MOTOROLA

Portable Cellular Phone SAR Test Report

Tests Requested By:	Motorola Mobility, Inc. 600 N. US Highway 45 Libertyville, IL 60048
Test Report #:	24875-1F Rev. B
Date of Report:	Jan 25, 2012
Date of Test:	Aug 23-2011 to Sep 17, 2011, Oct 17-19, 2011, Oct 24 – 25, 2011, Jan 9-10, 2012, and Jan 19-20, 2012
FCC ID #:	IHDP56ME5
Generic Name:	M0C68
Test Laboratory:	Motorola Mobility, Inc. - ADR Test Services Laboratory 600 N. US Highway 45 Libertyville, IL 60048
Report Author:	Steve Hauswirth Distinguished Member of the Technical Staff

Accreditation:

This laboratory is accredited to ISO/IEC 17025-2005 to perform the following tests:

Tests:	Procedures:
Electromagnetic Specific Absorption Rate	IEC 62209-1 RSS-102 IEEE 1528 - 2003 FCC OET Bulletin 65 (*including Supplement C*) Australian Communications Authority Radio Communications (Electromagnetic Radiation – Human Exposure) Standard 2003 CENELEC EN 50360 ARIB Std. T-56 (2002)

2404

On the following products or types of products:
Wireless Communications Devices (Examples): Two Way Radios; Portable Phones (including Cellular, Licensed Non-Broadcast and PCS); Low Frequency Readers; and Pagers

Statement of Compliance:

Motorola declares under its sole responsibility that the portable cellular telephone model to which this declaration relates, is in conformity with the appropriate General Population/Uncontrolled RF exposure standards, recommendations and guidelines (FCC 47 CFR §2.1093) as well as with CENELEC en50360:2001 and ANSI / IEEE C95.1. It also declares that the product was tested in accordance with IEEE 1528 / CENELEC EN62209-1 (2006), as well as other appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below:

Table of Contents

Revision History

Revision Version	Date	Notes
Rev. 0	Jan-10-2012	Initial report release.
Rev. A	Jan-19-2012	Section 2.3.1: updated values in "Time Averaged Conducted power (dBm) for GSM modes" table. Section 4, 6.3: various typo corrections Section 6.4: added simultaneous evaluations for CDMA
Rev. B	Jan-25-2012	Section 4, 5, 6.1, 6.2, 6.4, Appendices: various changes to include updated SAR results for CDMA 800.

1. Introduction

The Motorola Mobility ADR Test Services Laboratory has performed measurements of the maximum potential exposure to the user of the portable cellular phone covered by this test report. The Specific Absorption Rate (SAR) of this product was measured. The portable cellular phone was tested in accordance with [1], [4] and [5]. The SAR values measured for the portable cellular phone are below the maximum recommended levels of 1.6 W/kg in a 1 g average set in [3] and 2.0 W/kg in a 10 g average set in [2].

For ANSI / IEEE C95.1 (1 g), the final stand-alone SAR readings for this phone are given in the table below. These measurements were performed using a Dasy4™ v4.7 system manufactured by Schmid & Partner Engineering AG (SPEAG), of Zurich Switzerland.

Transmit Band	Head SAR (1 g $^{W}/_{kg}$)	Body SAR (1 g $^{W}/_{kg}$)
GSM 850	**0.37**	**0.34**
GSM 1900	**0.19**	**0.14**
WCDMA 850	**0.40**	**0.48**
WCDMA 1900	**0.42**	**0.13**
CDMA 800	**0.59**	**0.59**
Wi-Fi 2.45 GHz	**0.16**	**0.02**

2. Description of the Device Under Test

2.1 Antenna description

GSM/WCDMA (800/1900 MHz) and CDMA (800 MHz) Antenna

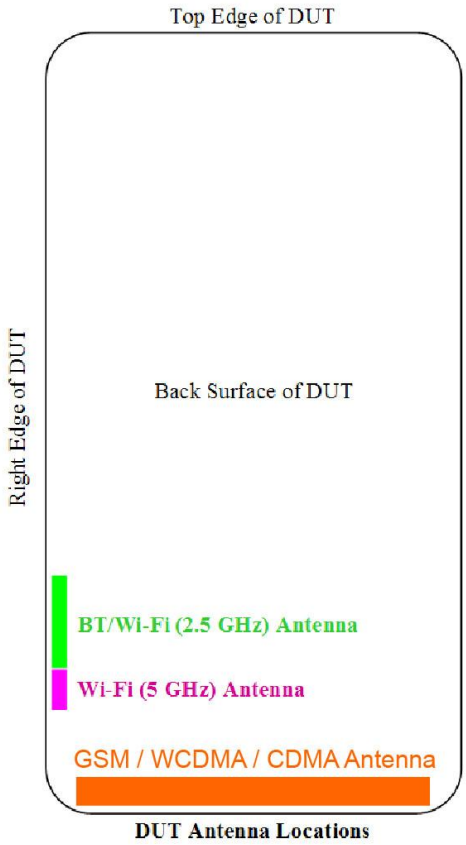
Type	Internal	
Location	Bottom Rear of Transceiver	
Dimensions	Width	1.3 mm
	Length	53.5 mm

Bluetooth/Wi-Fi (2.5 GHz) Antenna

Type	Internal	
Location	Right-Edge Rear of Transceiver	
Dimensions	Width	0.5 mm
	Length	16.2 mm

Wi-Fi (5 GHz) Antenna

Type	Internal	
Location	Right-Edge Rear of Transceiver	
Dimensions	Width	0.5 mm
	Length	3.9 mm



DUT Antenna Locations

2.2 Device Signaling[1]

Serial Number(s) (Functional Use)	LS3A280035 (GSM & WCDMA SAR testing) TA22300PPO (2.45 GHz SAR testing) TA594000CF (CDMA SAR testing) TA594002JB (CDMA SAR testing)
Production Unit or Identical Prototype (47 CFR §2..908)	Identical Prototype
Device Category	Portable (Mobile Station Class B)
RF Exposure Limits	General Population / Uncontrolled

Mode(s) of Operation	Modulation Mode(s)	Maximum Output Power Setting	Duty Cycle	Transmitting Frequency Range(s)
GSM 850	GMSK	33.5 dBm	1:8	824.2 - 848.8 MHz
GSM 1900	GMSK	31.0 dBm	1:8	1850.2 - 1909.8 MHz
WCDMA 850	QPSK	24.0 dBm	1:1	826.4 - 846.6 MHz
WCDMA 1900	QPSK	24.0 dBm	1:1	1852.4 - 1907.6 MHz
CDMA 800	QPSK	25.0 dBm	1:1	824.70 - 848.31 MHz
Wi-Fi 802.11b/g/n	BPSK	18.33 dBm	1:1	2412.0 - 2462.0 MHz
Wi-Fi 802.11a/n	BPSK	11.41 dBm	1:1	5180.0 - 5240.0 MHz, 5260.0 - 5320.0 MHz, 5500.0 - 5700.0 MHz, 5745.0 - 5825.0 MHz
Bluetooth	GFSK	9.57 dBm	1:1	2402.0 – 2480.0 MHz

GSM Data Functionality	GPRS/EDGE Class 12 (4 uplink timeslots; 4 downlink timeslots; 5 total timeslots per frame)
	Class B (DTM not supported)

Mode(s) of Operation	GPRS/EDGE 850				GPRS/EDGE 1900			
Modulation	GMSK				GMSK			
Maximum Output Power Setting (dBm)	33.5	30.5	**28.8**	27.5	31.0	28.0	**26.5**	25.0
Time Average Output Power Setting (dBm)	24.5	24.5	**24.6**	24.5	22.0	22.0	**22.3**	22.0
Duty Cycle	1:8	2:8	**3:8**	4:8	1:8	2:8	**3:8**	4:8
Transmitting Frequency Range(s)	824.2 - 848.8 MHz				1850.2 - 1909.8 MHz			

Mode(s) of Operation	EDGE 850				EDGE 1900			
Modulation	8PSK				8PSK			
Maximum Output Power Setting (dBm)	28.6	25.6	**23.9**	22.6	27.8	24.8	**23.1**	21.8
Time Average Output Power Setting (dBm)	19.6	19.6	**19.7**	19.6	18.8	18.8	**18.9**	18.8
Duty Cycle	1:8	2:8	**3:8**	4:8	1:8	2:8	**3:8**	4:8
Transmitting Frequency Range(s)	824.2 - 848.8 MHz				1850.2 - 1909.8 MHz			

[1] **Bolded** entries indicate data mode configurations of highest time-average power output per band and data mode type, and thus were utilized for SAR testing in this report.

2.3 Device Conducted Power Measurements

2.3.1 GSM modes

Band	Channel		Conducted power (dBm) for GSM modes[2]							
		GSM *CS Voice* **(1 Slot)**	**GPRS** *PS Data* **(1 Slot)**	**GPRS** *PS Data* **(2 Slots)**	**GPRS** *PS Data* **(3 Slots)[3]**	**GPRS** *PS Data* **(4 Slots)**	**EDGE** *PS Data* **(1 Slot)**	**EDGE** *PS Data* **(2 Slots)**	**EDGE** *PS Data* **(3 Slots)**	**EDGE** *PS Data* **(4 Slots)**
GSM 850	128	33.41	33.54	30.55	**28.79**	27.70	28.56	25.57	23.65	22.49
	190	33.41	33.55	30.47	**28.77**	27.57	28.40	25.71	23.64	22.56
	251	33.30	33.45	30.44	**28.77**	27.52	28.55	25.62	23.78	22.69
GSM 1900	512	31.16	31.04	28.19	**26.61**	25.08	27.66	24.60	22.96	21.62
	661	31.20	31.06	28.02	**26.30**	24.92	27.72	24.60	22.87	21.62
	810	31.00	31.07	28.14	**26.57**	25.04	27.87	24.88	23.11	22.01

Band	Channel	Time Averaged Conducted power (dBm) for GSM modes								
		GMSK *CS Voice* **(1 Slot)**	**GMSK** *PS Data* **(1 Slots)**	**GMSK** *PS Data* **(2 Slots)**	**GMSK** *PS Data* **(3 Slots)**	**GMSK** *PS Data* **(4 Slots)**	**8-PSK** *PS Data* **(1 Slots)**	**8-PSK** *PS Data* **(2 Slots)**	**8-PSK** *PS Data* **(3 Slots)**	**8-PSK** *PS Data* **(4 Slots)**
850	128	24.41	24.54	24.55	**24.59**	24.7	19.56	19.57	19.45	19.49
	190	24.41	24.55	24.47	**24.57**	24.57	19.4	19.71	19.44	19.56
	251	24.3	24.45	24.44	**24.57**	24.52	19.55	19.62	19.58	19.69
1900	512	22.16	22.04	22.19	**22.41**	22.08	18.66	18.6	18.76	18.62
	661	22.20	22.06	22.02	**22.10**	21.92	18.72	18.6	18.67	18.62
	810	22.00	22.07	22.14	**22.37**	22.04	18.87	18.88	18.91	19.01

[2] *CS Voice* denotes circuit-switched transmission for voice calling, and *PS Data* denotes packet-switched transmission for data sessions.

