Prüfbericht-Nr.: *Test Report No.:*	**17040437 006**	**Auftrags-Nr.:** *Order No.:*	164014360	Seite 1 von 23 *Page 1 of 23*
Kunden-Referenz-Nr.: *Client Reference No.:*	N/A	**Auftragsdatum:** *Order date:*	20.05.2014	

Auftraggeber: *Client:*	KEEN HIGH TECHNOLOGIES LTD. Block A1 & A2, Ze Da Li Industrial Park, Tangwei Area, Fuyong, Bao'an, Shenzhen, Guangdong, China
Prüfgegenstand: *Test item:*	Tablet
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	NS-15AT10
Auftrags-Inhalt: *Order content:*	FCC/IC Certification
Prüfgrundlage: *Test specification:*	CFR Title 47 Part 2 Subpart J Section 2.1093 ANSI/IEEE C95.1-1992 IEEE 1528-2003 FCC OET Bulletin 65 Supplement C (Edition 01-01) RSS-102 Issue 4 March 2010
Wareneingangsdatum: *Date of receipt:*	25.05.2014
Prüfmuster-Nr.: *Test sample No.:*	A000073356-004
Prüfzeitraum: *Testing period:*	06.06.2014 - 08.06.2014
Ort der Prüfung: *Place of testing:*	Audix Technology (Shenzhen) Co., Ltd.
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass

geprüft von / *tested by*:

13.06.2014	Owen Tian/Project Manager	
Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

kontrolliert von / *reviewed by*:

13.06.2014	Sam Lin/Technical Certicier	
Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*:

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

V04

STATEMENT OF COMPLIANCE

TEST ITEM	SPECIFICATION	RESULT
Specific Absorption Rate - Wi-Fi 802.11 b/g/n - 2.4GHz Band	OET Bulletin 65 Supplement C (Edition 01-01): *Evaluating compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*	PASS
Specific Absorption Rate - Wi-Fi 802.11 a/n - 5.2GHz Band	OET Bulletin 65 Supplement C (Edition 01-01): *Evaluating compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*	PASS
Specific Absorption Rate - Wi-Fi 802.11 a/n - 5.8GHz Band	OET Bulletin 65 Supplement C (Edition 01-01): *Evaluating compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*	PASS

This device complies with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6W/kg) specified in CFR Title 47 Part 2 Subpart J Section 2.1093 and ANSI/IEEE C95.1-1992.

This device has been testd in accordance with the measurement methods and procedure specified in IEEE 1528-2003 and FCC OET Bulletin 65 Supplement C (edition 01-01).

Refer to the maximum results of Specific Absorption Rate (SAR) durning testing as below.

FREQUENCY BAND	EXPOSURE POSITION	EQUIPMENT CLASS	HIGHEST REPORTED SAR VALUE (W/KG)
802.11 b/g/n - 2.4GHz Band	Body	DTS	1.100
802.11 a/n - 5.8GHz Band	Body		1.037
802.11 a/n - 5.2GHz Band	Body	NII	1.010

Contents

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: System Performance Check
Appendix B: Test Plots of SAR Measurement
Appendix C: Calibration Certificate

2. Test Sites

2.1 Test Facilities

Audix Technology (Shenzhen) Co., Ltd.

No. 6, Ke Feng Road, Block 52, Shenzhen Science & Industry Park Nantou, Shenzhen, Guangdong, P.R. China

The tests at the test site have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal Date	Cal. Interval
DASY5 SAR Test System	Speag	TX60 L speag	F09/5B1H1/01	July.12,13	1Year
Wireless Communication Test Set	Agilent	E5515C	GB44300243	May.09, 14	1Year
Power Meter	Anritsu	ML2487A	6K00002472	Apr. 28,14	1 Year
Power Sensor	Anritsu	MA2491A	032516	Apr. 28,14	1 Year
Signal Generator	HP	83732B	VS34490501	Apr. 28,14	1 Year
Amplifier	Milmega	ZHL-42W	C620601316	NCR	N/A
Dipole Validation Kits	Speag	D900V2	043	Mar.13,14	3Year
Dipole Validation Kits	Speag	D1900V2	5d018	Jun.10,13	3Year
Dipole Validation Kits	Speag	D2000V2	1023	Jun.11,13	3Year
Dipole Validation Kits	Speag	D2450V2	835	Mar.14,14	3Year
Dipole Validation Kits	Speag	D5GHzV2	1040	July.02,13	3Year
Attenuator	Agilent	8491A 3dB	MY39262001	Apr. 28,14	1Year
Attenuator	Agilent	8491A 10dB	MY39264375	Apr. 28,14	1Year
Data Acquisition Electronics	Speag	DAE4	899	July.25,12	2Year
E-Field Probe	Speag	ES3DV3	3139	July.25,12	2Year
E-Field Probe	Speag	EX3DV4	3767	July.27,12	2Year
Network Analyzer	Agilent	E5071B	MY42403549	Apr. 28,14	1Year

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a 10'' tablet with Wi-Fi, Bluetooth & GPS function.
For details refer to the User Manual and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification

Device type:	Portable device						
EUT Name:	Tablet						
Type Identification:	NS-15AT10						
Serial Number	A000073356-004						
FCC ID:	XUZNS-15AT10						
IC number:	10558A-NS15AT10						
Operating mode(s) / WiFi:	IEEE 802.11b	IEEE 802.11g	IEEE 802.11n (HT20)	IEEE 802.11n (HT40)	IEEE 802.11a	IEEE 802.11n (HT20)	IEEE 802.11n (HT40)
Test modulation	DSSS (DBPSK, DQPSK), CCK)	OFDM (DBPSK, DQPSK)	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
Transmit Frequency Range (MHz):	2412 - 2472	2412 - 2472	2412 - 2472	2422 - 2462	5180 - 5240, 5745 - 5825	5180 - 5240, 5745 - 5825	5190 - 5230, 5755 - 5795
Maximum tune-up average output power (dBm):	9	7	5	5	8	5	5
Operating mode(s) / Bluetooth:	Bluetooth 4.0						
Test modulation	GFSK, π/4DQPSK, 8DPSK for BDR & EDR mode, GFSK for LE mode						
Transmit Frequency Range (MHz):	2402-2480						
Maximum tune-up average output power (dBm):	0						
Hardware version:	V1.0A						
Software version:	V1.0.0						
Antenna type:	Integrated antenna						
Battery options:	DC 3.7V						

Table 3: List of WLAN Channel of 802.11b/g/n mode

802.11b		802.11g		802.11n (HT20)		802.11n (HT40)	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
1	2412	1	2412	1	2412	3	2422
2	2417	2	2417	2	2417	4	2427
3	2422	3	2422	3	2422	5	2432
4	2427	4	2427	4	2427	6	2437
5	2432	5	2432	5	2432	7	2442
6	2437	6	2437	6	2437	8	2447
7	2442	7	2442	7	2442	9	2452
8	2447	8	2447	8	2447	10	2457
9	2452	9	2452	9	2452	11	2462
10	2457	10	2457	10	2457		
11	2462	11	2462	11	2462		

Table 4: List of WLAN Channel of 802.11a/n mode

802.11a		802.11n (HT20)		802.11n (HT40)	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
36	5180	36	5180	38	5190
40	5200	40	5200	46	5230
44	5220	44	5220	151	5755
48	5240	48	5240	159	5795
149	5745	149	5745		
153	5765	153	5765		
157	5785	157	5785		
161	5805	161	5805		
165	5825	165	5825		

Table 5: List of Bluetooth Channel

Bluetooth (BDR & EDR)		Bluetooth (LE)	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
0	2402	0	2402
39	2441	19	2440
78	2480	39	2480

3.3 Independent Operation Modes

The basic operation modes are:

A. WiFi transmitting
   1. 802.11b
      a) CH1
      b) CH6
      c) CH11
   2. 802.11g
      a) CH1
      b) CH6
      c) CH11
   3. 802.11n (HT20)
      a) CH1
      b) CH6
      c) CH11
   4. 802.11n (HT40)
      a) CH3
      b) CH7
      c) CH11
   5. 802.11a
      a) CH36
      b) CH48
      c) CH149
      d) CH157
      e) CH165
   6. 802.11n (HT20)
      a) CH36
      b) CH48
      c) CH149
      d) CH157
      e) CH165
   7. 802.11n (HT40)
      a) CH38
      b) CH46
      c) CH151
      d) CH159

B. Off

3.4 Submitted Documents

- Bill of Material
- Constructional Drawing
- PCB Layout
- Photo Document
- Circuit Diagram
- Instruction Manual
- Rating Label

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The EUT is commanded to operate at maximum transmitting power. The EUT shall use its internal transmitter. The antenna, battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.

Table 6: Configuration of EUT

Operation mode	Frequency Range (MHz)	Modulation	Default Test Channel			Power Control Level
			Low	Middle	High	
802.11b/g/n(HT20)	2412-2462	DSSS, OFDM	CH1	CH6	CH11	Test software was used to configure the EUT to transmit at maximum output power
802.11n(HT40)	2422-2462	OFDM	CH1	CH6	CH11	
802.11a/n(HT20)	5180-5240	OFDM	CH36	---	CH48	
	5745-5825	OFDM	CH149	CH157	CH165	
802.11a/n(HT40)	5190-5230	OFDM	CH38	---	CH46	
	5755-5795	OFDM	CH151	---	CH159	
Bluetooth (BDR & EDR)	2402-2480	FHSS	CH0	CH39	CH78	
Bluetooth (LE)	2402-2480	GFSK	CH0	CH19	CH39	

5. Tissue Simulating Liquid Ingredients

The liquid is consisted of Water, Salt, Glycol, Sugar, Preventol and Cellulose. The liquid has previously been proven to be suited for worst-case. The following table shows the detail solution.

Table 7: Composition of Tissue Simulating Liquid

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 $M\Omega^{+}$ 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

5.1 Specific Absorption Rate (SAR) System Check

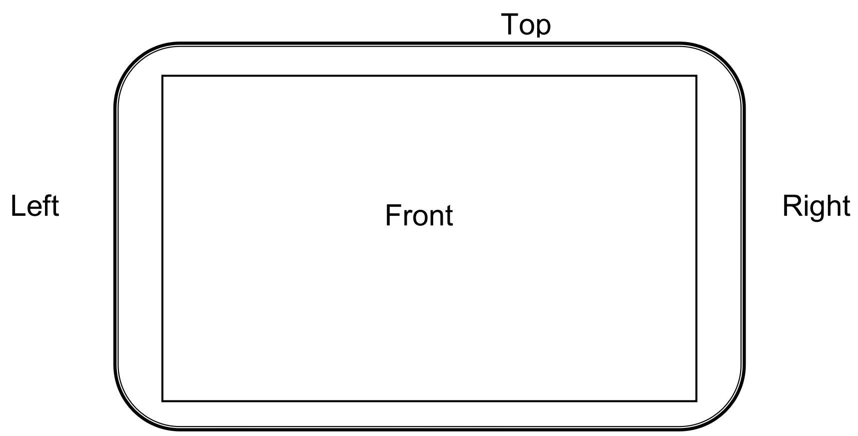
Dielectric parameters of the tissue simulating liquid were verified prior to the SAR evaluation using the dielectric proble kit and the network analyzer.

A system check measurement was made following the determination of the dielectric parameters of the tissue simulating liquid, using the dipole validation kit. A power level of 250 mW for 2.4GHz band or 100mW for 5GHz band as 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 following table.

Table 8: System Check Results of for Body of Tissue Simulating Liquid

Frequency (MHz)	Description	SAR(W/kg)		Dielectric Parameters		Temp
		1g	10g	ε_r	σ(s/m)	℃
2450	Recommended value ±10% window	12.8 11.52 - 14.08	5.86 5.27 - 6.45	52.7	1.95	---
	Measurement value (2014-06-06)	12.836	5.574	55.954	1.958	20.05
5200	Recommended value ±10% window	19.125 17.21 - 21.04	5.4 4.86 - 5.94	49	5.3	---
	Measurement value 2014-06-08	19.135	5.120	48.78	5.29	20.21
5800	Recommended value ±10% window	19.041 17.55 - 21.45	5.239 4.93 - 6.02	48.2	6	---
	Measurement value 2014-06-08	19.384	5.367	47.788	6.127	20.27

5.2 Exposure Positions Consideration



5.3 Phantom Description

The used SAM Phantom meets the requirements specified in Edition 01-01 of Supplement C to OET Bulletin 65 for Specific Absorption Rate (SAR) measurements.

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.

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.

5.4 Scanning Procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. 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 “area scan” measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strenth is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement. Standard grid spacing for head measurements is 15 mm in x- and y-dimension. If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation.

A “7x7x7 zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous “coarse” scan. This is a fine 7x7 grid where the robot additionally moves the probe in 7 steps along the z-axis away from the bottom of the Phantom. Grid spacing for the cube measurement is 5 mm in x and y-direction and 5 mm in z-direction. DASY5 is also able to perform repeated zoom scans if more than 1 peak is found during area scan.

5.5 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine. The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- Extraction of the measured data (grid and values) from the Zoom Scan
- Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- Generation of a high-resolution mesh within the measured volume
- Interpolation of all measured values form the measurement grid to the high-resolution grid
- Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to Surface
- Calculation of the averaged SAR within masses of 1g and 10g

Extrapolation

The extrapolation is based on a least square algorithm. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition (x, y and z -direction).

5.6 Test Operation and Test Software

Test operation refers to test setup in chapter 5.

A communication link is set up with the test mode software for WiFi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode.

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

802.11 a/n is tested for UNII operations on channel 36 and 48 in 5.15-5.25GHz band. Also 5.8GHz band is alos available for §15.247, hence channels 149, 157 and 165 should be tested instead of the UNII channels.

SAR is not required for 802.11g/n when the maximum average output power is less than ¼ dB higher than that measured on the corresponding 802.11b channels.

Each channel should be tested at the lowest data rate, and repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg.

For each frequency band testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than ¼ dB higher than those measured at the lowest data rate.

5.7 Special Accessories and Auxiliary Equipment

None.

