0.3A Max
Output: 5V---1.5A

Power Adapter 2# : Manufacturer: Meic; Model No.: MN-A110-L120
Input: 100-240V~, 50/60Hz, 0.3A Max
Output: 5V---2A

Power Adapter 3# : Manufacturer: Chicony; Model No.: W12-010N3A
Input: 100-240V~, 50/60Hz, 0.3A
Output: 5V---2A

Applicant : BYD Precision Manufacture Co., Ltd.
No.3001, Baohe Road, Baolong Industrial, Longgang, Shenzhen, P.R., China.

Manufacturer	: TOSHIBA CORPORATION 1-1, Shibaura 1-Chome, Minato-ku, Tokyo, Japan
Date of Test	: Jul.16~Aug.06, 2014
Date of Receipt	: Jul.13, 2014
Sample Type	: Prototype production

2. GENERAL DESCRIPTION

2.1. Product Description For EUT

[None]

2.2. Applied Standards

The Specific Absorption Rate (SAR) testing specification, method and procedure for this device is in accordance with the following standards:

· FCC 47 CFR Part 2 (2.1093)
· IEEE C95.1-1999
· IEEE 1528-2003
· FCC OET Bulletin 65 Supplement C (Edition 01-01)
· FCC KDB 447498 D01 v05r01
· FCC KDB 248227 D01 v01r02
· FCC KDB 865664 D01 SAR measurement requirement for 100 MHz to 6 GHz v01 r01
· 616217 D04 SAR for laptop and tablets v01 r01

2.3. Device Category and SAR Limits

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

2.4. Test Conditions

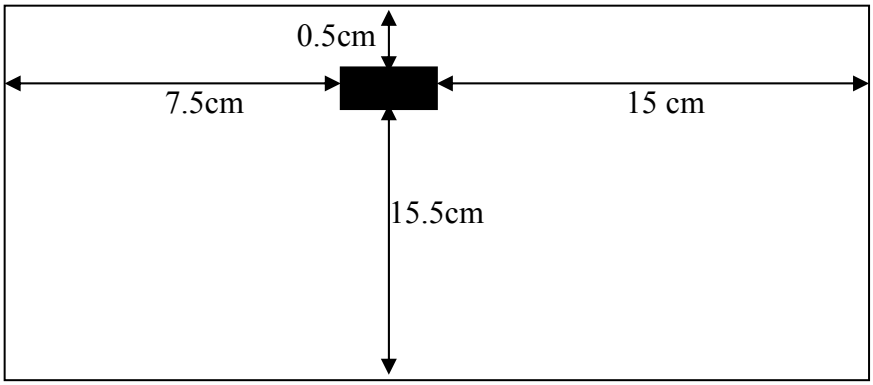
2.4.1. Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

2.4.2. Test Configuration

The distance between the EUT and the antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during all tests.

2.5. Exposure Positions Consideration



■: WiFi & BT Antenna (Tx/Rx)

(Front View)

Antenna	Description
WiFi/ Antenna (Tx/Rx)	802.11 a/b/g/n

Note:
1. The distance from the WLAN antenna to the back surface is 4mm.
2. The distance from the WLAN antenna to the Front surface is 6mm.
3. The length of the diagonal dimension of the EUT is larger than 20cm.

Sides for Body SAR tests Test distance: 0 mm						
Band	Back	Front	Top	Bottom	Right	Left
WIFI 2.4GHz	✓	X	✓	X	X	X
WIFI 5GHz	✓	X	✓	X	X	X

Note:
1. As the length of the diagonal dimension of the EUT is larger than 20cm. So, the front side can be excluded from SAR test.
2. The side which have a distance larger than 5cm from antenna can be excluded from SAR test.
3. The sum of the SAR value of 2.4G and 5GHz is less than 1.6W/Kg, thus the SAR evaluation for simultaneously can be excluded.

2.6. Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied. The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] ·[√ f(GHz)] ≤ 3.0 for 1-g SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

According to the KDB447498 appendix A, the SAR test exclusion threshold for 2450MHz at 5mm test separation distances is 10 mW 5.2GHz&5.3GHz is 7 mW, and5.4GHz &5.8GHz is 6mW

Appendix A

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

Standalone SAR test exclusion considerations

Band/Mode	F(GHz)	SAR test exclusion threshold (mW)	RF output power		SAR test exclusion
			dBm	mW	
2.4GHz WLAN 802.11 b	2.45	10	14.74	29.79	NO
BT 2.4GHz	2.45	10	4.977	3.15	YES
5.2GHz WLAN 802.11a	5.2&5.3	7	9	7.94	NO
5.8GHz WLAN 802.11 a	5.4&5.8	6	9.93	9.84	NO

2.7. Block Diagram of Test Setup

EUT

(Full Charged battery)

(EUT: Tablet PC)

2.8. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal Date	Cal. Interval
1.	DASY5 SAR Test System	Speag	TX60 L speag	F09/5B1H1/01	July.12,14	1Year
2.	Wireless Communication Test Set	Agilent	E5515C	GB44300243	May.09, 14	1Year
3.	Power Meter	Anritsu	ML2487A	6K00002472	Apr. 28,14	1 Year
4.	Power Sensor	Anritsu	MA2491A	032516	Apr. 28,14	1 Year
5	Signal Generator	HP	83732B	VS34490501	Apr. 28,14	1 Year
6	Amplifier	Milmega	ZHL-42W	C620601316	NCR	N/A
7.	Dipole Validation Kits	Speag	D900V2	1d088	May.26, 14	3Year
8.	Dipole Validation Kits	Speag	D1800V2	2d186	May.23, 14	3Year
9.	Dipole Validation Kits	Speag	D2000V2	1055	May.23, 14	3Year
10	Dipole Validation Kits	Speag	D2450V2	862	May.29, 14	3Year
11	Dipole Validation Kits	Speag	D5GHzV2	1102	Jun.16, 14	3Year
12.	Attenuator	Agilent	8491A 3dB	MY39262001	Apr. 28,14	1Year
13	Attenuator	Agilent	8491A 10dB	MY39264375	Apr. 28,14	1Year
14.	Data Acquisition Electronics	Speag	DAE4	899	Feb.07,14	2Year
15.	E-Field Probe	Speag	ES3DV3	3139	July.25,12	3Year
16.	E-Field Probe	Speag	EX3DV4	3767	July.27,12	3Year
17	Network Analyzer	Agilent	E5071B	MY42403549	Apr. 28,14	1Year

Note:

Dipole antenna calibration interval is 3 year, annual check result to be follow (Refer to KDB 865640, Dipole calibration):

Calibration date: May.17,13	
Antenna Parameters at 2450MHz	
Impedance, transformed to feed point	53.343 Ω -3.254j Ω
Return Loss	+24.745
Antenna Parameters at 5200MHz	
Impedance, transformed to feed point	52.4 Ω -6.98j Ω
Return Loss	+22.51
Antenna Parameters at 5800MHz	
Impedance, transformed to feed point	52.1 Ω -1.02j Ω
Return Loss	-31.15

2.9. Laboratory Environment

Temperature	Min:20℃,Max.25℃
Relative humidity	Min. = 30%, Max. = 70%
Note: Ambient noise is checked and found very low and in compliance with requirement of standards.	

2.10. Measurement Uncertainty

Test Item	Uncertainty
Uncertainty for SAR test	1g: 21.14
	10g: 20.64
Uncertainty for test site temperature and humidity	0.6℃

No.	source	Type	Uncertainty Value (%)	Probability Distribution	k	c_i	Standard ncertainty u_i' (%)	Degree of freedom V_{eff} or v_i
1	System repetivity	A	0.5	N	1	1	0.5	9
Measurement system								
2	-probe calibration	B	6	N	1	1	6	∞
3	-axial isotropy of the probe	B	4.7	R	$\sqrt{3}$	$\sqrt{0.5}$	1.9	∞
4	- Hemispherical isotropy of the probe	B	9.4	R	$\sqrt{3}$	$\sqrt{0.5}$	3.9	∞
5	-boundary effect	B	1.9	R	$\sqrt{3}$	1	1.1	∞
6	-probe linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
7	- System detection limits	B	1.0	R	$\sqrt{3}$	1	0.6	∞
8	-readout Electronics	B	1.0	N	1	1	1.0	∞
9	-response time	B	0	R	$\sqrt{3}$	1	0	∞
10	-integration time	B	4.3	R	$\sqrt{3}$	1	2.5	∞
11	-noise	B	0	R	$\sqrt{3}$	1	0	∞
12	-RF Ambient Conditions	B	3	R	$\sqrt{3}$	1	1.7	∞
13	-Probe Positioner Mechanical Tolerance	B	0.4	R	$\sqrt{3}$	1	0.2	∞
14	-Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞
15	-Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞
Test sample Related								
16	-Test Sample Positioning	A	2.9	N	1	1	2.9	71
17	-Device Holder Uncertainty	A	4.1	N	1	1	4.1	5
18	-Output Power Variation - SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.9	∞
Physical parameter								
19	-phantom	B	4.0	R	$\sqrt{3}$	1	2.3	∞
20	Algorithm for correcting SAR for deviations in permittivity and conductivity	B	1.9	N	1	0.84	0.9	∞

21	-Liquid conductivity (measurement uncertainty)	B	2.5	N	1	0.71	1.8	9
22	-Liquid permittivity (measurement uncertainty)	B	2.5	N	1	0.26	0.7	9
23	-Liquid conductivity -temperature uncertainty	B	1.7	R	$\sqrt{3}$	0.71	0.7	∞
24	-Liquid permittivity -temperature uncertainty	B	0.3	R	$\sqrt{3}$	0.26	0.05	∞
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{24} c_i^2 u_i^2}$					11.24	
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N		k=2	22.48	

2.11. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for the product Tablet PC (M/N: AT10-B) are as below:

Max. Reported SAR (1g)

Band	Position	Measured SAR	Scaled SAR
		SAR_{1g} (W/kg)	SAR_{1g} (W/kg)
WIFI 2.4GHz	Body	1.08	1.109
WIFI 5GHz	Body	1.06	1.155

The SAR values found for this device are below the maximum recommended levels of 1.6 W/Kg as averaged over any 1g tissue according to the ANSI C95.1-1999.

For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and which provides a minimum separation distance of 0 mm between this device and the body of the user. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

3. MEASURE PROCEDURES

3.1. General description of test procedures

For the 802.11a/b/g SAR body tests, a communication link is set up with the test mode software for WIFI mode test. The Absolute Radiofrequency Channel Number (ARFCN) is allocated to 1,6 and 11 respectively in the case of 2450 MHz. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate. Testing at higher data rates is not required when the maximum average output power is less than 0.25dB higher than those measured at the lowest data rate.

802.11b/g operating modes are tested independently according to the service requirements in each frequency band.802.11b/g modes are tested on channels1,6,11;however,if output power reduction is necessary for channels 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels must be tested instead.

SAR is not required for 802.11g channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels. When the maximum average output channel in each frequency band is not included in the “default test channels”, the maximum channel should be tested instead of an adjacent “default test channels”, these are referred to as the “required test channels” and are illustrated in table 1.

Please apply the following guidance for SAR testing:

1. Please use a 0 mm (touching) test separation distance on the flat phantom during SAR testing of this device. This separation distance is based on the guidance found in FCC KDB Publication 447498 D01, Section 5.2.3 3) as well as the RF exposure information for the original Tablet PC(FCC ID: ZW9-PDA0L).
2. Please utilize a body tissue simulating liquid (TSL) of the appropriate frequency during SAR testing.
3. Please use the guidance found in FCC KDB Publication 447498 D01 to determine which sides of the device need to be tested for SAR.
4. FCC KDB Publication 248227 D01 should be used for selection of the WiFi channels, data rates, etc.

Mode		GHz	Channel	Turbo Channel	"Default Test Channels"			
					§ 15.247		UNII	
					802.11b	802.11g		
802.11b/g		2.412	1 #		√	▽		
		2.437	6	6	√	▽		
		2.462	11 #		√	▽		
802.11a	UNII	5.18	36				√	
		5.20	40	42(5.21GHz)				*
		5.22	44					*
		5.24	48	50(5.25GHz)			√	
		5.26	52				√	
		5.28	56	58(5.29GHz)				*
		5.30	60					*
		5.32	64				√	
		5.500	100	Unknow				*
		5.520	104				√	
		5.540	108					*
		5.560	112					*
		5.580	116				√	
		5.600	120					*
		5.620	124				√	
		5.640	128					*
		5.660	132					*
		5.680	136				√	
		5700	140					
	UNII or § 15.247	5.745	149		√		√	
		5.765	153	152(5.76GHz)		*		
		5.785	157		√			
		5.805	161	160(5.80GHz)		*	√	
	§ 15.247	5.825	165		√			

Note:

√ = "default test channels"

* = possible 802.11a channels with maximum average output > the "default test channels"

∇ = possible 802.11g channels with maximum average output ¼ dB ≥ the "default test channels"

= when output power is reduced for channel 1 and/or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested

3.2. Position of module in Portable devices

SAR is required for Front, back, edge, Top and bottom with the most conservative exposure conditions, The EUT is tested at the following test positions:

WiFi 2.4GHz:

(1) Test Position Bottom Side: The Bottom Side of the EUT towards and directed tightly to touch the flat phantom.
(2) Test Position Top Side: The Top Side of the EUT towards and directed tightly to touch the flat phantom.
(3) Other side can be excluded from SAR test.

WiFi 5GHz:

(1) Test Position Bottom Side: The Bottom Side of the EUT towards and directed tightly to touch the flat phantom.
(2) Test Position Top Side: The Top Side of the EUT towards and directed tightly to touch the flat phantom.
(3) Other side can be excluded from SAR test.

4. SAR MEASUREMENTS SYSTEM

4.1. SAR Measurement Set-up

DASY5 system for performing compliance tests consists of the following items:

(1) A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).

(2) A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage It issue simulating liquid. The probe is equipped with an optical surface detector system.

(3) A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

(4) A unit to operate the optical surface detector which is connected to the EOC.

(5) The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.

(6) The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.

(7) DASY5 software and SEMCAD data evaluation software.

(8) Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

(9) The generic twin phantom enabling the testing of left-hand and right-hand usage.

(10) The device holder for handheld mobile phones.

(11) Tissue simulating liquid mixed according to the given recipes.

(12) System validation dipoles allowing to validate the proper functioning of the system.

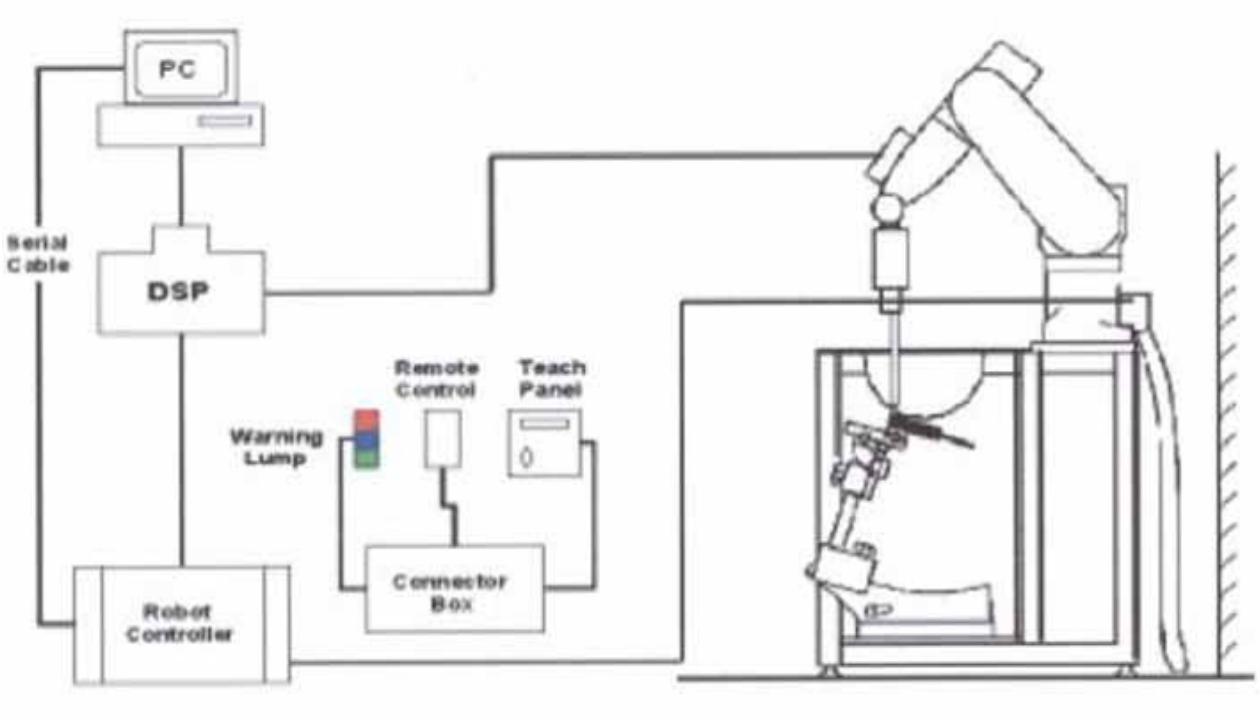


Figure 4.1 SAR Lab Test Measurement Set-up

4.2. ELI Phantom

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.

Figure 4.2 Top View of Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2.0 ± 0.2 mm (bottom plate)
Dimensions	Major axis: 600 mm Minor axis: 400 mm
Filling Volume	approx. 30 liters
Wooden Support	SPEAG standard phantom table

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters.
On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.
The phantom can be used with the following tissue simulating liquids:

*Water-sugar based liquid
*Glycol based liquids

4.3. Device Holder for SAM Twin Phantom

The SAR in the Phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source in 5 mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ± 20%. An accurate device position is therefore crucial for accurate and repeatable measurement. The position in which the devices must be measured, are defined by the standards.

The DASY5 device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (EPR).

Thus the device needs no repositioning when changing the angles.

The DASY5 device holder has been n ε_r e out of low-loss POδ[material having the following dielectric parameters: relative permittivity =3 and loss tangent = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

Figure 4.3 Device Holder

4.4. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangul -ar configuration and optimized for dosimetric evaluation.

Figure 4.4 EX3DV4 E-field Probe

4.4.1. EX3DV4 Probe Specification

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2dB (noise: typically < 1 µW/g)
Dimensions	Overall length: PRS-T2 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

4.5. 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/m3).

4.6. Scanning procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The ”reference“ and ”drift“ measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.The indicated drift is mainly the variation of the EUT’s output power and should vary max. ± 5 %.

The ”surface check“ measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles.

The difference between the optical surface detection and the actual surface depends on the Probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot. Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged.

After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan

Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY5 system allows evaluations that combine measured data and robot positions, such as:

· maximum search
· extrapolation
· boundary correction
· peak search for averaged SAR

During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation. For a grid using 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

5. DATA STORAGE AND EVALUATION

5.1. Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for thedata evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

5.2. Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	
	- Density	

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$Vi = Ui + Ui2 \cdot c f / d c pi$$

With ***Vi*** = compensated signal of channel i (i = x, y, z)

Ui = input signal of channel i (i = x, y, z)

cf = crest factor of exciting field (DASY parameter)

***dcp*i** = diode compression point (DASY parameter)

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

E-field probes: ***Ei = (Vi / Normi · ConvF)1/2***

H-field probes: ***Hi = (Vi)1/2 · (ai0 + ai1 f + ai2f2) / f***

With ***Vi*** = compensated signal of channel i (i = x, y, z)

Normi = sensor sensitivity of channel i (i = x, y, z)

ConvF = sensitivity enhancement in solution

aij = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

Ei = electric field strength of channel i in V/m

Hi = magnetic field strength of channel i in A/m

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

Etot = (Ex2+ EY2+ Ez2)1/2

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

SAR = (Etot2·) / (· 1000)

with

SAR = local specific absorption rate in mW/g

Etot = total field strength in V/m

= conductivity in [mho/m] or [Siemens/m]

= equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

Ppwe = *Etot2 / 3770* or ***Ppwe = Htot2 · 37.7***

with ***Ppwe*** = equivalent power density of a plane wave in mW/cm2

Etot = total electric field strength in V/m

Htot = total magnetic field strength in A/m

6. SYSTEM CHECK

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulates were measured every day using the dielectric probe kit and the network analyzer. A system check measurement was made following the determination of the dielectric parameters of the simulates, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. The system check results (dielectric parameters and SAR values) are given in the ANNEX A.

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %).

System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.

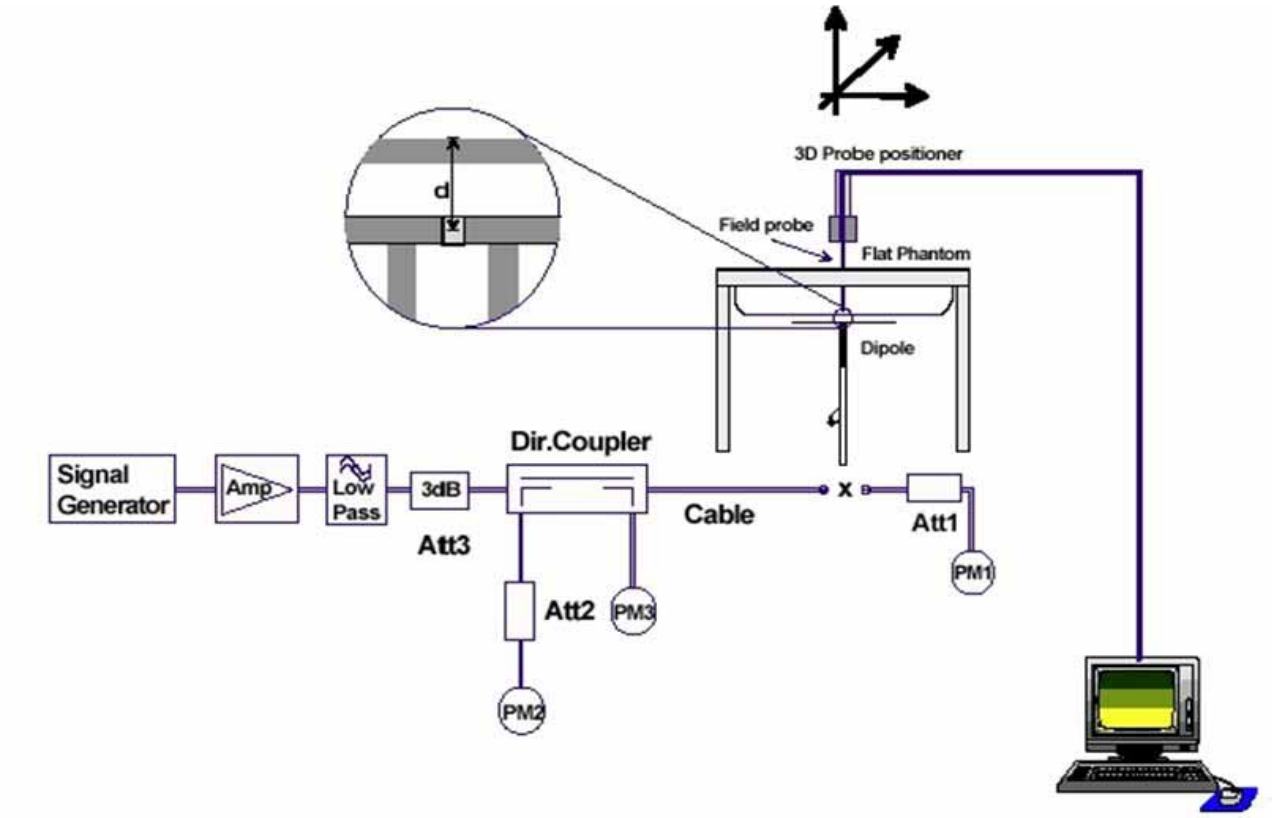


Figure 6.1: System Check Set-up

7. TEST RESULTS

7.1. Average power VS Data Rate(WIFI 2.4GHz & Bluetooth)

BT V2.1+EDR

Mode	CH（MHz）	Output power（dBm)
GFSK	2402	-3.843
	2441	-3.453
	2480	-2.511
8-DPSK	2402	-4.426
	2441	-4.227
	2480	-3.301

BT V4.0

Mode	CH（MHz）	Output power（dBm)
GFSK	2402	2.720
	2440	2.707
	2480	2.866

Note: The power of the Bluetooth is less than the SAR exclusion thresholds limit, so the SAR measurement for Bluetooth can be excluded.

WiFi 2.4GHz

Mode	CH	Peak Power	Average Power
802.11b (2.4GHz)	CH1	18.39	15.00
	CH6	18.72	15.47
	CH11	18.40	15.18
802.11g (2.4GHz)	CH1	20.35	11.95
	CH6	21.11	12.74
	CH11	21.03	12.36
802.11n HT20 (2.4GHz)	CH1	21.08	12.69
	CH6	21.89	13.36
	CH11	21.33	13.01
Note: SAR test was conducted at the data rate which has maximum output level.			

Note1 :Those data rate has the maximum power output.
Note2 : Per KDB 248227, 11g/n output power is less than 1/4 dB higher than 11b mode, thus the SAR can be excluded.
Note3: The WIFI and Bluetooth can not transmit simultaneously.

7.2. Output power VS Data Rate (WiFi 5GHz)

Mode	CH	Peak Power	Average Power
802.11a（5G）	36	19.25	11.05
	48	19.03	11.01
	52	18.27	10.13
	64	18.72	10.48
	104	19.76	11.96
	116	19.68	11.86
	124	19.75	11.83
	136	19.56	11.57
	149	20.46	12.58
	157	21.09	12.97
	165	20.78	12.78
802.11nHT20（5G）	36	17.65	9.57
	48	17.38	9.26
	52	16.82	9.04
	64	17.62	9.47
	104	19.43	11.12
	116	19.55	11.04
	124	19.22	11.15
	136	18.79	10.76
	149	19.74	11.76
	157	20.16	12.15
	165	19.67	11.63
Note: SAR test was conducted at the data rate which has maximum output level.			

Remark:

1. Per KDB 248227, 11n/11nac output power is less than 1/4 dB higher than 11a mode, thus the SAR can be excluded.
2. These date rate has the maximum power output.

7.3. System Check for Body Tissue simulating liquid

Frequency	Description	SAR(W/kg)		Dielectric Parameters		Temp
		1g	10g	εr	σ(s/m)	℃
2450MHz	Recommended value ±10% window	12.8 11.52 — 14.08	5.86 5.27 — 6.45	52.7	1.95	/
	Measurement value 2014-07-20	12.764	5.586	50.957	1.972	22.33
5200MHz	Recommended value ±10% window	19.125 17.21 — 21.04	5.4 4.86 — 5.94	49	5.3	/
	Measurement value 2014-08-06	19.135	5.120	49.156	5.314	22.18
5300MHz	Recommended value ±10% window	19.125 17.21 — 21.04	5.4 4.86 — 5.94	49	5.3	/
	Measurement value 2014-08-06	19.147	5.131	49.032	5.385	22.46
5500MHz	Recommended value ±10% window	20.347 17.55 — 21.45	5.652 4.93— 6.02	48.6	5.65	/
	Measurement value 2014-08-06	20.624	5.668	48.729	5.673	22.59
5600MHz	Recommended value ±10% window	20.347 17.55 — 21.45	5.652 4.93— 6.02	48.6	5.65	/
	Measurement value 2014-08-06	20.652	5.677	48.711	5.686	22.48
5800MHz	Recommended value ±10% window	19.041 17.55 — 21.45	5.239 4.93— 6.02	48.2	6	/
	Measurement value 2014-08-06	19.384	5.367	48.235	6.093	22.38

Note: Recommended Values used derive from the calibration certificate and 250 mW is used as feeding power to the calibrated dipole.