[3] **Bolded** entries indicate data mode configurations of highest time-average power output per band and data mode type, and thus were utilized for SAR testing in this report.

2.3.2 WCDMA modes

Per the "SAR Measurement Procedures for 3G Devices" released in October, 2007, 12.2 kbps RMC, 12.2 kbps AMR, HS-DPCCH Sub-test 1-4, and E-DCH Sub-test 1-5 modes were considered. The conducted power measurements (per section 5.2 of 3GPP TS 34.121) for each mode are shown in the table below.

Band	Channel	Conducted power (dBm) for WCDMA modes		Conducted Power (dBm) for WCDMA – HSDPA (Rel 5) Modes				Conducted Power (dBm) for WCDMA – HSPA (HSUPA/HSDPA-Rel 6) Modes				
		RMC	AMR	Subtest 1	Subtest 2	Subtest 3	Subtest 4	Subtest 1	Subtest 2	Subtest 3	Subtest 4	Subtest 5
WCDMA 850	4132	23.87	23.87	23.96	23.97	23.98	23.96	23.93	23.93	23.94	23.94	23.97
	4180	23.83	23.88	23.88	23.98	23.93	24.01	23.92	23.96	23.91	23.95	23.94
	4233	23.90	24.02	24.01	24.02	23.97	24.06	23.95	24.01	23.98	24.00	23.97
WCDMA 1900	9262	24.10	24.05	24.05	23.94	24.12	24.00	24.16	24.01	24.14	24.01	24.10
	9400	23.87	23.66	23.84	23.83	23.81	23.78	23.81	23.78	23.81	23.77	23.83
	9538	23.83	23.88	23.79	23.89	23.82	23.92	23.79	23.92	23.81	23.87	23.82

Maximum Power Reduction (MPR)

According to 3GPP 25.101 sub-clause 6.2.2, the maximum output power is allowed to be reduced by following the table.

Table 6.1A: UE maximum output power with HS-DPCCH and E-DCH

UE transmit channel configuration	CM (dB)	MPR (dB)
For all combinations of; DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH	$0 \leq CM \leq 3.5$	MAX (CM-1, 0)
Note 1: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to-average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (a function of the combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH).

When E-DPDCH channels are present, the beta gains on those channels are reduced first to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

The SW currently recalculates the cubic metric every time the beta gains on the E-DPDCH are reduced. The cubic metric will likely get lower each time this is done. However, there is no reported reduction of maximum output power in the HSUPA mode since the device also provides a mechanism to compensate for the power back-off by increasing the gain of TX_AGC in the transceiver (PA) device.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

2.3.3 CDMA modes

Per the "SAR Measurement Procedures for 3G Devices" released in October, 2007, RC1, RC3 and RC3 (FCH + SCH) CDMA modes, EVDO Rev O, EVDO Rev A were considered. The conducted power measurements (per steps 3, 4 & 10 of section 4.4.5.2 of 3GPP2 C.5.011 / TIA -98-E) for each mode are shown in the table below.

Measured Conducted Power (dBm) for CDMA modes							
		Loopback		Data[4]		EVDO Rev. O	EVDO Rev. A
Band	Channel	RC3 SO55	RC1 SO55	TDSO SO32 + FCH-SCH	TDSO SO32 + SCH	RTAP 153.6k	Subtype 2 RETAP
CDMA 800	1013	25.10	25.18	25.19	25.20	25.30	25.04
	384	24.95	25.07	25.04	25.03	25.20	24.89
	777	24.85	24.99	24.93	24.78	25.08	24.76

[4] The DUT system architecture does not support simultaneous voice and data during a single CDMA session to the cellular network. Operation in this mode is for data transmission only.

2.3.4 Wi-Fi 802.11 modes

Per "SAR Measurement Procedures for 802.11 a/b/g Transmitters" (FCC KDB 248227), power measurements were performed for 802.11 operational modes. The average conducted power measurements for each mode are shown in the tables below.

Justification for reduced test configurations for WiFi channels per KDB pub 248227 and April FCC/TCB Meeting Notes. For 2.4 GHz, highest average RF output power channel for the lowest data rate were selected for SAR evaluation. 802.11g & n modes were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b.

SAR test results for the 5 GHz transmit bands are provided in report *IHDP56ME5_FCC_5GHz_SAR_Report.pdf* included within the Exhibit 11 documents.

Mode	Freq [MHz]	Channel	Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1	**17.66**	17.59	17.52	17.53
802.11b	2437	6	**17.89**	17.94	17.91	17.84
802.11b	2462	11	**18.33**	18.24	18.22	18.18

Mode	Freq [MHz]	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	16.89	16.81	16.32	16.35	14.51	14.53	13.12	13.07
802.11g	2437	6	17.42	17.49	16.96	16.95	15.03	15.11	13.63	13.73
802.11g	2462	11	16.25	16.26	16.25	16.32	15.30	15.30	13.94	13.95

Mode	Freq [MHz]	Channel	Conducted Power [dBm]							
			Data Rate [Mbps] 800 ns Guard Interval							
			6.5	13	20	26	39	52	58	65
802.11n	2412	1	15.85	16.34	16.27	14.57	14.60	13.10	13.04	12.28
802.11n	2437	6	16.29	16.73	16.77	15.18	15.13	13.57	13.64	12.80
802.11n	2462	11	16.08	16.12	16.15	15.26	15.25	13.85	13.79	12.97

Mode	Freq [MHz]	Channel	Conducted Power [dBm]							
			Data Rate [Mbps] 400 ns Guard Interval							
			7.2	14.4	22	29	43	58	65	72
802.11n	2412	1	15.78	16.28	16.33	14.49	14.54	13.08	13.12	12.26
802.11n	2437	6	16.43	16.70	16.79	15.11	15.09	13.67	13.56	12.70
802.11n	2462	11	16.15	16.08	16.08	15.34	15.33	13.80	13.86	12.99

3. Test Equipment Used

3.1 Dosimetric System

The Motorola Mobility ADR Test Services Laboratory utilizes a Dosimetric Assessment System (Dasy4™ v4.7) manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. All the SAR measurements are taken within a shielded enclosure. The overall 10 g RSS uncertainty of the measurement system is ±10.8% (K=1) with an expanded uncertainty of ±21.6% (K=2). The overall 1 g RSS uncertainty of the measurement system is ±11.1% (K=1) with an expanded uncertainty of ±22.2% (K=2). The measurement uncertainty budget is given in Appendix 6. Per IEEE 1528, this uncertainty budget is applicable to the SAR range of 0.4 W/kg to 10 W/kg.

The list of calibrated equipment used for the measurements is shown in the following table.

Description	Serial Number	Cal Date	Cal Due Date
DASY4™ DAE V1	434	Jan-13-2011	Jan-13-2012
E-Field Probe ES3DV3	3115	Jan-12-2011	Jan-12-2012
DASY4™ DAE V1	699	Sep-20-2010	Sep-20-2011
DASY4™ DAE V1	702	Apr-14-2011	Apr-14-2012
E-Field Probe ES3DV3	3184	Mar-11-2011	Mar-11-2012
DASY4™ DAE V1	440	Nov-11-2010	Nov-11-2011
E-Field Probe ES3DV3	3124	Aug-23-2011	Aug-23-2012
DASY4™ DAE V1	376	Aug-31-2011	Aug-31-2012
E-Field Probe ES3DV3	650	Jun-20-2011	Jun-20-2012
DASY4™ DAE V1	3183	Sep-22-2011	Sep-22-2012
S.A.M. Phantom used for 800/1900 MHz	TP-1136		
S.A.M. Phantom used for 800 MHz	TP-1156		
S.A.M. Phantom used for 800 MHz	TP-1235		
S.A.M. Phantom used for 1800/1900/2450 MHz	TP-1131		
S.A.M. Phantom used for 800/2450 MHz	TP-1319		
Dipole Validation Kit, DV835V2	420TR	Jul-8-2011	Jul-8-2012
Dipole Validation Kit, DV835V2	422TR	Mar-18-2011	Mar-18-2012
Dipole Validation Kit, DV835V2	436TR	Mar-18-2011	Mar-18-2012
Dipole Validation Kit, DV835V2	434TR	Mar-9-2011	Mar-9-2013
Dipole Validation Kit, DV1800V2	250TR	Mar-17-2011	Mar-17-2012
Dipole Validation Kit, DV1800V2	259TR	Mar-17-2011	Mar-17-2012
Dipole Validation Kit, DV1800V2	271TR	Mar-08-2011	Mar-08-2012
Dipole Validation Kit, DV2450V2	863	Mar-17-2011	Mar-17-2012
Dipole Validation Kit, DV2450V2	766	Jul-15-2011	Jul-15-2012