6. Test Results

6.1 Huaman Exposure to Radiofrequency Electromagnetic Fields

RESULT: **Passed**

Date of testing	:	2014-06-06 to 2014-06-08
Test standard	:	CFR Title 47 Part 2 Subpart J Section 2.1093 ANSI/IEEE C95.1-1992 IEEE 1528-2003 FCC OET Bulletin 65 Suppplement C (Edition 01-01)
FCC KDB Publication	:	KDB 447498 D01 v05r01 KDB 248227 D01 v01r02 KDB 616217 D04 v01r01 KDB 865664 D01 v01r01
Limits	:	1.6W/kg

Test setup

Operation mode	:	A.1, A.5
Ambient temperature	:	24℃
Relative humidity	:	51%
Atmospheric pressure	:	101.0kPa

Table 9: Conducted Power of 802.11b/g/n (HT20)

802.11b/g/n (HT20)	Conducted Power (dBm)					
	CH1 / 2412		CH6 / 2437		CH11 / 2462	
	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power
802.11b (1Mbps)	9	6.67	9	6.56	9	6.62
802.11b (5.5Mbps)	9	9.43	9	9.18	9	9.33
802.11b (11Mbps)	9	10.12	9	10.08	9	10.21
802.11g (6Mbps)	7	4.95	7	5.02	7	5.31
802.11g (24Mbps)	7	5.83	7	6.01	7	6.03
802.11g (54Mbps)	7	6.06	7	6.19	7	6.26
802.11n (HT20) (MSC0)	5	3.10	5	3.24	5	3.26
802.11n (HT20) (MSC4)	5	3.52	5	3.97	5	4.16
802.11n (HT20) (MSC7)	5	4.04	5	4.25	5	4.40
802.11n (HT20) (MSC8)	5	5.80	5	6.21	5	6.27
802.11n (HT20) (MSC12)	5	6.77	5	7.07	5	6.98
802.11n (HT20) (MSC15)	5	6.88	5	7.31	5	7.26

Table 10: Conducted Power of 802.11n (HT40)

802.11b/g/n (HT40)	Conducted Power (dBm)					
	CH3 / 2422		CH7 / 2442		CH11 / 2462	
	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power
802.11n (HT40) (MSC0)	5	3.07	5	3.47	5	3.45
802.11n (HT40) (MSC4)	5	3.45	5	4.17	5	3.95
802.11n (HT40) (MSC7)	5	4.11	5	4.50	5	4.40
802.11n (HT40) (MSC8)	5	6.47	5	6.35	5	6.31
802.11n (HT40) (MSC12)	5	7.20	5	7.14	5	6.96
802.11n (HT40) (MSC15)	5	7.33	5	7.25	5	7.34

Table 11: Conducted Power of 802.11a

802.11b/g/n (HT40)	Conducted Power (dBm)							
	CH36 / 5180		CH48 / 5240		CH149 / 5745		CH165 / 5825	
	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power
802.11a (6Mbps)	8	7.82	8	7.64	8	11.59	8	10.80
802.11a (12Mbps)	8	8.67	8	8.35	8	12.25	8	11.46
802.11a (24Mbps)	8	8.86	8	8.65	8	12.44	8	11.70
802.11a (54Mbps)	8	8.96	8	8.74	8	12.64	8	11.89

Table 12: Conducted Power of 802.11n (HT20)

802.11b/g/n (HT20)	Conducted Power (dBm)							
	CH36 / 5180		CH48 / 5240		CH149 / 5745		CH165 / 5825	
	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power
802.11n (HT20) (MSC0)	5	1.53	5	2.03	5	6.77	5	6.24
802.11n (HT20) (MSC4)	5	2.76	5	3.07	5	7.84	5	7.23
802.11n (HT20) (MSC7)	5	2.98	5	3.36	5	7.98	5	7.43
802.11n (HT20) (MSC8)	5	4.86	5	5.07	5	10.71	5	9.59
802.11n (HT20) (MSC12)	5	6.26	5	6.09	5	11.25	5	10.28
802.11n (HT20) (MSC15)	5	6.34	5	6.14	5	11.44	5	10.47

Table 13: Conducted Power of 802.11n (HT40)

802.11b/g/n (HT40)	Conducted Power (dBm)							
	CH38 / 5190		CH46 / 5230		CH151 / 5755		CH159 / 5795	
	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power	Rated Average Power	Measured Average Power
802.11n (HT40) (MSC0)	5	1.16	5	1.27	5	6.64	5	6.06
802.11n (HT40) (MSC4)	5	0.87	5	0.85	5	6.28	5	5.86
802.11n (HT40) (MSC7)	5	2.01	5	2.00	5	7.46	5	7.11
802.11n (HT40) (MSC8)	5	3.89	5	3.32	5	10.17	5	9.33
802.11n (HT40) (MSC12)	5	4.55	5	4.43	5	10.35	5	10.04
802.11n (HT40) (MSC15)	5	4.67	5	4.57	5	10.54	5	10.22

Table 14: Conducted Power of Bluetooth (BDR & EDR)

Bluetooth	Conducted Power (dBm)		
	CH0 / 2402	CH39 / 2441	CH78 / 2480
Basic Date Rate	-3.15	-2.53	-1.87
Enhanced Data Rate	-6.41	-6.04	-5.76

Table 15: Conducted Power of Bluetooth (LE)

Bluetooth	Conducted Power (dBm)		
	CH0 / 2402	CH13 / 2440	CH39 / 2480
LE	-6.11	-5.39	-5.03

Note:
According to KDB 447498 D01 v05r01, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min.test separation distance, mm)]×[$\sqrt{f_{(GHz)}}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

The maximum output power of Bluetooth is -1.87dBm (0.65mW), and the minimum separation distance is 5mm, hence the exclusion thresholds is 0.2 < 3.0, therefore RF exposure evaluation is not required.

Table 16: Test result of SAR Values

Operation Mode	Test Position	Separation Distance (cm)	Channel	Measure Level (1g) W/kg	Scaled SAR Value (W/kg)	Test Plots
802.11b	Top	0	CH1	0.016	N/A (Note 1)	1
	Top	0	CH6	0.023		2
	Top	0	CH11	0.027		3
	Rear	0	CH1	1.050		4
	Rear	0	CH6	1.100		5
	Rear	0	CH11	1.080		6
	Left	0	CH1	0.842		7
	Left	0	CH6	0.959		8
	Left	0	CH11	0.909		9
802.11a	Top	0	CH36	0.081		10
	Top	0	CH48	0.076		11
	Top	0	CH149	0.090		12
	Top	0	CH157	0.086		13
	Top	0	CH165	0.095		14
	Rear	0	CH36	1.010		15
	Rear	0	CH48	1.005		16
	Rear	0	CH149	1.015		17
	Rear	0	CH157	1.001		18
	Rear	0	CH165	1.037		19
	Left	0	CH36	0.988		20
	Left	0	CH48	0.962		21
	Left	0	CH149	0.950		22
	Left	0	CH157	0.929		23
	Left	0	CH165	0.968		24

Note 1: Due to maximum measured power were greater than the rated power, hence the scaled SAR value is not required.

Refer to attached Appendix B for details of test results.

6.2 Measurement Uncertainty

6.2.1 Measurement uncertainty evaluation

This measurement uncertainty budget is suggested by IEEE P1528. The breakdown of the individual uncertainties is as follows:

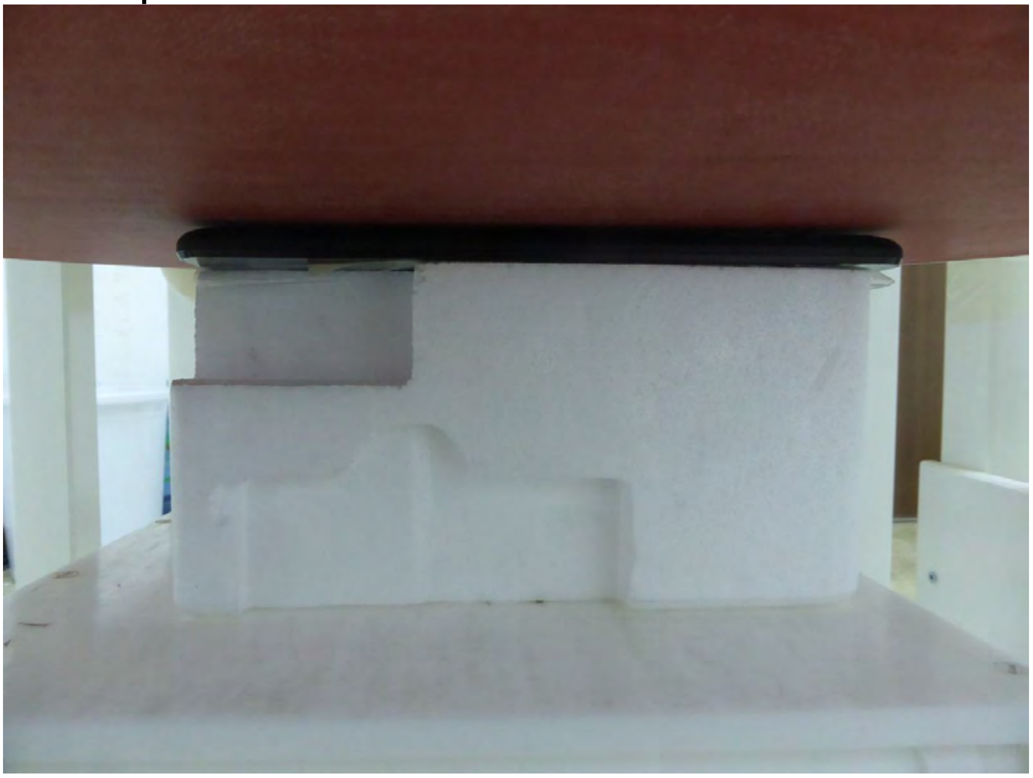
Table 17: Measurement Uncertainties

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	

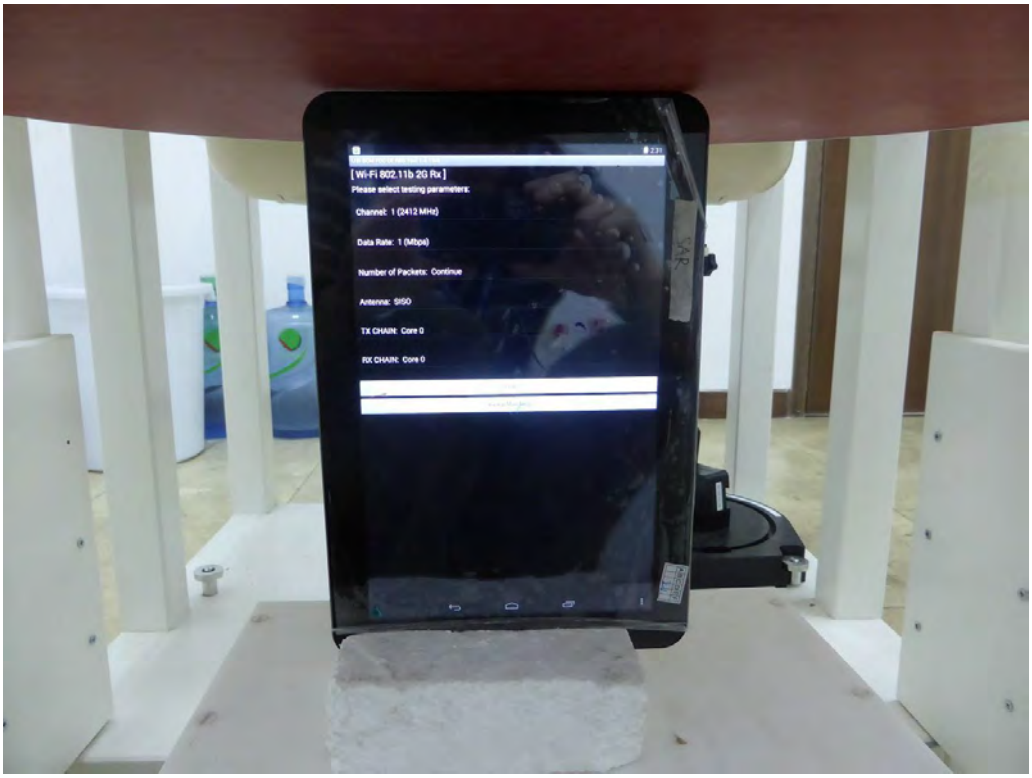
7. Photographs of the Test Set-Up

Photograph 1: Set-up for Rear side



Photograph 2: Set-up for Top side

Photograph 3: Set-up for Left side



8. List of Tables

9. List of Photographs

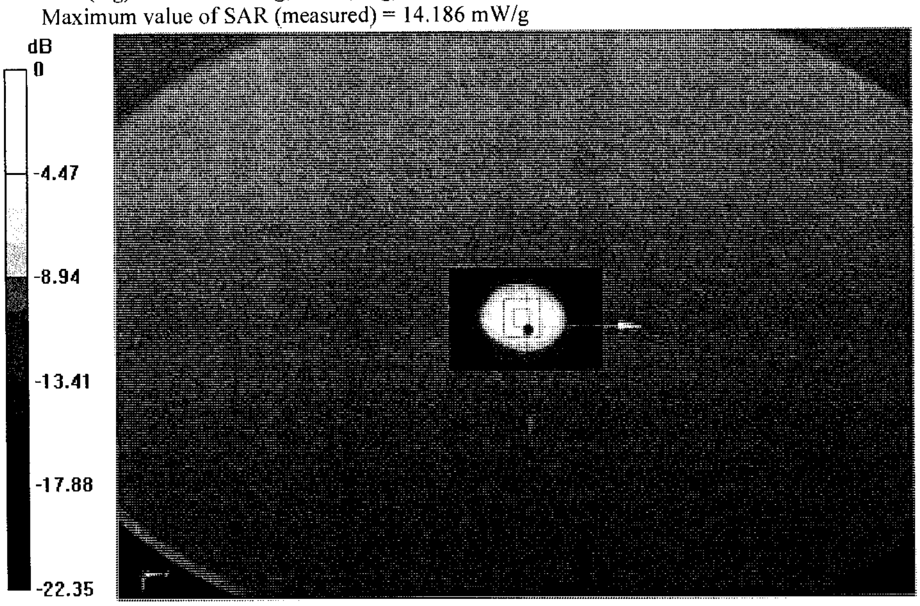
Test Laboratory: Audix SAR Lab Date: 06/06/2014

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 = 1.958 mho/m; ε_r = 55.954; 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 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/CW_2450/Area Scan (41x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 16.014 mW/g
Configuration/CW_2450/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.011 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 25.689
SAR(1 g) = 12.836 mW/g; SAR(10 g) = 5.574 mW/g
Maximum value of SAR (measured) = 14.186 mW/g



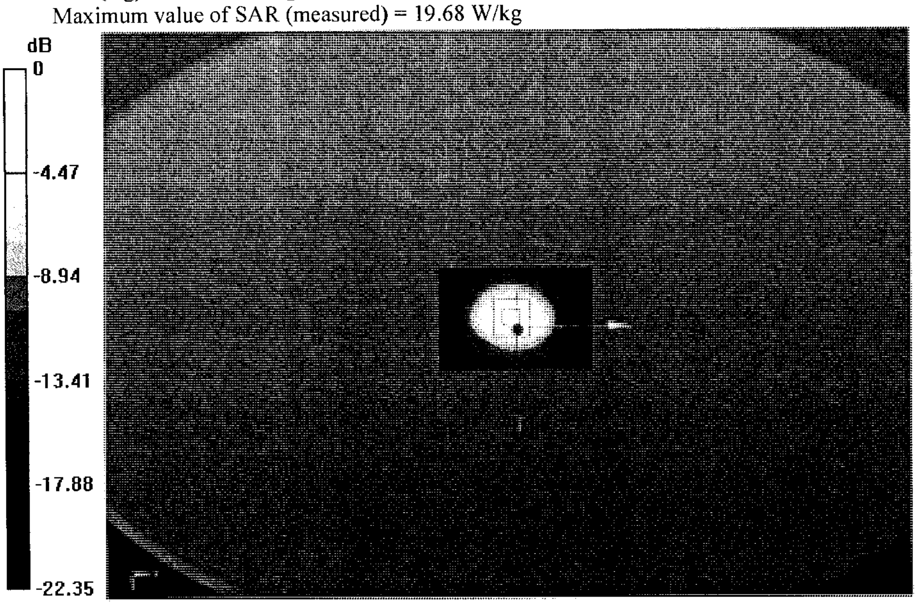
Test Laboratory: Audix SAR Lab Date: 08/06/2014

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 = 5.29 mho/m; ε_r = 48.78; 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 (61x81x1):
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



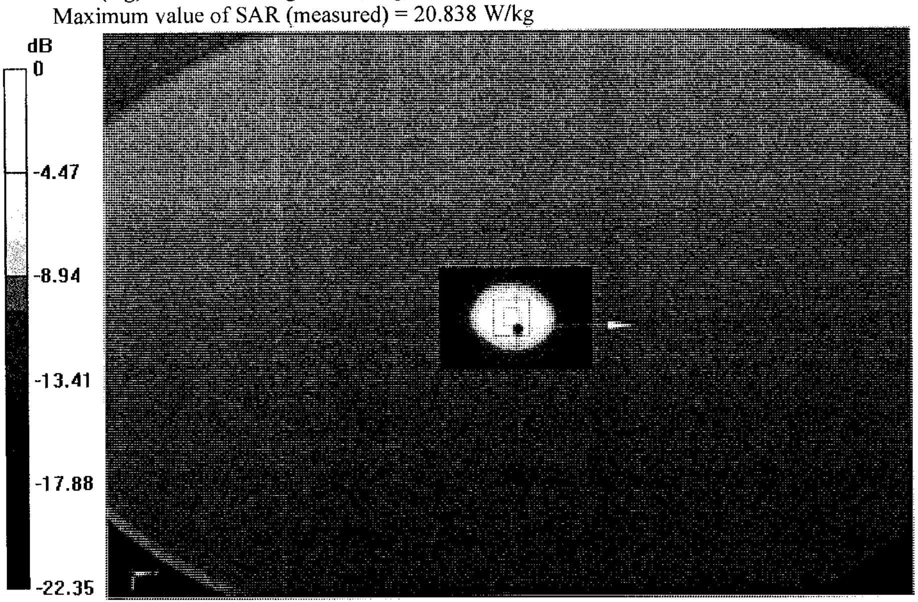
Test Laboratory: Audix SAR Lab Date: 08/06/2014