7.4. Test Results (WiFi IEEE802.11b 2.4GHz)

CH	Test Position	Output Power		Measured Results		Scaled		Power Drift (dBm)
		Max. Target AV Power (dBm)	Measured AV Power (dBm)	SAR1g (W/kg)	SAR10g (W/kg)	SAR1g (W/kg)	SAR10g (W/kg)	
CH1	Back	15.5	15.00	0.911	0.342	1. 022	0.384	0.09
	Top	15.5	15.00	0.411	0.181	0. 461	0.203	0.01
CH6	Back	15.5	15.47	1.08	0.322	1. 087	0.324	0.04
	Top	15.5	15.47	0.474	0.206	0. 477	0.207	0.16
CH11	Back	15.5	15.18	1.03	0.532	1. 109	0.573	0.14
	Top	15.5	15.18	0.539	0.233	0. 580	0.251	-0.14
Conclusion: PASS								
Note : Factor= Max.Target AV Power/Measured Power Scaled SAR= Measured SAR*Factor The Max.Reported SAR : **1.109W/kg for 1g SAR**								

7.5. Test Results (WiFi 5GHz)

Test Position	Channel	Output Power		Measured Results		Scaled		Power Drift (dBm)
		Max. Target AV Power (dBm)	Measured AV Power (dBm)	SAR**1g** (W/kg)	SAR**10g** (W/kg)	SAR**1g** (W/kg)	SAR**10g** (W/kg)	
Back	36	11.5	11.05	1.010	0.585	1.120	0.649	0.13
	48	11.5	11.01	1.005	0.590	1.125	0.661	0.11
	52	10.5	10.13	1.060	0.583	1.155	0.635	-0.19
	64	10.5	10.48	1.018	0.597	1.023	0.600	0.15
	104	12	11.96	1.013	0.541	1.023	0.546	-0.15
	116	12	11.86	1.045	0.569	1.079	0.588	-0.13
	124	12	11.83	1.032	0.552	1.073	0.574	0.16
	136	12	11.57	1.007	0.531	1.112	0.587	-0.17
	149	13	12.58	1.015	0.544	1.118	0.599	0.14
	157	13	12.97	1.001	0.571	1.008	0.575	0.19
	165	13	12.78	1.037	0.557	1.091	0.586	0.06
Top	36	11.5	11.05	0.623	0.303	0.691	0.336	0.18
	48	11.5	11.01	0.553	0.262	0.619	0.293	0.08
	52	10.5	10.13	0.614	0.294	0.669	0.320	0.19
	64	10.5	10.48	0.538	0.259	0.540	0.260	-0.17
	104	12	11.96	0.578	0.271	0.584	0.274	0.17
	116	12	11.86	0.549	0.260	0.567	0.268	0.16
	124	12	11.83	0.717	0.338	0.746	0.352	0.16
	136	12	11.57	0.616	0.307	0.680	0.339	0.15
	149	13	12.58	0.465	0.242	0.512	0.267	0.14
	157	13	12.97	0.504	0.263	0.507	0.265	0.09
	165	13	12.78	0.669	0.366	0.704	0.385	0.04

Conclusion: PASS

Note :

Factor= Max.Target AV Power/Measured Power

Scaled SAR= Measured SAR*Factor

The Max.Reported SAR : **1.155 W/kg for 1g SAR**

7.6. Composition of Ingredients for Tissue Simulating Liquids

The following tissue formulations are provided for reference only as some of The parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue Parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

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

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	78
Mineral Oil	11
Emulsifiers	9
Additives and Salt	2

7.7. Dielectric Performance for Body Tissue simulating liquid

Frequency	Description	Dielectric Parameters		Temp
		εr	σ(s/m)	℃
2450MHz	Recommended value ±10% window	52.7	1.95	/
	Measurement value 2014-7-20	50.957	1.972	22.33
5200MHz	Recommended value ±10% window	49	5.3	/
	Measurement value 2014-08-06	49.156	5.314	22.18
5300MHz	Recommended value ±10% window	49	5.3	/
	Measurement value 2014-08-06	49.032	5.385	22.46
5500MHz	Recommended value ±10% window	48.6	5.65	/
	Measurement value 2014-08-06	48.729	5.673	22.59
5600MHz	Recommended value ±10% window	48.6	5.65	/
	Measurement value 2014-08-06	48.711	5.686	22.48
5800MHz	Recommended value ±10% window	48.2	6	/
	Measurement value 2014-08-06	48.235	6.093	22.38

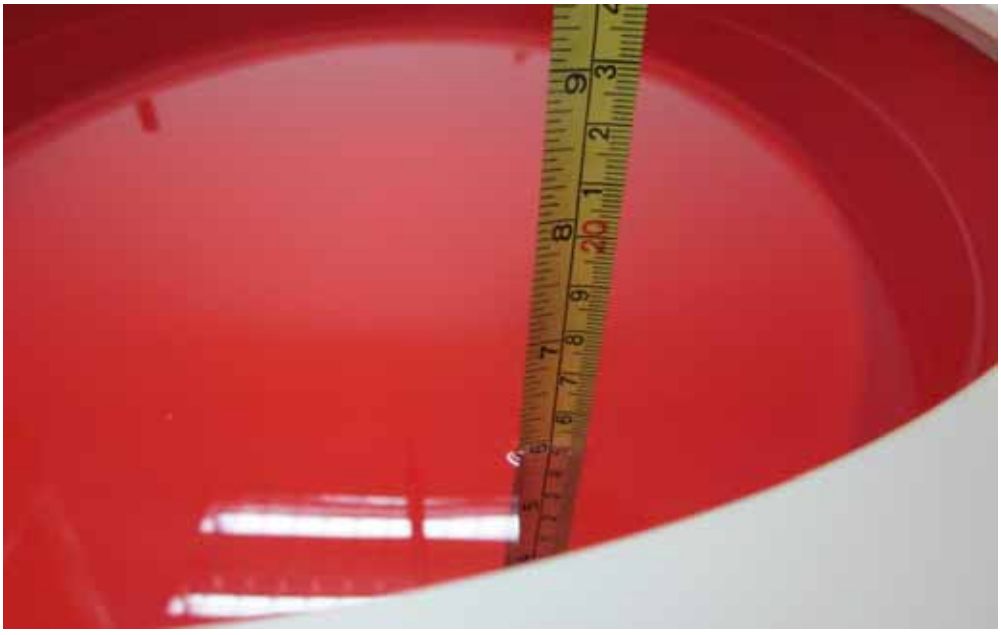


Figure 4.4: Liquid depth in the Flat Phantom

8. ANNEX A: SYSTEM CHECK RESULTS

Test Laboratory: Audix SAR Lab Date: 20/07/2014

CW_2450MHz

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:862
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.972 mho/m; ε_r = 50.957; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

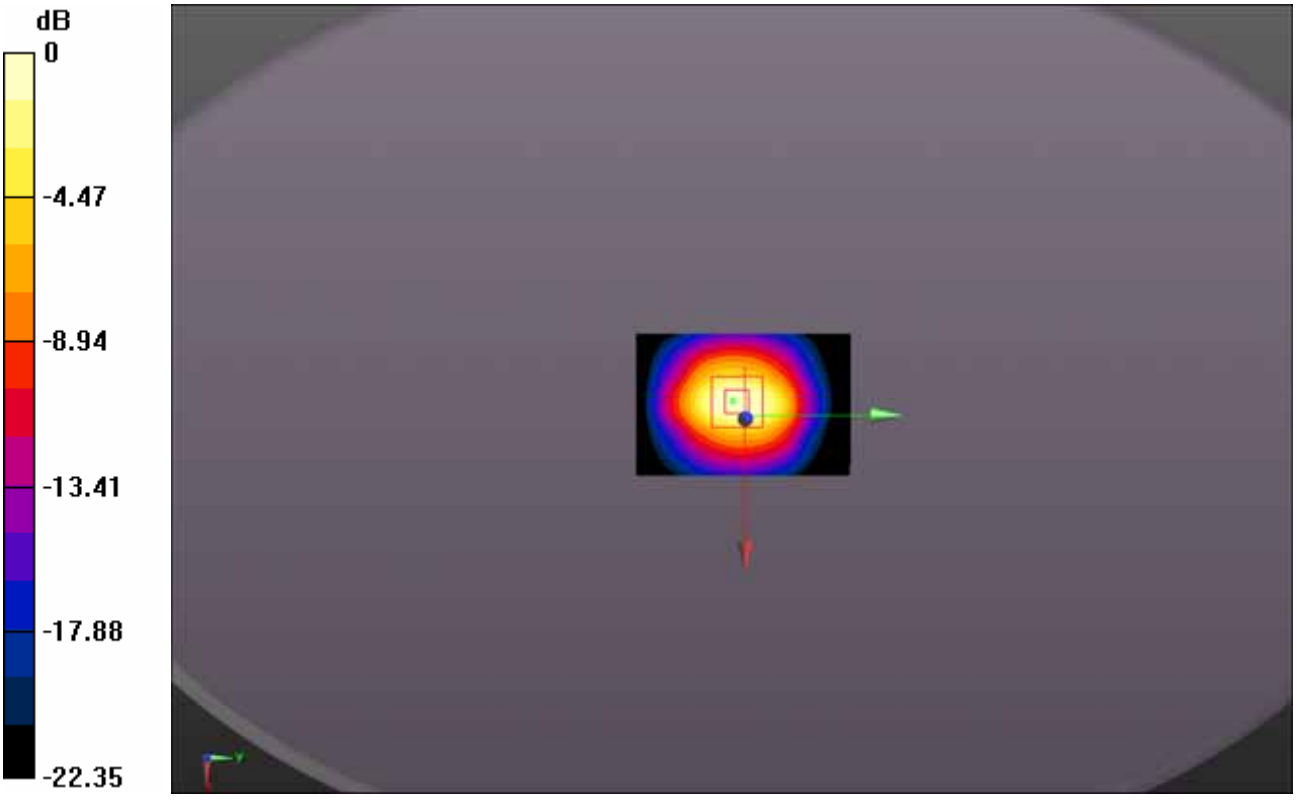
- Probe: ES3DV3 - SN3139; ConvF(4.16, 4.16, 4.16); Calibrated: 25/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

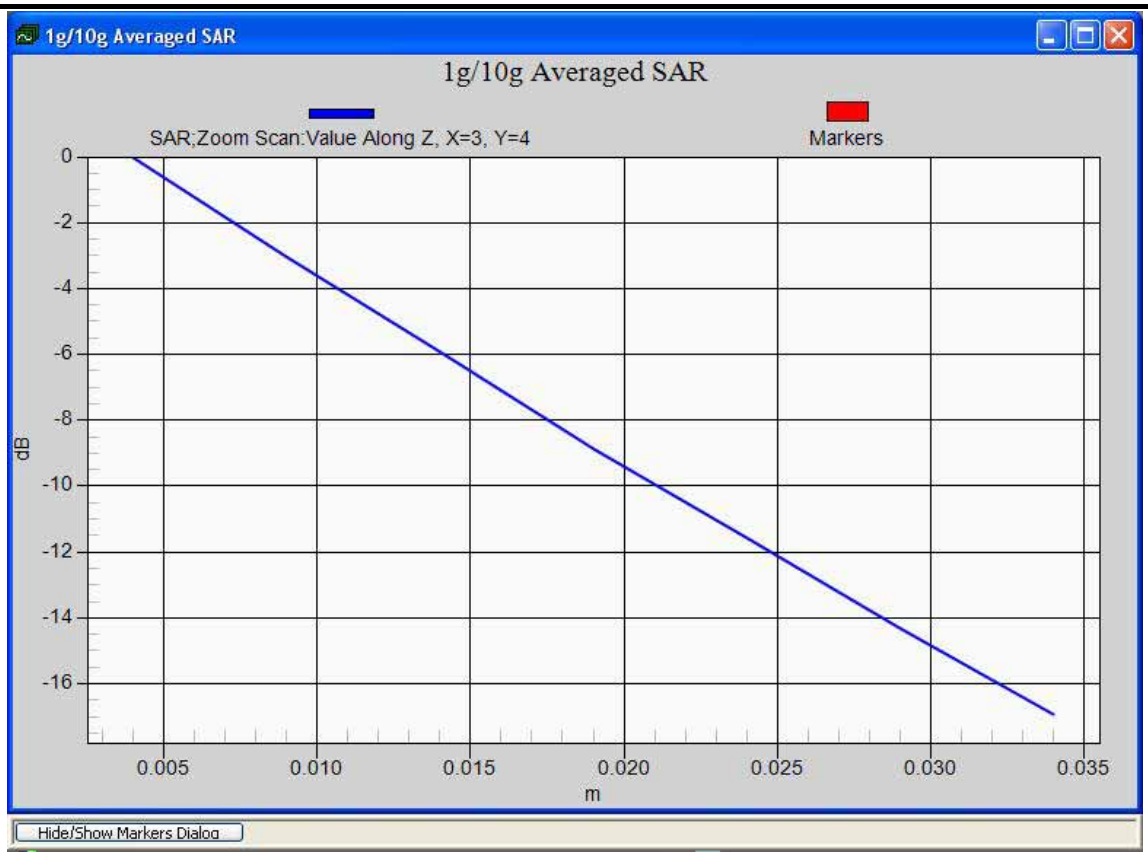
Configuration/CW_2450/Area Scan (41x61x1):

Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 16.531 mW/g

Configuration/CW_2450/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.248 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 25.328
SAR(1 g) = 12.764 mW/g; SAR(10 g) = 5.586 mW/g
Maximum value of SAR (measured) = 14.253 mW/g




1g/10g Averaged SAR
1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=3, Y=4
Markers
0
-2
-4
-6
-8
-10
-12
-14
-16
dB
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m
Hide/Show Markers Dialog

Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

CW_ 5200MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102
Communication System: IEEE 802.11a WiFi 5GHz ; Frequency: 5200 MHz
Medium parameters used: f = 5200 MHz; σ = 5.314 mho/m; ε_r = 49.156; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

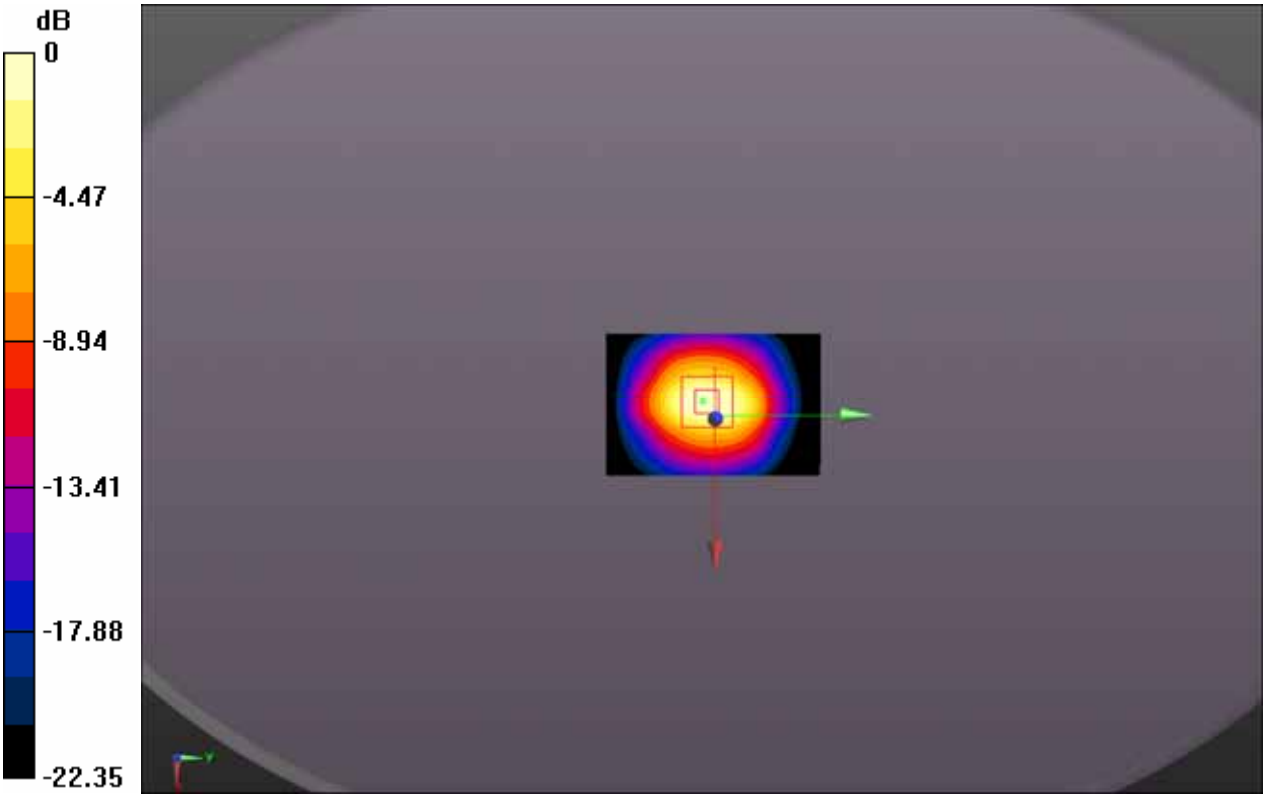
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CW_5200/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 7.986 W/kg

Configuration/802.11b_CW_5200/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.003 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 6.489 mW/g
SAR(1 g) = 19.135 mW/g; SAR(10 g) = 5.120 mW/g
Maximum value of SAR (measured) = 19.68 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

CW_ 5300MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102
Communication System: IEEE 802.11a WiFi 5GHz ; Frequency: 5300 MHz
Medium parameters used: f = 5300 MHz; σ = 5.358 mho/m; ε_r = 49.032; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

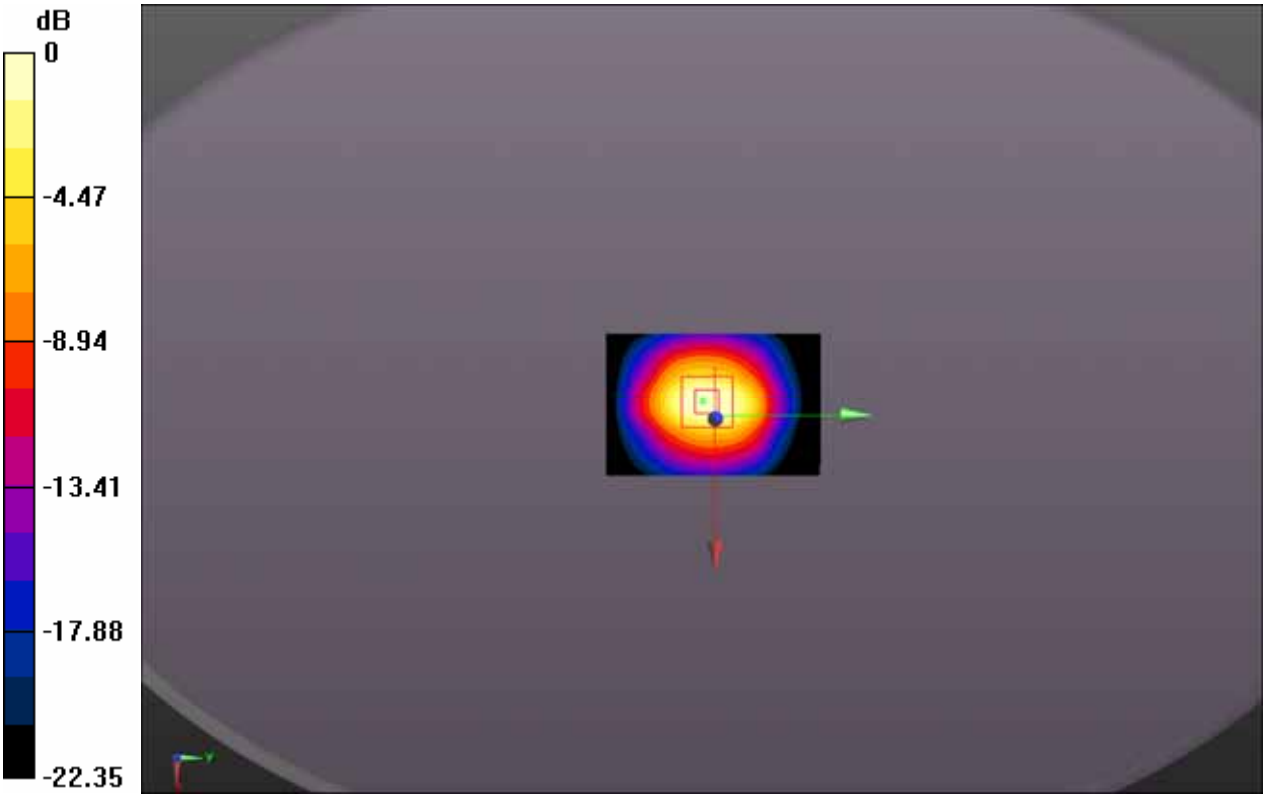
- Probe: EX3DV4 - SN3898; ConvF(5.23, 5.23, 5.23); Calibrated: 10/03/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CW_5300/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 7.964 W/kg

Configuration/802.11b_CW_5300/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.005 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 6.512 mW/g
SAR(1 g) = 19.147 mW/g; SAR(10 g) = 5.131 mW/g
Maximum value of SAR (measured) = 19.74 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

CW_ 5500MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102
Communication System: IEEE 802.11a WiFi 5GHz ; Frequency: 5500 MHz
Medium parameters used: f = 5500 MHz; σ = 5.673 mho/m; ε_r = 48.729; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

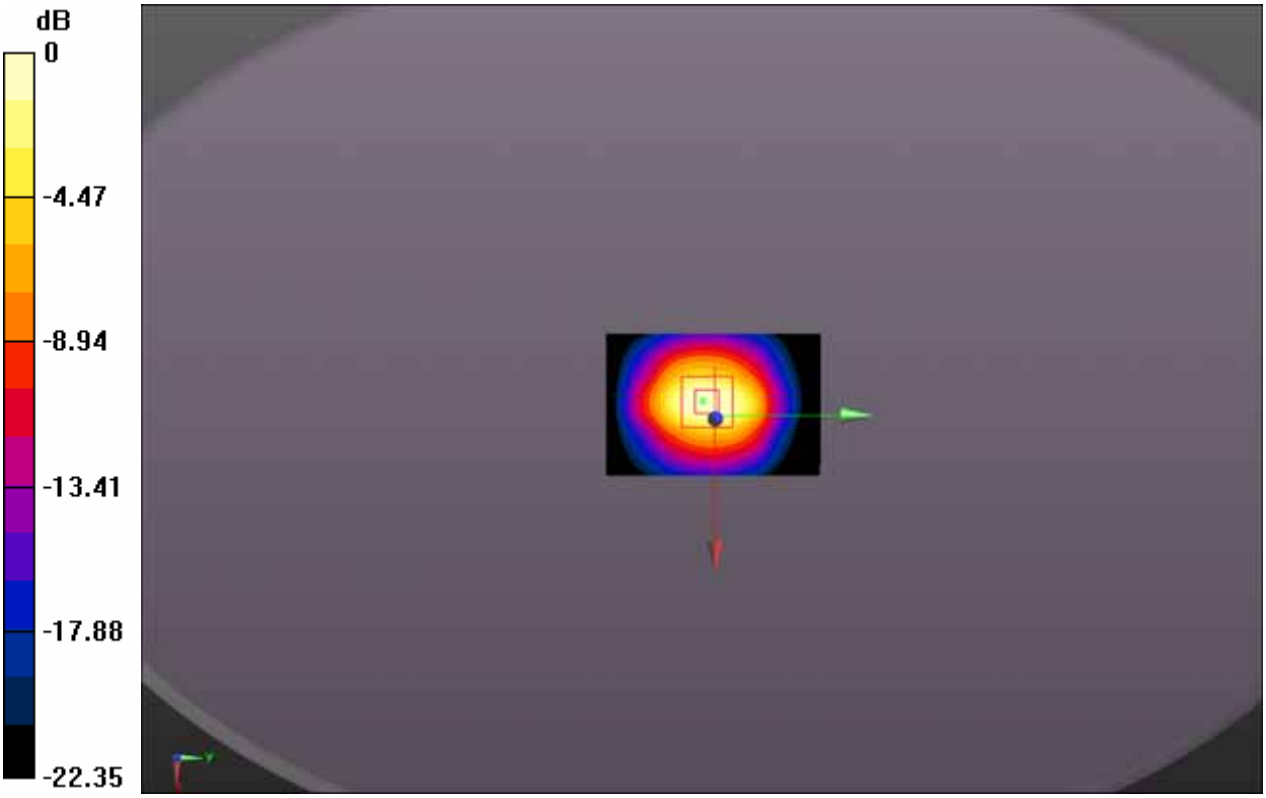
- Probe: EX3DV4 - SN3767; ConvF(4.21, 4.21, 4.21); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CW_5500/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 7.955 W/kg

Configuration/802.11b_CW_5500/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.009 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 6.509 mW/g
SAR(1 g) = 20.624 mW/g; SAR(10 g) = 5.668 mW/g
Maximum value of SAR (measured) = 22.08 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

CW_ 5600MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102
Communication System: IEEE 802.11a WiFi 5GHz ; Frequency: 5600 MHz
Medium parameters used: f = 5600 MHz; σ = 5.686 mho/m; ε_r = 48.711; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

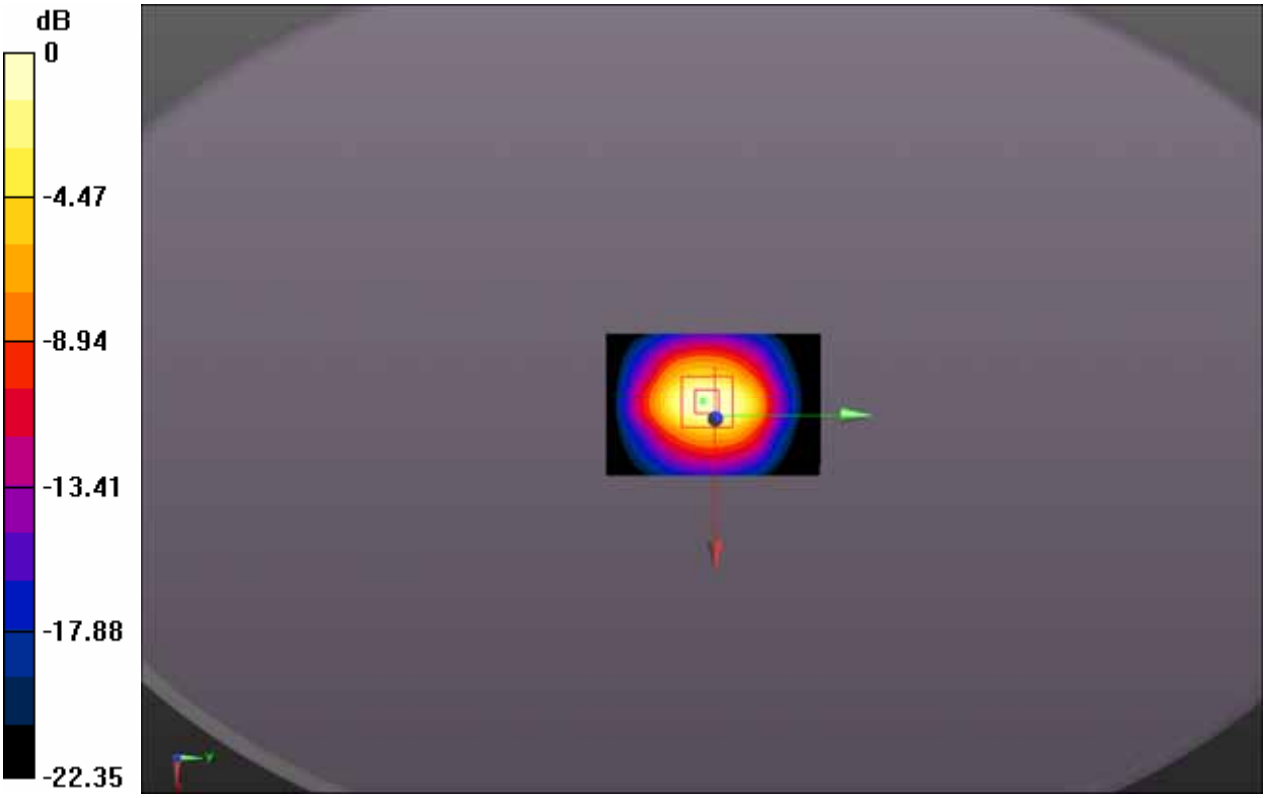
- Probe: EX3DV4 - SN3898; ConvF(4.74, 4.74, 474); Calibrated: 10/03/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CW_5600/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 7.938 W/kg