3.2 Additional Equipment

Description	Serial Number	Cal Date	Cal Due Date
Signal Generator HP8648C	3847A04982	Nov-18-2009	Nov-18-2011
Signal Generator HP8648C	3847A04843	Apr-01-2011	Apr-01-2013
Power Meter E4419B	GB39510900	Mar-28-2011	Mar-28-2013
Power Sensor #1 - E9301A	US39211007	Aug-16-2011	Aug-16-2012
Power Sensor #2 - E9301A	US39211008	Aug-16-2011	Aug-16-2012
Signal Generator HP8648C	3847A04632	Aug-13-2011	Aug-13-2013
Power Meter E4419B	GB39511087	Dec-22-2009	Dec-22-2011
Power Sensor #1 - E9301A	US39211006	Oct-25-2010	Oct-25-2011
Power Sensor #2 - E9301A	US39210934	Oct-25-2010	Oct-25-2011
Power Meter E4419B	GB39511084	Apr-27-2011	Apr-27-2013
Power Sensor #1 - E9301A	US39210929	Apr-04-2011	Apr-04-2013
Power Sensor #2 - E9301A	US39210930	Apr-04-2011	Apr-04-2013
Signal Generator HP8648C	3847A04843	Mar-28-2011	Mar-28-2013
Power Meter E4419B	GB39511084	Mar-28-2011	Mar-28-2013
Power Sensor #1 - E9301A	US39210929	Mar-31-2011	Mar-31-2012
Power Sensor #2 - E9301A	US39210930	Mar-31-2011	Mar-31-2012
Network Analyzer HP8753ES	US39171846	May-19-2011	May-19-2012
Dielectric Probe Kit HP85070C	US99360070		

4. Electrical parameters of the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity, ε_r, and the conductivity, σ, of the tissue simulating liquids were measured with a HP85070 Dielectric Probe Kit These values, along with the temperature of the simulated tissue are shown in the table below. The recommended limits for permittivity and conductivity are also shown. A mass density of $\rho = 1\ ^{g}/_{cm^3}$ was entered into the system in all the cases. It can be seen that the measured parameters are within tolerance of the recommended limits specified in [1] and [5].

E-field probes calibrated at 1810 MHz were used for "1900 MHz" band (1850 MHz - 1910 MHz) SAR measurements. FCC KDB 450824 provides additional requirements on page 3 of 6 for SAR testing that is performed with probe calibration points that are more than 50 MHz removed from the measured bands. The KDB requires; "(2) When nominal tissue dielectric parameters are specified in the probe calibration data, the tissue dielectric parameters measured for routine measurements should be less than the target Er and higher than the target Sigma values to minimize SAR underestimations". The 1900 MHz simulated tissues listed below meet these criteria.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		
			ε_r	σ (S/m)	Temp (°C)
835	**Head**	**Measured,** Aug-23-2011	40.6	0.91	18.4
		Measured, Sep-07-2011	41.9	0.91	20.7
		Measured, Jan-20-2012	41.1	0.91	20.3
		Recommended Limits	41.5 ±5%	0.90 ±5%	18-25
	Body	**Measured,** Sep-09-2011	53.8	0.98	20.7
		Measured, Sep-17-2011	55.3	0.97	20.2
		Measured, Oct-24-2011	53.6	0.97	18.4
		Measured, Jan-9-2012	54.6	0.98	20.1
		Measured, Jan-20-2012	54.3	0.99	20.5
		Recommended Limits	55.2 ±5%	0.97 ±5%	18-25
1880	**Head**	**Measured,** Aug-23-2011	39.9	1.47	18.6
		Measured, Aug-24-2011 (early morning)	39.9	1.47	18.6
		Measured, Aug-24-2011 (late afternoon)	39.5	1.47	19.1
		Measured, Sep-02-2011	38.0	1.46	19.0
		Measured, Sep-03-2011 (early morning)	38.0	1.46	19.0
		Recommended Limits	40.0 ±5%	1.40 ±5%	18-25
	Body	**Measured,** Aug-25-2011	51.0	1.57	19.2
		Measured, Sep-03-2011	50.7	1.57	19.2
		Measured, Oct-24-2011	50.9	1.58	18.6
		Recommended Limits	53.3 ±5%	1.52 ±5%	18-25
2450	**Head**	**Measured,** Oct-19-2011	38.2	1.86	20.1
		Recommended Limits	39.2 ±5%	1.80 ±5%	18-25
	Body	**Measured,** Oct-17-2011	50.7	1.94	20.3
		Measured, Jan-10-2012	51.3	1.94	20.2
		Recommended Limits	52.7 ±5%	1.95 ±5%	18-25

The list of ingredients and the percent composition used for the simulated tissues are indicated in the table below.

Ingredient	782 / 835 / 900 MHz Head	782 / 835 / 900 MHz Body	1800 MHz / 1900 MHz Head	1800 MHz / 1900 MHz Body	2450 MHz Head	2450 MHz Body
Sugar	57	44.9	--	--	--	--
DGBE	--	--	47	30.8	--	30
Diacetin	--	--	--	--	51	--
Water	40.45	53.06	52.62	68.8	48.75	70
Salt	1.45	0.94	0.38	0.4	0.15	--
HEC	1	1	--	--	--	--
Bact.	0.1	0.1	--	--	0.1	--

5. System Accuracy Verifications

A system accuracy verification of the DASY4™ was performed using the measurement equipment listed in Section 3.1. The daily system accuracy verification occurs within the flat section of the SAM phantom.

A SAR measurement was performed to verify the measured SAR was within ±10% from the target SAR indicated in Appendix 7. These frequencies are within ±10% of the compliance test mid-band frequency as required in [1] and [5]. The test was conducted on the same days as the measurement of the DUT. Recommended limits for permittivity and conductivity, specified in [5], are shown in the table below. The obtained results from the system accuracy verification are also displayed in the table below. SAR values are normalized to 1 W forward power delivered to the dipole. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values. The distributions of SAR compare well with those of the reference measurements (see Appendix 1). The simulated tissue depth was verified to be 15.0 cm ± 0.5 cm. Z-axis scans showing the SAR penetration are also included in Appendix 1. All system accuracy verifications were performed within 24 hours of SAR testing. The same phantoms, simulated tissue and test equipment were used for these verifications and the SAR testing.

System Accuracy Verification Measurements for Head SAR Measurements							
f (MHz)	Description	Measured SAR (W/kg), 1 gram	Normalized SAR (W/kg), 1 gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
				ε_r	σ (S/m)		
835	**Measured,** Aug-23-2011	2.0	10.00	40.6	0.91	20.8	18.4
	Recommended Limits		9.73	41.5 ±5%	0.90 ±5%	18-25	18-25
	Measured, Sep-07-2011	1.95	9.75	41.9	0.91	21.1	20.5
	Recommended Limits		9.33	41.5 ±5%	0.90 ±5%	18-25	18-25
	Measured, Jan-20-2012	2.03	10.15	41.4	0.91	22.0	20.3
	Recommended Limits		9.69	41.5 ±5%	0.90 ±5%	18-25	18-25
1800	**Measured,** Aug-23-2011	7.69	38.45	40.3	1.38	20.4	18.2
	Measured, Aug-24-2011	7.77	38.85	39.9	1.38	21.0	19.3
	Measured, Sep-02-2011	7.95	39.75	38.4	1.37	20.8	19.0
	Recommended Limits		38.6	40.0 ±5%	1.40 ±5%	18-25	18-25
2450	**Measured,** Oct-19-2011	11.3	56.5	38.2	1.86	21.5	20.5
	Recommended Limits		54.2	39.2 ±5%	1.80 ±5%	18-25	18-25

The following probe conversion factors were used on the E-Field probe(s) used with the system accuracy verification measurements for head SAR measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3115	835	5.87	5 of 11
		2450	4.39	5 of 11
	3124	835	6.08	5 of 11
	3184	835	6.11	5 of 11
		1810	5.11	5 of 11

System Accuracy Verification Measurements for Body SAR Measurements							
f (MHz)	Description	Measured SAR (W/kg), 1 gram	Normalized SAR (W/kg), 1 gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
				ε_r	σ (S/m)		
835	**Measured,** Sep-09-2011	1.90	9.50	53.8	0.98	21.2	19.7
	Measured, Sep-17-2011	1.86	9.30	55.3	0.97	21.1	20.2
	Recommended Limits		9.77	55.2 ±5%	0.97 ±5%	18-25	18-25
	Measured, Oct-24-2011	2.02	10.1	53.6	0.97	21.7	20.5
	Recommended Limits		9.39	55.2 ±5%	0.97 ±5%	18-25	18-25
	Measured, Jan-9-2012	2.02	10.10	54.6	0.98	21.8	20.9
	Measured, Jan-20-2012	2.07	10.35	54.3	0.99	21.8	20.5
	Recommended Limits		10.00	55.2 ±5%	0.97 ±5%	18-25	18-25
1800	**Measured,** Aug-25-2011	8.23	41.15	51.7	1.50	21.2	18.5
	Recommended Limits		37.9	53.3 ±5%	1.52 ±5%	18-25	18-25
	Measured, Sep-03-2011	7.92	39.60	51.1	1.48	21.3	19.2
	Recommended Limits		37.5	53.3 ±5%	1.52 ±5%	18-25	18-25
	Measured, Oct-24-2011	7.94	39.7	51.3	1.48	21.2	20.6
	Recommended Limits		37.2	53.3 ±5%	1.52 ±5%	18-25	18-25
2450	**Measured,** Oct-17-2011	11.4	57.0	50.7	1.94	21.4	20.8
	Recommended Limits		52.8	52.7 ±5%	1.95 ±5%	18-25	18-25
	Measured, Jan-10-2011	10.3	51.5	51.3	1.94	22.1	20.2
	Recommended Limits		50.4	52.7 ±5%	1.95 ±5%	18-25	18-25

The following probe conversion factors were used on the E-Field probe(s) used with the system accuracy verification measurements for body SAR measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3115	835	5.88	6 of 11
		1810	4.61	6 of 11
		2450	4.12	6 of 11
	3184	835	6.10	6 of 11
		1810	4.90	6 of 11
	3124	835	6.04	6 of 11
	3183	2450	4.31	6 of 11

6. Test Results

For GSM, WCDMA and CDMA modes, the test sample was operated using an actual transmission through a base station simulator. Wi-Fi testing was conducted using manufacturer test mode software, per guidance given in FCC KDB 248227. The base station simulator or test software was set up for the proper channels, transmitter power levels and transmit modes of operation.