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 = 6.127 mho/m; ε_r = 47.788; 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 (61x81x1):
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



Test Plots 1: Top side, CH1, 802.11b

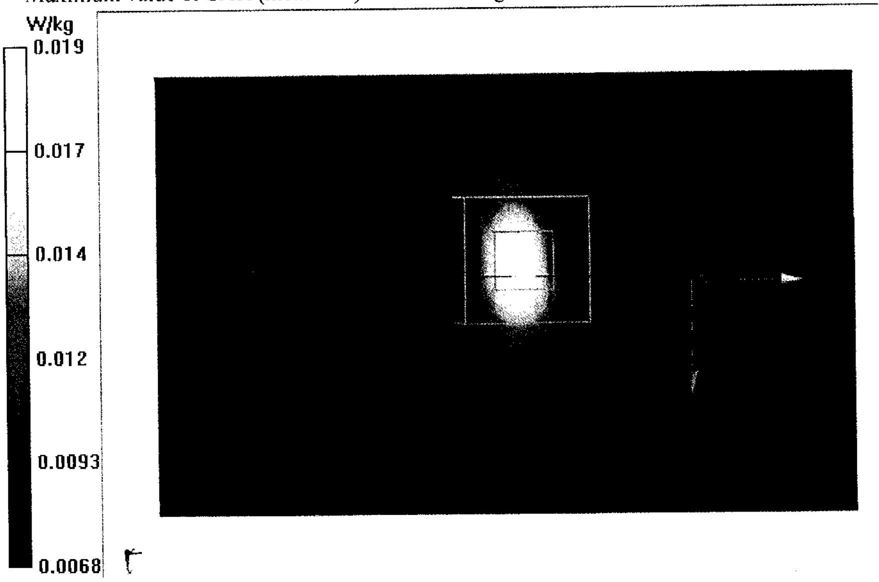
Test Laboratory: Audix SAR Lab Date: 06/06/2014

802.11b_CH1-Top(2412MHz)

DUT: Tablet PC
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 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CH1-Top/Area Scan (51x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0194 W/kg
Configuration/802.11b_CH1-Top/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.012 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.0250 W/kg
SAR(1 g) = 0.016 W/kg; SAR(10 g) = 0.013 W/kg
Maximum value of SAR (measured) = 0.0180 W/kg



Test Plots 2: Top side, CH6, 802.11b

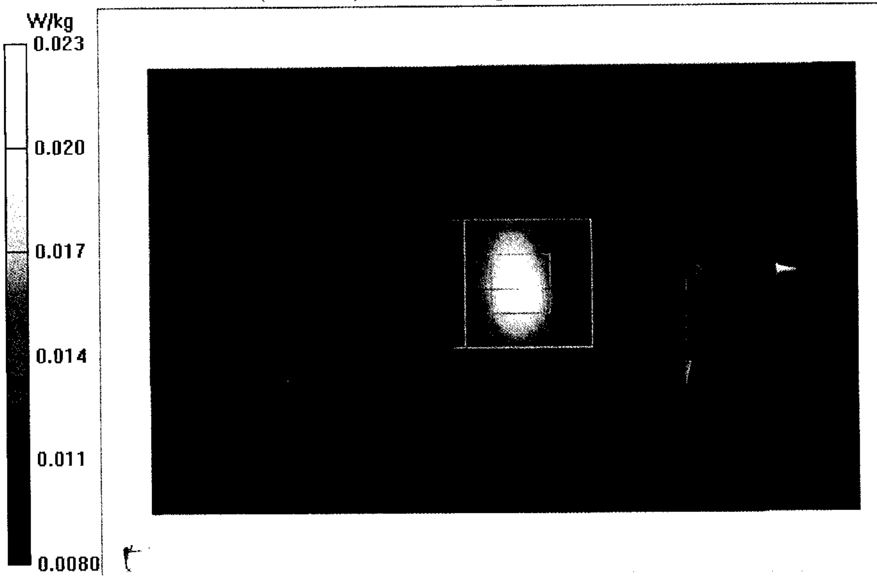
Test Laboratory: Audix SAR Lab Date: 06/06/2014

802.11b_CH6-Top(2437MHz)

DUT: Tablet PC
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 = 49.871; 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 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CH6-Top/Area Scan (51x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0227 W/kg
Configuration/802.11b_CH6-Top/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.307 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.0700 W/kg
SAR(1 g) = 0.023 W/kg; SAR(10 g) = 0.017 W/kg
Maximum value of SAR (measured) = 0.0248 W/kg



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Test Plots 3: Top side, CH11, 802.11b

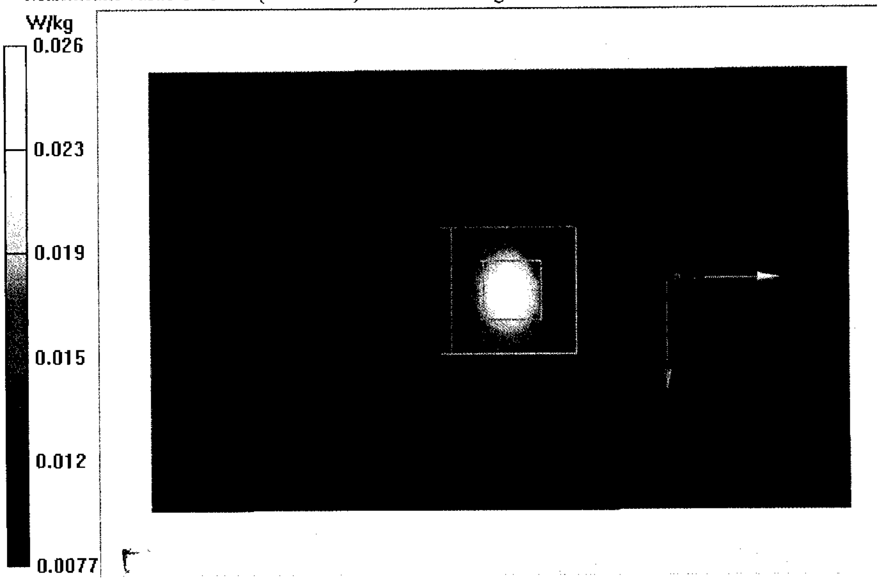
Test Laboratory: Audix SAR Lab Date: 06/06/2014

802.11b_CH11-Top(2462MHz)

DUT: Tablet PC
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 = 49.727;
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 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CH11-Top/Area Scan (51x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0265 W/kg
Configuration/802.11b_CH11-Top/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.595 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.0540 W/kg
SAR(1 g) = 0.027 W/kg; SAR(10 g) = 0.018 W/kg
Maximum value of SAR (measured) = 0.0296 W/kg



Test Plots 4: Rear side, CH1, 802.11b

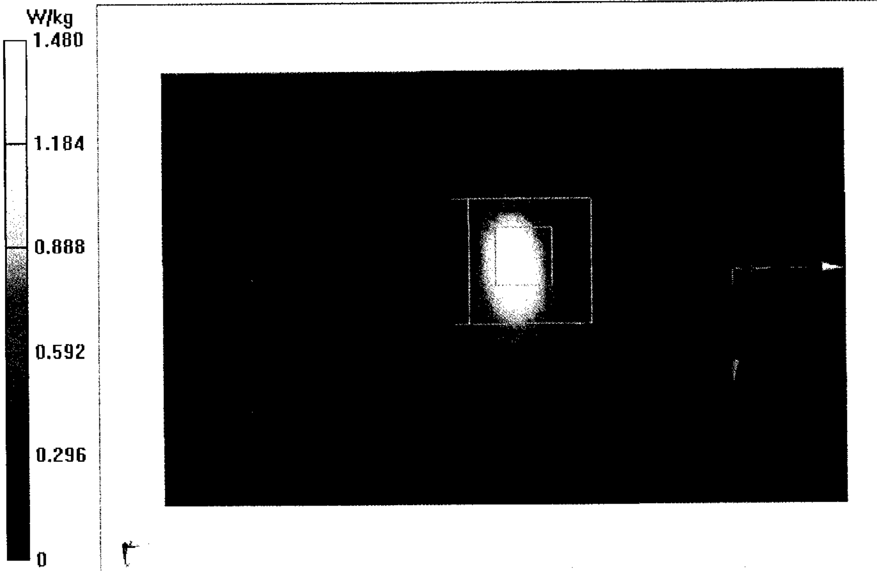
Test Laboratory: Audix SAR Lab Date: 06/06/2014

802.11b_CH1-Back(2412MHz)

DUT: Tablet PC
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 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CH1-Back/Area Scan (51x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.48 W/kg
Configuration/802.11b_CH1-Back/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.599 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 3.05 W/kg
SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.402 W/kg
Maximum value of SAR (measured) = 1.35 W/kg



Test Plots 5: Rear side, CH6, 802.11b

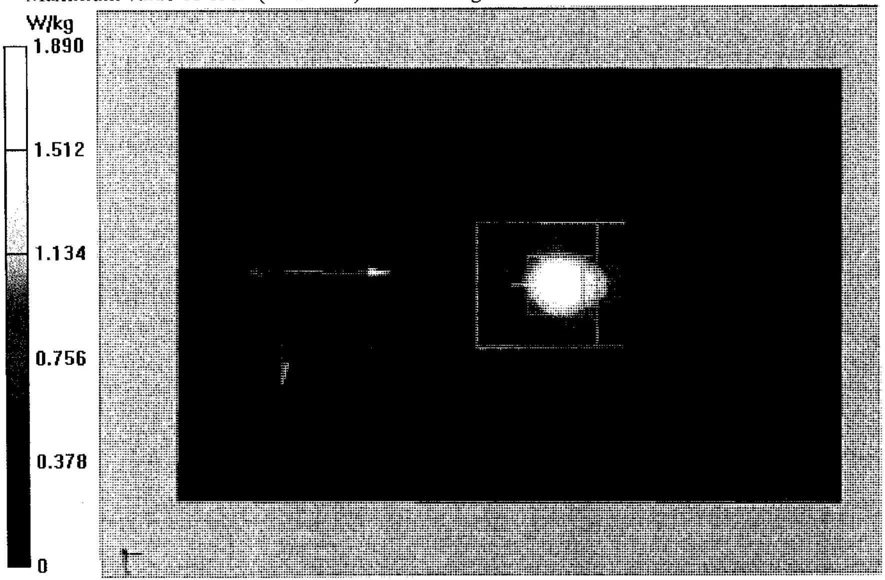
Test Laboratory: Audix SAR Lab Date: 06/06/2014

802.11b_CH6-Back(2437MHz)

DUT: Tablet PC
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 = 49.871; 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 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CH6-Back/Area Scan (51x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.89 W/kg
Configuration/802.11b_CH6-Back/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.105 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.58 W/kg
SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.432 W/kg
Maximum value of SAR (measured) = 1.31 W/kg



Test Plots 6: Rear side, CH11, 802.11b

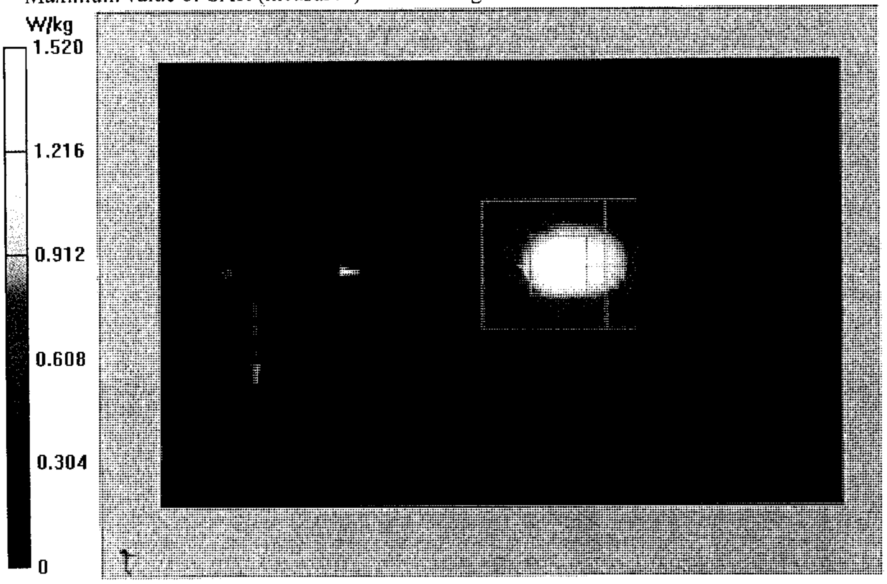
Test Laboratory: Audix SAR Lab Date: 06/06/2014

802.11b_CH11-Back(2462MHz)

DUT: Tablet PC
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 = 49.727;
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: EL1 4.0; Type: QDOVA001BA; Serial: 1112
- Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CH11-Back/Area Scan (51x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.52 W/kg
Configuration/802.11b_CH11-Back/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.853 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 2.82 W/kg
SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.457 W/kg
Maximum value of SAR (measured) = 1.40 W/kg



Test Plots 7: Left side, CH1, 802.11b

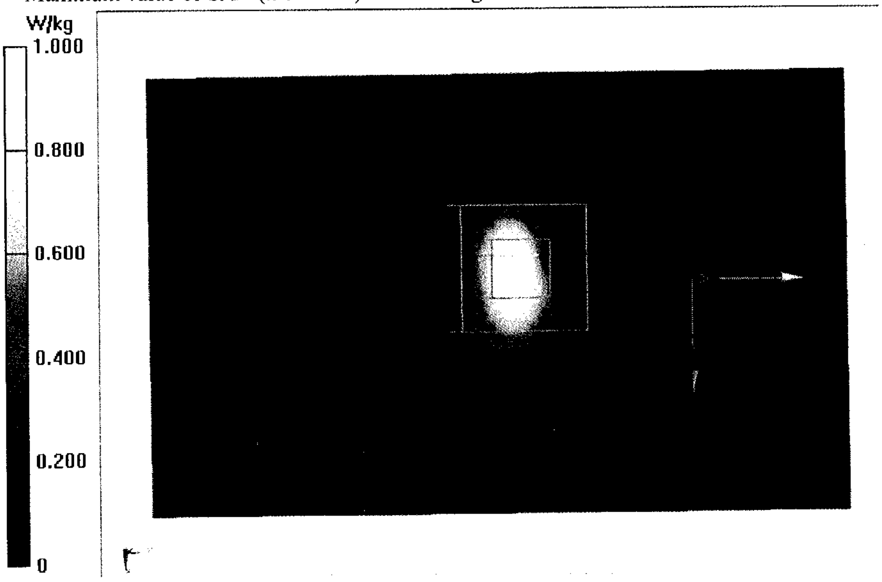
Test Laboratory: Audix SAR Lab Date: 06/06/2014

802.11b_CH1-Left(2412MHz)

DUT: Tablet PC
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 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CH1-Left/Area Scan (51x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.00 W/kg
Configuration/802.11b_CH1-Left/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.845 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 2.40 W/kg
SAR(1 g) = 0.842 W/kg; SAR(10 g) = 0.294 W/kg
Maximum value of SAR (measured) = 1.02 W/kg