Configuration/802.11b_CW_5600/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.001 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 6.556 mW/g
SAR(1 g) = 20.652 mW/g; SAR(10 g) = 5.677 mW/g
Maximum value of SAR (measured) = 22.23 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

CW_ 5800MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102
Communication System: IEEE 802.11a WiFi 5GHz ; Frequency: 5800 MHz
Medium parameters used: f = 5800 MHz; σ = 6.093 mho/m; ε_r = 48.235; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

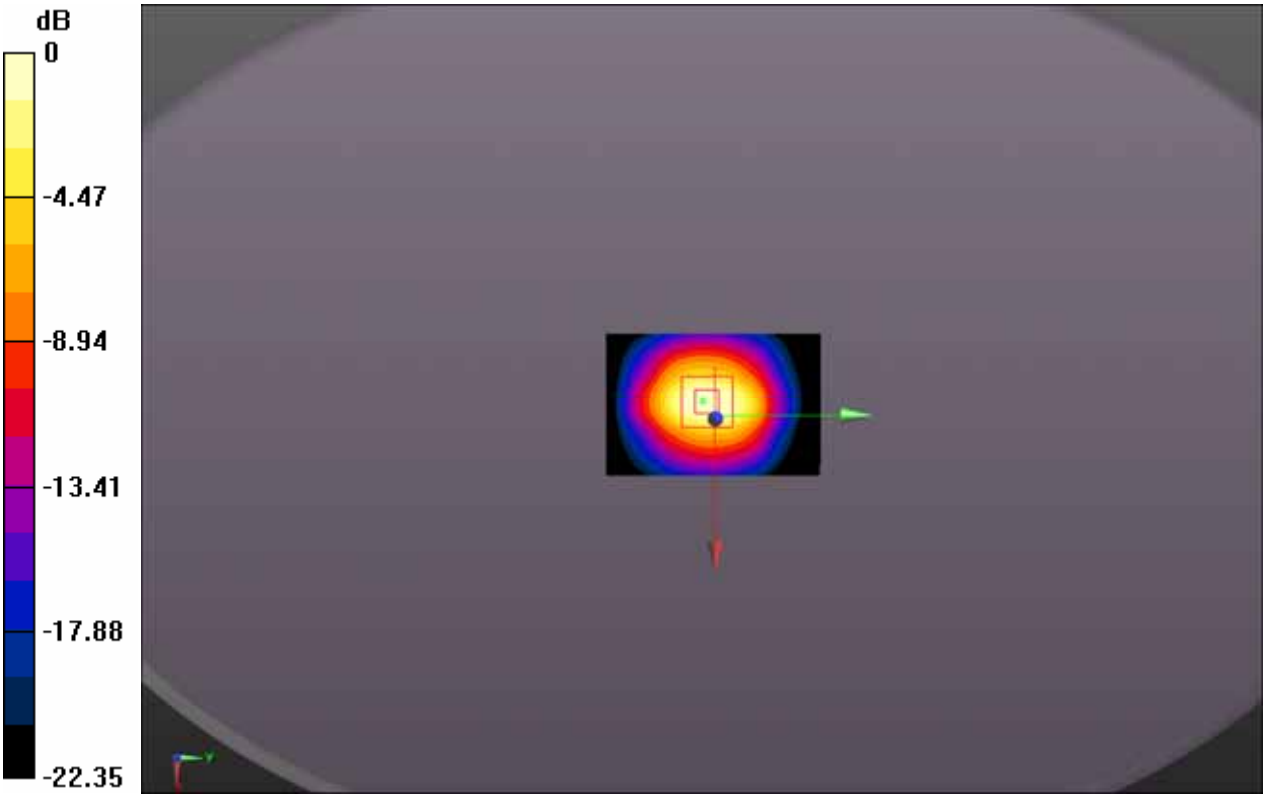
- Probe: EX3DV4 - SN3767; ConvF(4.22, 4.22, 4.22); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CW_5800/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 7.866 W/kg

Configuration/802.11b_CW_5800/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.010 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 6.522 mW/g
SAR(1 g) = 19.384 mW/g; SAR(10 g) = 5.367 mW/g
Maximum value of SAR (measured) = 20.838 W/kg



9. ANNEX B: GRAPH RESULTS

2.4G:

Test Laboratory: Audix SAR Lab Date: 20/07/2014

802.11b_CH1-Back(2412MHz)

DUT: Tablet PC **M/N:AT10-B**

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0); Frequency: 2412 MHz;Medium parameters used: f = 2412 MHz; σ = 1.929 S/m; ε_r = 50.266; ρ = 1000 kg/m^3 ;Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3139; ConvF(4.16, 4.16, 4.16); Calibrated: 25/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11b_CH1-Back/Area Scan (61x81x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm;

Maximum value of SAR (interpolated) = 1.270 W/kg

Configuration/802.11b_CH1-Back/Zoom Scan (7x7x7)/Cube 0:

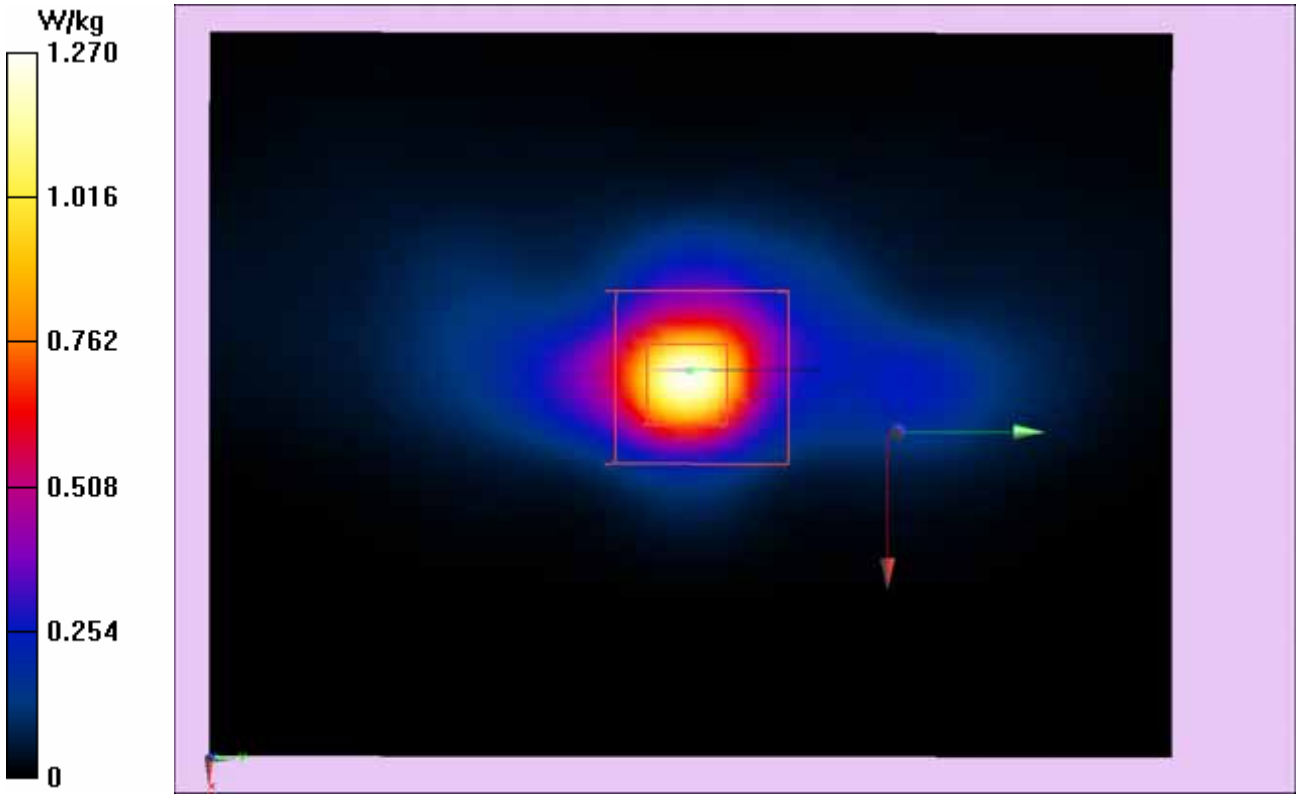
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.15 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 6.52 W/kg

SAR(1 g) = 0.911 W/kg; SAR(10 g) = 0.342 W/kg

Maximum value of SAR (measured) = 1.12 W/kg



Test Laboratory: Audix SAR Lab Date: 20/07/2014

802.11b_CH1-Top(2412MHz)

DUT: Tablet PC **M/N:AT10-B**

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0); Frequency: 2412 MHz;Medium parameters used: f = 2412 MHz; σ = 1.929 S/m; ε_r = 50.266; ρ = 1000 kg/m^3 ;Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3139; ConvF(4.16, 4.16, 4.16); Calibrated: 25/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11b_CH1-Top/Area Scan (61x81x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.540 W/kg

Configuration/802.11b_CH1-Top/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.584 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.976 W/kg

SAR(1 g) = 0.461 W/kg; SAR(10 g) = 0.212 W/kg

Maximum value of SAR (measured) = 0.523 W/kg

Configuration/802.11b_CH1-Top/Zoom Scan (7x7x7)/Cube 1:

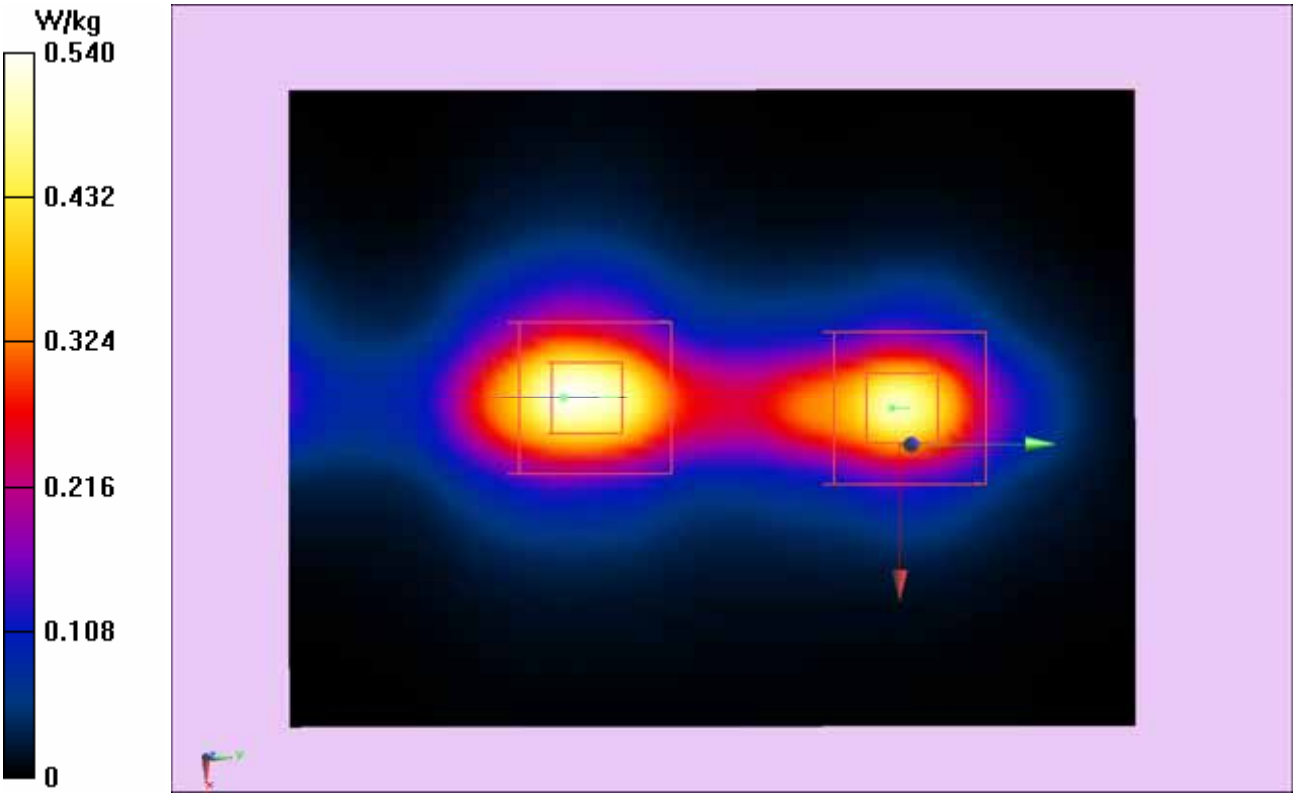
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.584 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.864 W/kg

SAR(1 g) = 0.411 W/kg; SAR(10 g) = 0.181 W/kg

Maximum value of SAR (measured) = 0.477 W/kg



Test Laboratory: Audix SAR Lab Date: 20/07/2014

802.11b_CH6-Back(2437MHz)

DUT: Tablet PC **M/N:AT10-B**

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0); Frequency: 2437 MHz;Medium parameters used (interpolated): f = 2437 MHz; σ = 1.963 S/m; ε_r = 50.579; ρ = 1000 kg/m^3 ;Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3139; ConvF(4.16, 4.16, 4.16); Calibrated: 25/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11b_CH6-Back/Area Scan (61x81x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.470W/kg

Configuration/802.11b_CH6-Back/Zoom Scan (7x7x7)/Cube 0:

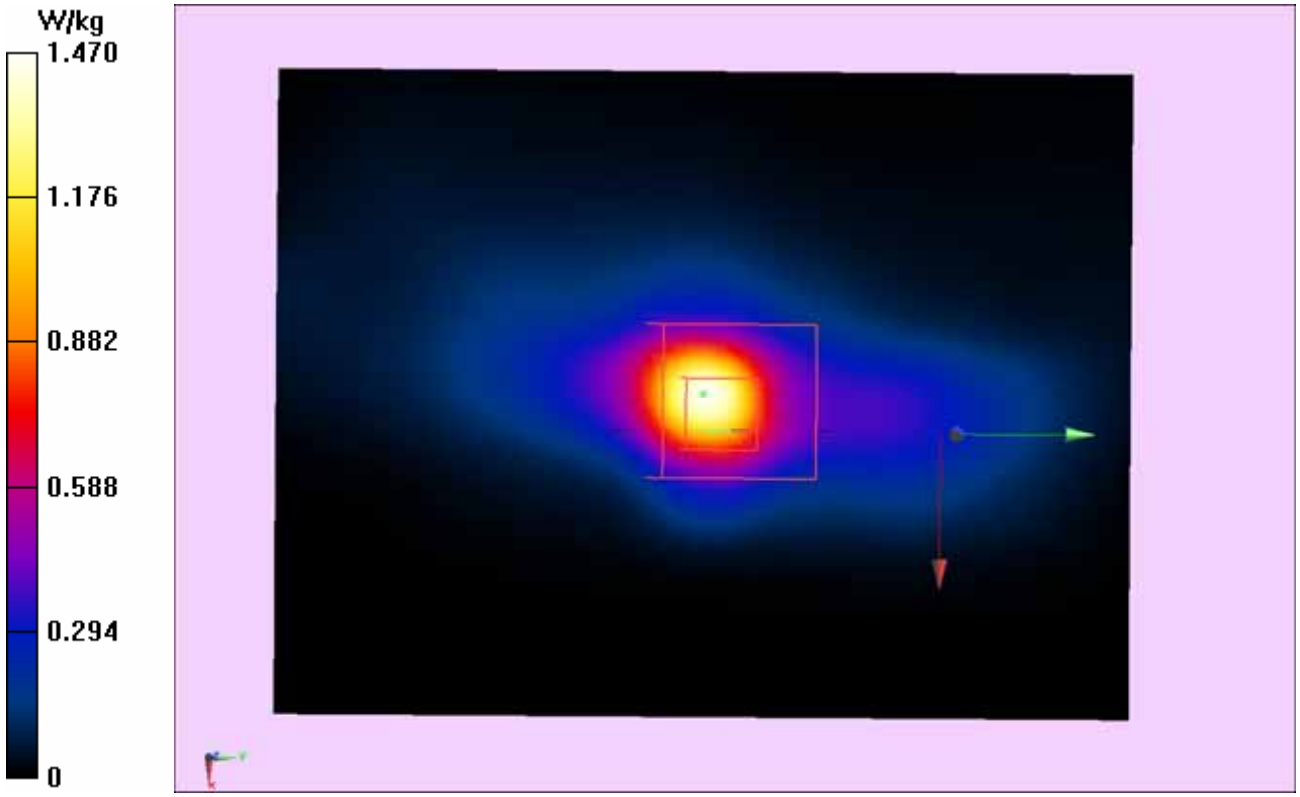
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.78 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 5.33 W/kg

SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.322 W/kg

Maximum value of SAR (measured) = 1.25 W/kg



Test Laboratory: Audix SAR Lab Date: 20/07/2014

802.11b_CH6-Top(2437MHz)

DUT: Tablet PC **M/N:AT10-B**

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0); Frequency: 2437 MHz;Medium parameters used (interpolated): f = 2437 MHz; σ = 1.963 S/m; ε_r = 50.579; ρ = 1000 kg/m^3 ;Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3139; ConvF(4.16, 4.16, 4.16); Calibrated: 25/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11b_CH6-Top/Area Scan (61x81x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.533 W/kg

Configuration/802.11b_CH6-Top/Zoom Scan (7x7x7)/Cube 0:

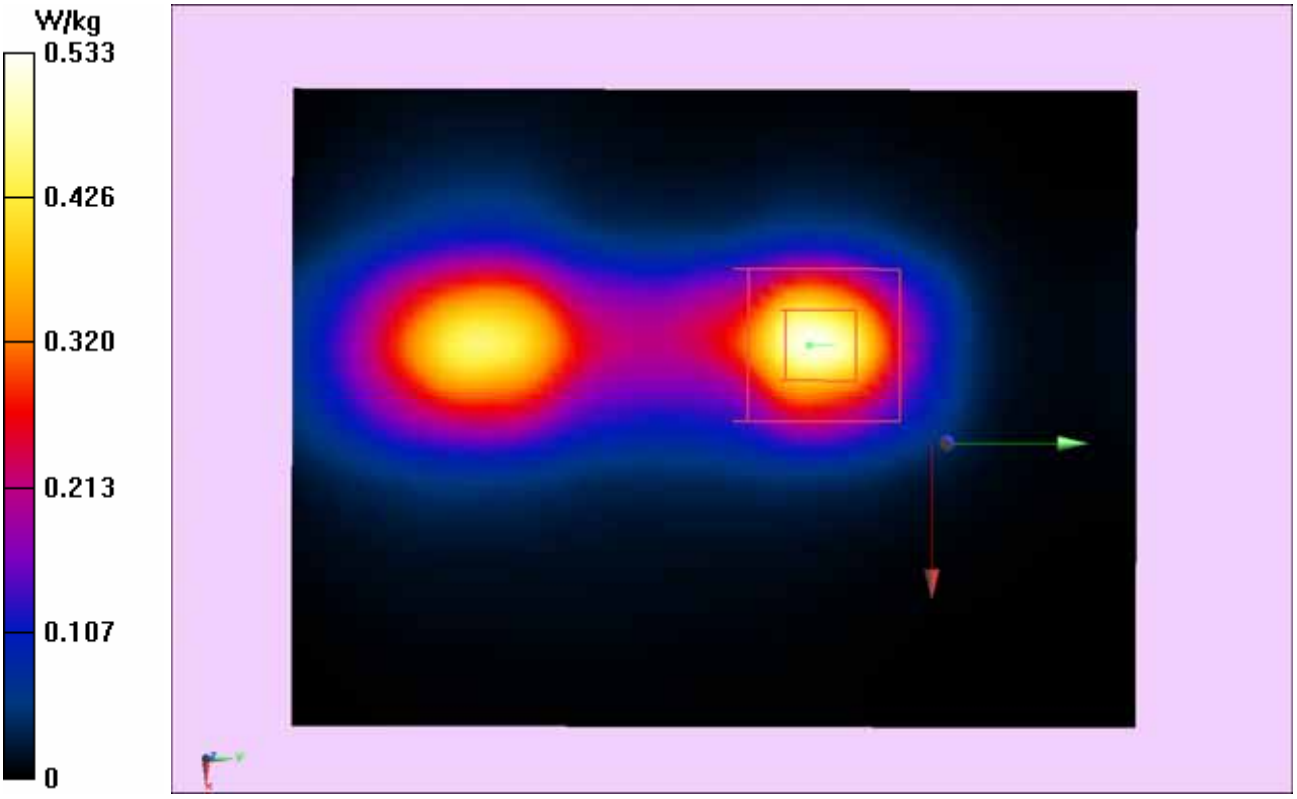
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.275 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 1.00 W/kg

SAR(1 g) = 0.474 W/kg; SAR(10 g) = 0.206 W/kg

Maximum value of SAR (measured) = 0.550 W/kg



Test Laboratory: Audix SAR Lab Date: 20/07/2014

802.11b_CH11-Back(2462MHz)

DUT: Tablet PC **M/N:AT10-B**

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0); Frequency: 2462 MHz;Medium parameters used: f = 2462 MHz; σ = 2.015 S/m; ε_r = 51.217; ρ = 1000 kg/m^3 ;Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3139; ConvF(4.16, 4.16, 4.16); Calibrated: 25/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11b_CH11-Back/Area Scan (61x81x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.650 W/kg

Configuration/802.11b_CH11-Back/Zoom Scan (7x7x7)/Cube 0:

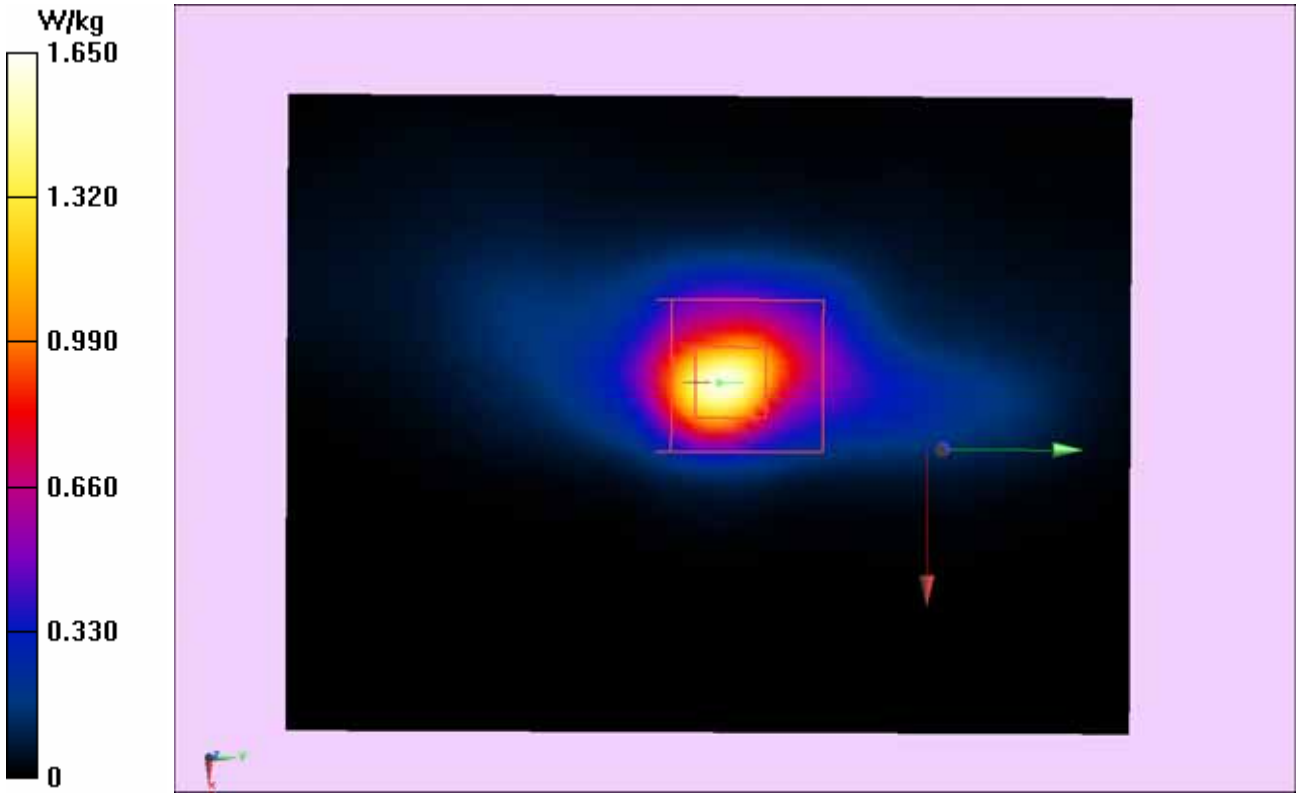
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.91 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 6.67 W/kg

SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.532 W/kg

Maximum value of SAR (measured) = 1.33 W/kg



Test Laboratory: Audix SAR Lab Date: 20/07/2014

802.11b_CH11-Top(2462MHz)

DUT: Tablet PC **M/N:AT10-B**

Communication System: UID 0, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) (0); Frequency: 2462 MHz;Medium parameters used: f = 2462 MHz; σ = 2.015 S/m; ε_r = 51.217; ρ = 1000 kg/m^3 ;Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3139; ConvF(4.16, 4.16, 4.16); Calibrated: 25/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11b_CH11-Top/Area Scan (61x81x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.656 W/kg

Configuration/802.11b_CH11-Top/Zoom Scan (7x7x7)/Cube 0:

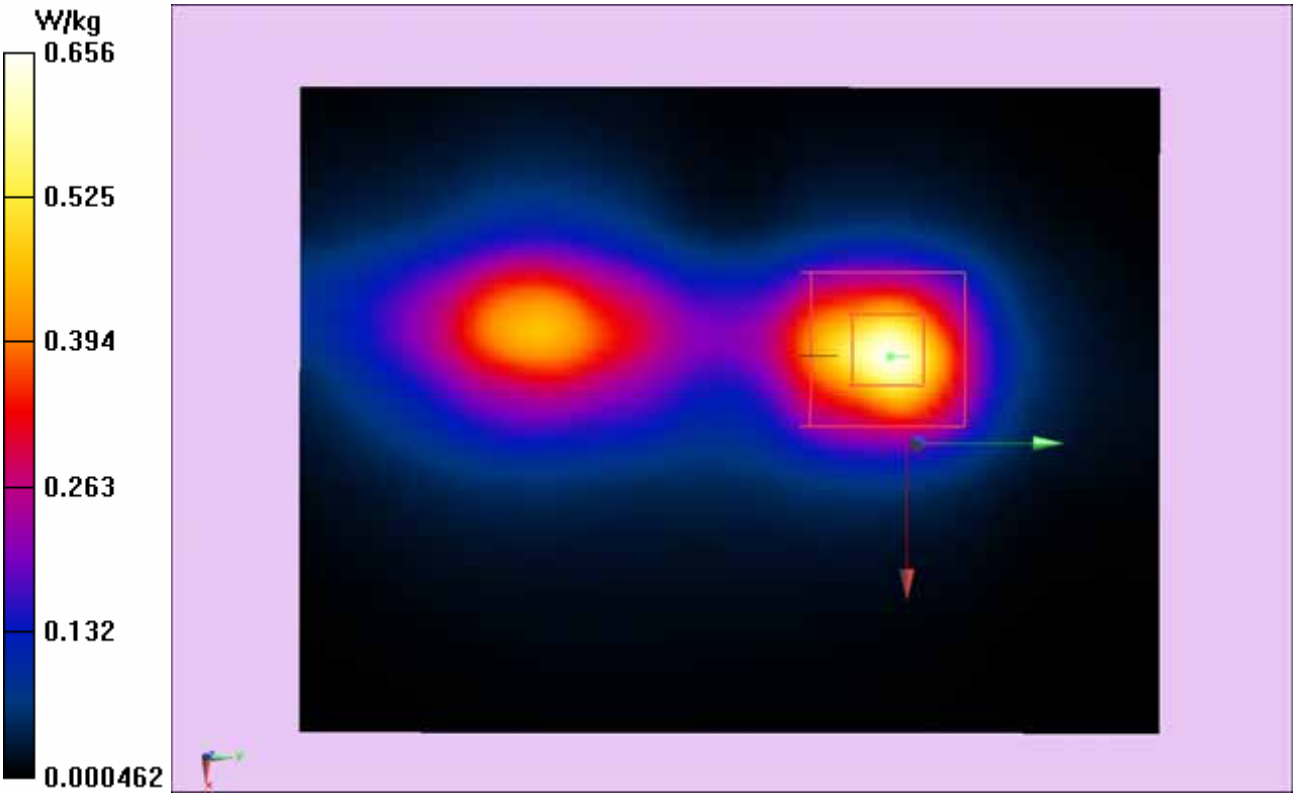
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.468 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.539 W/kg; SAR(10 g) = 0.233 W/kg

Maximum value of SAR (measured) = 0.627 W/kg



5G:

Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH36-Back(5180MHz)

DUT: Tablet PC M/N: AT10-B

Communication System: IEEE 802.11a WiFi 5.1GHz ; Frequency: 5180 MHz
Medium parameters used: f = 5180 MHz; σ = 5.297 S/m; ε_r = 48.924; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

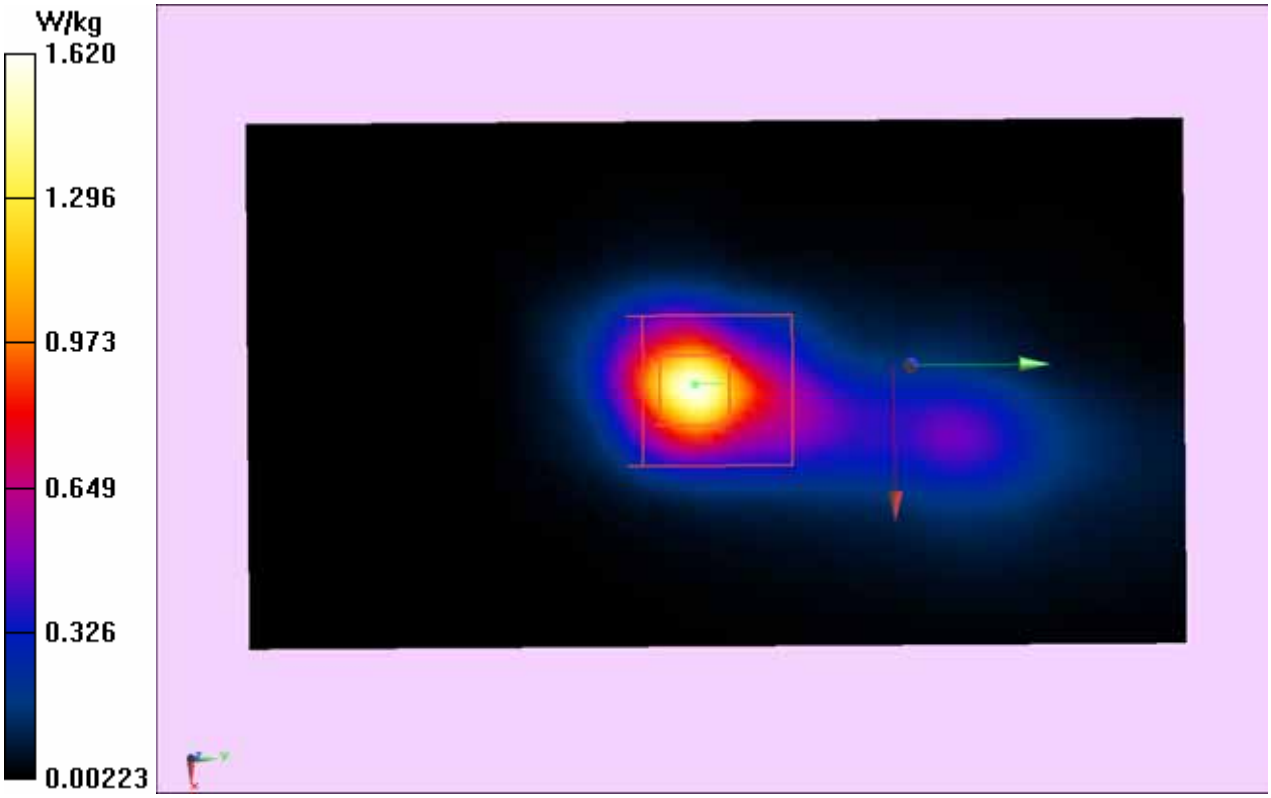
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH36-Back/Area Scan (61x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.620 W/kg

Configuration/802.11a_CH36 -Back/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.371 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 2.534 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.585 W/kg
Maximum value of SAR (measured) = 1.15 W/kg



Test Laboratory: Audix SAR Lab Date: 06/08/2014

802.11a_CH36-Top(5180MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.1GHz ; Frequency: 5180 MHz
Medium parameters used: f = 5180 MHz; σ = 5.297 S/m; ε_r = 48.924; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

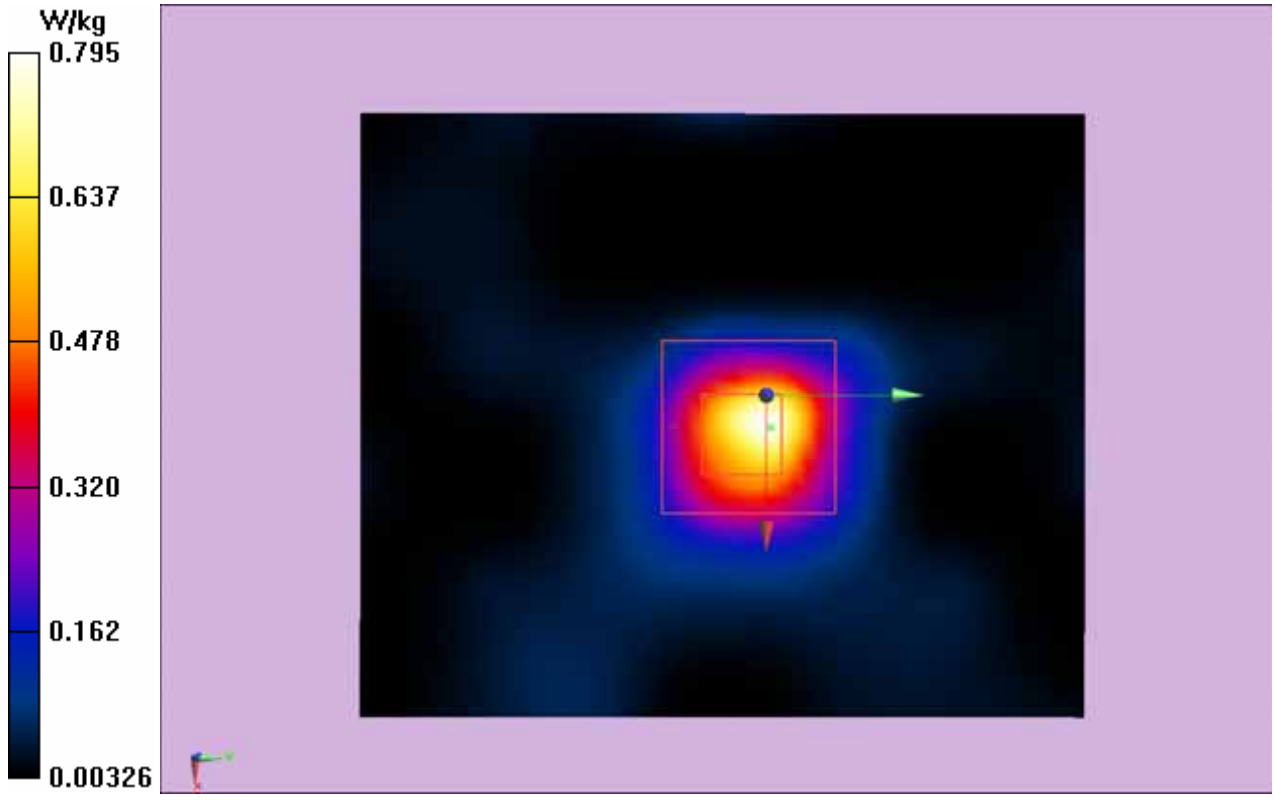
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH36-Top /Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.795 W/kg

Configuration/802.11a_CH36-Top /Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.708 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 1.291 W/kg
SAR(1 g) = 0.623 W/kg; SAR(10 g) = 0.303 W/kg
Maximum value of SAR (measured) = 0.719 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH48-Back(5240MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.1GHz ; Frequency: 5240 MHz
Medium parameters used: f = 5240 MHz; σ = 5.357 S/m; ε_r = 49.473; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

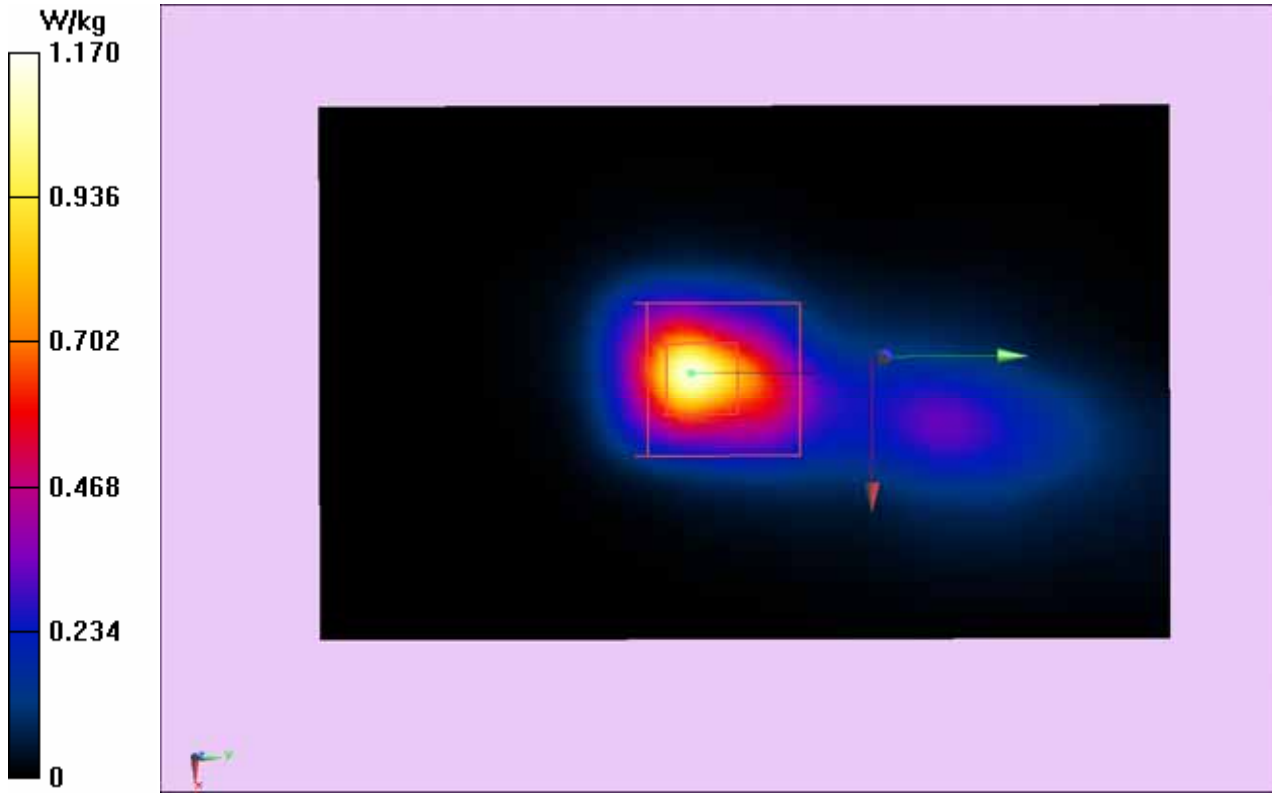
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH48-Back/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.170 W/kg

Configuration/802.11a_CH48-Back/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.476 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 3.162 W/kg
SAR(1 g) = 1.005 W/kg; SAR(10 g) = 0.590 W/kg
Maximum value of SAR (measured) = 1.191 W/kg



Test Laboratory: Audix SAR Lab Date: 06/08/2014

802.11a_CH48-Top(5240MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.1GHz ; Frequency: 5240 MHz
Medium parameters used: f = 5240 MHz; σ = 5.357 S/m; ε_r = 49.473; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

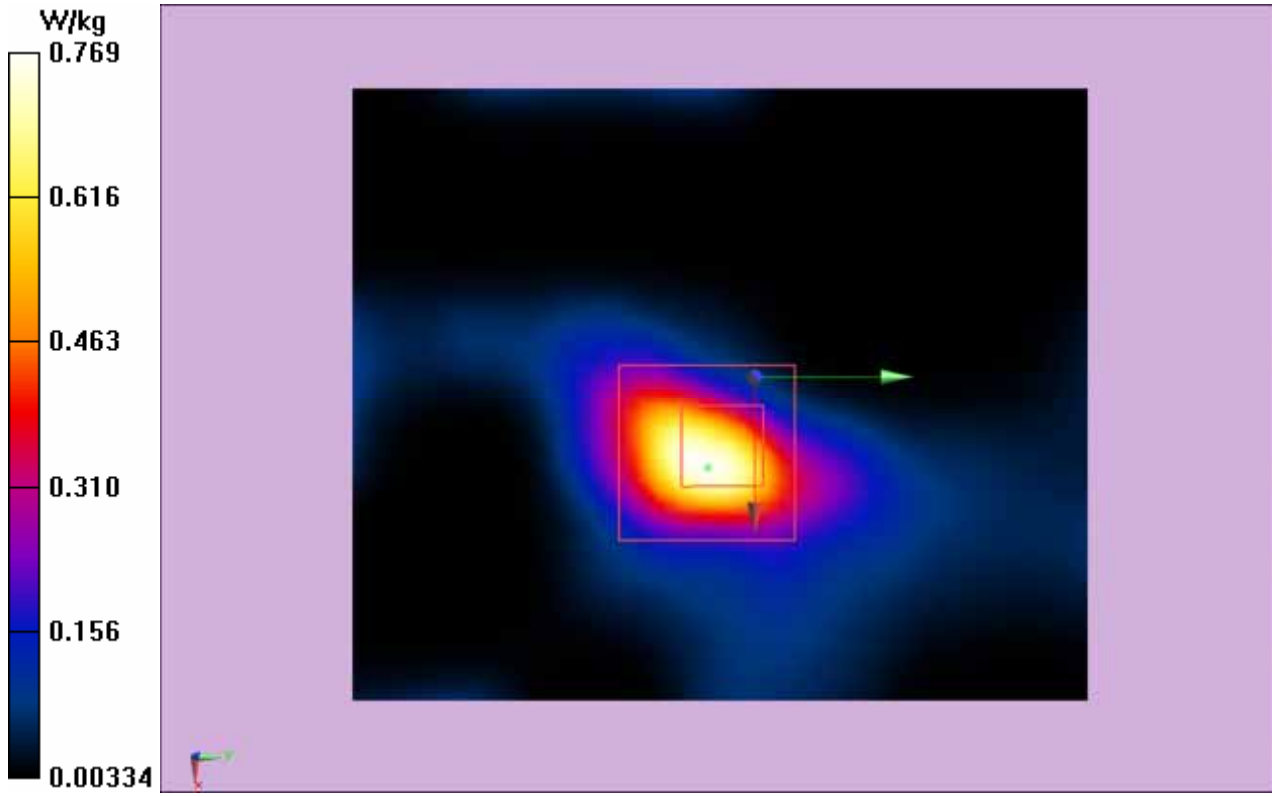
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH48-Top/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.769 W/kg

Configuration/802.11a_CH48-Top/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.822 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.325 W/kg
SAR(1 g) = 0.553 W/kg; SAR(10 g) = 0.262 W/kg
Maximum value of SAR (measured) = 0.601 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH52-Back(5260MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.2GHz ; Frequency: 5260 MHz
Medium parameters used: f = 5260 MHz; σ = 5.622 S/m; ε_r = 49.824; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

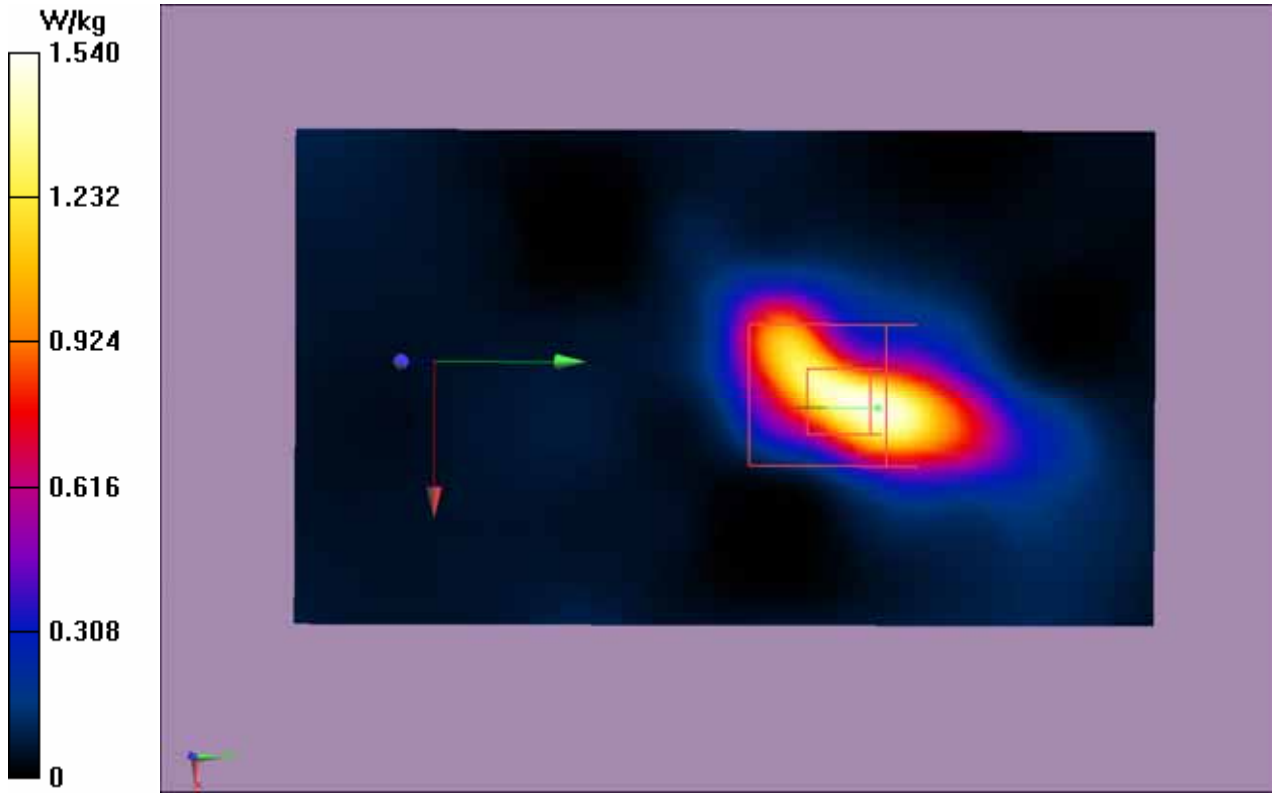
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH52-Back/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.540 W/kg

Configuration/802.11a_CH52-Back/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.452 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 3.13 W/kg
SAR(1 g) = 1.060 W/kg; SAR(10 g) = 0.583 W/kg
Maximum value of SAR (measured) = 1.156 W/kg



Test Laboratory: Audix SAR Lab Date: 06/08/2014

802.11a_CH52-Top(5260MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.2GHz ; Frequency: 5260 MHz
Medium parameters used: f = 5260 MHz; σ = 5.622 S/m; ε_r = 49.824; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

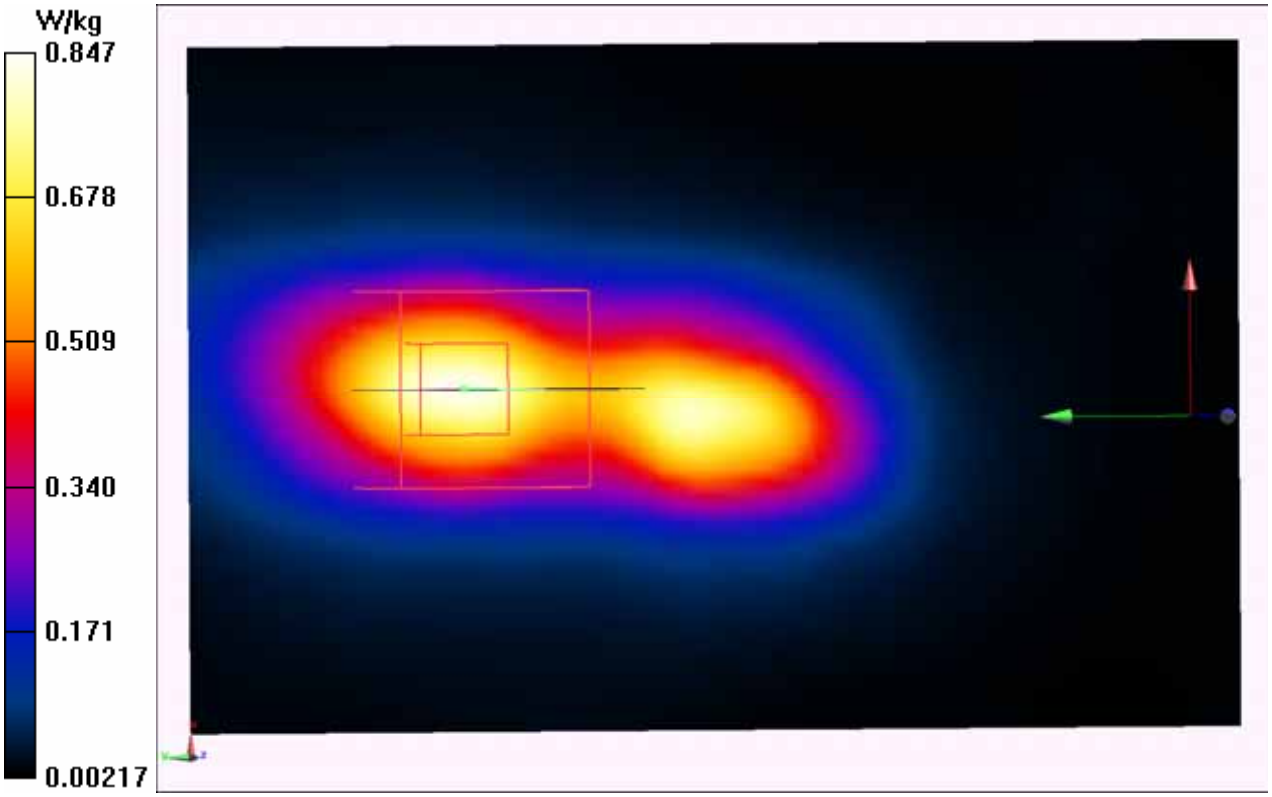
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH52-Top/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.847 W/kg

Configuration/802.11a_CH52-Top/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.500 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 1.036 W/kg
SAR(1 g) = 0.614 W/kg; SAR(10 g) = 0.294 W/kg
Maximum value of SAR (measured) = 0.712 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH64-Back(5320MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.2GHz ; Frequency: 5320 MHz
Medium parameters used: f = 5320 MHz; σ = 5.731S/m; ε_r = 50.019; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

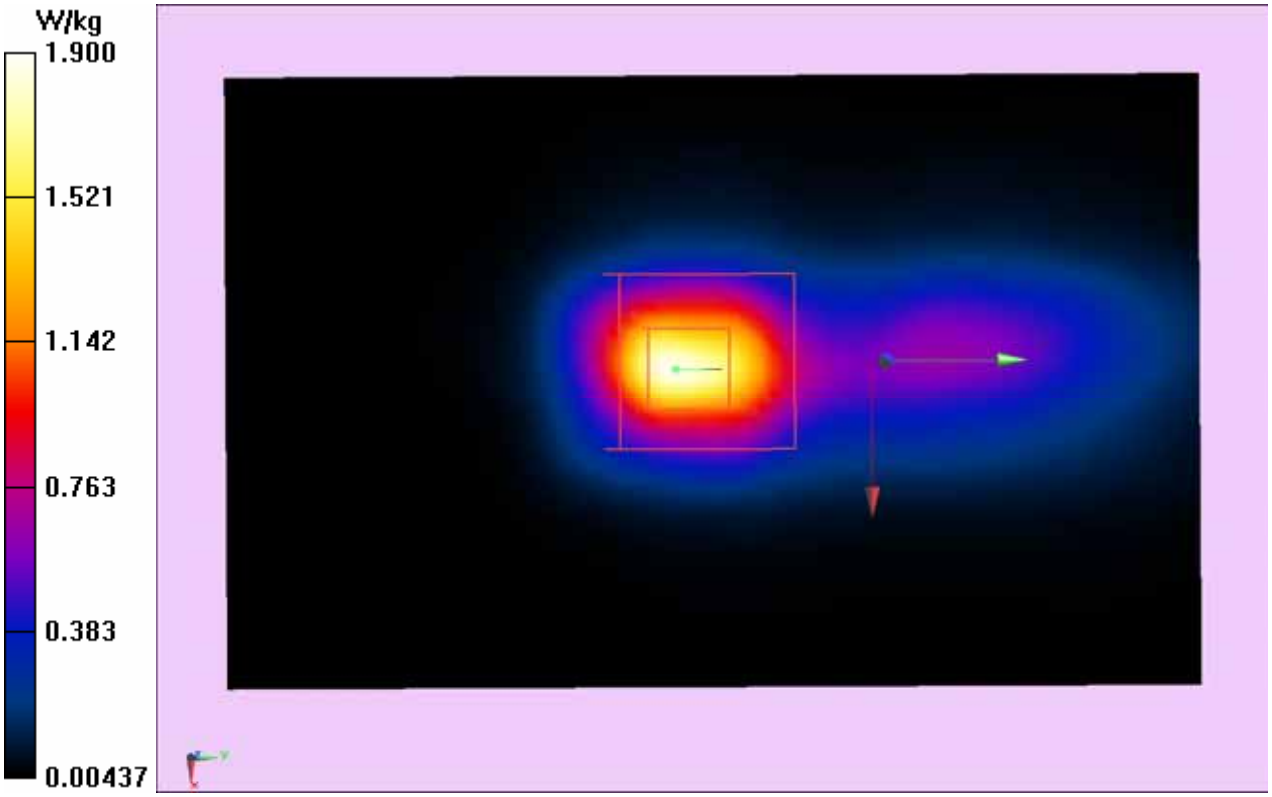
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_ CH64-Back /Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.900 W/kg