The phone was tested in the configurations stipulated in [1], [4] and [5]. The phone was positioned into these configurations using the device holder supplied with the DASY4™ SAR measurement system The default settings for the "coarse" and "cube" scans were chosen and used for measurements. The grid spacing of the coarse scan was set to 15 mm or less as shown in the SAR plots included in Appendices 2 through 5. Please refer to the DASY4™ manual for additional information on SAR scanning procedures and algorithms used.

The Cellular Phone model covered by this report has the following battery options:

Model SNN5899A - 1800 mAH battery

This battery was used to do all of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery.

6.1 Head Adjacent Test Results

The SAR results shown in tables 1 through 4 are maximum SAR values averaged over 1 gram of phantom tissue, to demonstrate compliance to [3] and also over 10 grams of phantom tissue, to demonstrate compliance to [6]. Also shown are the temperature of the simulated tissue after the test, the measured drift, the measured conducted output power levels, power reduction amount (when applicable), the measured SAR corrected for probe calibration (when applicable), and the extrapolated SAR. The exact method of extrapolation is:

$$\textit{Extrapolated SAR} = (\textit{Measured or Corrected SAR}) * 10^{(-drift/10)}$$

The SAR reported at the end of the measurement process by the DASY4™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test.

The left head and right head SAR contour distributions are similar. Because of this similarity, the cheek/touch and 15° tilt test conditions with the highest SAR values in each band are indicated as bold numbers in the following tables and are included in Appendix 2. All other test conditions measured lower SAR values than those included in Appendix 2.

The SAR measurements were performed using the SAM phantoms listed in section 3.1. Since the same phantoms and simulated tissue were used for the system accuracy verification and the device SAR measurements, the Z-axis scans included in Appendix 1 are applicable for verification of simulated tissue depth.

The following probe conversion factors were used on the E-Field probe(s) used for head-adjacent measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3115	835	5.87	5 of 11
		2450	4.39	5 of 11
	3124	835	6.08	5 of 11
	3184	835	6.11	5 of 11
		1810	5.11	5 of 11

Left Head Cheek Position																
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
835	GSM 850, CS Voice	SNN5899A	128												
			190	18.2	-0.127	33.41		0.25		0.26	0.331		0.34		
			251												
	WCDMA 850, 12.2 kbps RMC		4132												
			4180	19.8	-0.206	23.83		0.269		0.28	0.349		0.37		
			4233												
	CDMA 800, RC3 SO55		1013												
			384	**20.7**	**-0.17**	**24.95**		**0.426**		**0.44**	**0.571**		**0.59**	**5x5x7**	**63**
			777												
1880	GSM 1900, CS Voice		512												
			661	19.6	0.032	31.20		0.051		0.05	0.085		0.09		
	WCDMA 1900, 12.2 kbps RMC		810												
			9262												
			9400	18.0	0.011	23.87		0.102		0.10	0.167		0.17		
			9538												
2450	802.11b, 1 Mbps		1												
			6												
			11	20.7	-0.226	18.33		0.0373		0.04	0.0686		0.07		

Table 1: SAR measurement results at the highest possible output power, measured in a head cheek position against the ICNIRP and ANSI SAR Limit.

Right Head Cheek Position																
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
835	GSM 850, CS Voice	SNN5899A	128												
			190	**18.2**	**-0.100**	**33.41**		**0.255**		**0.26**	**0.357**		**0.37**	**5x5x7**	**64**
			251												
	GPRS 850, PS Data 3 Upslots		190	20.0	-0.290	28.77		0.193		0.21	0.286		0.31		
	WCDMA 850, 12.2 kbps RMC		4132												
			4180	**19.8**	**0.117**	**23.83**		**0.288**		**0.29**	**0.400**		**0.40**	**5x5x7**	**65**
			4233												
	CDMA 800, RC3 SO55		1013												
			384	20.5	-0.099	24.95		0.415		0.42	0.557		0.57		
			777												
1880	GSM 1900, CS Voice		512												
			661	**20.2**	**0.098**	**31.20**		**0.109**		**0.11**	**0.187**		**0.19**	**5x5x7**	**66**
	GPRS 1900, PS Data 3 Upslots		810												
			661	20.0	0.089	26.30		0.064		0.06	0.111		0.11		
	WCDMA 1900, 12.2 kbps RMC		9262												
			9400	**18.1**	**0.162**	**23.87**		**0.241**		**0.24**	**0.417**		**0.42**	**5x5x7**	
			9538												
2450	802.11b, 1 Mbps		1	**20.7**	**-0.194**	**17.66**		**0.078**		**0.08**	**0.151**		**0.16**	**5x5x7**	**68**
			6	20.7	-0.0992	17.89		0.0665		0.07	0.126		0.13		
			11	20.7	0.0197	18.33		0.0642		0.06	0.120		0.12		

Table 2: SAR measurement results at the highest possible output power, measured in a head cheek position against the ICNIRP and ANSI SAR Limit.

Left Head 15° Tilt Position																
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
835	GSM 850, CS Voice	SNN5899A	128												
			190	**18.2**	**-0.051**	**33.41**		**0.168**		**0.17**	**0.223**		**0.23**	**5x5x7**	**69**
			251												
	WCDMA 850, 12.2 kbps RMC		4132												
			4180	19.9	0.106	19.9		0.176		0.18	0.229		0.23		
			4233												
	CDMA 800, RC3 SO55		1013												
			384	20.3	-0.12	24.95		0.294		0.30	0.382		0.39		
			777												
1880	GSM 1900, CS Voice		512												
			661	**19.6**	**-0.016**	**31.20**		**0.026**		**0.03**	**0.046**		**0.05**	**5x5x7**	**70**
			810												
	WCDMA 1900, 12.2 kbps RMC		9262												
			9400	**18.0**	**0.124**	**23.87**		**0.057**		**0.06**	**0.099**		**0.10**	**5x5x7**	**71**
			9538												
2450	802.11b, 1 Mbps		1												
			6												
			11	**20.2**	**0.021**	**18.33**		**0.022**		**0.02**	**0.0426**		**0.04**	**5x5x7**	**72**

Table 3: SAR measurement results at the highest possible output power, measured in a head tilt position against the ICNIRP and ANSI SAR Limit.

Right Head 15° Tilt Position																
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
835	GSM 850, CS Voice	SNN5899A	128												
			190	18.2	0.017	33.41		0.162		0.16	0.213		0.21		
			251												
	WCDMA 850, 12.2 kbps RMC		4132												
			4180	**20.2**	**0.100**	**23.83**		**0.199**		**0.20**	**0.259**		**0.26**	**5x5x7**	**73**
			4233												
	CDMA 800, RC3 SO55		1013												
			384	**20.1**	**0.071**	**24.95**		**0.319**		**0.32**	**0.417**		**0.42**	**5x5x7**	**74**
			777												
1880	GSM 1900, CS Voice		512												
			661	20.1	-0.408	31.20		0.023		0.03	0.040		0.04		
			810												
	WCDMA 1900, 12.2 kbps RMC		9262												
			9400	18.0	0.121	23.87		0.053		0.05	0.090		0.09		
			9538												
2450	802.11b, 1 Mbps		1												
			6												
			11	20.2	0.0225	18.33		0.0144		0.01	0.0264		0.03		

Table 4: SAR measurement results at the highest possible output power, measured in a head tilt position against the ICNIRP and ANSI SAR Limit.

6.2 Body Worn Test Results

The SAR results shown in tables 5 and 6 are maximum SAR values averaged over 1 gram of phantom tissue, to demonstrate compliance to [3] and also over 10 grams of phantom tissue, to demonstrate compliance to [6]. Also shown are the temperature of the simulated tissue after the test, the measured drift, the measured conducted output power levels, power reduction amount (when applicable), the measured SAR corrected for probe calibration (when applicable), and the extrapolated SAR. The exact method of extrapolation is:

$$Extrapolated\ SAR = (Measured\ or\ Corrected\ SAR) * 10^{(-drift/10)}$$

The SAR reported at the end of the measurement process by the DASY4™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test.

The test conditions that produced the highest SAR values in each band are indicated as bold numbers in the following tables and are included in Appendix 3. All other test conditions measured lower SAR values than those included in Appendix 3.

A SPEAG™ MFP V5.1 C Triple Modular Phantom was used for the body-worn tests. The triple modular phantom consists of three identical modules that can be installed and removed separately without emptying the liquid. Each module of the triple phantom is constructed of glass-fiber reinforced vinylester (VG-GF) with a thickness at the bottom of 2.0 mm. It measures 29.2 cm(long) by 17.8 cm(wide) by 17.8 cm(tall). Alternately, a "flat" phantom was used for the body-worn tests. This "flat" phantom is made out of 1" thick natural High Density Polyethylene with a thickness at the bottom of 2.0 mm. It measures 52.7 cm(long) by 26.7 cm(wide) by 21.2 cm(tall).

The simulated tissue depth was verified to be 15.0 cm ± 0.5 cm. The same device holder described in section 6 was used for positioning the phone. Functional accessories were divided into two categories, the ones with metal components and the ones with non-metal components. For non-metallic component accessories, testing was performed on the accessory that displayed the closest proximity to the flat phantom. Each metallic component accessory, if any, was checked for uniqueness of metal component so that each is tested with the device. If multiple accessories shared an identical metal component, only the accessory that dictates the closest spacing to the body was tested. The cellular phone was tested with a headset connected to the device for all body-worn SAR measurements.