Test Plots 8: Left side, CH6, 802.11b

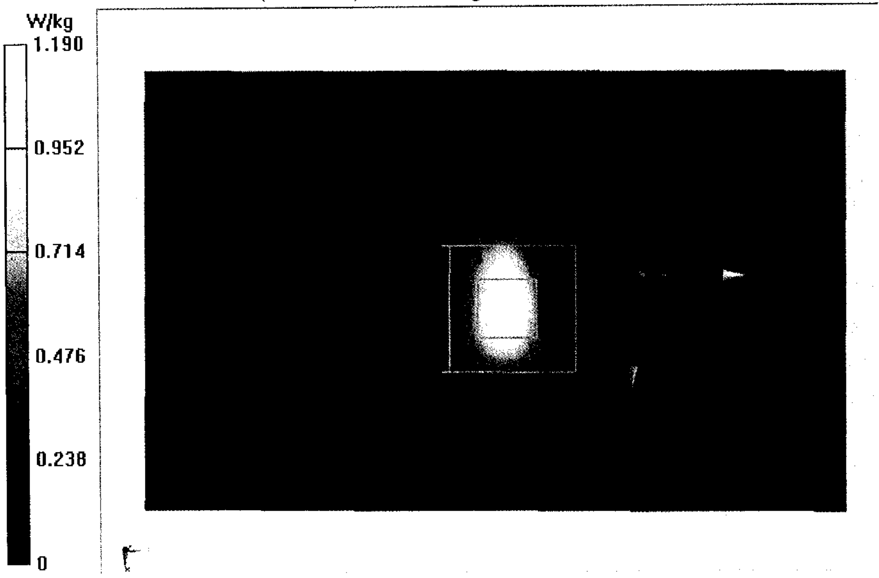
Test Laboratory: Audix SAR Lab Date: 06/06/2014

802.11b_CH6-Left(2437MHz)

DUT: Tablet PC
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 = 49.871; 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 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CH6-Left/Area Scan (51x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.19 W/kg
Configuration/802.11b_CH6-Left/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.711 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 2.73 W/kg
SAR(1 g) = 0.959 W/kg; SAR(10 g) = 0.337 W/kg
Maximum value of SAR (measured) = 1.17 W/kg



Test Plots 9: Left side, CH11, 802.11b

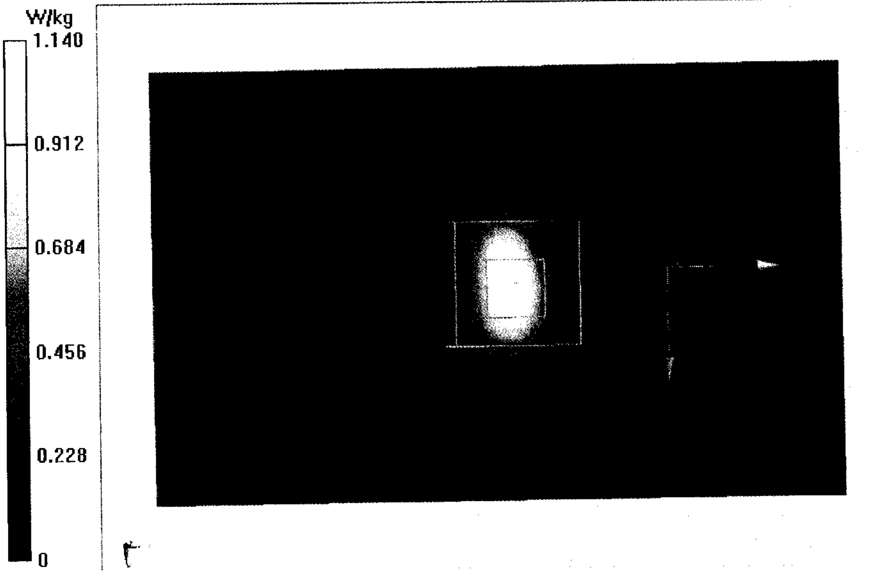
Test Laboratory: Audix SAR Lab Date: 06/06/2014

802.11b_CH11-Left(2462MHz)

DUT: Tablet PC
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 = 49.727;
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 (7); SEMCAD X Version 14.6.10 (7164)

Configuration/802.11b_CH11-Left/Area Scan (51x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.14 W/kg
Configuration/802.11b_CH11-Left/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.491 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 2.67 W/kg
SAR(1 g) = 0.909 W/kg; SAR(10 g) = 0.316 W/kg
Maximum value of SAR (measured) = 1.09 W/kg



Test Plots 10: Top side, CH36, 802.11a

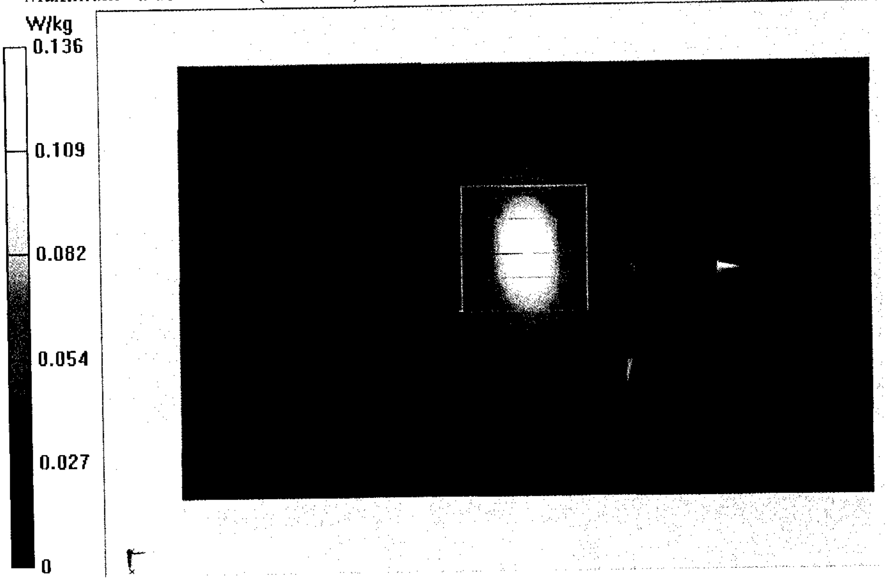
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH36-Top(5180MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.1GHz ; Frequency: 5180 MHz
Medium parameters used: f = 5180 MHz; σ = 5.483 S/m; ε_r = 48.859; 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 Sn915; Calibrated: 11/06/2013
- 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 (61x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.136 W/kg
Configuration/802.11a_CH36-Top/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.460 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.275 W/kg
SAR(1 g) = 0.081 W/kg; SAR(10 g) = 0.022 W/kg
Maximum value of SAR (measured) = 0.102 W/kg



Test Plots 11: Top side, CH48, 802.11a

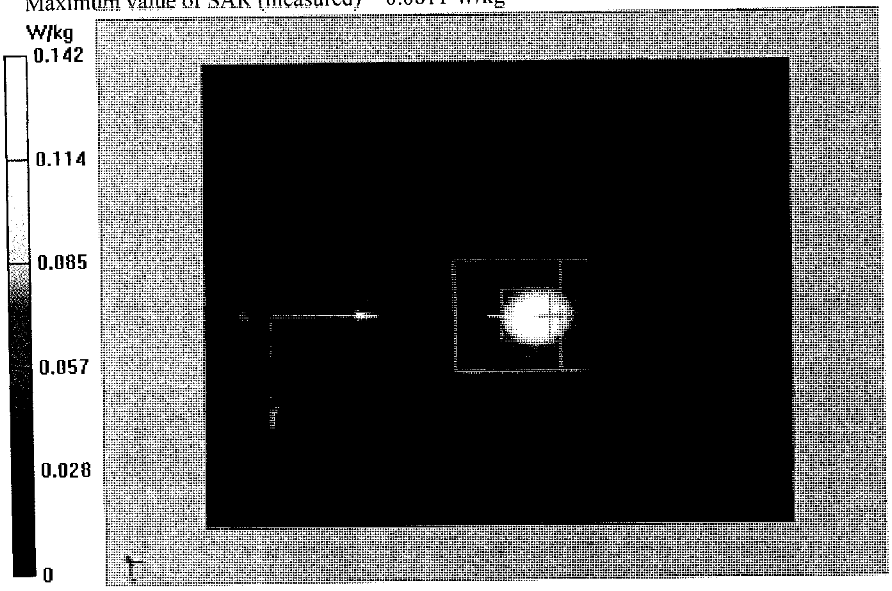
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH48-Top(5240MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.1GHz ; Frequency: 5240 MHz
Medium parameters used: f = 5240 MHz; σ = 5.148 S/m; ε_r = 48.564; 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 Sn915; Calibrated: 11/06/2013
- 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 (61x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.142 W/kg
Configuration/802.11a_CH48-Top/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.245 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.162 W/kg
SAR(1 g) = 0.076 W/kg; SAR(10 g) = 0.021 W/kg
Maximum value of SAR (measured) = 0.0811 W/kg



Test Plots 12: Top side, CH149, 802.11a

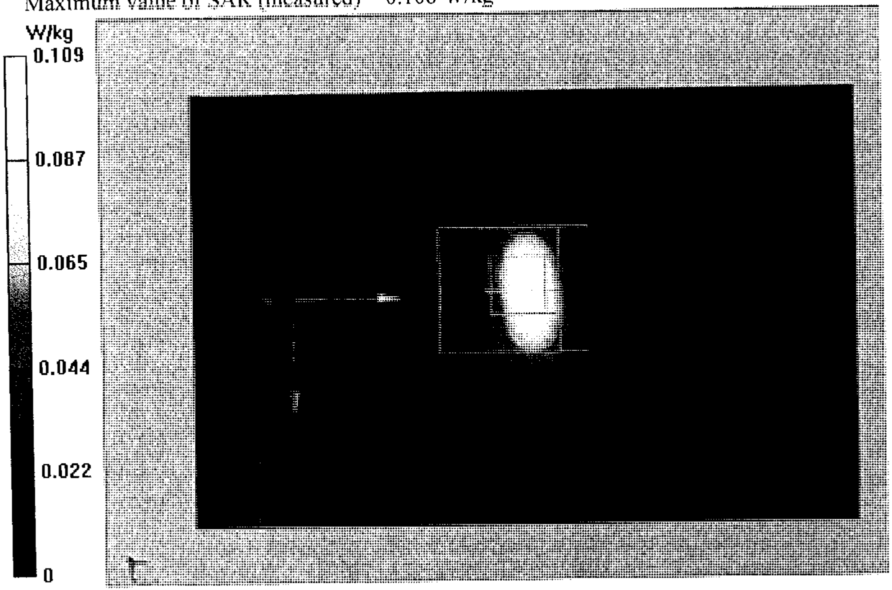
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH149-Top(5745MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5745 MHz
Medium parameters used: f = 5745 MHz; σ = 6.043S/m; ε_r = 48.411; 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 Sn915; Calibrated: 11/06/2013
- 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 (61x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.109 W/kg
Configuration/802.11a_CH149-Top/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.232 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.386 W/kg
SAR(1 g) = 0.090 W/kg; SAR(10 g) = 0.032 W/kg
Maximum value of SAR (measured) = 0.108 W/kg



Test Plots 13: Top side, CH157, 802.11a

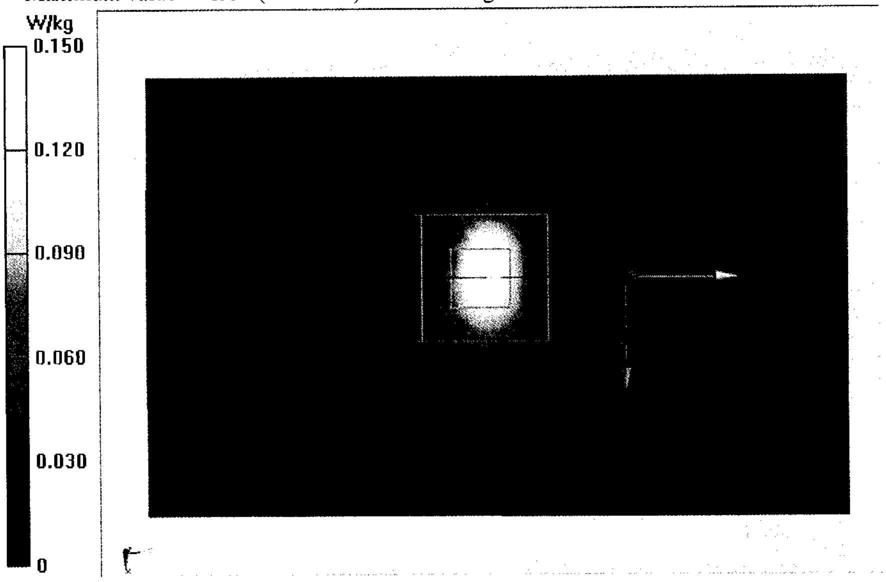
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH157-Top(5785MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5785 MHz
Medium parameters used: f = 5785 MHz; σ = 6.053S/m; ε_r = 48.024; 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 Sn915; Calibrated: 11/06/2013
- 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 (61x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.150 W/kg
Configuration/802.11a_CH157-Top/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.873 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.077 W/kg
SAR(1 g) = 0.086 W/kg; SAR(10 g) = 0.028 W/kg
Maximum value of SAR (measured) = 0.075 W/kg



Test Plots 14: Top side, CH165, 802.11a

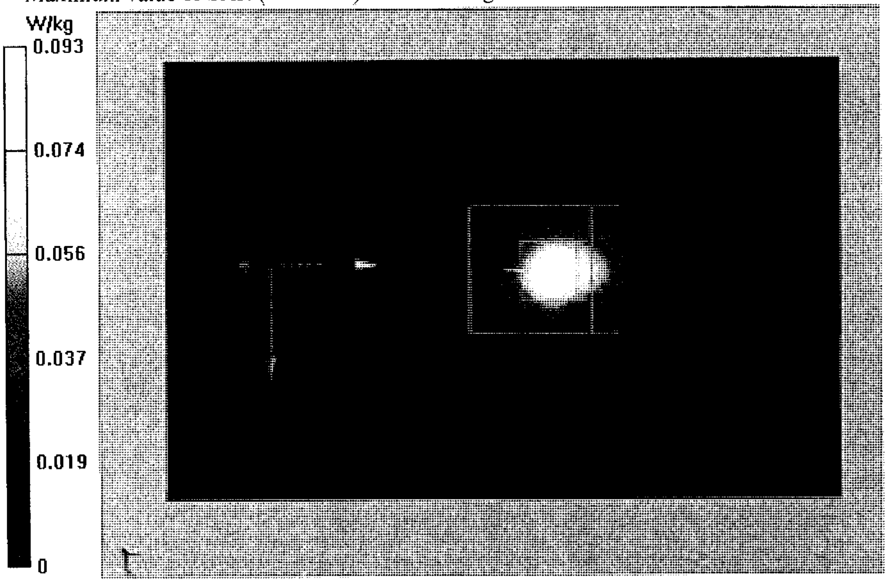
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH165-Top(5825MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5825 MHz
Medium parameters used: f = 5825 MHz; σ = 6.161 S/m; ε_r = 48.335; 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 Sn915; Calibrated: 11/06/2013
- 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-Top/Area Scan (61x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.093 W/kg
Configuration/802.11a_CH165-Top/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.264 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.687 W/kg
SAR(1 g) = 0.095 W/kg; SAR(10 g) = 0.033 W/kg
Maximum value of SAR (measured) = 0.099 W/kg



Test Plots 15: Rear side, CH36, 802.11a

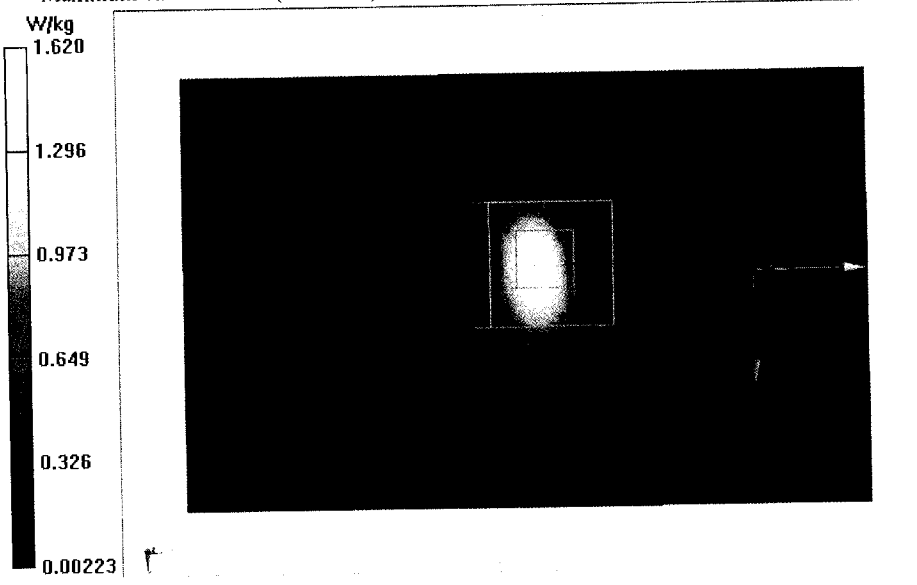
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH36-Back(5180MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.1GHz ; Frequency: 5180 MHz
Medium parameters used: f = 5180 MHz; σ = 5.483 S/m; ε_r = 48.859; 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 (61x81x1):
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 Plots 16: Rear side, CH48, 802.11a