Configuration/802.11b_ CH64-Back /Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.931 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 3.05 W/kg
SAR(1 g) = 1.018 W/kg; SAR(10 g) = 0.597 W/kg
Maximum value of SAR (measured) = 1.241 W/kg



Test Laboratory: Audix SAR Lab Date: 06/08/2014

802.11a_CH64-Top(5320MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.2GHz ; Frequency: 5320 MHz
Medium parameters used: f = 5320 MHz; σ = 5.731S/m; ε_r = 50.019; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

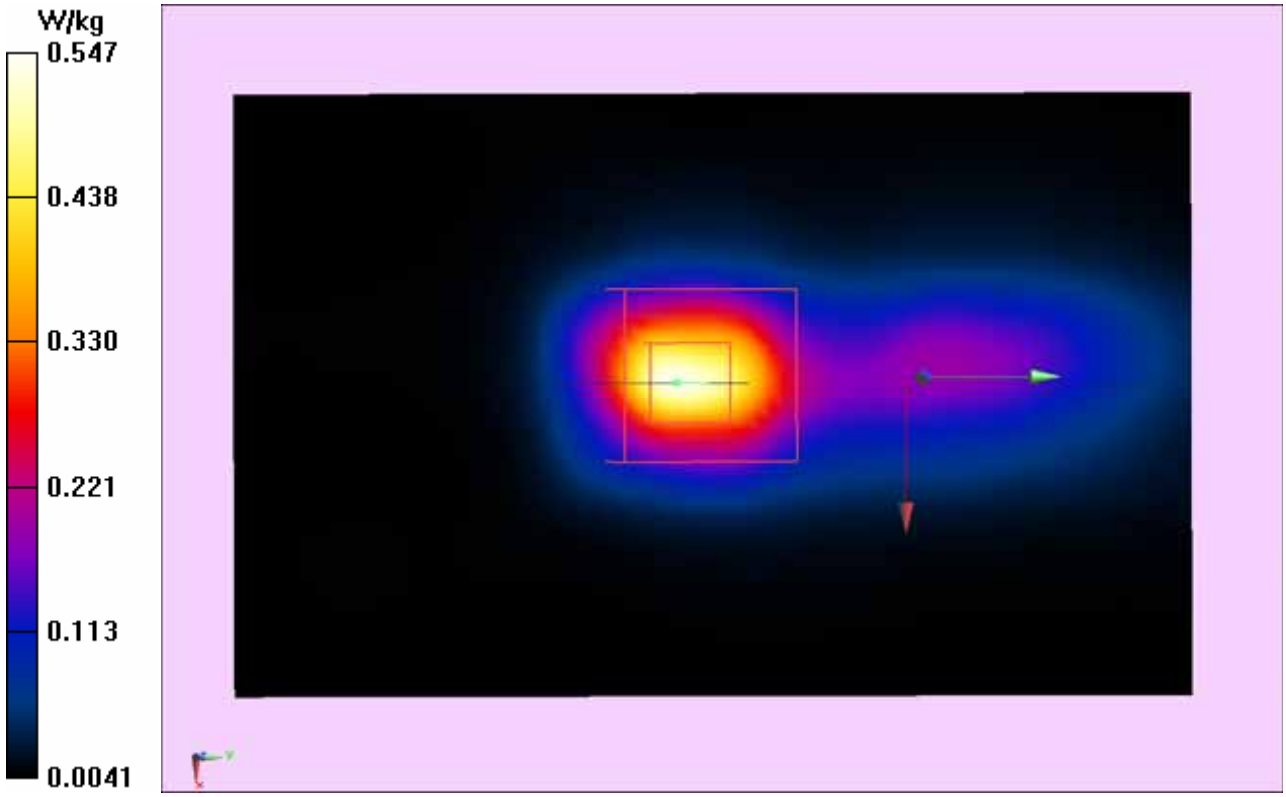
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_ CH64-Top /Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.547 W/kg

Configuration/802.11b_ CH64-Top /Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.741 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.949 mW/g
SAR(1 g) = 0.538 W/kg; SAR(10 g) = 0.259 W/kg
Maximum value of SAR (measured) = 0.548 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH104-Back(5520MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.4GHz; Frequency: 5520 MHz
Medium parameters used: f = 5520 MHz; σ = 5.675 S/m; ε_r = 48.908; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

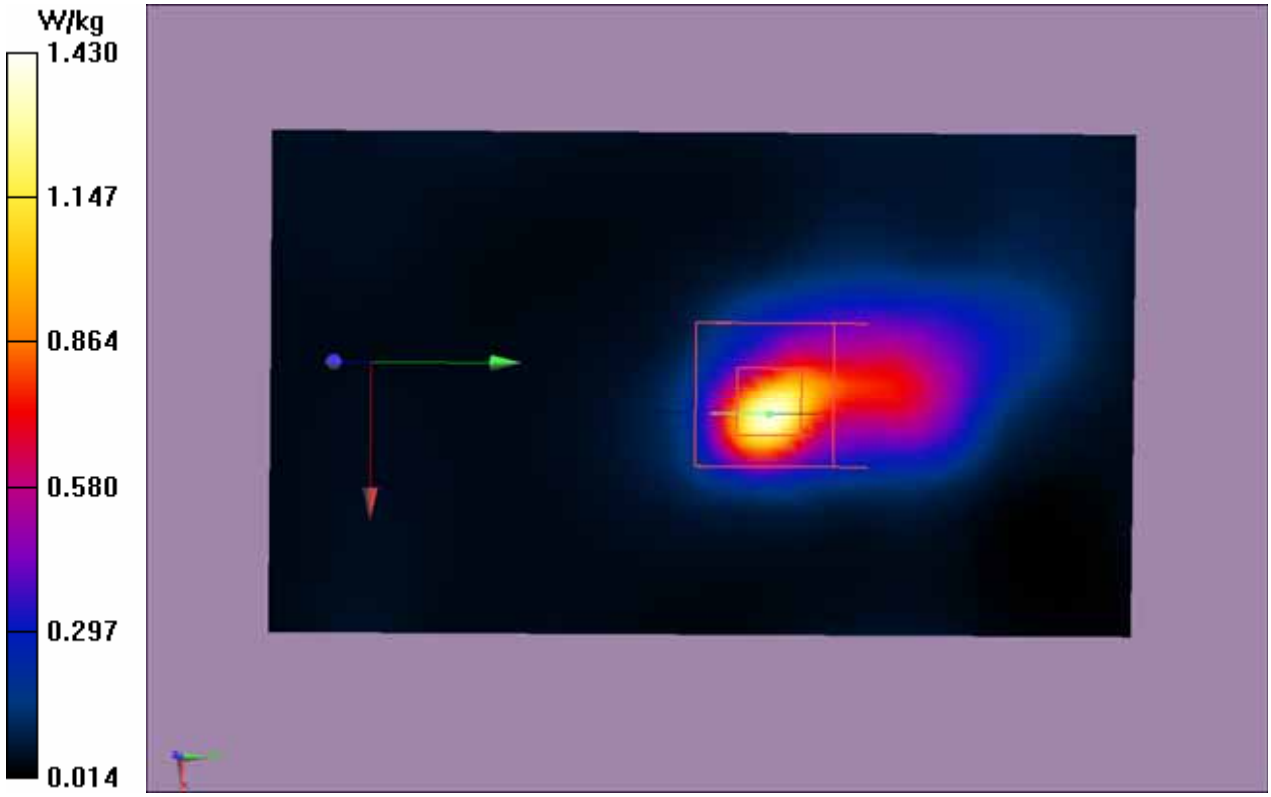
- Probe: EX3DV4 - SN3767; ConvF(4.21, 4.21, 4.21); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH104-Back/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.43 W/kg

Configuration/802.11a_CH104-Back/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.992 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 1.013 W/kg; SAR(10 g) = 0.541 W/kg
Maximum value of SAR (measured) = 1.30 W/kg



Test Laboratory: Audix SAR Lab Date: 06/08/2014

802.11a_CH104-Top(5520MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.4GHz; Frequency: 5520 MHz
Medium parameters used: f = 5520 MHz; σ = 5.675 S/m; ε_r = 48.908; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

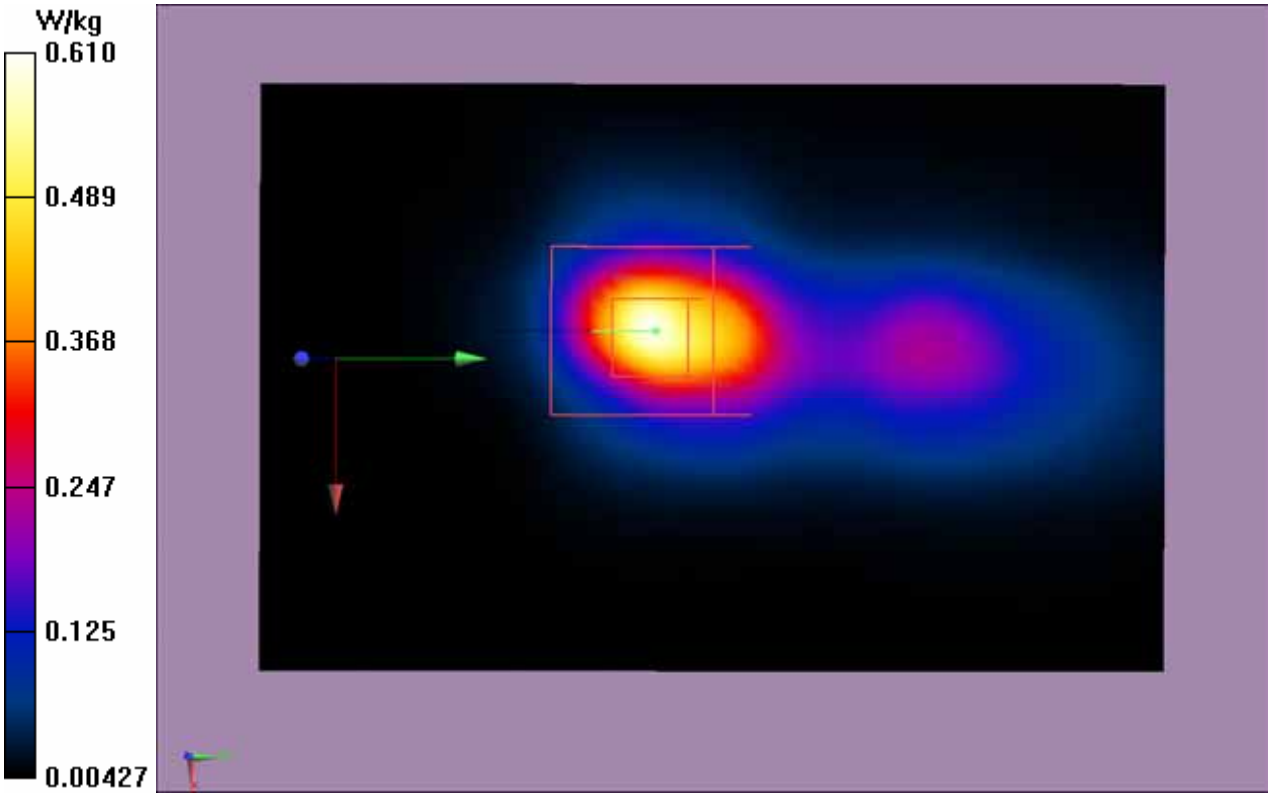
- Probe: EX3DV4 - SN3767; ConvF(4.21, 4.21, 4.21); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH104-Top/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.610 W/kg

Configuration/802.11a_CH104-Top/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.379 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.835 W/kg
SAR(1 g) = 0.578 W/kg; SAR(10 g) = 0.271 W/kg
Maximum value of SAR (measured) = 0.614 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH116-Back(5580MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.4GHz; Frequency: 5580 MHz
Medium parameters used: f = 5580 MHz; σ = 5.713 S/m; ε_r = 49.112; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

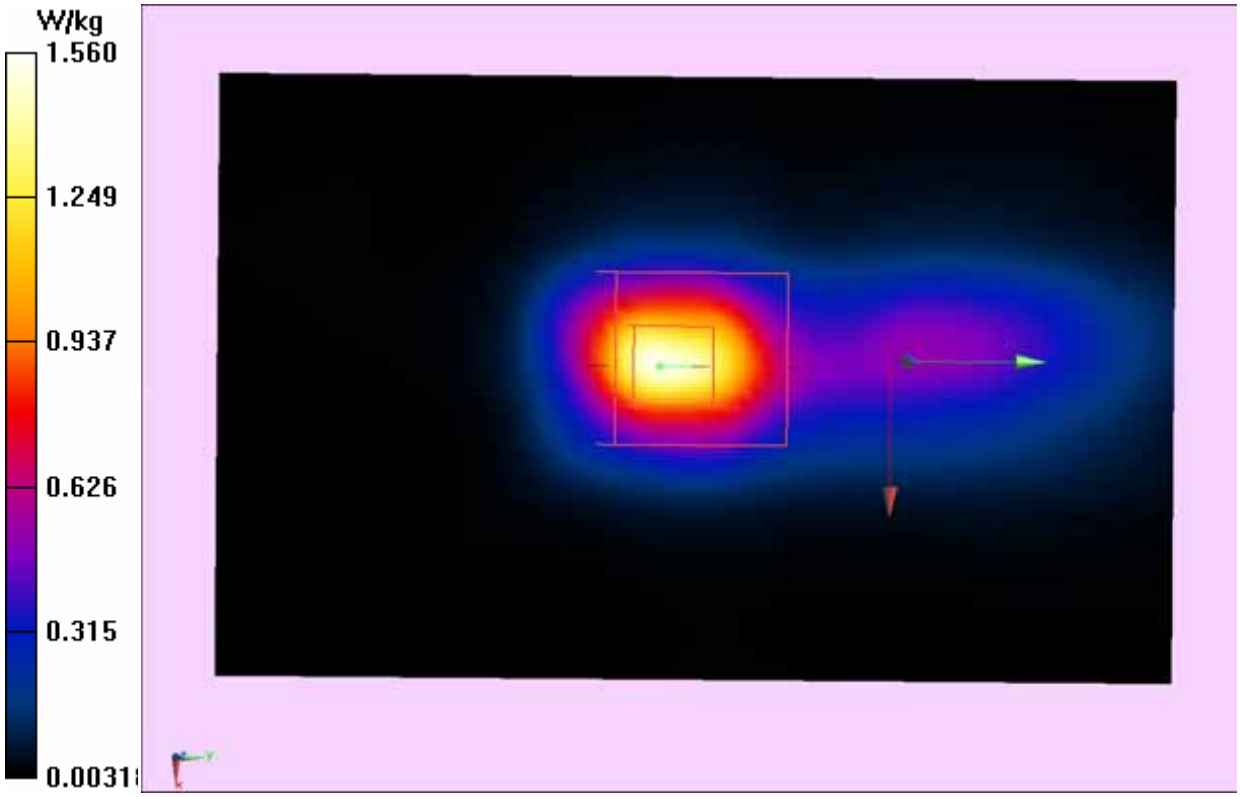
- Probe: EX3DV4 - SN3767; ConvF(4.21, 4.21, 4.21); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH116-Back/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.560 W/kg

Configuration/802.11a_CH116-Back/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.373 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 2.70 W/kg
SAR(1 g) = 1.045 W/kg; SAR(10 g) = 0.569 W/kg
Maximum value of SAR (measured) = 1.380 W/kg



Test Laboratory: Audix SAR Lab Date: 06/08/2014

802.11a_CH116-Top(5580MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.4GHz; Frequency: 5580 MHz
Medium parameters used: f = 5580 MHz; σ = 5.713 S/m; ε_r = 49.112; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

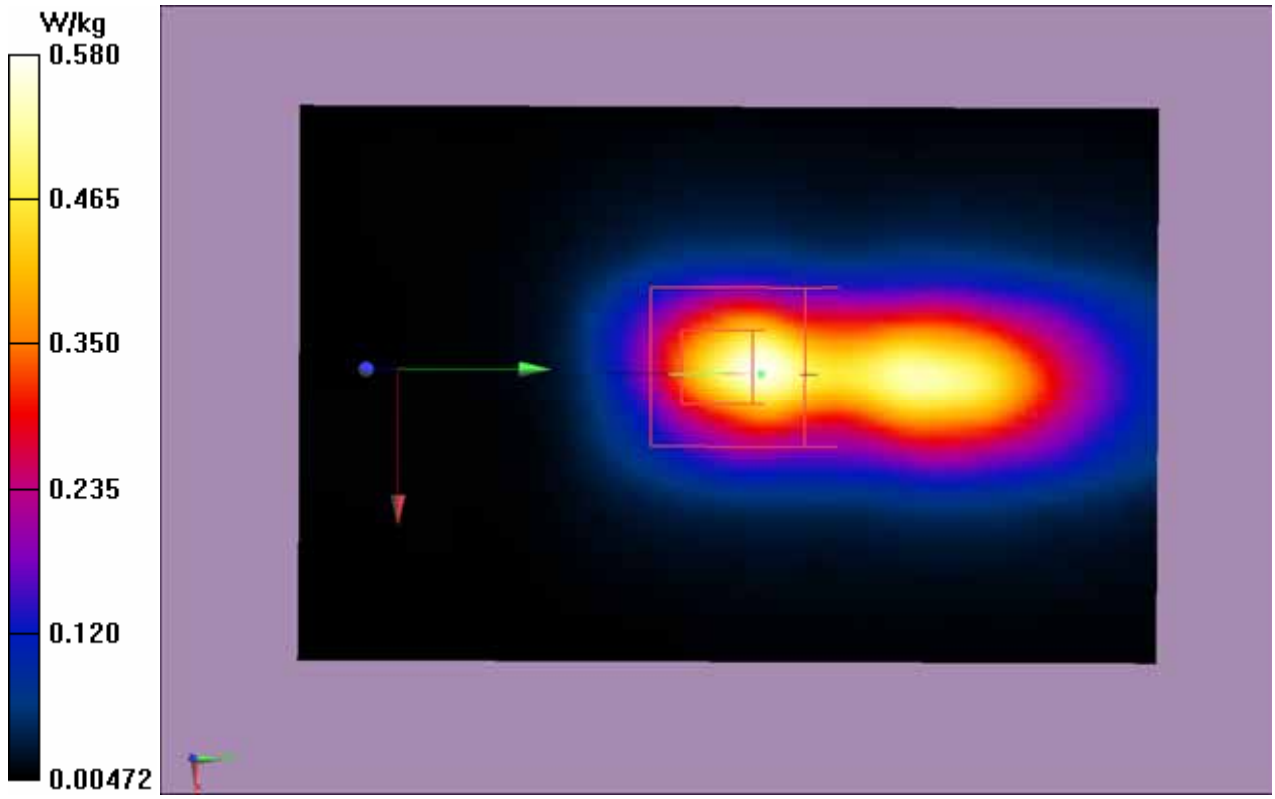
- Probe: EX3DV4 - SN3767; ConvF(4.21, 4.21, 4.21); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH116-Top/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.580 W/kg

Configuration/802.11a_CH116-Top/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.879 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.815 W/kg
SAR(1 g) = 0.549 W/kg; SAR(10 g) = 0.260 W/kg
Maximum value of SAR (measured) = 0.597W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH124-Back(5620MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.4GHz ; Frequency: 5620 MHz
Medium parameters used: f = 5620 MHz; σ = 5.776 S/m; ε_r = 49.305 ; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

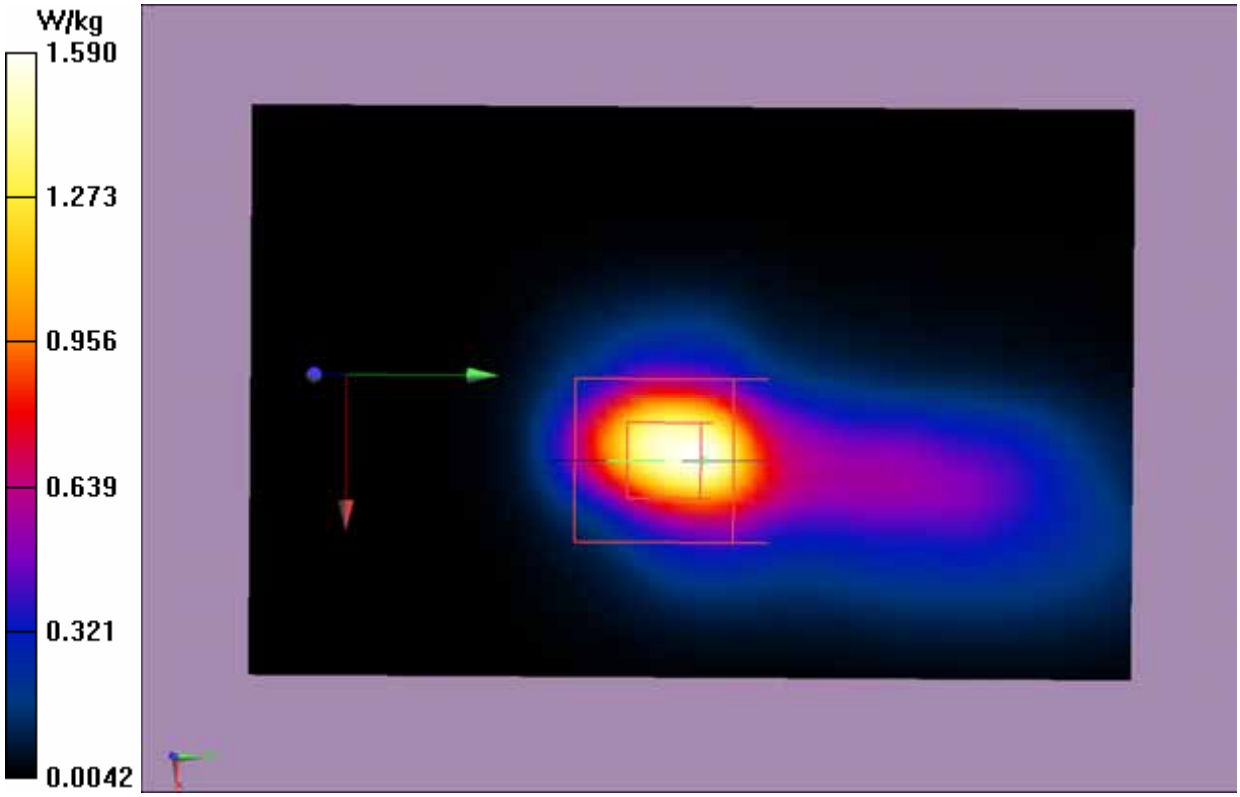
- Probe: EX3DV4 - SN3767; ConvF(4.22, 4.22, 4.22); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH124-Back/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.590 W/kg

Configuration/802.11a_CH124-Back/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.632 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 2.981 W/kg
SAR(1 g) = 1.032 W/kg; SAR(10 g) = 0.552 W/kg
Maximum value of SAR (measured) = 1.137 W/kg



Test Laboratory: Audix SAR Lab Date: 06/08/2014

802.11a_CH124-Top(5620MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.4GHz ; Frequency: 5620 MHz
Medium parameters used: f = 5620 MHz; σ = 5.776 S/m; ε_r = 49.305 ; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

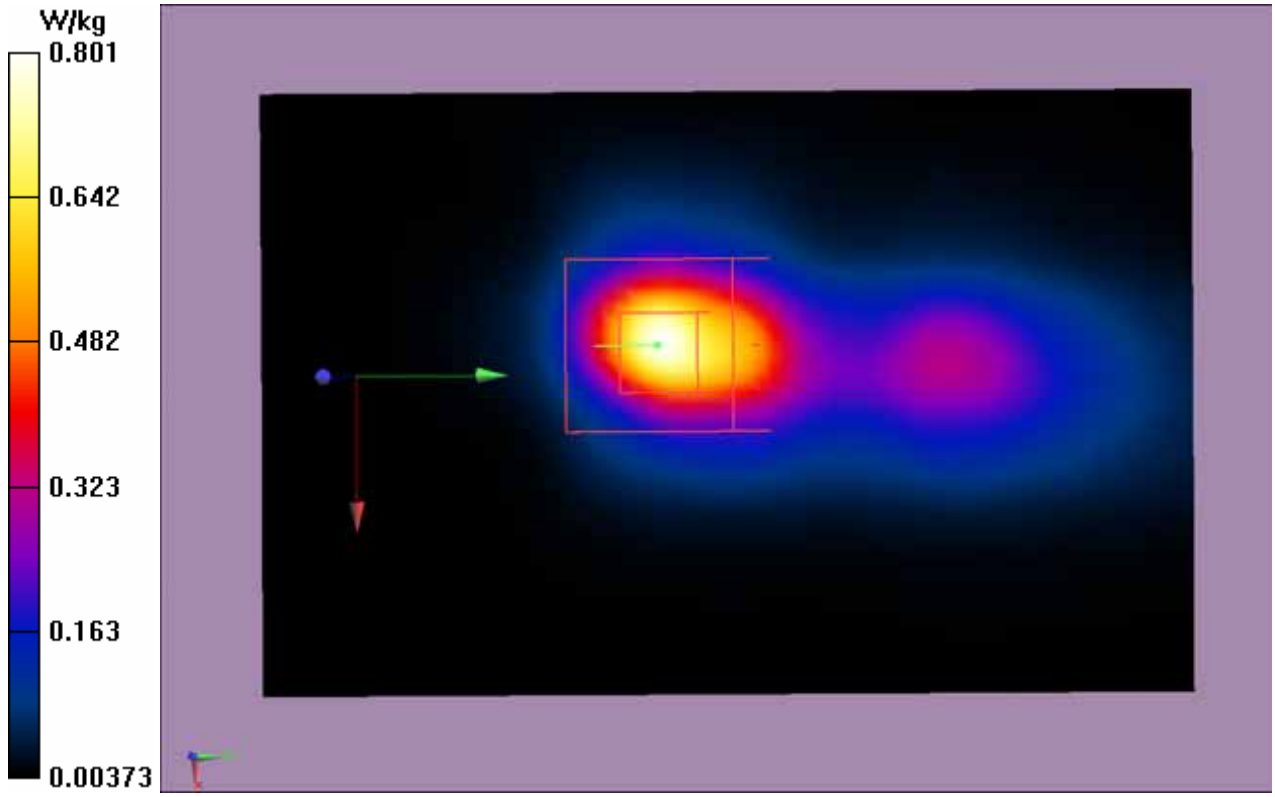
- Probe: EX3DV4 - SN3767; ConvF(4.22, 4.22, 4.22); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH124-Top/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.801 W/kg

Configuration/802.11a_CH124-Top/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.641 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.983 W/kg
SAR(1 g) = 0.717 W/kg; SAR(10 g) = 0.338 W/kg
Maximum value of SAR (measured) = 0.810 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH136-Back(5680MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.4GHz ; Frequency: 5680 MHz
Medium parameters used: f = 5680 MHz; σ = 5.812S/m; ε_r = 49.633; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