There are no body-worn accessories available for this phone at the time of testing thus the device was tested per the Supplement C testing guidelines for devices that do not have body-worn accessories. A separation distance of 25 mm between the device and the flat phantom was used for testing body-worn SAR. The chosen separation distance of 25 mm is utilized in order to support any case or holder accessories offered or to be offered by Motorola for this product. The device was tested with the front and back of the device facing the phantom. Both sides of the device were tested for Body SAR for the purpose of including the SAR evaluation for body-worn accessories that support the device with the front side facing the user.

The cellular phone was also tested in data mode operations. For these tests, a separation distance of 25 mm between the device and the flat phantom was used. The device was tested in the worst-case SAR position and channel configuration from the voice-mode body-worn testing for the data modes.

The following probe conversion factors were used on the E-Field probe(s) used for the body-worn measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3115	835	5.88	6 of 11
		2450	4.12	6 of 11
	3124	835	6.04	6 of 11
	3184	1810	4.90	6 of 11

Body-Worn, Front of Phone 25 mm from Phantom																
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
835	GSM 850, CS Voice	SNN5899A	128												
			190	18.1	-0.121	33.41		0.127		0.13	0.168		0.17		
			251												
	GPRS 850, PS Data 3 Upslots		190	**20.0**	**0.106**	**28.77**		**0.254**		**0.25**	**0.336**		**0.34**	**5x5x7**	**76**
	EDGE 850, PS Data 3 Upslots		190	20.0	0.085	23.64		0.086		0.09	0.113		0.11		
	WCDMA 850, 12.2 kbps RMC		4132												
			4180	**20.2**	**-0.056**	**23.83**		**0.352**		**0.36**	**0.470**		**0.48**	**5x5x7**	**77**
			4233												
	CDMA 800, TDSO SO32		1013												
			384	19.7	0.033	25.03		0.441		0.44	0.582		0.58		
			777												
1880	GSM 1900, CS Voice		512												
			661	19.0	-0.073	31.20		0.047		0.05	0.075		0.08		
			810												
	WCDMA 1900, 12.2 kbps RMC		9262												
			9400	19.0	0.066	23.87		0.066		0.07	0.108		0.11		
			9538												
2450	802.11b, 1 Mbps		1												
			6												
			11	20.8	0.0401	18.33		0.0142		0.01	0.0243		0.02		

Table 5: SAR measurement results at the highest possible output power, measured in a body-worn position against the ICNIRP and ANSI SAR Limit.

Body-Worn, Back of Phone 25 mm from Phantom																
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
835	GSM 850, CS Voice	SNN5899A	128												
			190	18.0	-0.092	33.41		0.101		0.10	0.134		0.14		
			251												
	WCDMA 850, 12.2 kbps RMC		4132												
			4180	20.2	-0.052	23.83		0.299		0.30	0.399		0.40		
			4233												
	CDMA 800, TDSO SO32		1013												
			384	**20.3**	**-0.022**	**25.03**		**0.441**		**0.44**	**0.584**		**0.59**	**5x5x7**	**78**
			777												
1880	GSM 1900, CS Voice		512												
			661	**19.0**	**-0.115**	**31.20**		**0.086**		**0.09**	**0.140**		**0.14**	**5x5x7**	**79**
			810												
	GPRS 1900, PS Data 3 Upslots		661	20.2	-0.157	26.30		0.052		0.05	0.084		0.09		
	EDGE 1900, PS Data 3 Upslots		661	20.2	0.070	22.87		0.026		0.03	0.043		0.04		
	WCDMA 1900, 12.2 kbps RMC		9262												
			9400	**19.0**	**0.049**	**23.87**		**0.082**		**0.08**	**0.132**		**0.13**	**5x5x7**	**80**
			9538												
2450	802.11b, 1 Mbps		1	**20.8**	**0.0015**	**17.66**		**0.0144**		**0.01**	**0.0246**		**0.02**	**5x5x7**	**81**
			6	20.8	0.127	17.89		0.0124		0.01	0.0217		0.02		
			11	20.8	-0.823	18.33		0.0142		0.01	0.0244		0.02		

Table 6: SAR measurement results at the highest possible output power, measured in a body-worn position against the ICNIRP and ANSI SAR Limit.

6.3 Lapdock Accessory Test Results

The DUT supports the use of the Motorola Lapdock™ 500. SAR testing was performed with the DUT placed into the Lapdock™ 500, and the Lapdock™ 500 placed for testing per FCC KDB 616217. For GSM, WCDMA and CDMA modes, the test sample was operated using an actual transmission through a base station simulator. Wi-Fi testing was conducted using manufacturer test mode software, per guidance given in FCC KDB 248227. The base station simulator or test software was set up for the proper channels, transmitter power levels and transmit modes of operation.

The Motorola Lapdock™ 500 supports the use of data modes within the phone for a data connection to the Internet. While the phone is attached to the Lapdock™ 500, the phone is still able to make an receive calls. These calls can be simultaneous to the data transmission, if the technology in the phone supports this (eg: WiFi and GSM). An evaluation of the simultaneous transmitter SAR is provided in section 6.5. The 5 GHz WiFi modes (802.11a/n) do not operate in with Lapdock™ 500.

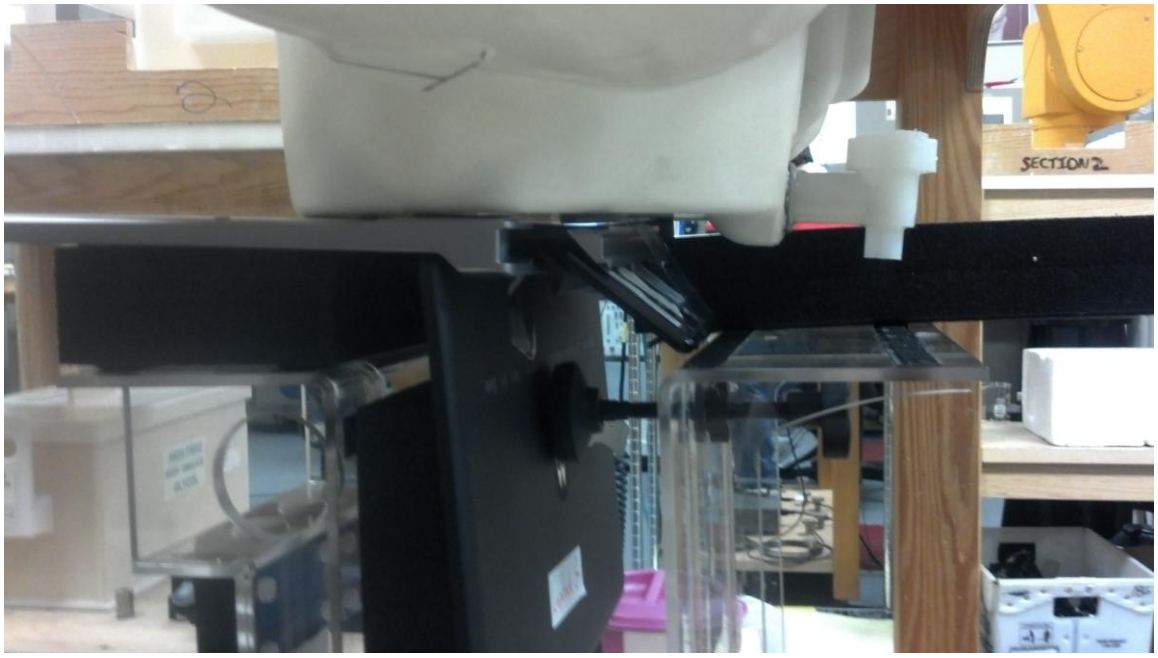
The SAR results shown in table 7 are maximum SAR values averaged over 1 gram of phantom tissue, to demonstrate compliance to [3] and also over 10 grams of phantom tissue, to demonstrate compliance to [6]. Also shown are the temperature of the simulated tissue after the test, the measured drift, the measured conducted output power levels, power reduction amount (when applicable), the measured SAR corrected for probe calibration (when applicable), and the extrapolated SAR. The exact method of extrapolation is:

$$Extrapolated\ SAR = (Measured\ or\ Corrected\ SAR) * 10^{(-drift/10)}$$

The SAR reported at the end of the measurement process by the DASY4™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test.

The test conditions that produced the highest SAR values in each band are indicated as bold numbers in the following tables and are included in Appendix 4.

The SAR measurements were performed using the flat section of the SAM phantoms listed in section 3.1. The simulated tissue depth was verified to be 15.0 cm ± 0.5 cm. The DUT and Lapdock™ 500 were placed using a Laptop Extension Kit available from SPEAG™ that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM Phantoms.



The following probe conversion factors were used on the E-Field probe(s) used for the Lapdock™ 500 body measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3115	835	5.88	6 of 11
		1810	4.61	6 of 11
	3124	835	6.04	6 of 11
	3183	2450	4.31	6 of 11

Lapdock against Body,
Bottom Surface of Lapdock 500 Placed 0 mm from Phantom, Screen opened 90 degrees

f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
835	GPRS 850, PS Data 3 Upslots	SNN5899A	128												
			190	**20.1**	**-0.482**	**28.77**		**0.571**		**0.64**	**0.836**		**0.93**	**5x5x7**	**83**
			251												
	GSM 850, CS Voice		128												
			190	20.1	-0.0807	33.41		0.532		0.54	0.781		0.80		
			251												
	WCDMA 850, 12.2 kbps RMC		4132												
			4180	**20.1**	**-0.043**	**23.83**		**0.398**		**0.40**	**0.578**		**0.58**	**5x5x7**	**84**
			4233												
	CDMA 800, TDSO SO32		1013	20.1	0.054	25.20		0.854		0.85	1.22		1.22		
			384	19.8	-0.23	25.03		0.81		0.85	1.15		1.21		
			777	**20.4**	**-0.24**	**24.78**		**0.91**		**0.96**	**1.25**		**1.32**	**5x5x7**	**85**
1880	GPRS 1900, PS Data 3 Upslots		512												
			661	**20.5**	**-0.186**	**26.30**		**0.060**		**0.06**	**0.10**		**0.10**	**5x5x7**	**86**
			810												
	GSM 1900, CS Voice		512												
			661	20.5	-0.001	31.20		0.0595		0.06	0.10		0.10		
			810												
	WCDMA 1900, 12.2 kbps RMC		9262												
			9400	**20.5**	**-0.020**	**23.87**		**0.506**		**0.51**	**0.891**		**0.90**	**5x5x7**	**87**
			9538												
2450	802.11b, 1 Mbps		1												
			6												
			11	**19.6**	**0.70**	**15.62**		**0.125**		**0.125**	**0.279**		**0.279**	**5x5x7**	**88**

Table 7: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

6.4 Description and Evaluation of Simultaneous Transmitters

Per "SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas" (FCC KDB 648474), the necessity of stand-alone and simultaneous SAR testing was evaluated for the licensed and unlicensed transmitters of the device under test.