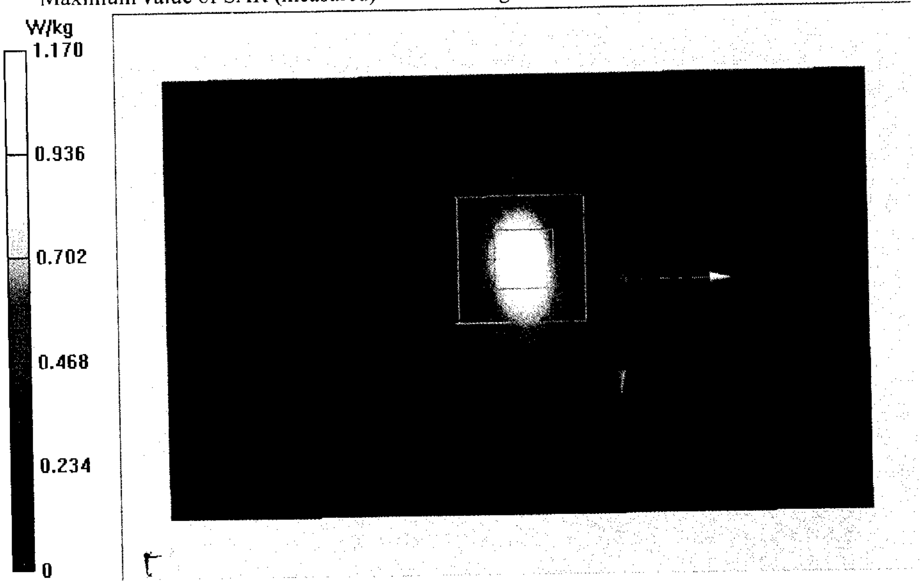
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH48-Back(5240MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.1GHz ; Frequency: 5240 MHz
Medium parameters used: f = 5240 MHz; σ = 5.148 S/m; ε_r = 48.564; 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 (61x81x1):
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 Plots 17: Rear side, CH149, 802.11a

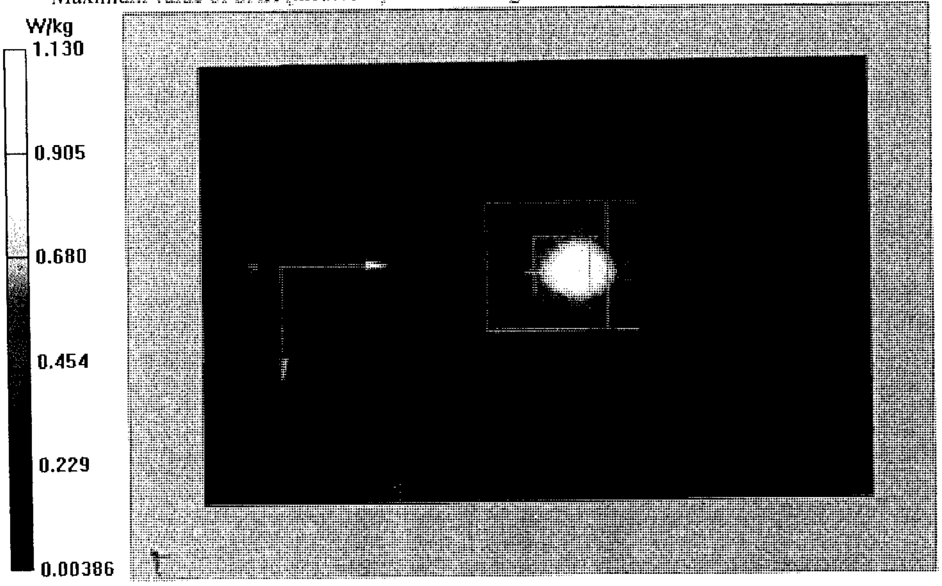
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH149-Back(5745MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5745 MHz
Medium parameters used: f = 5745 MHz; σ = 6.043S/m; ε_r = 48.411; 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-Back/Area Scan (61x81x1):
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 Plots 18: Rear side, CH157, 802.11a

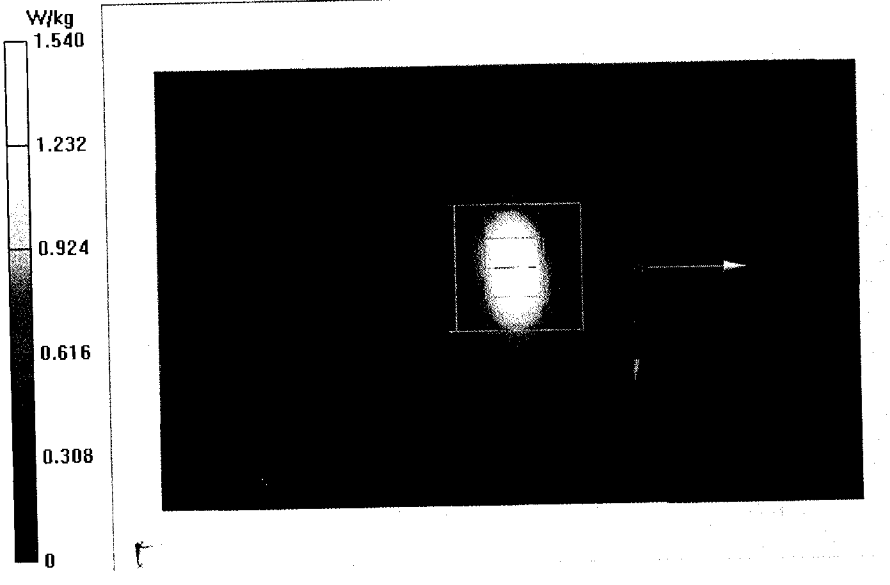
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH157-Back(5785MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5785 MHz
Medium parameters used: f = 5785 MHz; σ = 6.053S/m; ε_r = 48.024; 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 (61x81x1):
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 Plots 19: Rear side, CH165, 802.11a

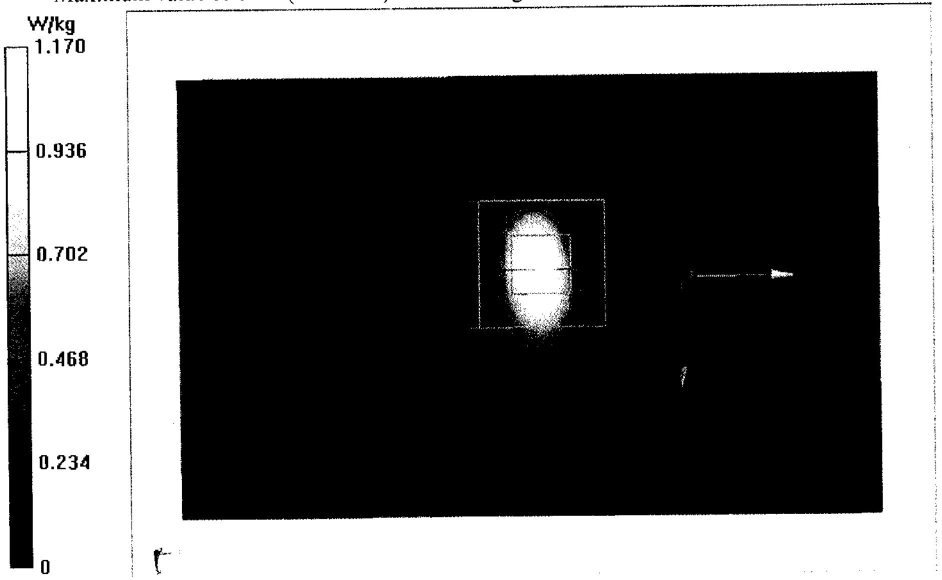
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH165-Back(5825MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5825 MHz
Medium parameters used: f = 5825 MHz; σ = 6.161 S/m; ε_r = 48.335; 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 (61x81x1):
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 Plots 20: Left side, CH36, 802.11a

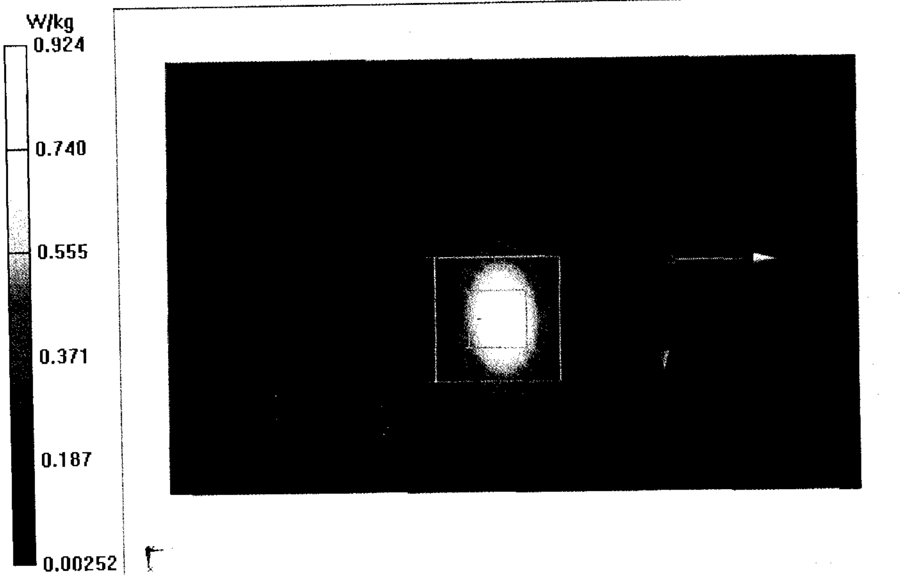
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH36-Left(5180MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.1GHz ; Frequency: 5180 MHz
Medium parameters used: f = 5180 MHz; σ = 5.483 S/m; ε_r = 48.859; 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-Left/Area Scan (61x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.924 W/kg
Configuration/802.11a_CH36-Left/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.416 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 2.211 W/kg
SAR(1 g) = 0.988 W/kg; SAR(10 g) = 0.526 W/kg
Maximum value of SAR (measured) = 0.991 W/kg



Test Plots 21: Left side, CH48, 802.11a

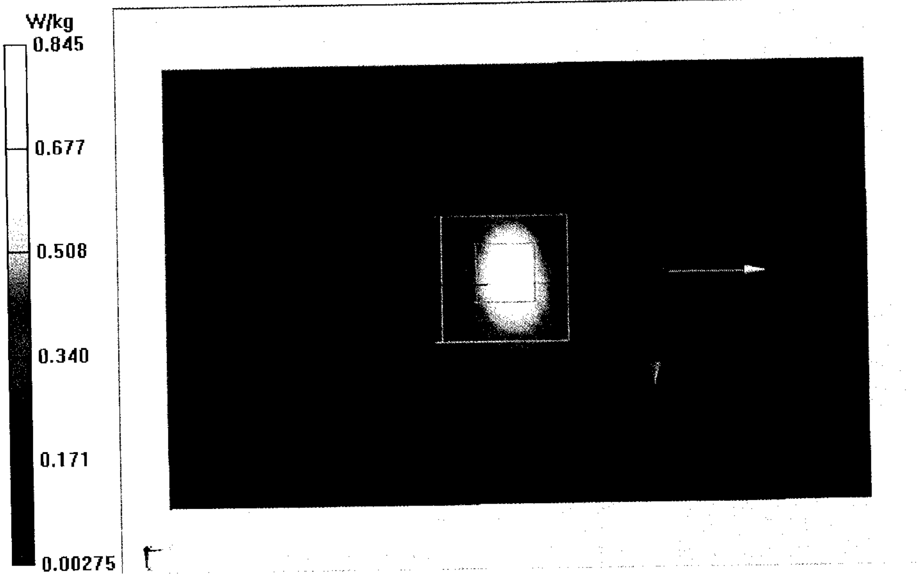
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH48-Left(5240MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.1GHz ; Frequency: 5240 MHz
Medium parameters used: f = 5240 MHz; σ = 5.148 S/m; ε_r = 48.564; 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-Left/Area Scan (61x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.845 W/kg
Configuration/802.11a_CH48-Left/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.192 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 2.580 W/kg
SAR(1 g) = 0.962 W/kg; SAR(10 g) = 0.504 W/kg
Maximum value of SAR (measured) = 0.989 W/kg



Test Plots 22: Left side, CH149, 802.11a

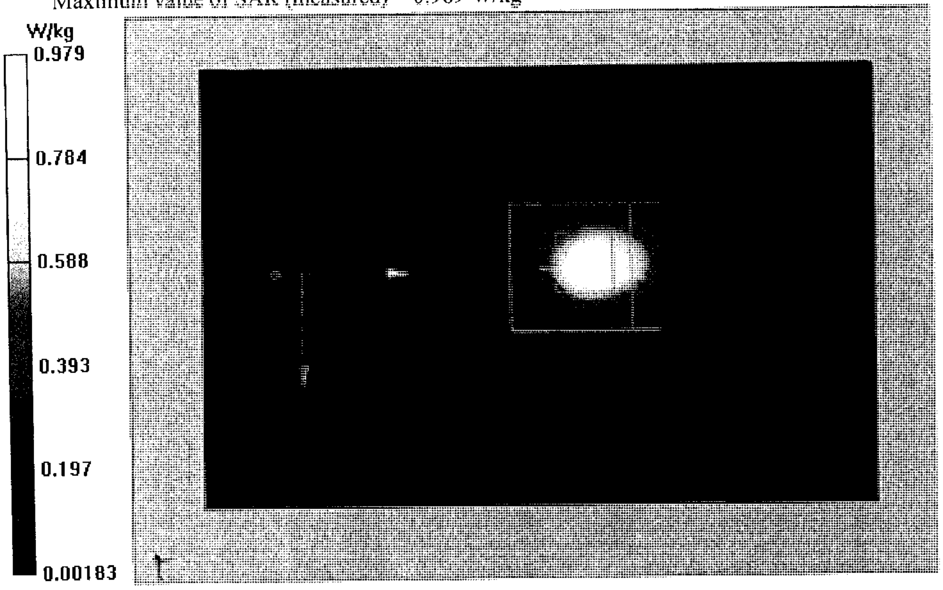
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH149-Left(5745MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5745 MHz
Medium parameters used: f = 5745 MHz; σ = 6.043S/m; ε_r = 48.411; 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-Left/Area Scan (61x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.979 W/kg
Configuration/802.11a_CH149-Left/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.942 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 3.06 W/kg
SAR(1 g) = 0.950 W/kg; SAR(10 g) = 0.513 W/kg
Maximum value of SAR (measured) = 0.989 W/kg