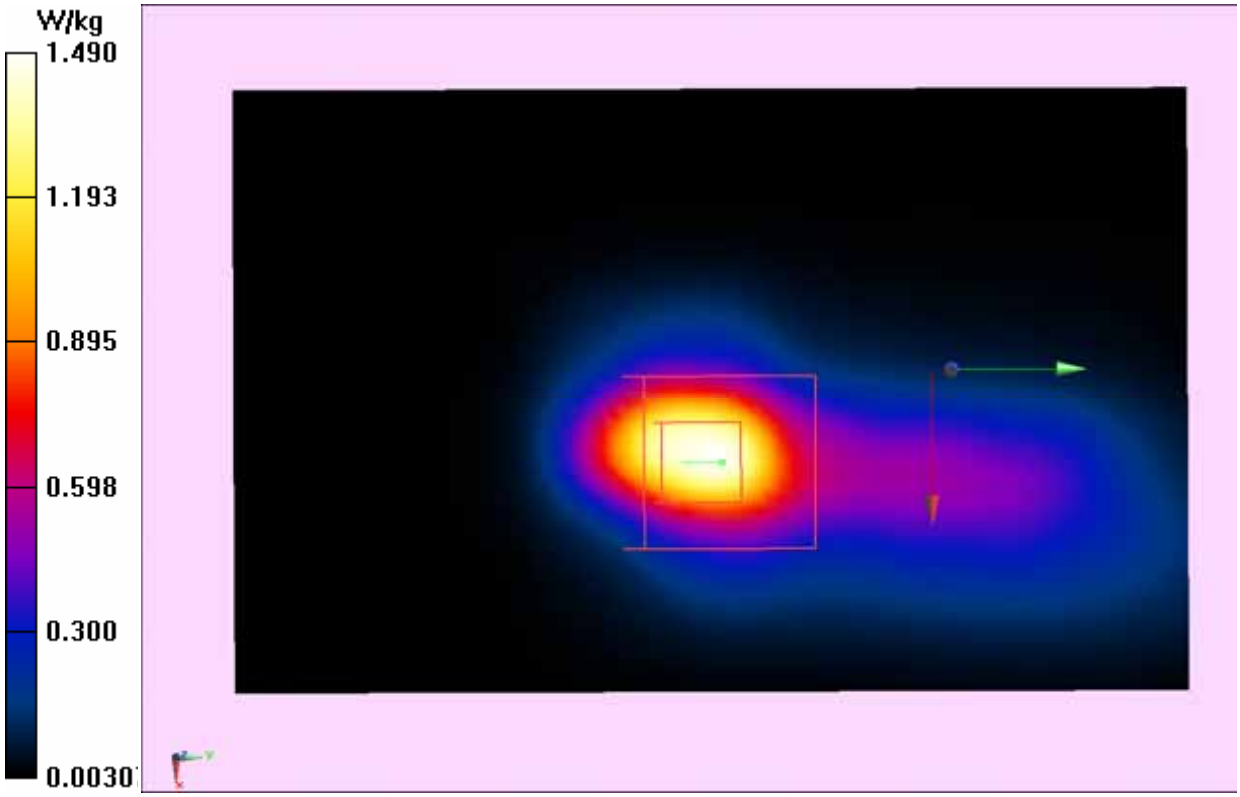
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH136-Back/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.490 W/kg

Configuration/802.11a_CH136-Back/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.164 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 3.422 W/kg
SAR(1 g) = 1.007 W/kg; SAR(10 g) = 0.531 W/kg
Maximum value of SAR (measured) = 1.151 W/kg



Test Laboratory: Audix SAR Lab Date: 06/08/2014

802.11a_CH136-Top(5680MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.4GHz ; Frequency: 5680 MHz
Medium parameters used: f = 5680 MHz; σ = 5.812S/m; ε_r = 49.633; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

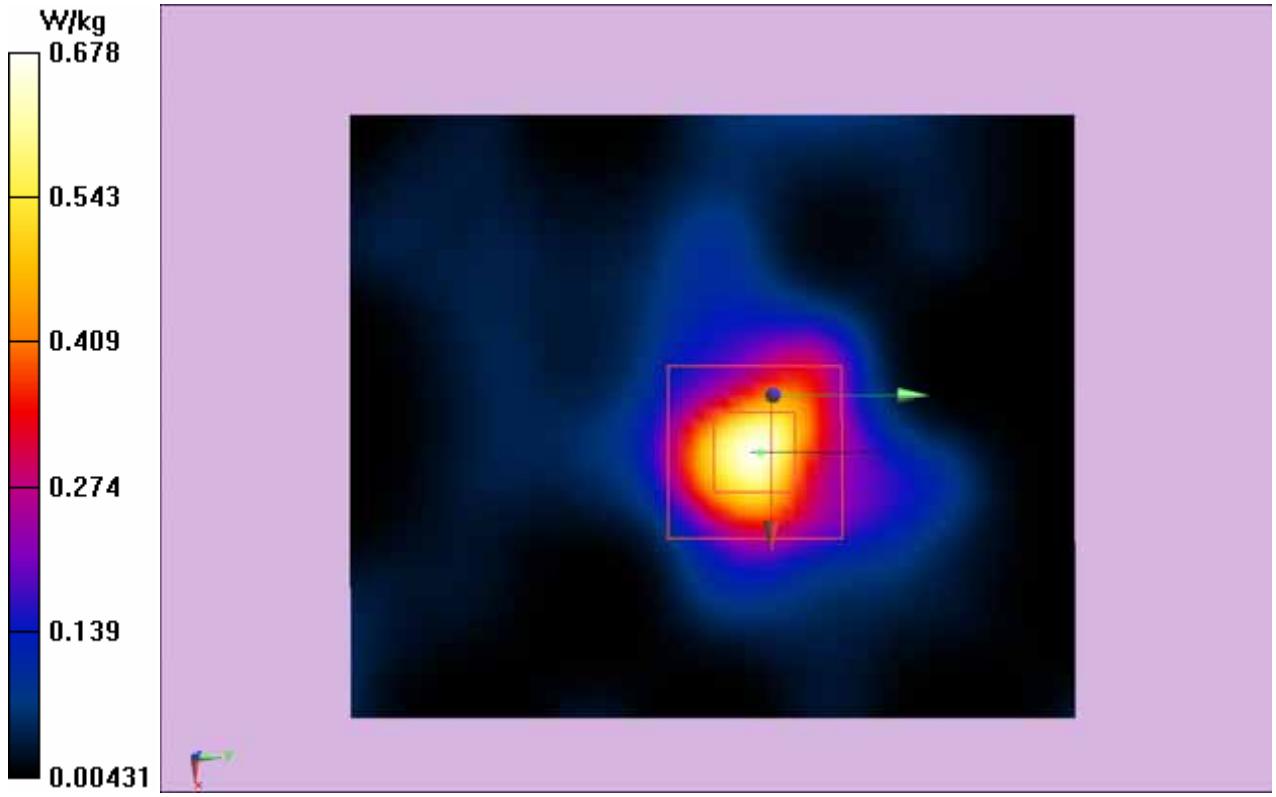
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH136-Top/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.678 W/kg

Configuration/802.11a_CH136-Top/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.116 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 1.344 W/kg
SAR(1 g) = 0.616 W/kg; SAR(10 g) = 0.307 W/kg
Maximum value of SAR (measured) = 0.641 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH149-Back(5745MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5745 MHz
Medium parameters used: f = 5745 MHz; σ = 5.986S/m; ε_r = 47.873; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

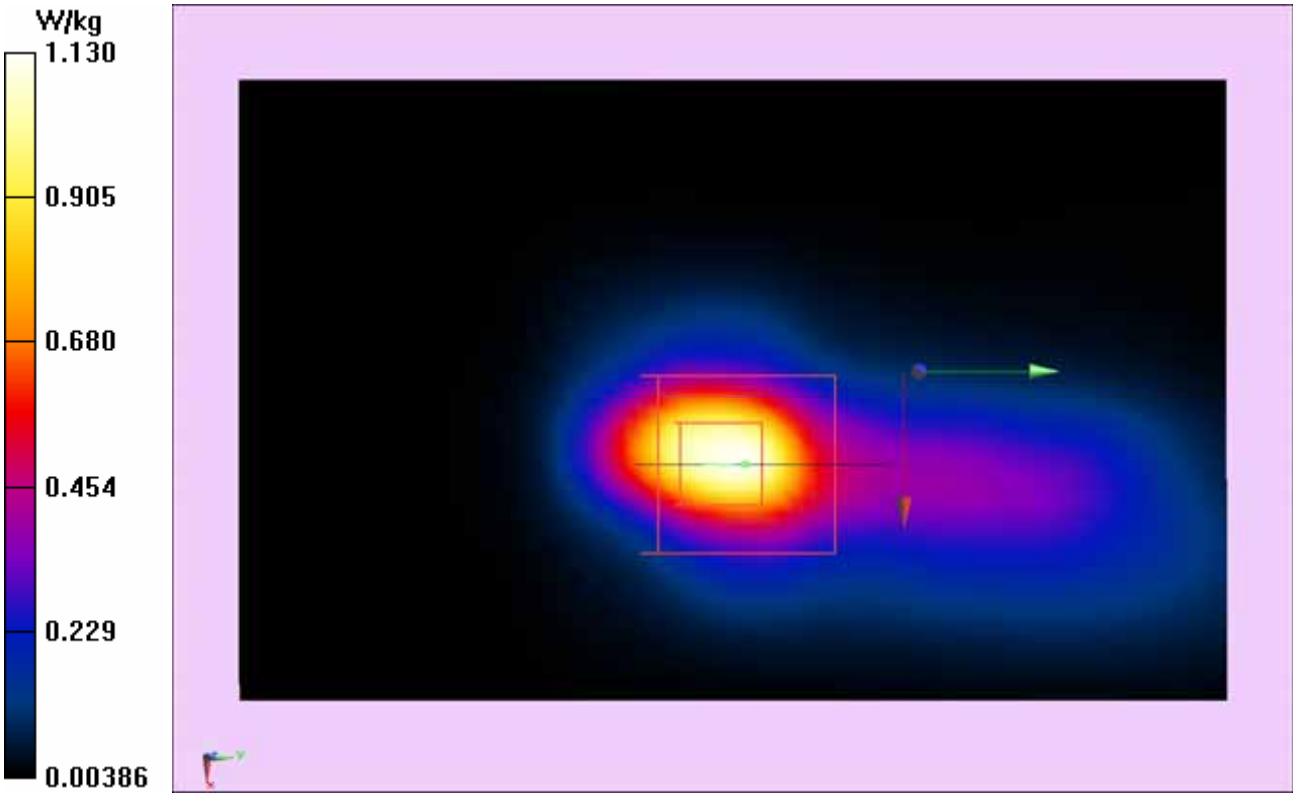
- Probe: EX3DV4 - SN3767; ConvF(4.58, 4.58, 4.58); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH149-Back/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.130 W/kg

Configuration/802.11a_CH149-Back/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.684 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 3.395 W/kg
SAR(1 g) = 1.015 W/kg; SAR(10 g) = 0.544 W/kg
Maximum value of SAR (measured) = 1.364 W/kg



Test Laboratory: Audix SAR Lab Date: 06/08/2014

802.11a_CH149-Top(5745MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5745 MHz
Medium parameters used: f = 5745 MHz; σ = 5.986S/m; ε_r = 47.783; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

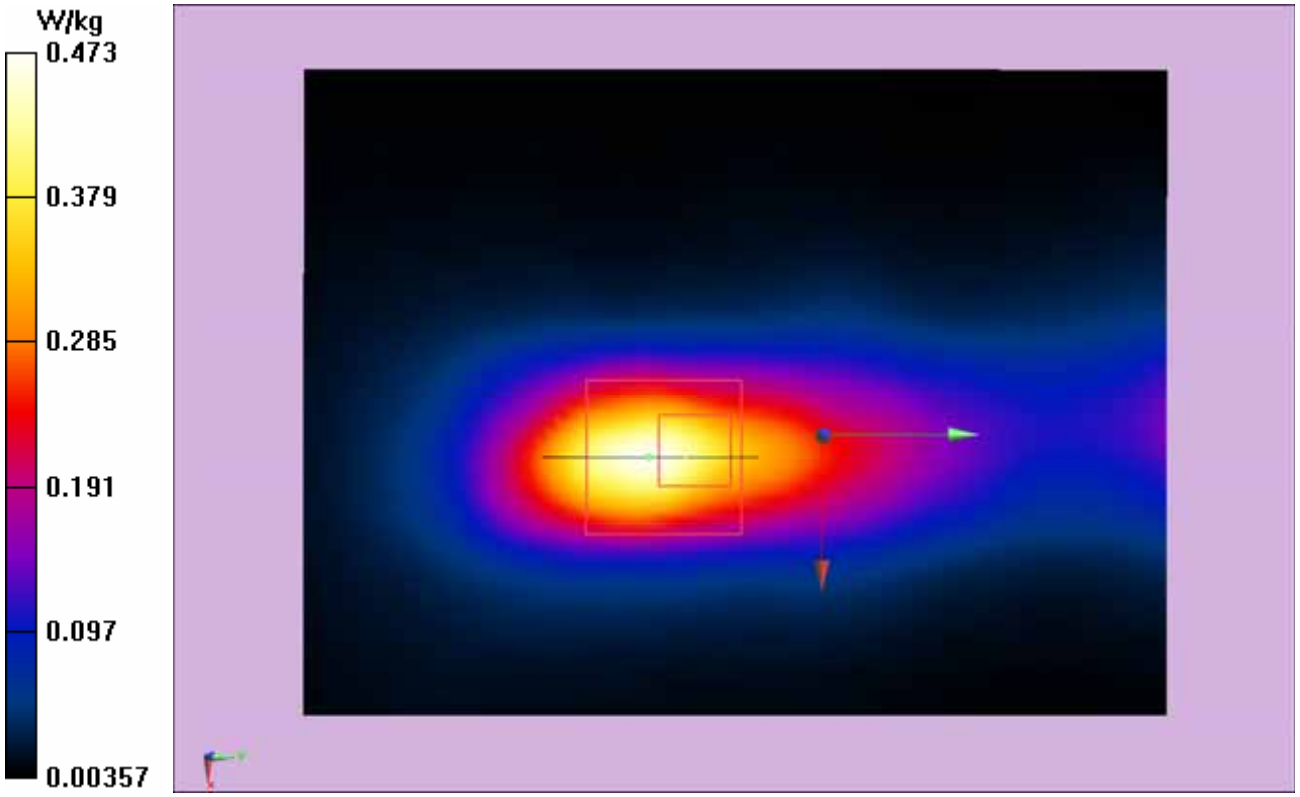
- Probe: EX3DV4 - SN3767; ConvF(4.22, 4.22, 4.22); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH149-Top/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.473 W/kg

Configuration/802.11a_CH149-Top/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.935 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.465 W/kg; SAR(10 g) = 0.242 W/kg
Maximum value of SAR (measured) = 0.482 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH157-Back(5785MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5785 MHz
Medium parameters used: f = 5785 MHz; σ = 5.993S/m; ε_r = 47.929; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

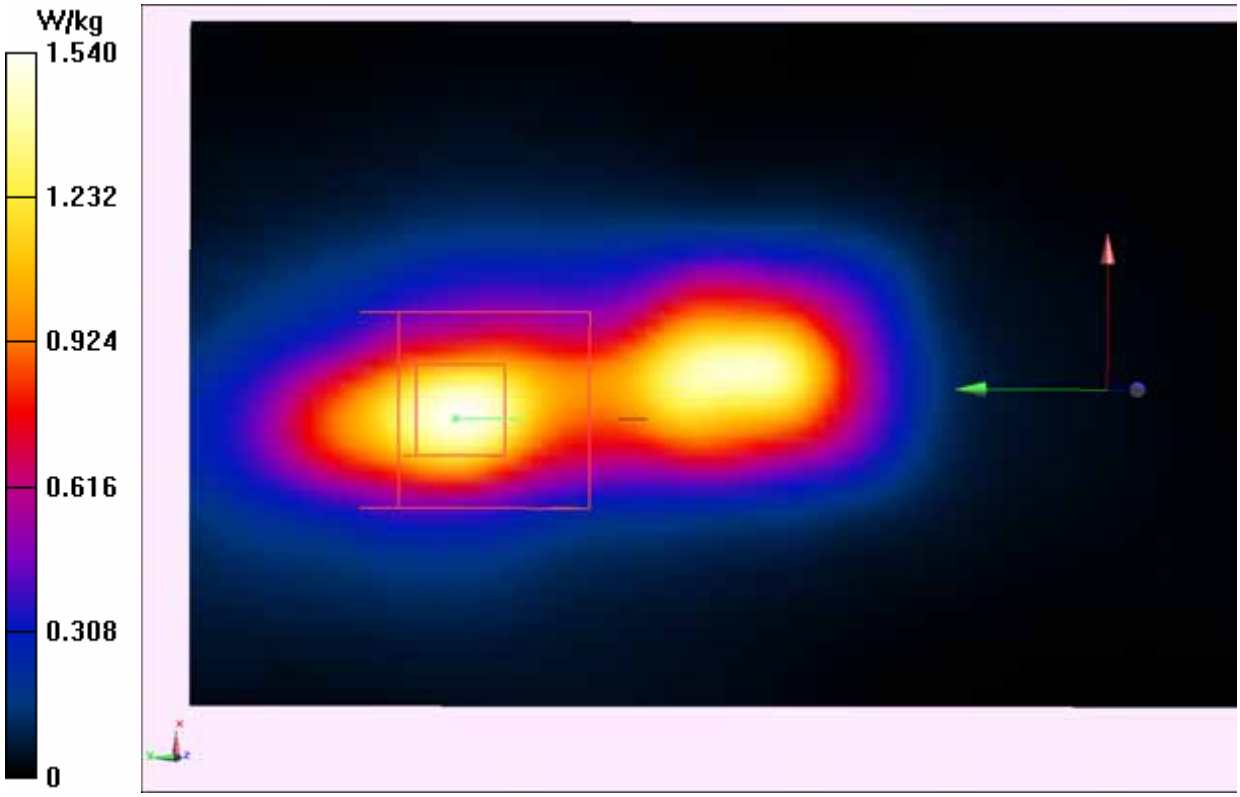
- Probe: EX3DV4 - SN3767; ConvF(4.22, 4.22, 4.22); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH157-Back/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.540 W/kg

Configuration/802.11a_CH157-Back/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.586 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 3.028 W/kg
SAR(1 g) = 1.001 W/kg; SAR(10 g) = 0.571 W/kg
Maximum value of SAR (measured) = 1.105 W/kg



Test Laboratory: Audix SAR Lab Date: 06/08/2014

802.11a_CH157-Top(5785MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5785 MHz
Medium parameters used: f = 5785 MHz; σ = 5.993S/m; ε_r = 47.929; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

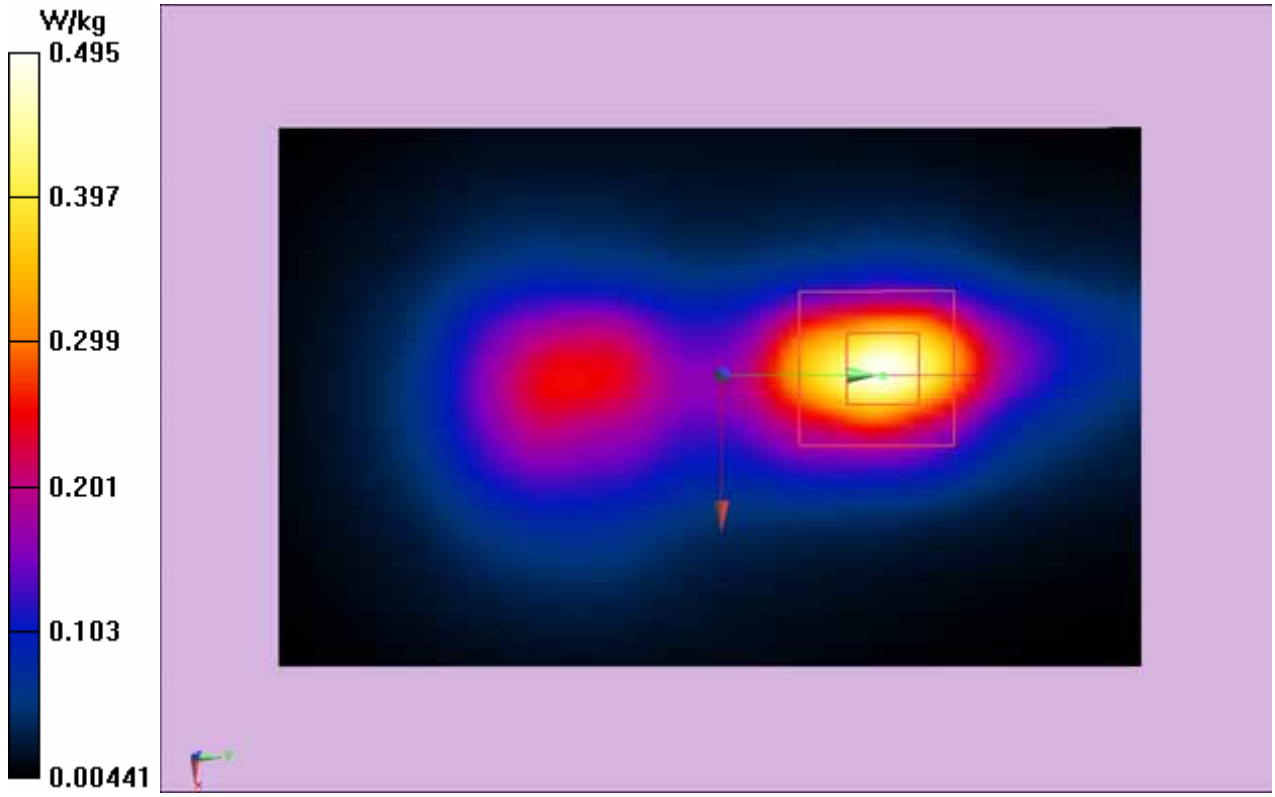
- Probe: EX3DV4 - SN3767; ConvF(4.22, 4.22, 4.22); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH157-Top/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.495 W/kg

Configuration/802.11a_CH157-Top/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.581 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.981 W/kg
SAR(1 g) = 0.504 W/kg; SAR(10 g) = 0.263 W/kg
Maximum value of SAR (measured) = 0.521 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH165-Back(5825MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5825 MHz
Medium parameters used: f = 5825 MHz; σ = 6.132 S/m; ε_r = 48.374; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

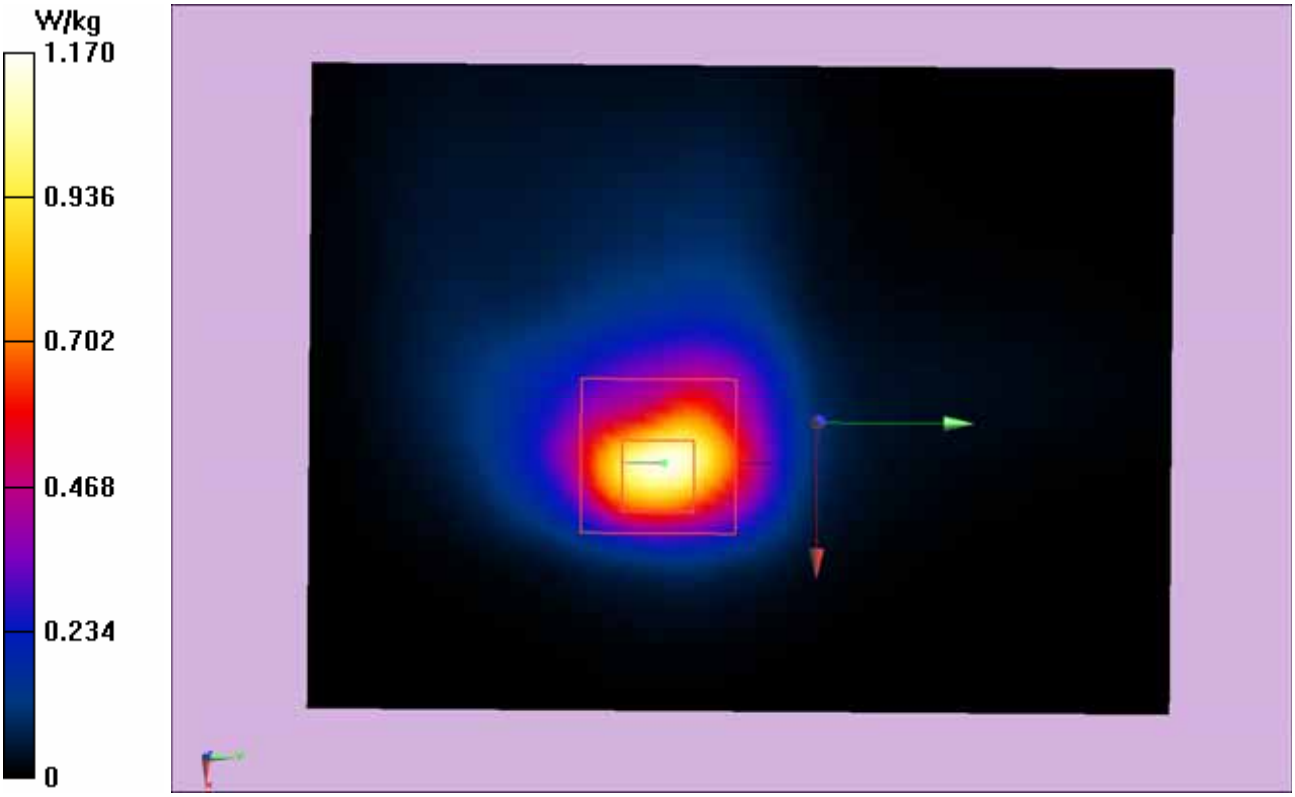
- Probe: EX3DV4 - SN3767; ConvF(4.22, 4.22, 4.22); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11a_CH165-Back/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.170W/kg

Configuration/802.11a_CH165-Back/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.085 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.557 W/kg
SAR(1 g) = 1.037 W/kg; SAR(10 g) = 0.557 W/kg
Maximum value of SAR (measured) = 1.182 W/kg



Test Laboratory: Audix SAR Lab **Date: 06/08/2014**

802.11a_CH165-Vertical-Front(5825MHz)

DUT: Tablet PC M/N: AT10-B
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5825 MHz
Medium parameters used: f = 5825 MHz; σ = 6.132 S/m; ε_r = 48.374; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

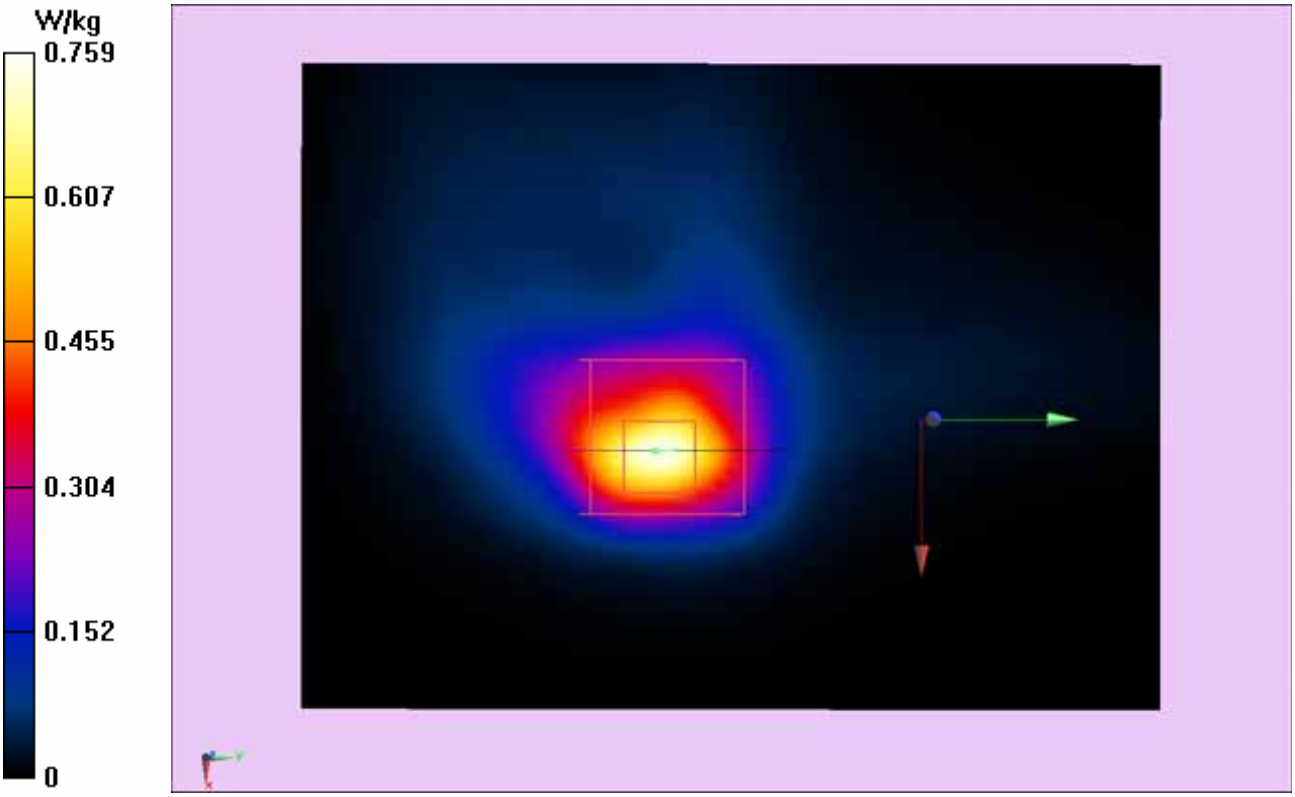
- Probe: EX3DV4 - SN3767; ConvF(4.22, 4.22, 4.22); Calibrated: 27/07/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn899; Calibrated: 07/02/2014
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CH165-Top/Area Scan (51x61x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.759 W/kg

Configuration/802.11b_CH165-Top/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.577 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.744 W/kg
SAR(1 g) = 0.669 W/kg; SAR(10 g) = 0.366 W/kg
Maximum value of SAR (measured) = 0.686W/kg



10. ANNEX C: DASY CABLIBRATION CERTIFICATE

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

s p e a g

IMPORTANT NOTICE

USAGE OF THE DAE 4

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

Battery Exchange: The battery cover of the DAE4 unit is closed using a screw, over tightening the screw may cause the threads inside the DAE to wear out.