By device design the GSM, WCDMA and CDMA transmitters may operate simultaneously with either the Wi-Fi 802.11 transmitter or the Bluetooth transmitter. The separation distance between the Wi-Fi 802.11/Bluetooth antenna and the main antenna is 1.76 cm. Pictorial representation of the antenna locations and separation distances are given in Exhibit 7d.

The Bluetooth transmitter of the device under test can be excluded from stand-alone and simultaneous SAR evaluation, per the **bolded** requirements from FCC KDB 648474, as follows. Note that Bluetooth mode is not intended for use in configurations against the head and this evaluation considers only the body-worn configuration.

1. The highest output conducted power measured for Bluetooth on the device under test is 9.06 mW **[≤ 12 mW]**
2. The separation distance between the Bluetooth antenna and the GSM/WCDMA/CDMA antenna is 2.34 cm **[< 2.5 cm]**
3. The highest 1-g Body-Worn SAR values for the other transmitters are:
GSM 850 (0.34 $^{W}/_{kg}$); GSM 1900 (0.14 $^{W}/_{kg}$); WCDMA 850 (0.48 $^{W}/_{kg}$); WCDMA 1900 (0.13 $^{W}/_{kg}$), CDMA 800 (0.59 $^{W}/_{kg}$) **[< 1.2 $^{W}/_{kg}$]**

The Wi-Fi and the Bluetooth cannot transmit simultaneously, so there is no co-location test requirement for Wi-Fi and Bluetooth. GSM supports voice and data transmission, though not simultaneously. WCDMA supports voice and data transmission simultaneously.

Description of Simultaneous Transmit Capabilities			
Transmitter Combinations		Scenario Supported?	Notes
#1	GSM (CS Voice) + GSM (PS Data)	No	DUT system architecture does not support simultaneous voice and data (except on WCDMA), multiple voice channels, or multiple data channels during a single session on the cellular network.
#2	GSM (CS Voice) + WCDMA (Data)	No	
#3	GSM (CS Voice) + CDMA (Data)	No	
#4	WCDMA (Voice) + GSM (PS Data)	No	
#5	WCDMA (Voice) + CDMA (Data)	No	
#6	CDMA (Voice) + GSM (PS Data)	No	
#7	CDMA (Voice) + WCDMA (Data)	No	
#8	GSM (PS Data) + WCDMA (Data)	No	
#9	GSM (CS Voice) + WCDMA (Voice)	No	
#10	WCDMA (Voice) + WCDMA (Data)	Yes	Inherent support in the WCDMA transmission scheme
#11	GSM (CS Voice) + Wi-Fi	Yes	Supported for voice plus background data.
#12	WCDMA (Voice) + Wi-Fi	Yes	
#13	CDMA (Voice) + Wi-Fi	Yes	
#14	GSM (PS Data) + Wi-Fi	No	DUT does not support simultaneous data mode operation. Mobile hotspot functionality is not enabled in the firmware.
#15	WCDMA (Data) + Wi-Fi	No	
#16	CDMA (Data) + Wi-Fi	No	

For the transmitters requiring stand-alone SAR testing (GSM, CDMA, WCDMA, and Wi-Fi 802.11), the KDB guidelines direct that if the sum of the 1 g SAR measured for the simultaneously transmitting antennas is less than the SAR limit, SAR measurement for simultaneous transmission is not required. Further, if the SAR-to-peak-location separation ratio for two simultaneously transmitting antennas is less than 0.3 then SAR measurement for simultaneous transmission is likewise not required. Evaluations of the head and body simultaneous SAR summations for the worst-case SAR transmitter configurations are presented in the tables below.

The following SAR summations for simultaneous evaluation are provided to demonstrate a GSM or WCDMA voice link with a simultaneous data link on Wi-Fi.

Evaluations for Simultaneous SAR, Head and Body positions														
Transmitter Combination	Transmitter Stand-Alone 1 g SAR Values (W/kg)						1 g SAR Summations (W/kg)							
Band / Position	GSM 850	GSM 1900	WCDMA 850	WCDMA 1900	Wi-Fi 2450	Wi-Fi 5 GHz	GSM 850 + Wi-Fi 2450	GSM 1900 + Wi-Fi 2450	WCDMA 850 + Wi-Fi 2450	WCDMA 1900 + Wi-Fi 2450	GSM 850 + Wi-Fi 5 GHz	GSM 1900 + Wi-Fi 5 GHz	WCDMA 850 + Wi-Fi 5 GHz	WCDMA 1900 + Wi-Fi 5 GHz
Left Head Cheek	0.34	0.09	0.37	0.17	0.07	0.035	0.41	0.16	0.44	0.24	0.38	0.13	0.41	0.21
Left Head 15° Tilt	0.23	0.05	0.23	0.10	0.04	0.011	0.27	0.09	0.27	0.14	0.24	0.06	0.24	0.11
Right Head Cheek	0.37	0.19	0.40	0.42	0.16	0.054	0.53	0.35	0.56	0.58	0.42	0.24	0.45	0.47
Right Head 15° Tilt	0.21	0.04	0.26	0.09	0.03	0.028	0.24	0.07	0.29	0.12	0.24	0.07	0.29	0.12
Body Worn, Front of Phone 25 mm from Phantom	0.17	0.08	0.48	0.11	0.02	0.027	0.19	0.10	0.50	0.13	0.20	0.11	0.51	0.14
Body Worn, Back of Phone 25 mm from Phantom	0.14	0.14	0.40	0.13	0.02	0.031	0.16	0.16	0.42	0.15	0.17	0.17	0.43	0.16

The following SAR summations for simultaneous evaluation are provided to demonstrate a CDMA voice link with a simultaneous data link on Wi-Fi.

Evaluations for Simultaneous SAR, Head and Body positions					
Transmitter Combination	Transmitter Stand-Alone 1 g SAR Values (W/kg)			1 g SAR Summations (W/kg)	
Band / Position	CDMA 800	Wi-Fi 2450	Wi-Fi 5 GHz	CDMA 800 + Wi-Fi 2450	CDMA 800 + Wi-Fi 5 GHz
Left Head Cheek	0.59	0.07	0.035	0.66	0.625
Left Head 15° Tilt	0.39	0.04	0.011	0.43	0.401
Right Head Cheek	0.57	0.16	0.054	0.73	0.624
Right Head 15° Tilt	0.42	0.03	0.028	0.45	0.448
Body Worn, Front of Phone 25 mm from Phantom	0.58	0.02	0.027	0.60	0.607
Body Worn, Back of Phone 25 mm from Phantom	0.59	0.02	0.031	0.61	0.621

The following LapDock™ 500 position SAR summations for simultaneous evaluation are provided to demonstrate a data link (over WiFi) with a simultaneous voice call (over GSM, WCDMA).

Evaluations for Simultaneous SAR, LapDock Position			
Transmit Mode	SAR (W/Kg)	2.45 GHz WiFi SAR (W/Kg)	1 g SAR Summations (W/kg)
GSM 850	0.80	0.279	1.079
WCDMA 850	0.58	0.279	0.859
GSM 1900	0.10	0.279	0.379
WCDMA 1900	0.90	0.279	1.179
CDMA 800	1.32	0.279	1.599

As no summation of transmitter SAR values results in a value greater than the compliance limit, no measurements for simultaneous SAR are required.

References

[1] CENELEC, en62209-1:2006 “Human Exposure to Radio Frequency Fields From Hand - Held and Body - Mounted Wireless Communication Devices – Human Models, Instrumentation, and Procedures”

[2] CENELEC, en50360:2001 “Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz – 3 GHz)”.