Test Plots 23: Left side, CH157, 802.11a

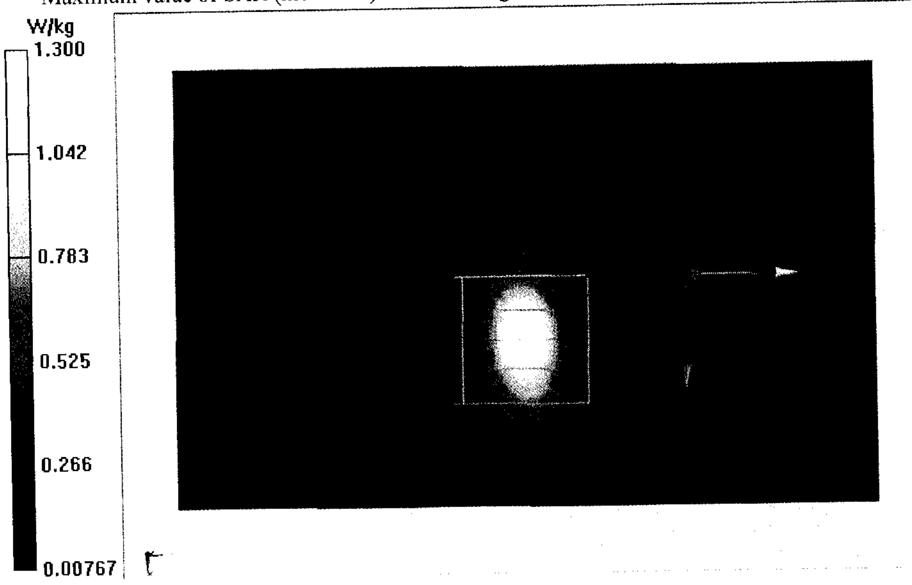
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH157-Left(5785MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5785 MHz
Medium parameters used: f = 5785 MHz; σ = 6.053S/m; ε_r = 48.024; 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-Left/Area Scan (61x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.300 W/kg
Configuration/802.11a_CH157-Left/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.230 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 2.028 W/kg
SAR(1 g) = 0.929 W/kg; SAR(10 g) = 0.481 W/kg
Maximum value of SAR (measured) = 0.950 W/kg



Test Plots 24: Left side, CH165, 802.11a

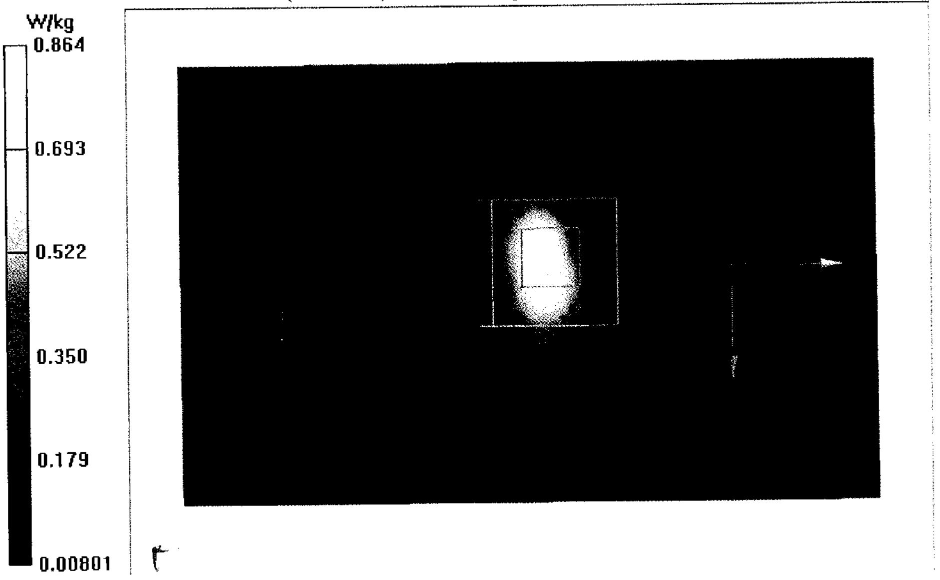
Test Laboratory: Audix SAR Lab Date: 08/06/2014

802.11a_CH165-Left(5825MHz)

DUT: Tablet PC
Communication System: IEEE 802.11a WiFi 5.8GHz ; Frequency: 5825 MHz
Medium parameters used: f = 5825 MHz; $\sigma = 6.161$ S/m; $\varepsilon_r = 48.335$; $\rho = 1000$ 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-Left/Area Scan (61x81x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.864 W/kg
Configuration/802.11a_CH165-Left/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.826 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 2.570 W/kg
SAR(1 g) = 0.968 W/kg; SAR(10 g) = 0.525 W/kg
Maximum value of SAR (measured) = 0.988 W/kg



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speag

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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.

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Accreditation No.: **SCS 108**

Client **Audix - CN (Auden)**

Certificate No: **DAE4-899_Jul12**

CALIBRATION CERTIFICATE

Object: DAE4 - SD 000 D04 BJ - SN: 899

Calibration procedure(s): QA CAL-06.v24
Calibration procedure for the data acquisition electronics (DAE)

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
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-11 (No:11450)	Sep-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V2.1	SE UWS 053 AA 1001	05-Jan-12 (in house check)	In house check: Jan-13

	Name	Function	Signature
Calibrated by:	Eric Hainfeld	Technician	
Approved by:	Fin Bomholt	R&D Director	i.V.

Issued: July 25, 2012

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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 = $6.1\mu V$, full range = -100...+300 mV
Low Range: 1LSB = 61nV , full range = -1.......+3mV
DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	402.461 ± 0.1% (k=2)	403.037 ± 0.1% (k=2)	403.027 ± 0.1% (k=2)
Low Range	3.97886 ± 0.7% (k=2)	3.97416 ± 0.7% (k=2)	3.98171 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	350 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	199994.26	-3.60	-0.00
Channel X	+ Input	20000.44	-0.45	-0.00
Channel X	- Input	-19998.64	1.65	-0.01
Channel Y	+ Input	199995.43	-2.58	-0.00
Channel Y	+ Input	20000.07	-0.93	-0.00
Channel Y	- Input	-20000.18	0.13	-0.00
Channel Z	+ Input	199994.36	-3.84	-0.00
Channel Z	+ Input	19999.80	-1.14	-0.01
Channel Z	- Input	-20002.23	-1.82	0.01

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2001.03	0.29	0.01
Channel X	+ Input	201.51	0.39	0.19
Channel X	- Input	-198.31	0.39	-0.20
Channel Y	+ Input	2001.31	0.49	0.02
Channel Y	+ Input	200.62	-0.65	-0.32
Channel Y	- Input	-198.08	0.47	-0.23
Channel Z	+ Input	2000.80	0.02	0.00
Channel Z	+ Input	200.54	-0.71	-0.35
Channel Z	- Input	-199.80	-1.26	0.64

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	8.64	6.85
	- 200	-7.03	-8.70
Channel Y	200	13.52	13.38
	- 200	-14.82	-14.74
Channel Z	200	-7.05	-7.41
	- 200	5.47	5.70

3. Channel separation

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

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	0.57	-4.30
Channel Y	200	6.63	-	0.60
Channel Z	200	9.91	6.53	-

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	16013	16362
Channel Y	15643	16338
Channel Z	15800	13916

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	0.47	-1.07	1.68	0.45
Channel Y	0.32	-1.08	1.30	0.46
Channel Z	-0.66	-1.86	0.41	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

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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

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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

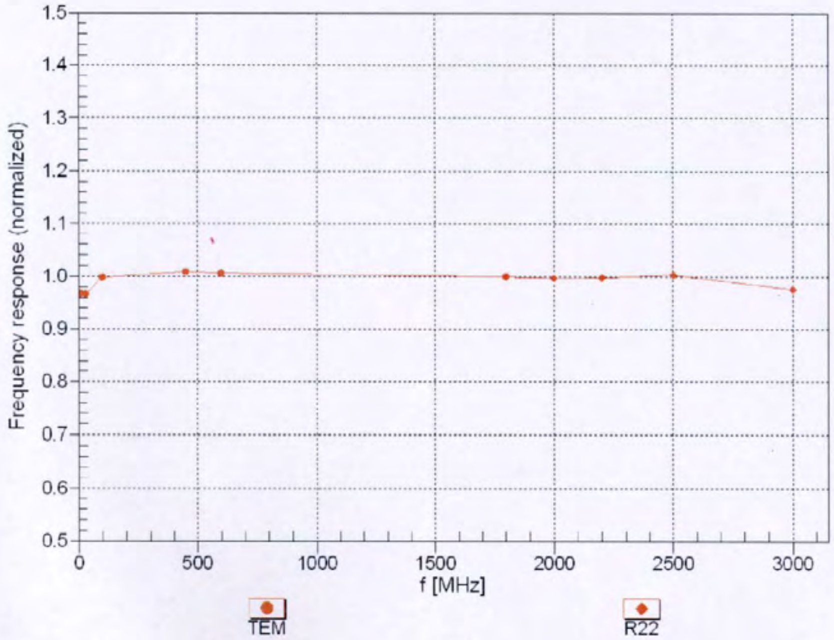
Calibration Parameter Determined in Body Tissue Simulating Media

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.

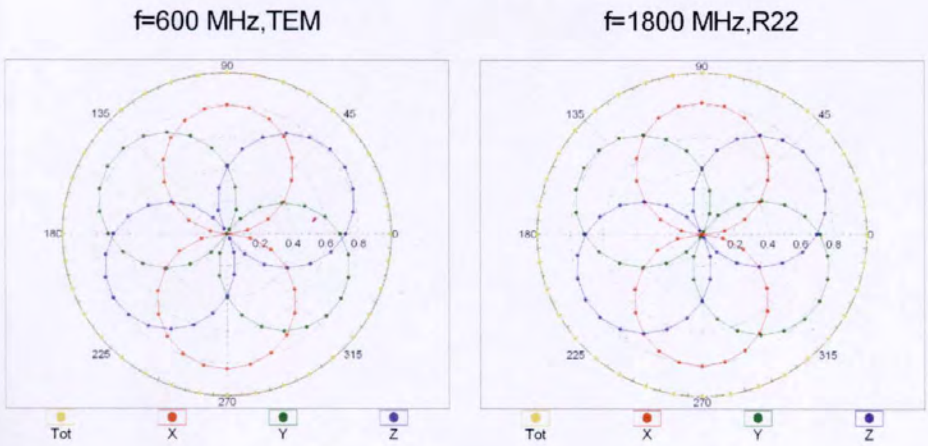
ES3DV3– SN:3139 July 25, 2012

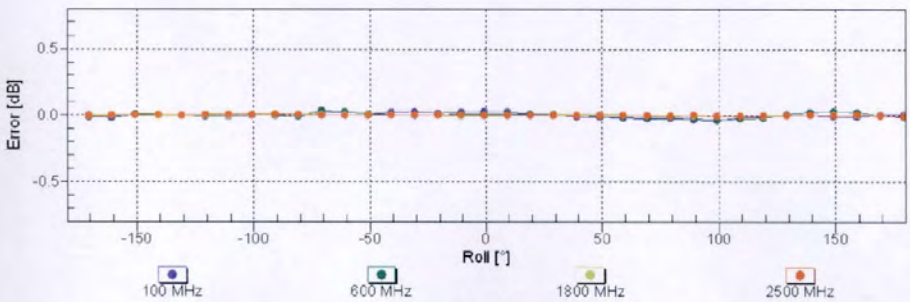
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

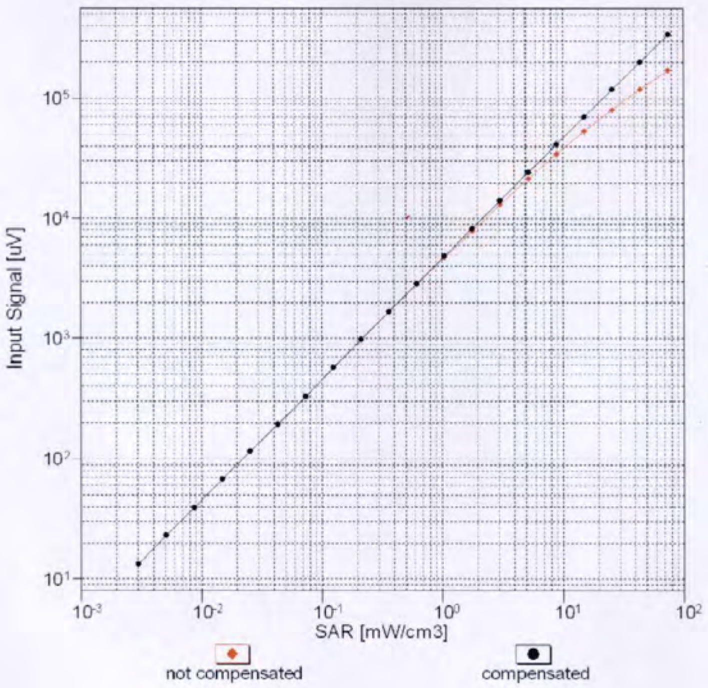
Receiving Pattern (ϕ), $\vartheta = 0°$

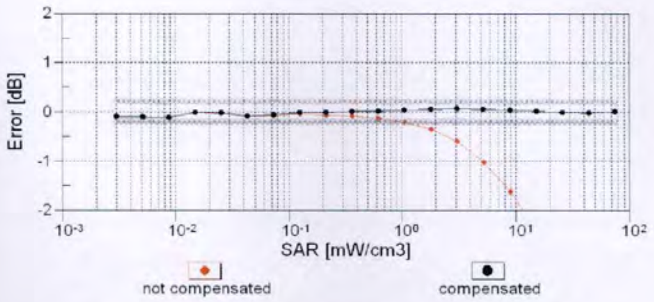




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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





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

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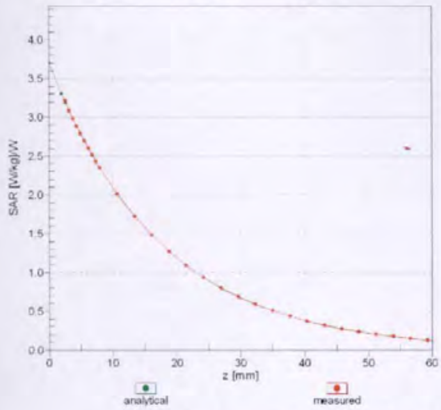
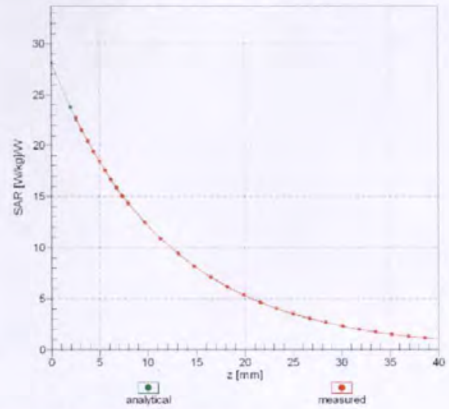
Conversion Factor Assessment

f = 900 MHz,WGLS R9 (H_convF)

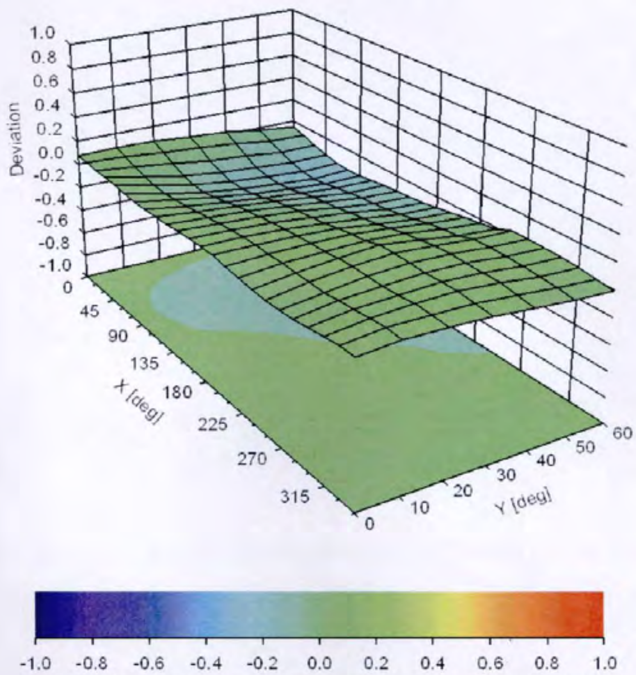


f = 1900 MHz,WGLS R22 (H_convF)



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

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CNAS L0442

Client **AUDEN** **Certificate No: Z14-97005**

CALIBRATION CERTIFICATE

Object D2450V2 - SN: 835

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

Calibration date: March 14, 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 ES3DV3	SN 3149	5- Sep-13 (SPEAG, No.ES3-3149_Sep13)	Sep-14
DAE4	SN 905	11-Jun-13 (SPEAG, DAE4-905_Jun13)	Jun -14
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:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: March 17, 2014

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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%.