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

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

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

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

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

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

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

Schmid & Partner Engineering

TN_BR040315AD DAE4.doc 11.12.2009

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 Audix-CN (Auden)

Certificate No: DAE4-899_Feb14

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BJ - SN: 899
Calibration procedure(s)	QA CAL-06.v26 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	February 07, 2014

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	01-Oct-13 (No:13976)	Oct-14
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Auto DAE Calibration Unit	SE UWS 053 AA 1001	07-Jan-14 (in house check)	In house check: Jan-15
Calibrator Box V2.1	SE UMS 006 AA 1002	07-Jan-14 (in house check)	In house check: Jan-15

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	
Approved by:	Fin Bomholt	Deputy Technical Manager	

Issued: February 7, 2014

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

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

Methods Applied and Interpretation of Parameters

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

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1µV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

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

Calibration Factors	X	Y	Z
High Range	402.444 ± 0.02% (k=2)	403.022 ± 0.02% (k=2)	403.015 ± 0.02% (k=2)
Low Range	3.97807 ± 1.50% (k=2)	3.97561 ± 1.50% (k=2)	3.98289 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	349.5 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200020.74	-12.32	-0.01
Channel X	+ Input	20003.94	0.42	0.00
Channel X	- Input	-20000.86	4.43	-0.02
Channel Y	+ Input	200024.54	-8.07	-0.00
Channel Y	+ Input	20003.50	0.05	0.00
Channel Y	- Input	-20005.35	-0.07	0.00
Channel Z	+ Input	200023.23	-9.62	-0.00
Channel Z	+ Input	20001.41	-2.00	-0.01
Channel Z	- Input	-20003.84	1.48	-0.01

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.38	0.01	0.00
Channel X	+ Input	200.71	0.20	0.10
Channel X	- Input	-199.43	0.24	-0.12
Channel Y	+ Input	2000.51	0.18	0.01
Channel Y	+ Input	200.06	-0.37	-0.19
Channel Y	- Input	-200.21	-0.52	0.26
Channel Z	+ Input	2000.02	-0.18	-0.01
Channel Z	+ Input	199.46	-0.87	-0.44
Channel Z	- Input	-201.40	-1.60	0.80

2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	9.88	7.90
	- 200	-5.85	-7.46
Channel Y	200	13.76	13.66
	- 200	-14.94	-14.95
Channel Z	200	-7.66	-7.63
	- 200	5.58	5.36

3. Channel separation

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

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	1.07	-4.97
Channel Y	200	7.56	-	-0.02
Channel Z	200	10.11	6.31	-

4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	16014	16535
Channel Y	15650	17105
Channel Z	15821	16109

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.61	-0.53	2.08	0.53
Channel Y	0.05	-1.07	0.99	0.45
Channel Z	-0.61	-1.61	0.30	0.40

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

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 **Audix-CN (Auden)**

Certificate No: **ES3-3139_Jul12**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3139**

Calibration procedure(s) **QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4**
Calibration procedure for dosimetric E-field probes

Calibration date: **July 25, 2012**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 25, 2012

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
Swiss Calibration Service

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

Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

Probe ES3DV3

SN:3139

Manufactured: February 12, 2007
Calibrated: July 25, 2012

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3139

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.28	1.32	1.35	± 10.1 %
DCP (mV)[B]	106.6	102.5	104.0	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
0	CW	0.00	X	0.00	0.00	1.00	117.7	±3.0 %
			Y	0.00	0.00	1.00	117.9	
			Z	0.00	0.00	1.00	118.7	

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

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3139

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)
835	41.5	0.90	5.92	5.92	5.92	0.36	1.73	± 12.0 %
900	41.5	0.97	5.88	5.88	5.88	0.51	1.36	± 12.0 %
1450	40.5	1.20	5.20	5.20	5.20	0.30	1.96	± 12.0 %
1750	40.1	1.37	5.24	5.24	5.24	0.53	1.50	± 12.0 %
1900	40.0	1.40	5.02	5.02	5.02	0.48	1.57	± 12.0 %
2000	40.0	1.40	4.98	4.98	4.98	0.80	1.20	± 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:3139

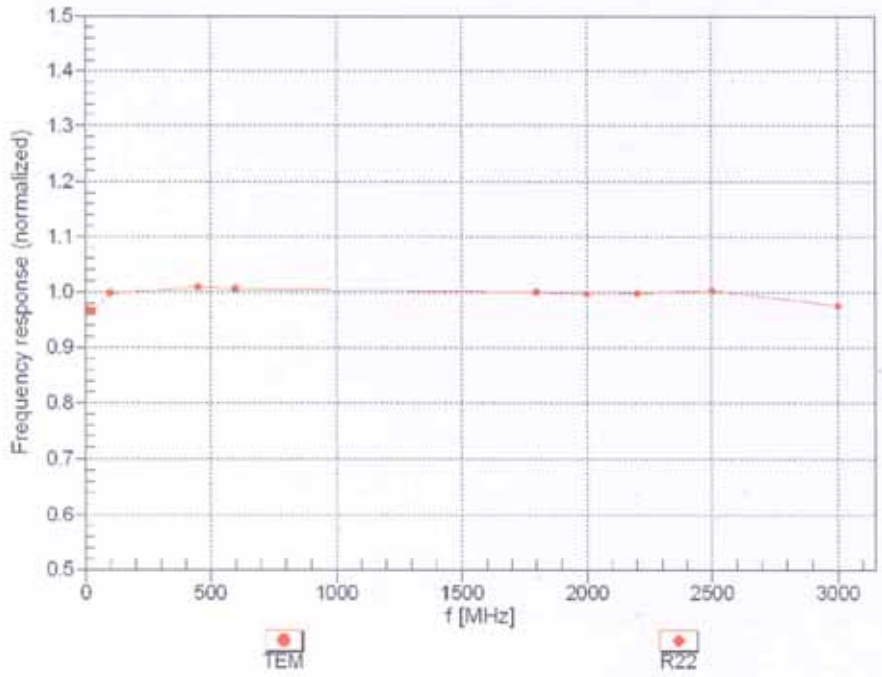
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	55.2	0.97	5.91	5.91	5.91	0.74	1.23	± 12.0 %
900	55.0	1.05	5.87	5.87	5.87	0.80	1.09	± 12.0 %
1450	54.0	1.30	5.16	5.16	5.16	0.80	1.13	± 12.0 %
1750	53.4	1.49	4.79	4.79	4.79	0.40	1.79	± 12.0 %
1900	53.3	1.52	4.53	4.53	4.53	0.45	1.68	± 12.0 %
2000	53.3	1.52	4.64	4.64	4.64	0.80	1.04	± 12.0 %
2450	52.7	1.95	4.16	4.16	4.16	0.71	1.14	± 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.

ES3DV3– SN:3139 July 25, 2012

Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



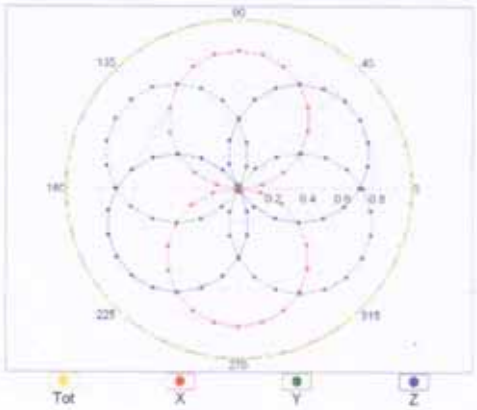
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

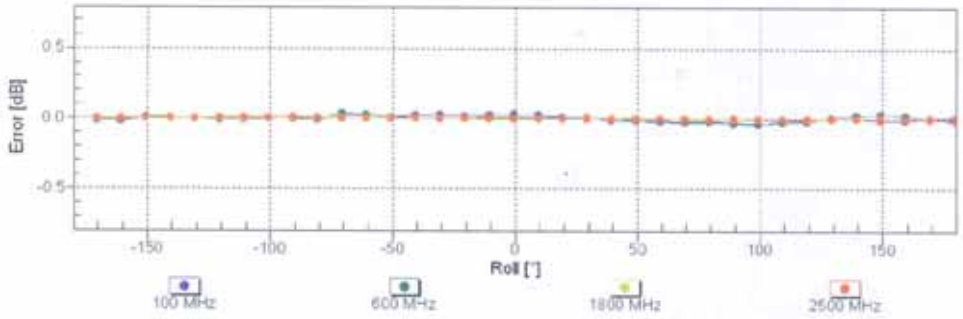
ES3DV3– SN:3139 July 25, 2012

Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM

f=1800 MHz,R22



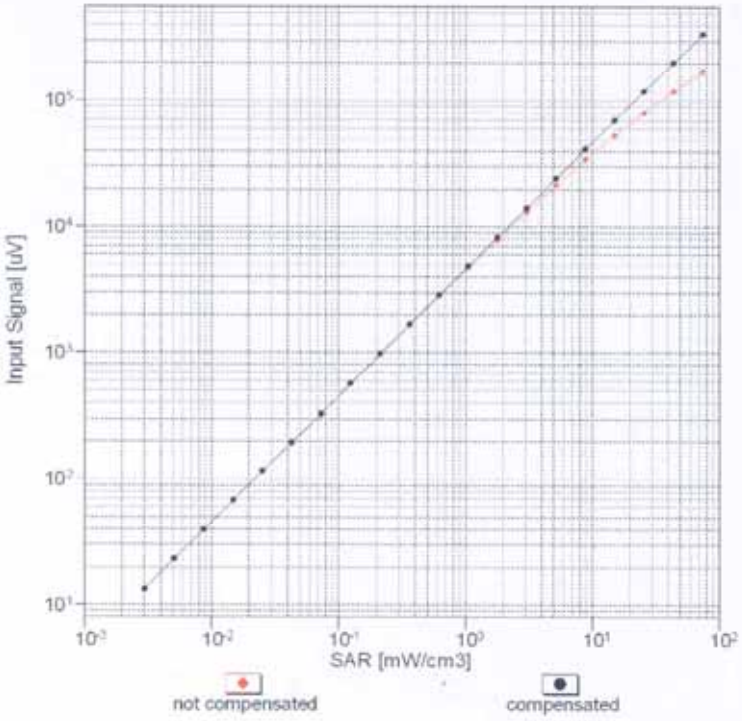


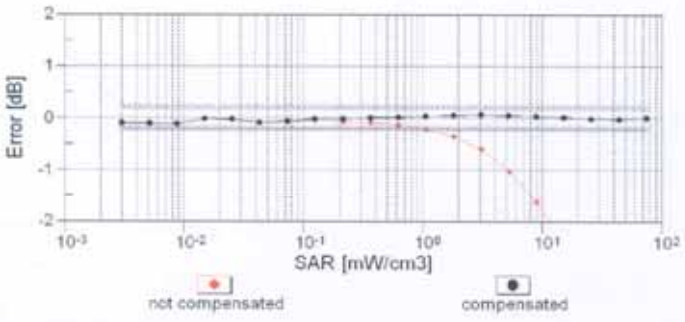
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Certificate No: ES3-3139_Jul12 Page 8 of 11

ES3DV3– SN:3139 July 25, 2012

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)



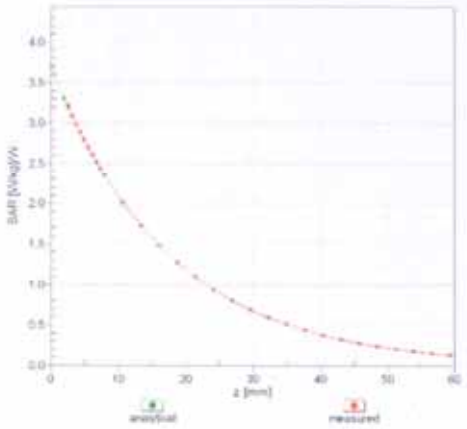


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

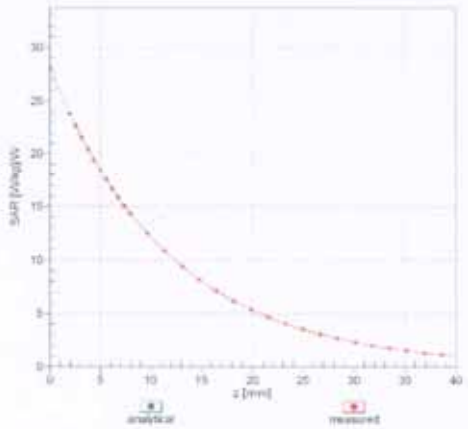
ES3DV3– SN:3139 July 25, 2012

Conversion Factor Assessment

f = 900 MHz,WGLS R9 (H_convF)

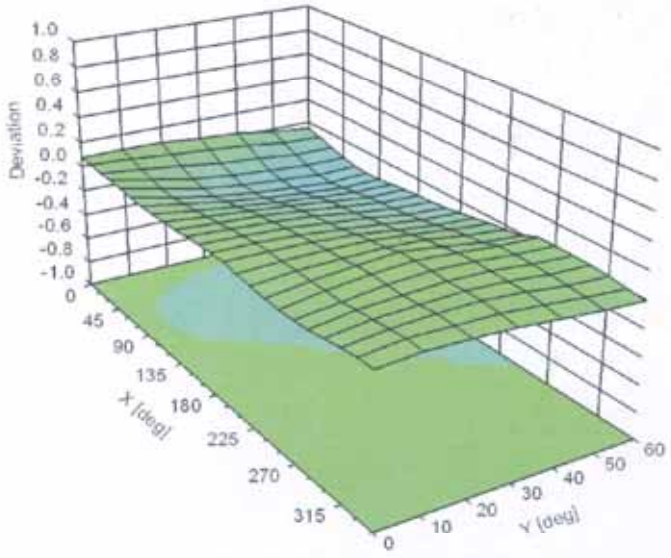


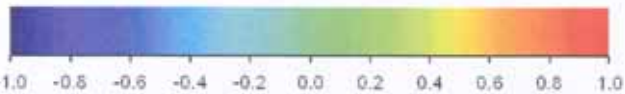
f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3139

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	89.2
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	3 mm

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com
CNAS 校准 CNAS L0442

Client **Auden** **Certificate No: Z14-97048**

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 862
Calibration Procedure(s)	TMC-OS-E-02-194 Calibration procedure for dipole validation kits
Calibration date:	May 29, 2014

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102083	11-Sep-13 (TMC, No.JZ13-443)	Sep-14
Power sensor NRV-Z5	100595	11-Sep-13 (TMC, No. JZ13-443)	Sep -14
Reference Probe EX3DV4	SN 3846	3- Sep-13 (SPEAG, No.EX3-3846_Sep13)	Sep-14
DAE4	SN 1331	23-Jan-14 (SPEAG, DAE4-1331_Jan14)	Jan -15
Signal Generator E4438C	MY49070393	13-Nov-13 (TMC, No.JZ13-394)	Nov-14
Network Analyzer E8362B	MY43021135	19-Oct-13 (TMC, No.JZ13-278)	Oct-14

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: May 30, 2014

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
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 300MHz to 3GHz)", February 2005
c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

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.

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%.

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Measurement Conditions

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

DASY Version	DASY52	52.8.8.1222
Extrapolation	Advanced Extrapolation	
Phantom	Twin Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.8 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.5 ± 6 %	1.82 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**53.1 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.35 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**25.3 mW /g ± 20.4 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.2 ± 6 %	1.94 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**50.4 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.99 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**24.0 mW /g ± 20.4 % (k=2)**

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.6Ω- 6.07jΩ
Return Loss	- 24.0dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	52.1Ω- 6.08jΩ
Return Loss	- 24.0dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.346 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
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

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DASY5 Validation Report for Head TSL Date: 27.05.2014

Test Laboratory: TMC, Beijing, China

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN: 862

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.819 S/m; ε_r = 38.51; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(6.78, 6.78, 6.78); Calibrated: 2013-09-03;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

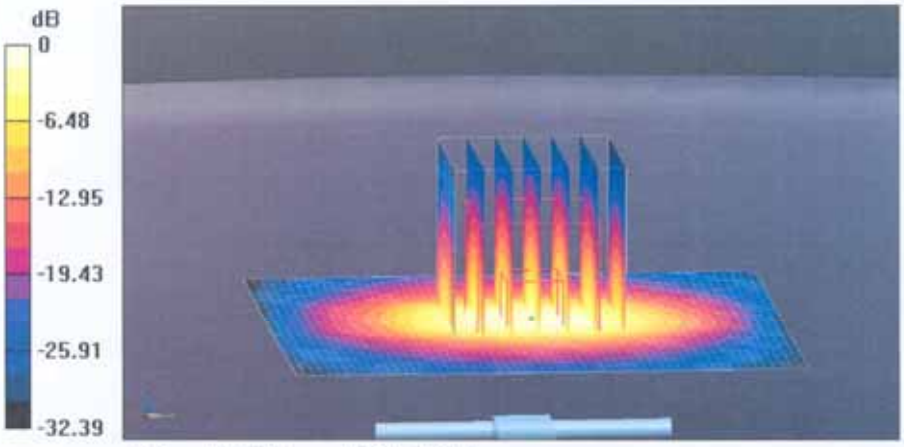
System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=xx mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 106.6 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 26.8 W/kg

SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.35 W/kg

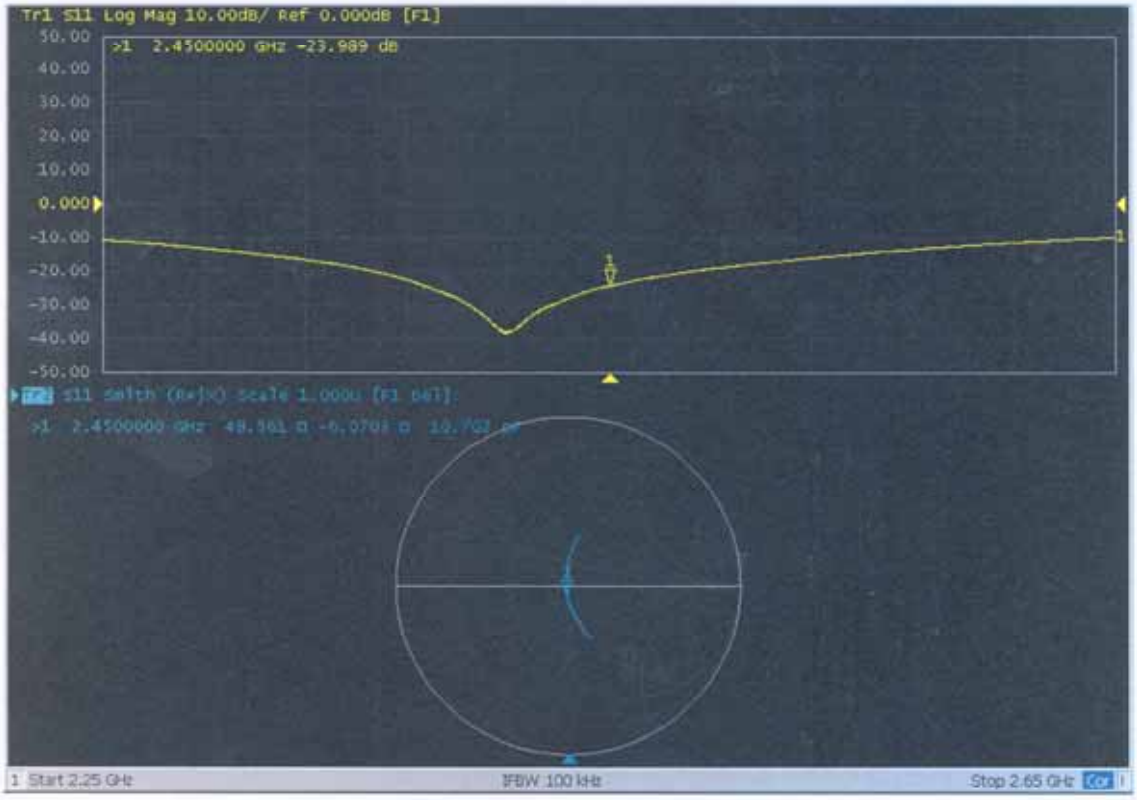
Maximum value of SAR (measured) = 20.1 W/kg



0 dB = 19.6 W/kg = 12.93 dBW/kg

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Impedance Measurement Plot for Head TSL



Certificate No: Z14-97048 Page 6 of 8

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DASY5 Validation Report for Body TSL Date: 28.05.2014

Test Laboratory: TMC, Beijing, China

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN: 862

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.94 S/m; ε_r = 52.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(6.73, 6.73, 6.73); Calibrated: 2013-09-03;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

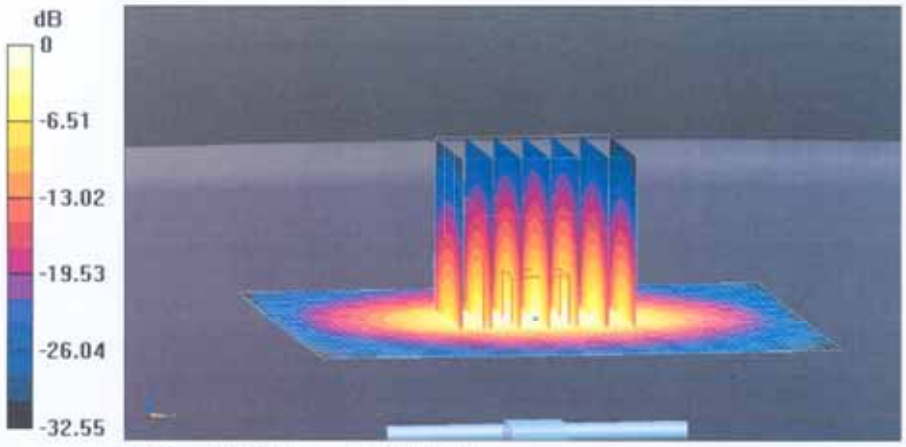
System Performance Check at Frequencies above 1 GHz/d=10mm, Pin=xx mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.55 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 25.2 W/kg

SAR(1 g) = 12.6 W/kg; SAR(10 g) = 5.99 W/kg

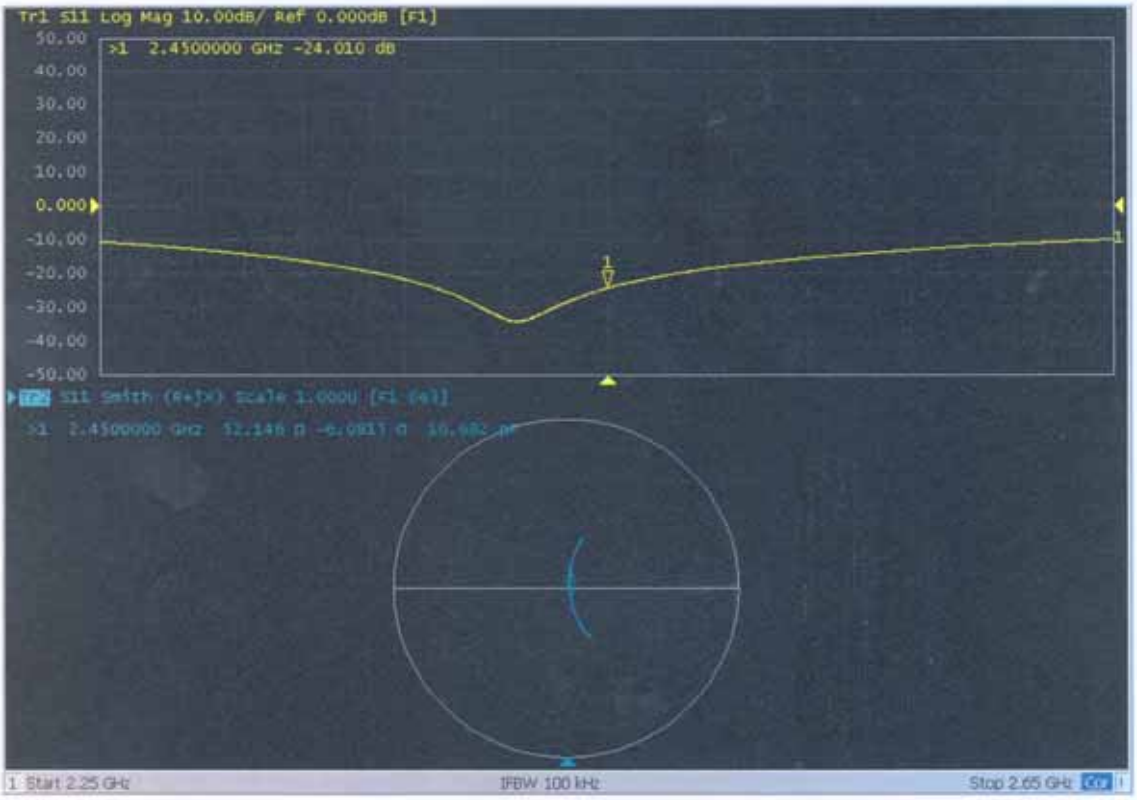
Maximum value of SAR (measured) = 19.0 W/kg



0 dB = 18.1 W/kg = 12.58 dBW/kg

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Impedance Measurement Plot for Body TSL



Certificate No: Z14-97048 Page 8 of 8

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
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 Audix-CN (Auden)

Certificate No: EX3-3767_Jul12

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3767

Calibration procedure(s) QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: July 27, 2012

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 27, 2012

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
Swiss Calibration Service

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

Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

Probe EX3DV4

SN:3767

Manufactured: July 6, 2010
Calibrated: July 27, 2012

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3767

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μV/(V/m)²)[A]	0.54	0.55	0.49	± 10.1 %
DCP (mV)[B]	100.8	100.0	100.9	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
0	CW	0.00	X	0.00	0.00	1.00	166.5	±3.5 %
			Y	0.00	0.00	1.00	166.3	
			Z	0.00	0.00	1.00	153.1	

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

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3767

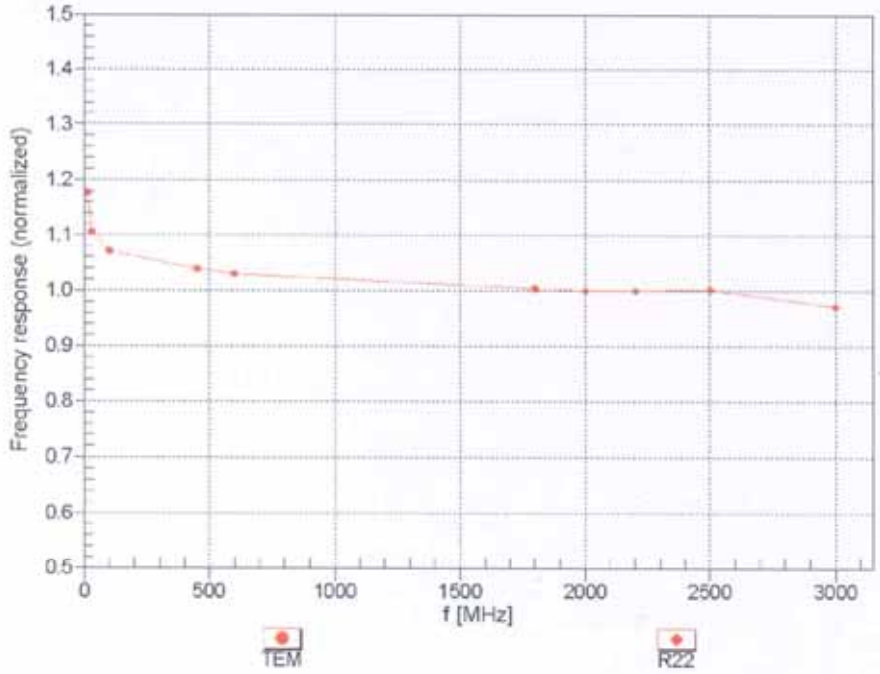
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
5200	49.0	5.30	4.58	4.58	4.58	0.40	1.90	± 13.1 %
5500	48.6	5.65	4.21	4.21	4.21	0.50	1.90	± 13.1 %
5800	48.2	6.00	4.22	4.22	4.22	0.50	1.90	± 13.1 %

[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.