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Measurement Conditions

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

DASY Version	DASY52	52.8.7.1137
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	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.6 ± 6 %	1.80 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	13.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**52.6 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 **(10 g) of Head TSL**	Condition	
SAR measured	250 mW input power	6.04 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**24.1 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	51.9 ± 6 %	1.97 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	13.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**51.6 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 **(10 g) of Body TSL**	Condition	
SAR measured	250 mW input power	5.98 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**23.8 mW /g ± 20.4 % (k=2)**

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.7Ω+ 2.44jΩ
Return Loss	- 27.4dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.6Ω+ 6.15jΩ
Return Loss	- 23.4dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.141 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

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DASY5 Validation Report for Head TSL Date: 3.14.2014

Test Laboratory: TMC, Beijing, China

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 835

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: f = 2450 MHz; σ = 1.802 S/m; εr = 38.63; ρ = 1000 kg/m3

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3149; ConvF(4.48,4.48,4.48); Calibrated: 2013/9/5
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn905; Calibrated: 11/6/2013
- Phantom: SAM 1593; Type: QD000P40CC;
- DASY52 52.8.7(1137); SEMCAD X Version 14.6.10 (7164)

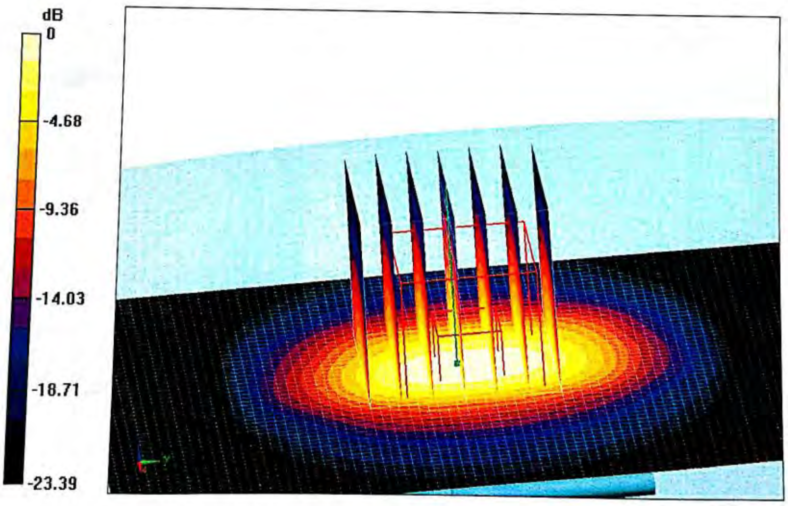
Dipole Calibration for Head Tissue/Pin=250mW, d=10mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 98.666 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 27.8 W/kg

SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.04 W/kg

Maximum value of SAR (measured) = 17.4 W/kg



0 dB = 17.4 W/kg = 12.41 dBW/kg

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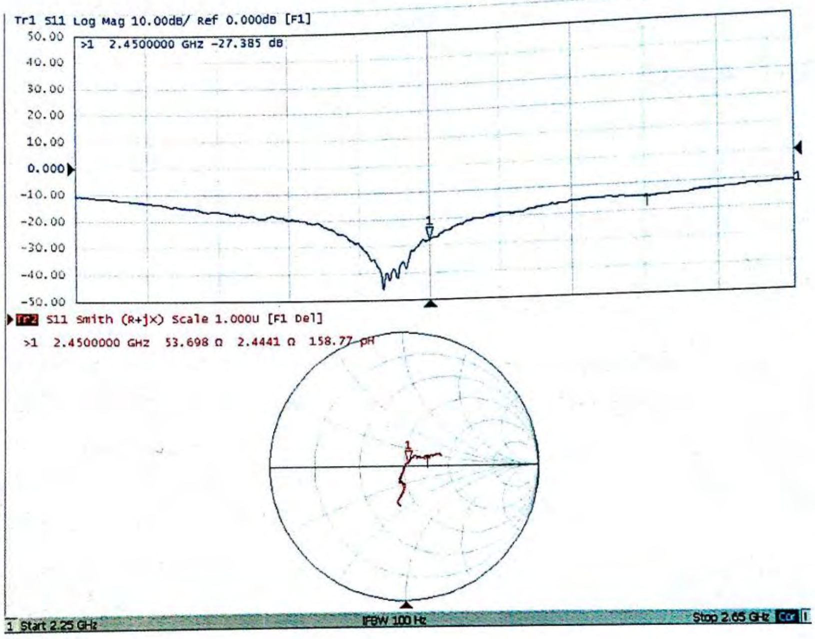
Impedance Measurement Plot for Head TSL



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Date: 3.14.2014

DASY5 Validation Report for Body TSL

Test Laboratory: TMC, Beijing, China

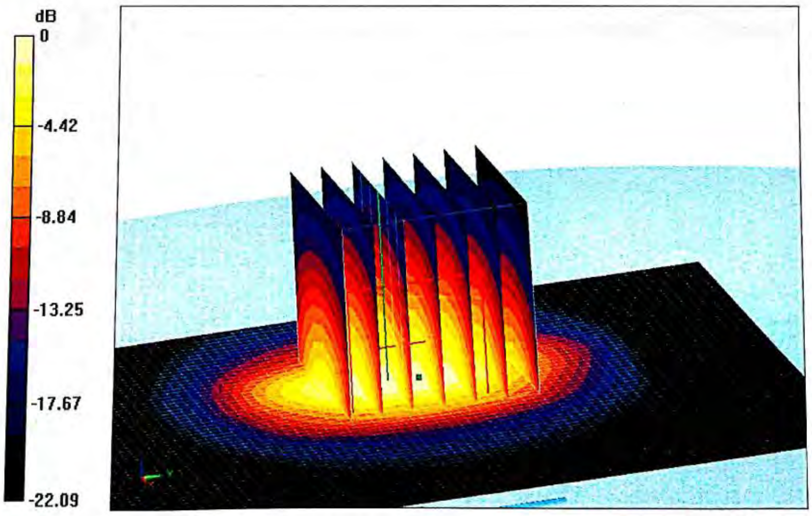
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 835

Communication System: CW; Frequency: 2450 MHz;
Medium parameters used: f = 2450 MHz; σ = 1.968 S/m; εr = 51.92; ρ = 1000 kg/m3
Phantom section: Flat Phantom
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DVS - SN3149; ConvF(4.21,4.21,4.21) ; Calibrated: 2013/9/5
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn905; Calibrated: 11/6/2013
- Phantom: SAM1186; Type: QD000P40CC;
- DASY52 52.8.7(1137); SEMCAD X Version 14.6.10 (7164)

Dipole Calibration for Body Tissue/Pin=250mW, d=10mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 75.798 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 27.4 W/kg
SAR(1 g) = 13 W/kg; SAR(10 g) = 5.98 W/kg
Maximum value of SAR (measured) = 17.0 W/kg



0 dB = 17.0 W/kg = 12.30 dBW/kg

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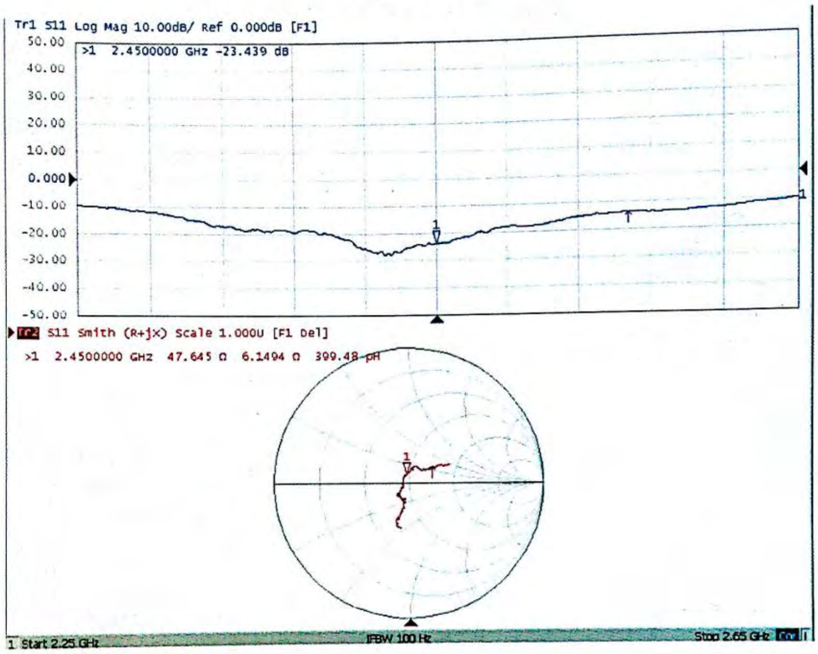
Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client Auden

Certificate No: D5GHzV2-1040_Jul13

CALIBRATION CERTIFICATE

Object	D5GHzV2 - SN: 1040
Calibration procedure(s)	QA CAL-22.v2 Calibration procedure for dipole validation kits between 3-6 GHz
Calibration date:	July 02, 2013

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	01-Nov-12 (No. 217-01640)	Oct-13
Power sensor HP 8481A	US37292783	01-Nov-12 (No. 217-01640)	Oct-13
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-13 (No. 217-01736)	Apr-14
Type-N mismatch combination	SN: 5047.3 / 06327	04-Apr-13 (No. 217-01739)	Apr-14
Reference Probe EX3DV4	SN: 3503	28-Dec-12 (No. EX3-3503_Dec12)	Dec-13
DAE4	SN: 601	25-Apr-13 (No. DAE4-601_Apr13)	Apr-14

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	Israe El-Naouq
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 2, 2013

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEC 62209-2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", March 2010

b) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

c) 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%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz ± 1 MHz 5300 MHz ± 1 MHz 5600 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

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	36.0 ± 6 %	4.47 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.86 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**78.5 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.24 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.4 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.9 ± 6 %	4.57 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5300 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.21 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**82.0 W / kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.5 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.5 ± 6 %	4.86 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.19 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**81.7 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.33 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.3 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5800 MHz

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	35.2 ± 6 %	5.07 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.79 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**77.7 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.21 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.1 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5200 MHz

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	49.3 ± 6 %	5.46 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.47 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**74.8 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.09 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.0 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.42 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	49.1 ± 6 %	5.58 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5300 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.65 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**76.6 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.5 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	48.6 ± 6 %	5.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	8.10 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**81.2 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.24 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**22.4 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5800 MHz

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	48.3 ± 6 %	6.28 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**74.8 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.06 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.6 W/kg ± 19.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	48.8 Ω - 6.8 jΩ
Return Loss	- 23.1 dB

Antenna Parameters with Head TSL at 5300 MHz

Impedance, transformed to feed point	48.5 Ω - 3.4 jΩ
Return Loss	- 28.4 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	55.7 Ω - 3.9 jΩ
Return Loss	- 23.7 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	54.8 Ω - 2.0 jΩ
Return Loss	- 26.1 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	48.7 Ω - 5.7 jΩ
Return Loss	- 24.6 dB

Antenna Parameters with Body TSL at 5300 MHz

Impedance, transformed to feed point	48.4 Ω - 2.5 jΩ
Return Loss	- 30.4 dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	56.3 Ω - 2.5 jΩ
Return Loss	- 23.9 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	55.0 Ω - 1.2 jΩ
Return Loss	- 26.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.202 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
Manufactured on	December 30, 2005

DASY5 Validation Report for Head TSL

Date: 02.07.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1040

Communication System: UID 0 - CW ; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; $\sigma = 4.47$ S/m; $\varepsilon_r = 36$; $\rho = 1000$ kg/m^3 , Medium parameters used: f = 5300 MHz; $\sigma = 4.57$ S/m; $\varepsilon_r = 35.9$; $\rho = 1000$ kg/m^3 , Medium parameters used: f = 5600 MHz; $\sigma = 4.86$ S/m; $\varepsilon_r = 35.5$; $\rho = 1000$ kg/m^3 , Medium parameters used: f = 5800 MHz; $\sigma = 5.07$ S/m; $\varepsilon_r = 35.2$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

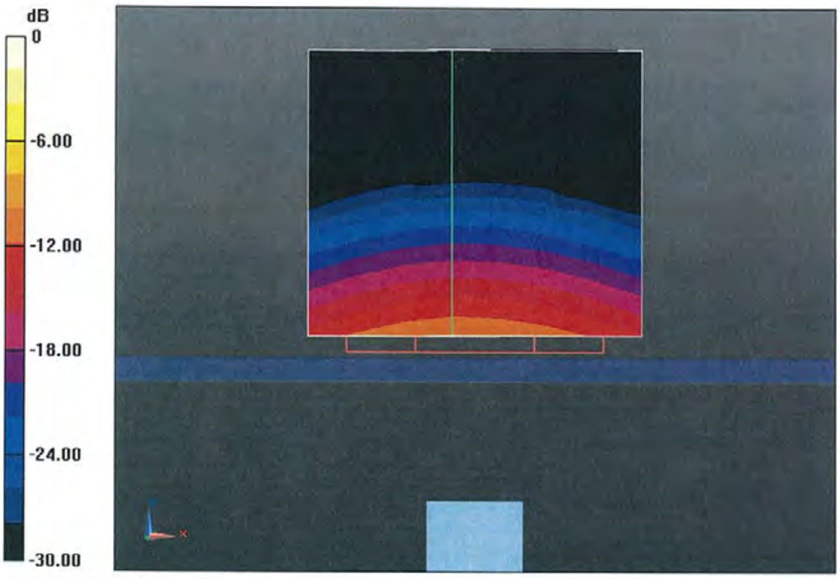
- Probe: EX3DV4 - SN3503; ConvF(5.41, 5.41, 5.41); Calibrated: 28.12.2012, ConvF(5.1, 5.1, 5.1); Calibrated: 28.12.2012, ConvF(4.76, 4.76, 4.76); Calibrated: 28.12.2012, ConvF(4.81, 4.81, 4.81); Calibrated: 28.12.2012;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.803 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 28.9 W/kg
SAR(1 g) = 7.86 W/kg; SAR(10 g) = 2.24 W/kg
Maximum value of SAR (measured) = 17.7 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.656 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 30.7 W/kg
SAR(1 g) = 8.21 W/kg; SAR(10 g) = 2.35 W/kg
Maximum value of SAR (measured) = 18.7 W/kg

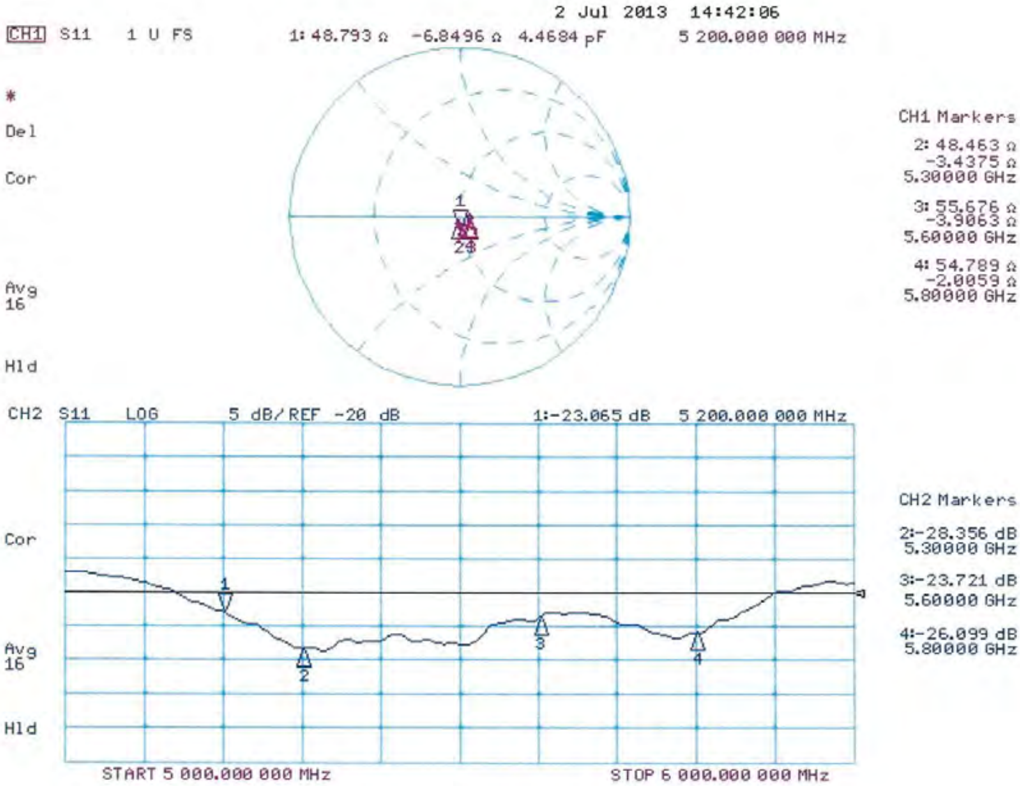
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.415 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 32.4 W/kg
SAR(1 g) = 8.19 W/kg; SAR(10 g) = 2.33 W/kg
Maximum value of SAR (measured) = 19.1 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 61.555 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 32.3 W/kg
SAR(1 g) = 7.79 W/kg; SAR(10 g) = 2.21 W/kg
Maximum value of SAR (measured) = 18.5 W/kg



0 dB = 18.5 W/kg = 12.67 dBW/kg

Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Date: 01.07.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1040

Communication System: UID 0 - CW ; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 5.46 S/m; ε_r = 49.3; ρ = 1000 kg/m^3 , Medium parameters used: f = 5300 MHz; σ = 5.58 S/m; ε_r = 49.1; ρ = 1000 kg/m^3 , Medium parameters used: f = 5600 MHz; σ = 5.99 S/m; ε_r = 48.6; ρ = 1000 kg/m^3 , Medium parameters used: f = 5800 MHz; σ = 6.28 S/m; ε_r = 48.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

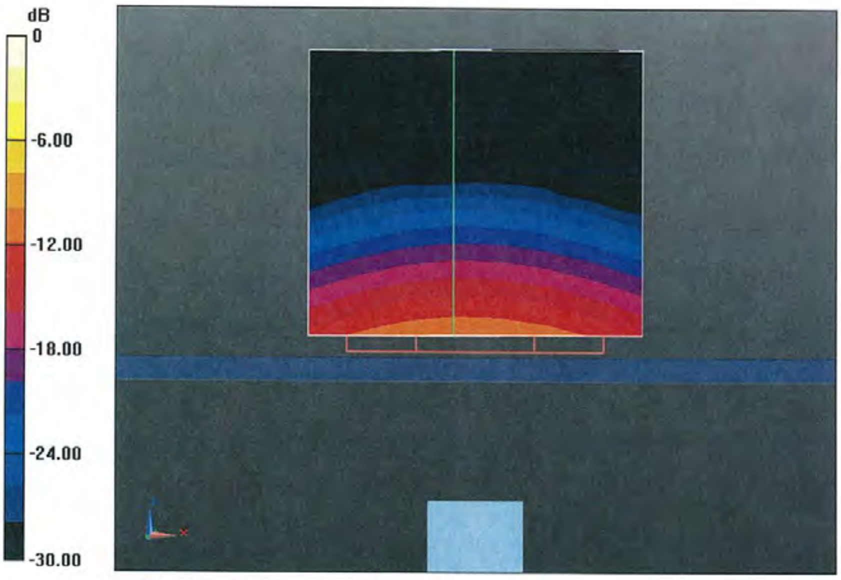
- Probe: EX3DV4 - SN3503; ConvF(4.91, 4.91, 4.91); Calibrated: 28.12.2012, ConvF(4.67, 4.67, 4.67); Calibrated: 28.12.2012, ConvF(4.22, 4.22, 4.22); Calibrated: 28.12.2012, ConvF(4.38, 4.38, 4.38); Calibrated: 28.12.2012;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 58.836 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 29.5 W/kg
SAR(1 g) = 7.47 W/kg; SAR(10 g) = 2.09 W/kg
Maximum value of SAR (measured) = 17.3 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 58.767 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 31.0 W/kg
SAR(1 g) = 7.65 W/kg; SAR(10 g) = 2.14 W/kg
Maximum value of SAR (measured) = 18.1 W/kg

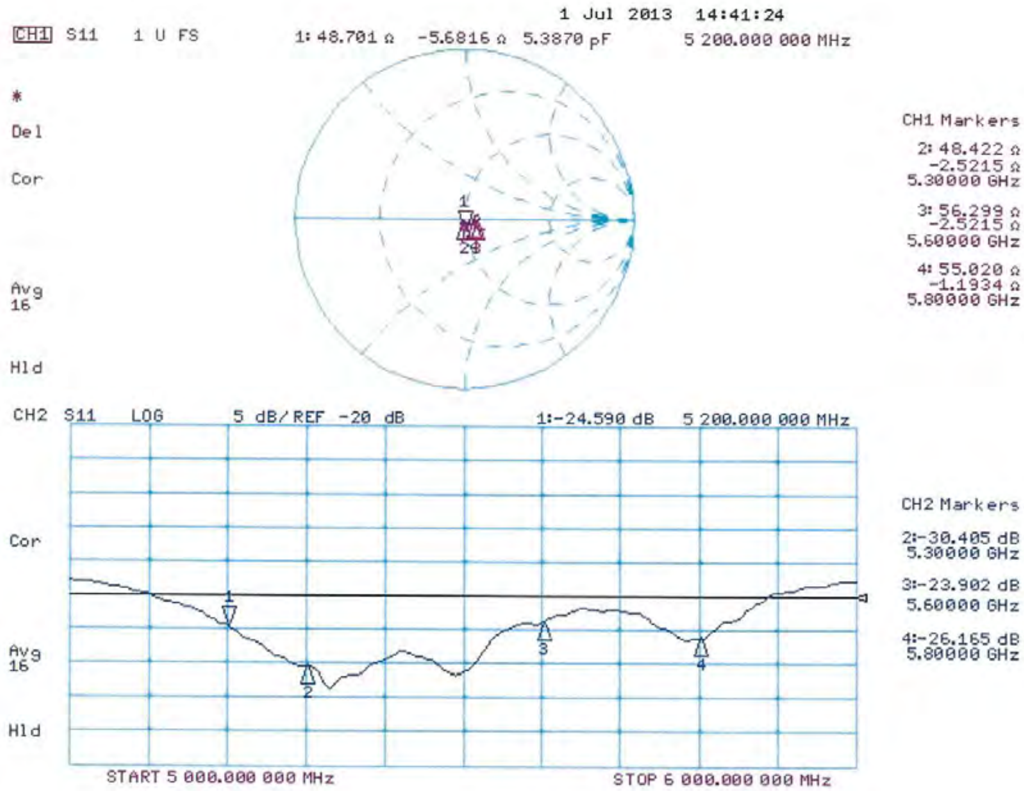
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 58.538 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 35.9 W/kg
SAR(1 g) = 8.1 W/kg; SAR(10 g) = 2.24 W/kg
Maximum value of SAR (measured) = 19.6 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 55.408 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 35.1 W/kg
SAR(1 g) = 7.46 W/kg; SAR(10 g) = 2.06 W/kg
Maximum value of SAR (measured) = 18.5 W/kg



0 dB = 18.5 W/kg = 12.67 dBW/kg

Impedance Measurement Plot for Body TSL



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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

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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!)

EX3DV4– SN:3767 July 27, 2012

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

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[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.

EX3DV4– SN:3767 July 27, 2012

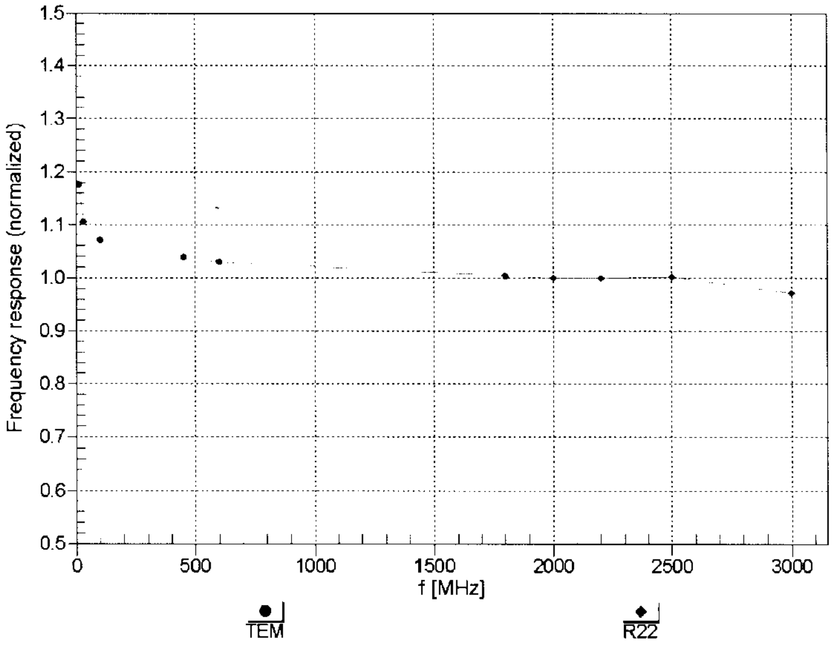
DASY/EASY - Parameters of Probe: EX3DV4 - SN:3767

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.

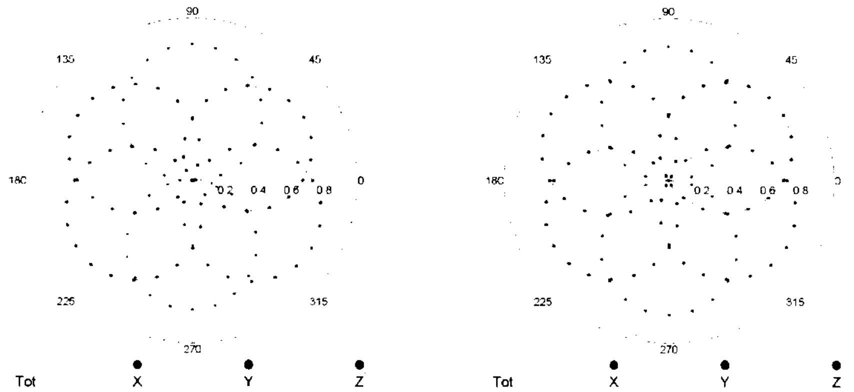
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)

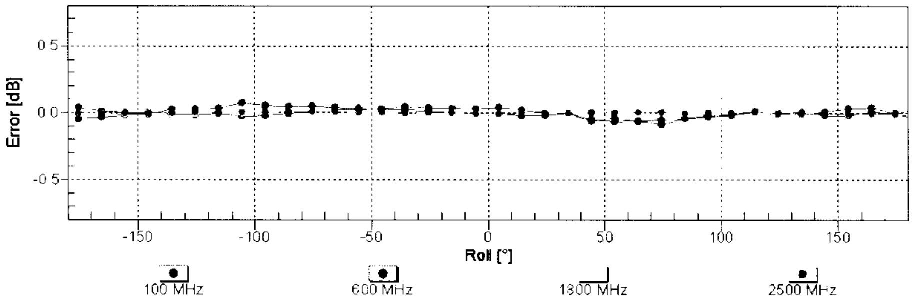


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM f=1800 MHz,R22

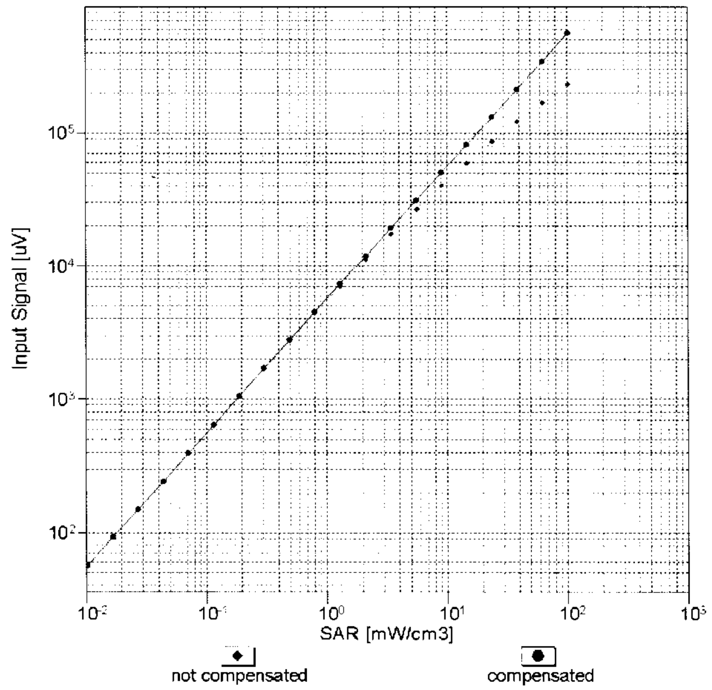


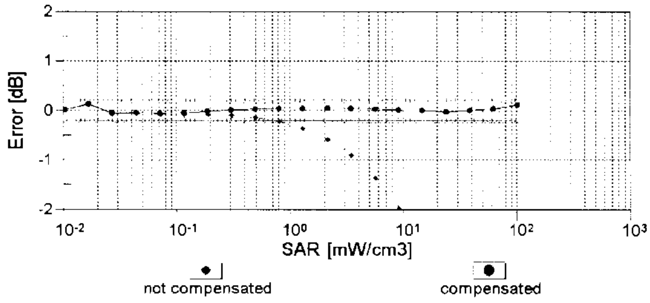


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

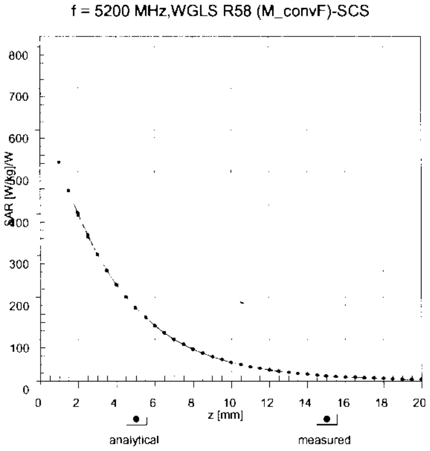
(TEM cell , f = 900 MHz)

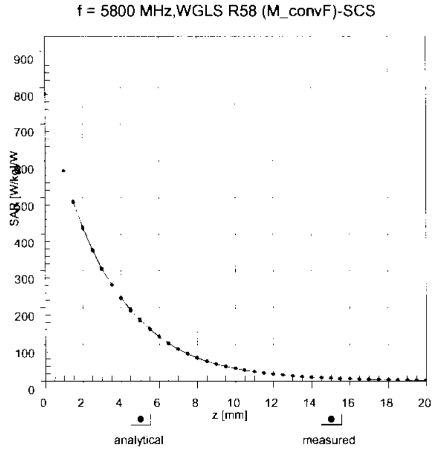




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

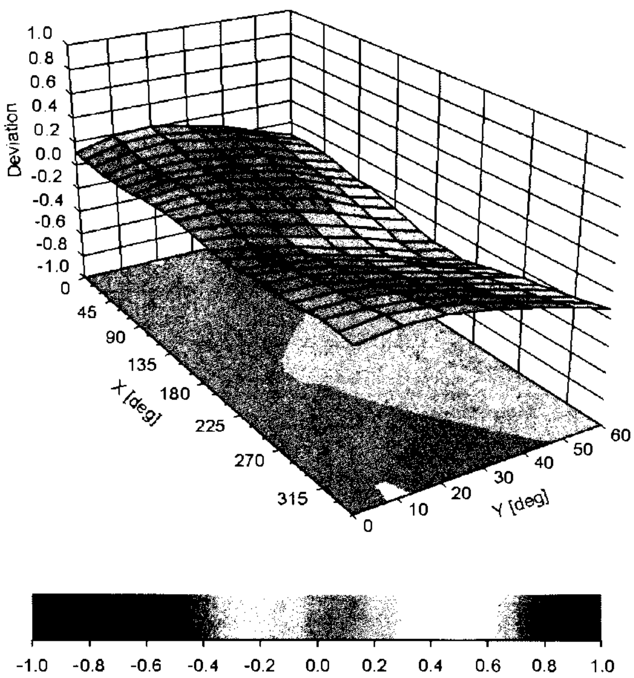
Conversion Factor Assessment





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