EX3DV4– SN:3767 July 27, 2012

Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)

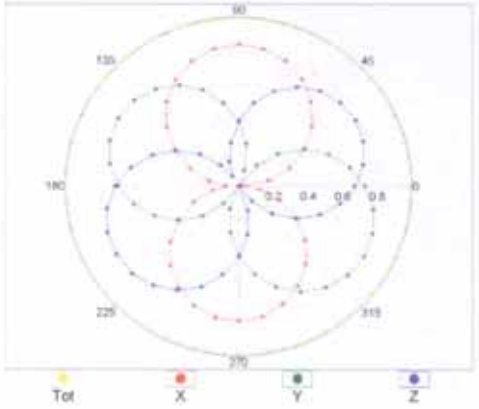


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

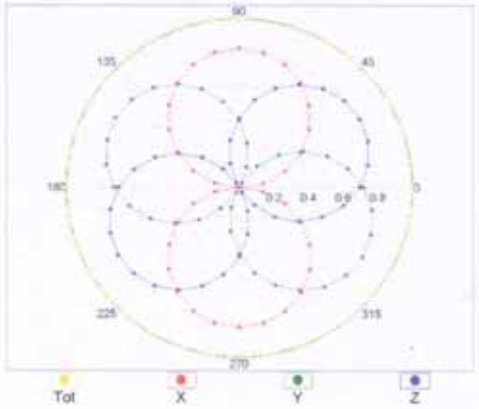
EX3DV4– SN:3767 July 27, 2012

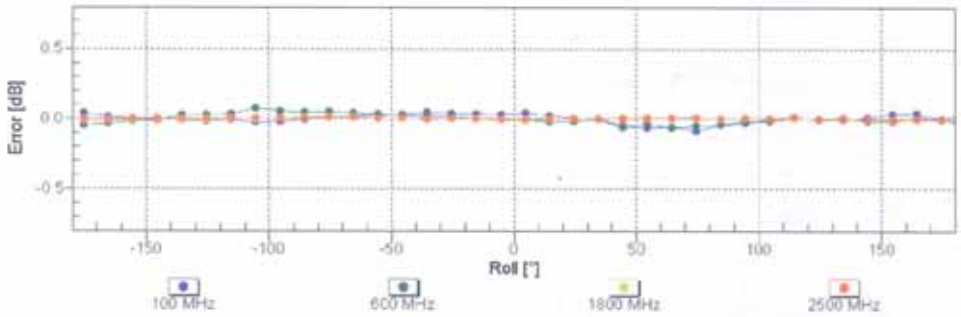
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



f=1800 MHz,R22

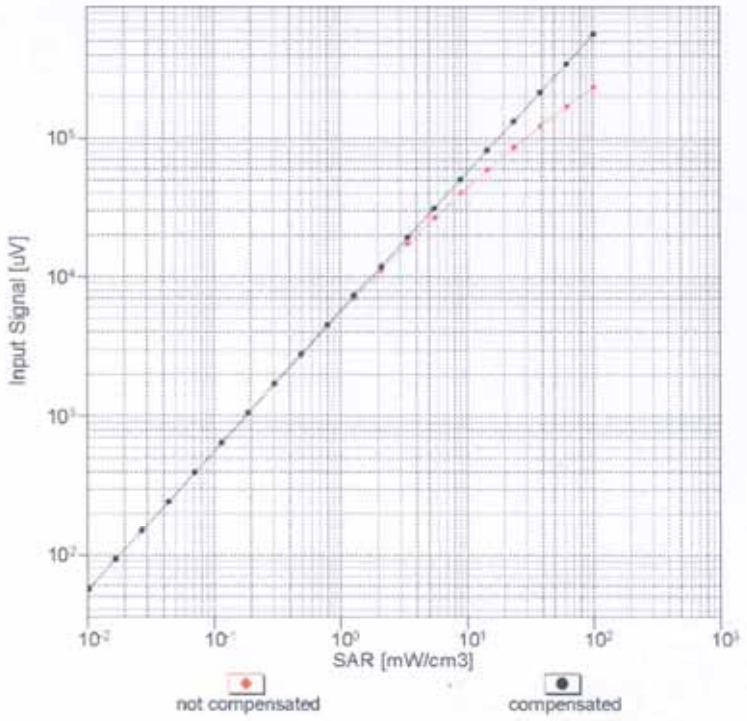


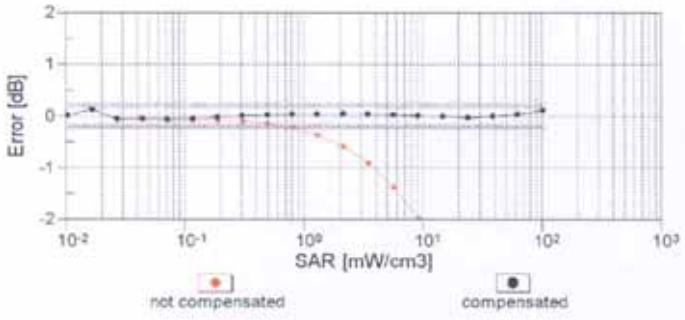


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Certificate No: EX3-3767_Jul12 Page 7 of 10

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)

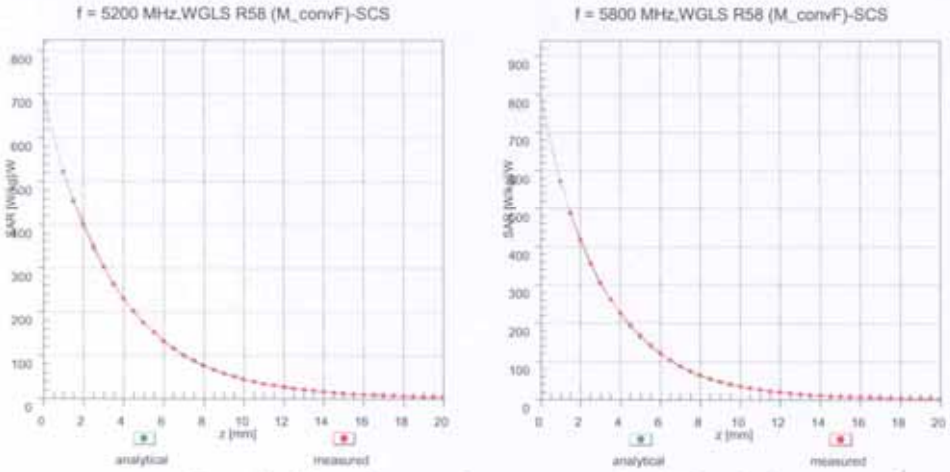




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

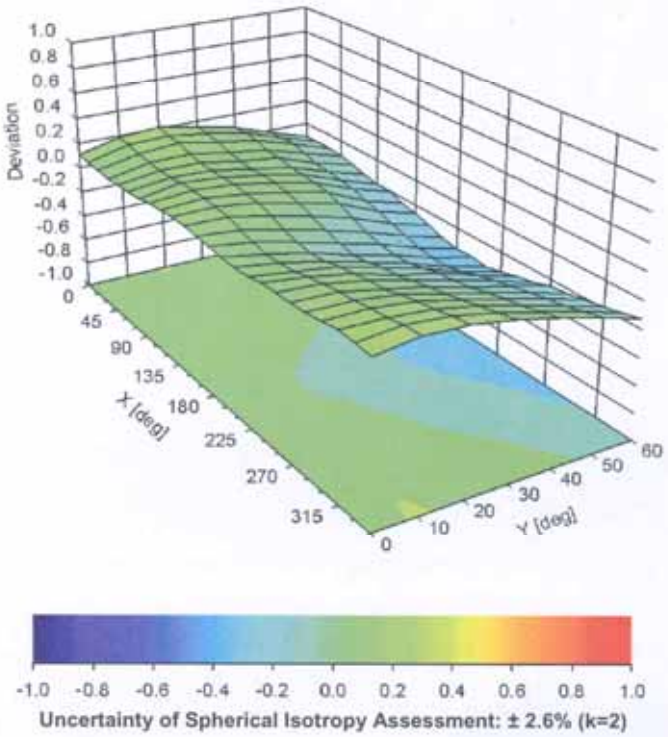
EX3DV4– SN:3767 July 27, 2012

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3767

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	144.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 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

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

CNAS 校准 CNAS L0442

Client Auden Certificate No: Z14-97049

CALIBRATION CERTIFICATE

Object D5GHzV2 - SN:1102

Calibration Procedure(s) TMC-OS-E-02-194
Calibration procedure for dipole validation kits

Calibration date: June 16, 2014

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(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102083	11-Sep-13 (TMC, No.JZ13-443)	Sep-14
Power sensor NRV-Z5	100595	11-Sep-13 (TMC, No. JZ13-443)	Sep -14
Reference Probe EX3DV4	SN 3846	3- Sep-13 (SPEAG, No.EX3-3846_Sep13)	Sep-14
DAE4	SN 1331	23-Jan-14 (SPEAG, DAE4-1331_Jan14)	Jan -15
Signal Generator E4438C	MY49070393	13-Nov-13 (TMC, No.JZ13-394)	Nov-14
Network Analyzer E8362B	MY43021135	19-Oct-13 (TMC, No.JZ13-278)	Oct-14

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: June 17, 2014

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

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 300MHz to 3GHz)", February 2005

c) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

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.

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%.

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Measurement Conditions

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

DASY Version	DASY52	52.8.8.1222
Extrapolation	Advanced Extrapolation	
Phantom	Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	
Frequency	5200 MHz ± 1 MHz 5500 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.3 ± 6 %	4.62 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5200MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	7.81 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**78.2 mW /g ± 23.0 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.23 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**22.3 mW /g ± 22.2 % (k=2)**

Head TSL parameters at 5500MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.2 ± 6 %	5.04 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5500MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	8.30 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**82.9 mW /g ± 23.0 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.38 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**23.8 mW /g ± 22.2 % (k=2)**

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Head TSL parameters at 5800MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.9 ± 6 %	5.28 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL at 5800MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	7.57 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**75.5 mW /g ± 23.0 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.15 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**21.4 mW /g ± 22.2 % (k=2)**

Body TSL parameters at 5200MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	48.1 ± 6 %	5.32 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5200MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	7.55 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**75.2 mW /g ± 23.0 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.18 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.7 mW /g ± 22.2 % (k=2)**

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Body TSL parameters at 5500MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.65 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.5 ± 6 %	5.62 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5500MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	8.05 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**80.1 mW /g ± 23.0 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.30 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**22.9 mW /g ± 22.2 % (k=2)**

Body TSL parameters at 5800MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.2 ± 6 %	6.05 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL at 5800MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	7.23 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**72.0 mW /g ± 23.0 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.05 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**20.4 mW /g ± 22.2 % (k=2)**

Appendix

Antenna Parameters with Head TSL at 5200MHz

Impedance, transformed to feed point	50.2Ω-8.19jΩ
Return Loss	- 21.8dB

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Antenna Parameters with Head TSL at 5500MHz

Impedance, transformed to feed point	52.0Ω- 4.65jΩ
Return Loss	- 26.0dB

Antenna Parameters with Head TSL at 5800MHz

Impedance, transformed to feed point	54.7Ω- 1.58jΩ
Return Loss	- 26.5dB

Antenna Parameters with Body TSL at 5200MHz

Impedance, transformed to feed point	51.6Ω- 7.57jΩ
Return Loss	- 22.4dB

Antenna Parameters with Body TSL at 5500MHz

Impedance, transformed to feed point	51.1Ω- 5.61jΩ
Return Loss	- 25.0dB

Antenna Parameters with Body TSL at 5800MHz

Impedance, transformed to feed point	54.5Ω- 0.89jΩ
Return Loss	- 27.2dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.183 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
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

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DASY5 Validation Report for Head TSL Date: 16.06.2014

Test Laboratory: TMC, Beijing, China

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

Communication System: UID 0, CW; Frequency: 5200 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5200 MHz; σ = 4.62 S/m; ε_r = 36.3; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(5.25, 5.25, 5.25); Calibrated: 2013-09-03;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: ELI 4.0; Type: QDOVA001BA
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

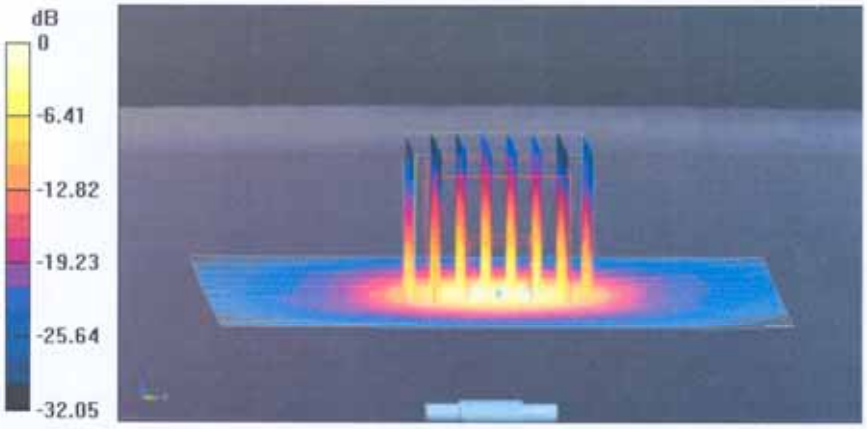
System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 69.42 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 36.0 W/kg

SAR(1 g) = 7.81 W/kg; SAR(10 g) = 2.23 W/kg

Maximum value of SAR (measured) = 18.5 W/kg



0 dB = 19.1 W/kg = 12.81 dBW/kg

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DASY5 Validation Report for Head TSL Date: 16.06.2014

Test Laboratory: TMC, Beijing, China

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

Communication System: UID 0, CW; Frequency: 5500 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5500 MHz; σ = 5.04 S/m; ε_r = 35.2; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(4.8, 4.8, 4.8); Calibrated: 2013-09-03;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: ELI 4.0; Type: QDOVA001BA
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

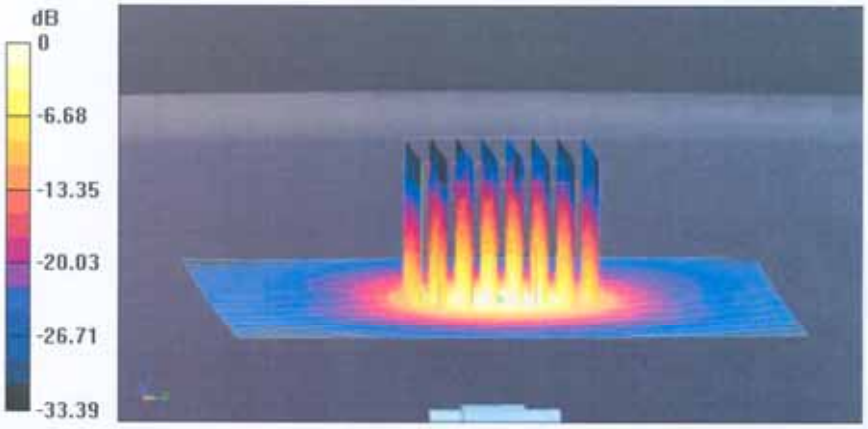
System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 69.93 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 40.2 W/kg

SAR(1 g) = 8.3 W/kg; SAR(10 g) = 2.38 W/kg

Maximum value of SAR (measured) = 20.5 W/kg



0 dB = 20.5 W/kg = 13.13 dBW/kg

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DASY5 Validation Report for Head TSL Date: 16.06.2014

Test Laboratory: TMC, Beijing, China

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

Communication System: UID 0, CW; Frequency: 5800 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5800 MHz; σ = 5.28 S/m; ε_r = 34.9; ρ = 1000 kg/m^3

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(4.51, 4.51, 4.51); Calibrated: 2013-09-03;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: ELI 4.0; Type: QDOVA001BA
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

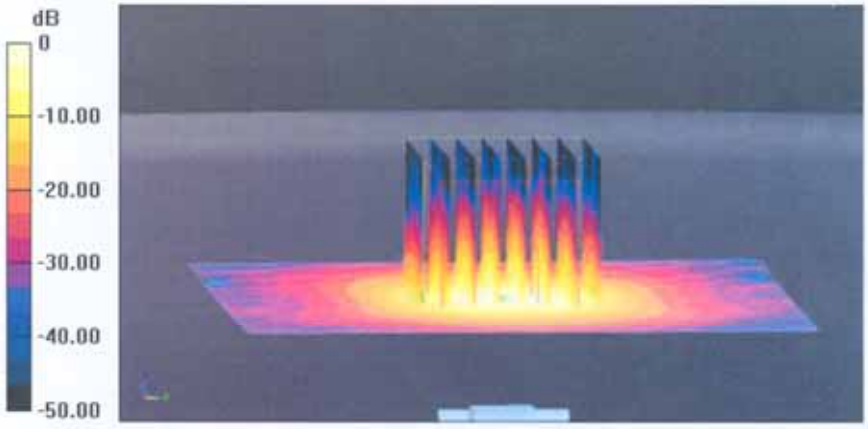
System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 66.33 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 37.9 W/kg

SAR(1 g) = 7.57 W/kg; SAR(10 g) = 2.15 W/kg

Maximum value of SAR (measured) = 19.2 W/kg

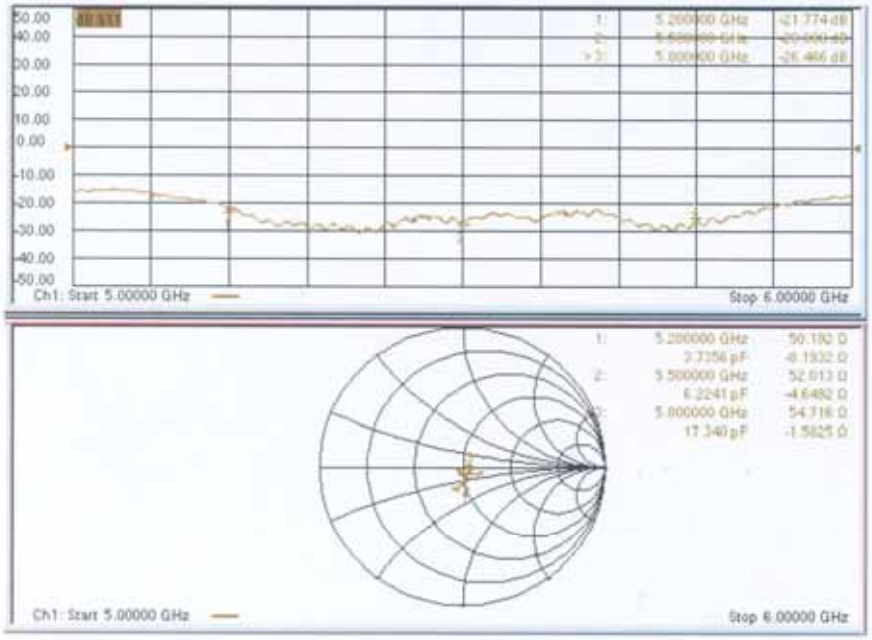


0 dB = 18.9 W/kg = 12.77 dBW/kg

In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Impedance Measurement Plot for Head TSL



In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DASY5 Validation Report for Body TSL Date: 13.06.2014

Test Laboratory: TMC, Beijing, China

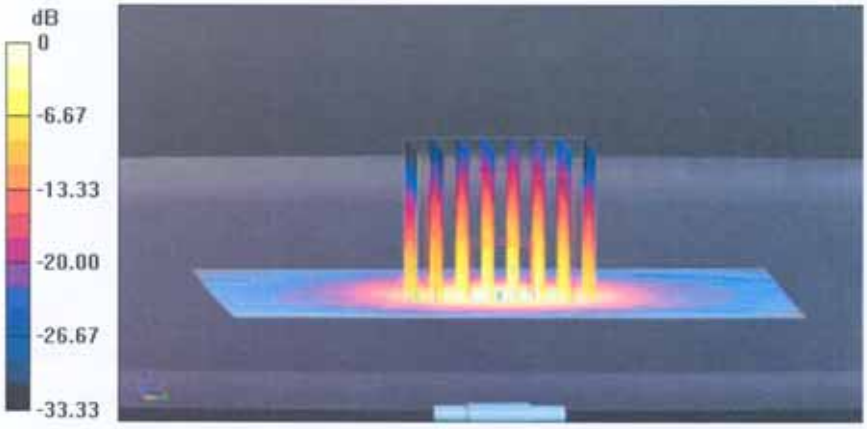
DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

Communication System: UID 0, CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5200 MHz; σ = 5.32 S/m; ε_r = 48.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(4.36, 4.36, 4.36); Calibrated: 2013-09-03;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: ELI 4.0; Type: QDOVA001BA
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.52 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 29.4 W/kg
SAR(1 g) = 7.55 W/kg; SAR(10 g) = 2.18 W/kg
Maximum value of SAR (measured) = 17.2 W/kg



0 dB = 17.3 W/kg = 12.38 dBW/kg

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DASY5 Validation Report for Body TSL Date: 13.06.2014

Test Laboratory: TMC, Beijing, China

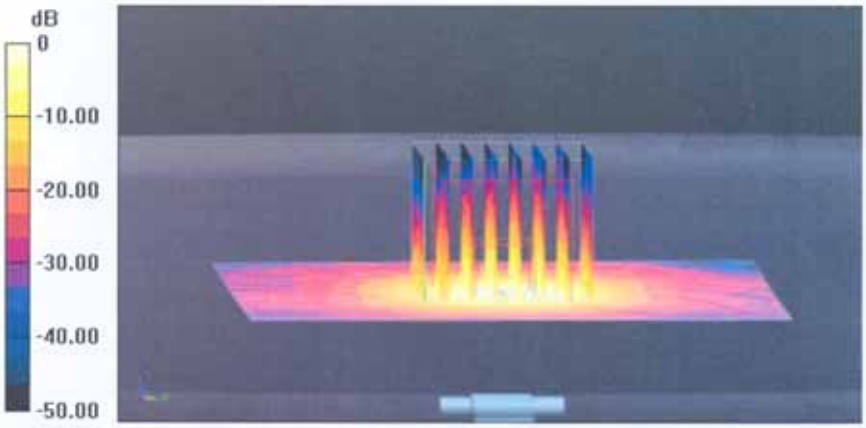
DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

Communication System: UID 0, CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5500 MHz; σ = 5.62 S/m; ε_r = 47.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(3.81, 3.81, 3.81); Calibrated: 2013-09-03;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: ELI 4.0; Type: QDOVA001BA
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.16 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 33.5 W/kg
SAR(1 g) = 8.05 W/kg; SAR(10 g) = 2.3 W/kg
Maximum value of SAR (measured) = 18.8 W/kg



0 dB = 18.9 W/kg = 12.76 dBW/kg

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

DASY5 Validation Report for Body TSL Date: 13.06.2014

Test Laboratory: TMC, Beijing, China

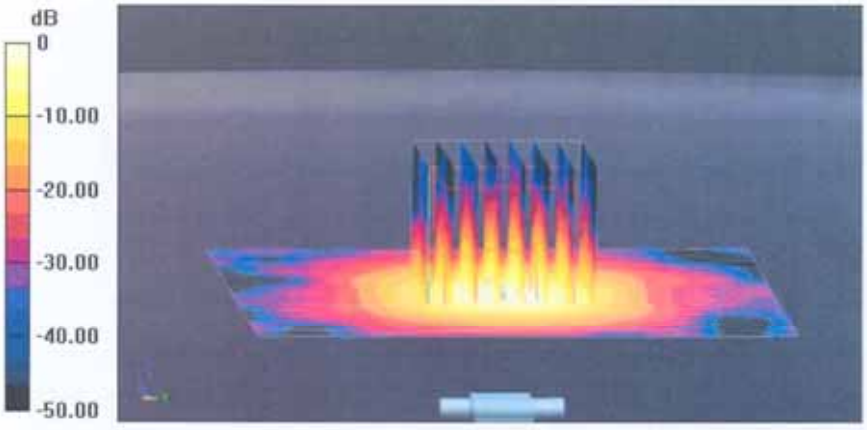
DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1102

Communication System: UID 0, CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5800 MHz; σ = 6.05 S/m; ε_r = 47.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(3.94, 3.94, 3.94); Calibrated: 2013-09-03;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2014-01-23
- Phantom: ELI 4.0; Type: QDOVA001BA
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 63.52 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 33.4 W/kg
SAR(1 g) = 7.23 W/kg; SAR(10 g) = 2.05 W/kg
Maximum value of SAR (measured) = 17.4 W/kg



0 dB = 17.6 W/kg = 12.45 dBW/kg

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.52 Huayuanbei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: Info@emcite.com Http://www.emcite.com

Impedance Measurement Plot for Body TSL