[3] ANSI / IEEE, C95.1 1992 Edition “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”

[4] FCC OET Bulletin 65 Supplement C 01-01

[5] IEEE 1528 2003 Edition “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”

[6] ICNIRP Guidelines “Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz)”

Appendix 1

SAR distribution comparisons for System Accuracy Verifications

System Accuracy Verification Measurements for Head SAR Measurements

Date/Time: 8/23/2011 7:12:30 AM

Test Laboratory: Motorola - Aug-23-2011 835 MHz Head

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 436TR; FCC ID: IHDP56ME5
Procedure Notes: 835 MHz System Performance Check; Dipole Sn# 436TR; Input Power = 200 mW
Sim.Temp@meas = 18.4□C; Sim.Temp@SPC = 18.4□C; Room Temp @ SPC = 20.8□C
Communication System: CW - Dipole; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Validation *HEAD Tissue*
Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3

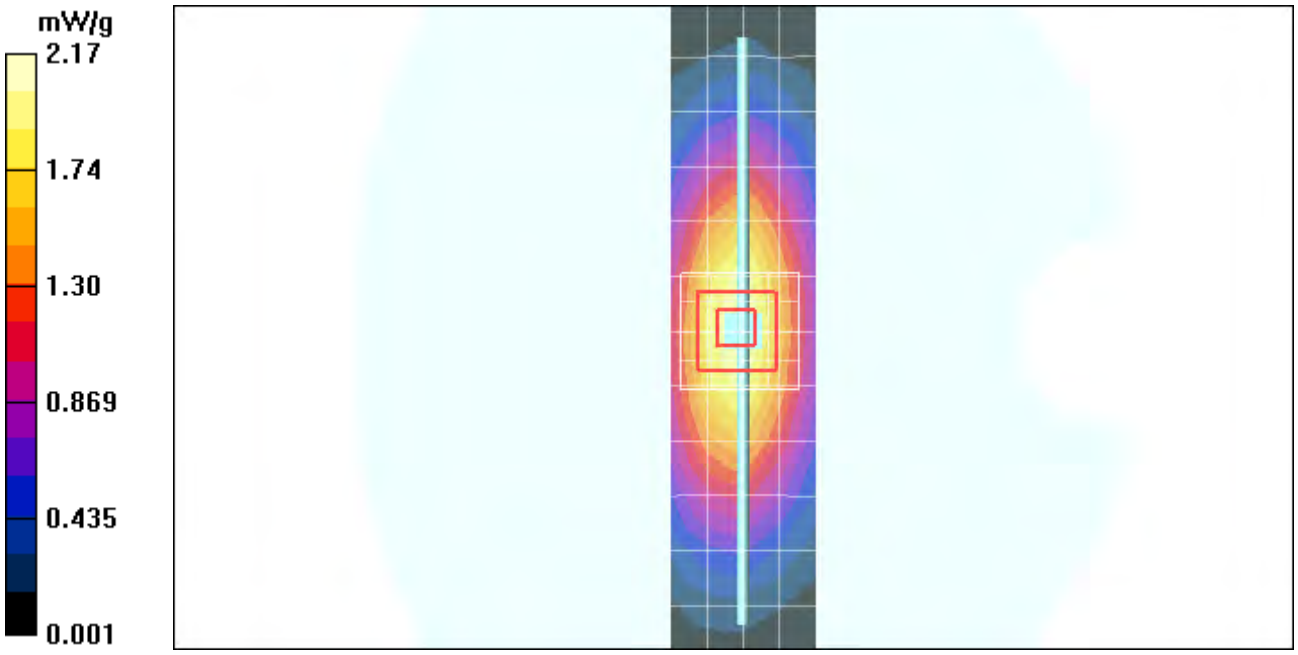
DASY4 Configuration:

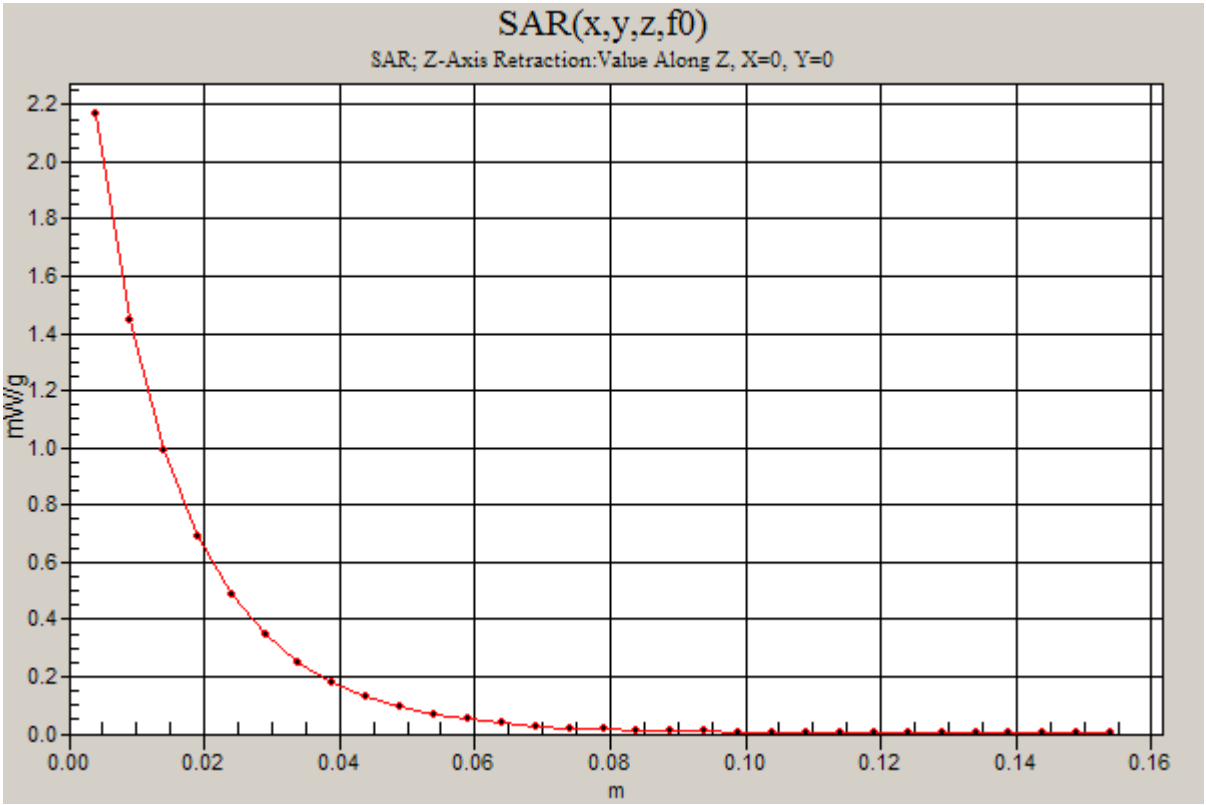
- Probe: ES3DV3 - SN3184; ConvF(6.11, 6.11, 6.11); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1235;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (5x15x1):
Measurement grid: dx=10mm, dy=15mm; Maximum value of SAR (measured) = 2.15 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.0 V/m; Power Drift = -0.010 dB; Peak SAR (extrapolated) = 2.98 W/kg
SAR(1 g) = 2 mW/g; SAR(10 g) = 1.3 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):
Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.17 mW/g


mW/g
2.17
1.74
1.30
0.869
0.435
0.001


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date/Time: 9/7/2011 5:26:41 PM

Test Laboratory: Motorola - Sep-07-2011 835 MHz

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 422TR; FCC ID: IHDP56ME5
Procedure Notes: 835 MHz System Performance Check; Dipole Sn# 422TR; Input Power = 200 mW
Sim.Temp@meas = 20.7*C; Sim.Temp@SPC = 20.5*C; Room Temp @ SPC = 21.1*C
Communication System: CW - Dipole; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Validation *HEAD Tissue*
Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3

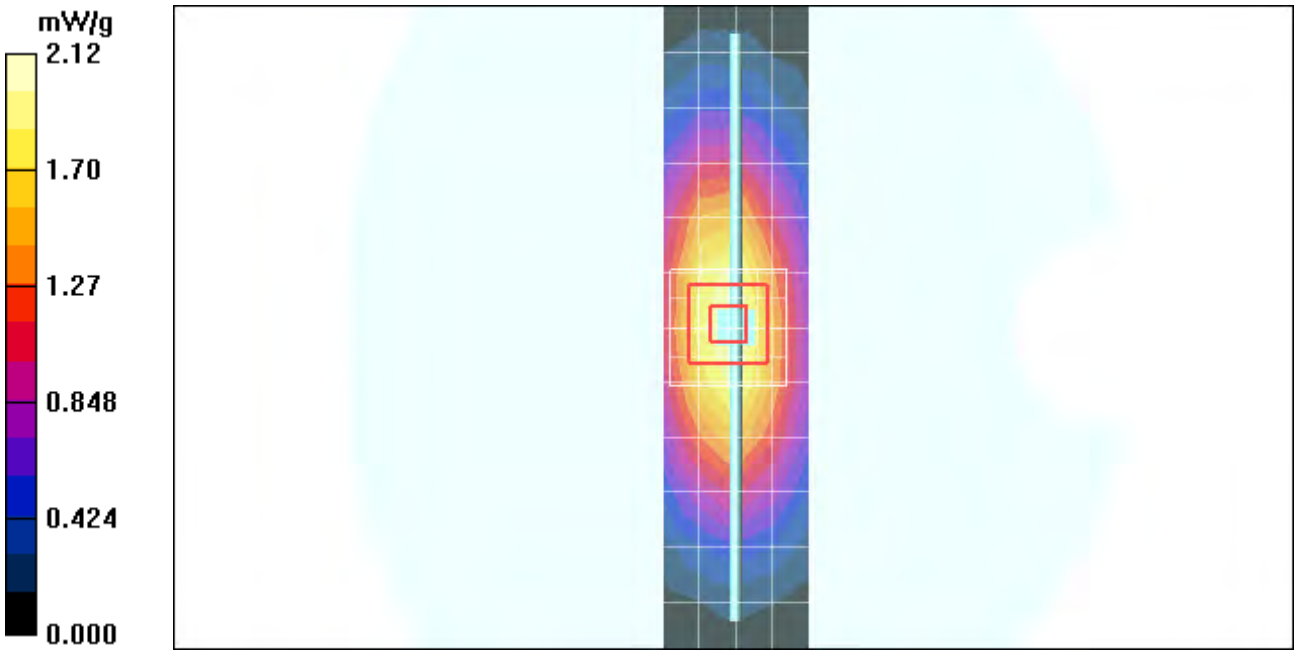
DASY4 Configuration:

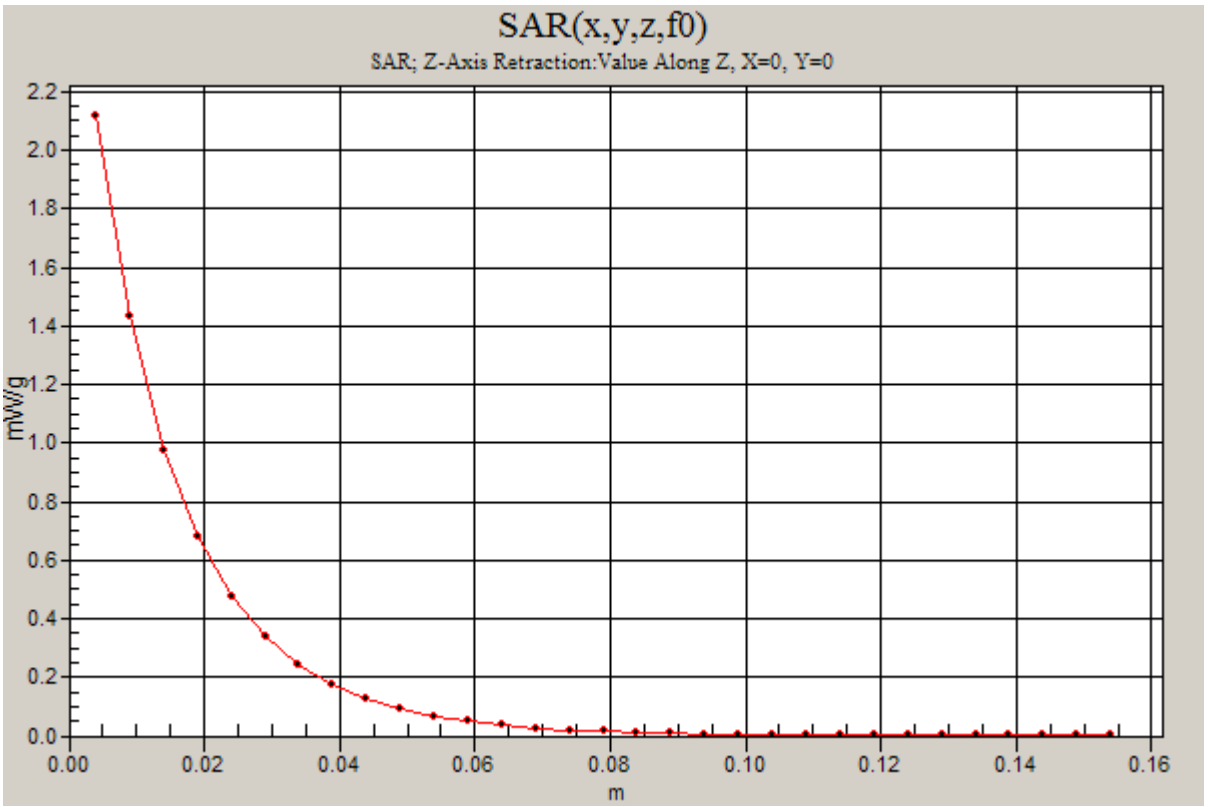
- Probe: ES3DV3 - SN3115; ConvF(5.87, 5.87, 5.87); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 SUGAR SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (5x15x1):
Measurement grid: dx=10mm, dy=15mm; Maximum value of SAR (measured) = 2.09 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 48.9 V/m; Power Drift = -0.005 dB; Peak SAR (extrapolated) = 2.87 W/kg
SAR(1 g) = 1.95 mW/g; SAR(10 g) = 1.28 mW/g; Maximum value of SAR (measured) = 2.12 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):
Measurement grid: dx=20mm, dy=20mm, dz=5mm


mW/g
2.12
1.70
1.27
0.848
0.424
0.000


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date/Time: 1/20/2012 8:47:03 AM

Test Laboratory: Motorola Mobility 835 MHz System Performance Check

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:434tr;
Procedure Notes: PM1 Power =200 mW Refl.Pwr PM3 = -22.67 dB Sim.Temp@SPC = 20.3 Room Temp @ SPC = 22

Communication System: _CW - Dipole; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Validation *HEAD Tissue* ; Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3

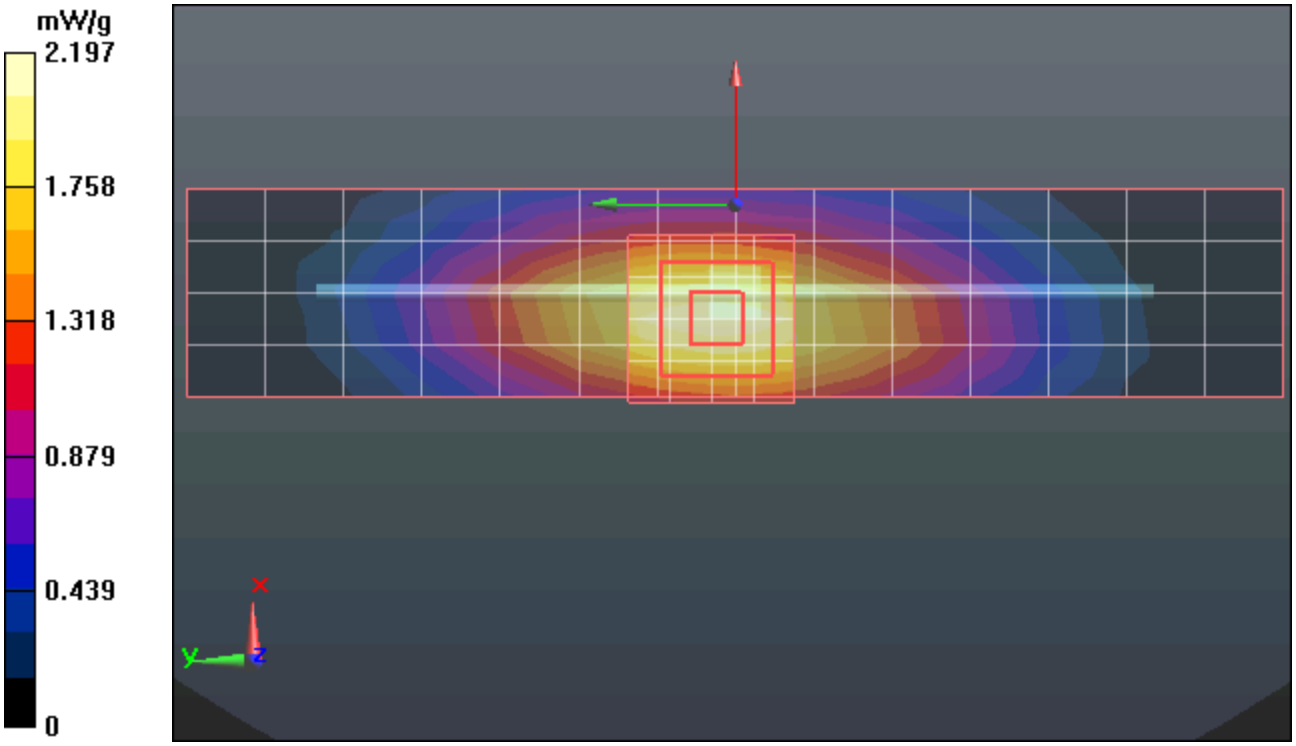
DASY4 Configuration:

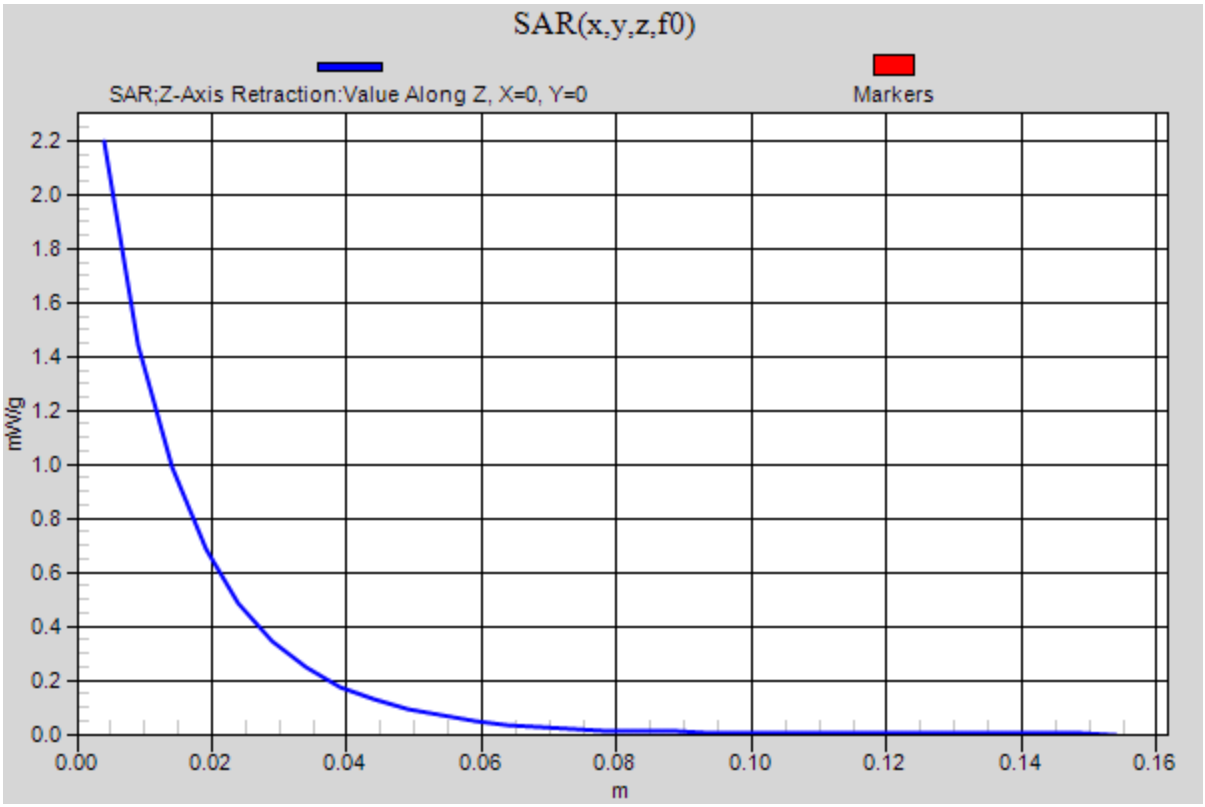
- Probe: ES3DV3 - SN3124; ConvF(6.08, 6.08, 6.08); Calibrated: 8/23/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 8/31/2011
- Phantom: R#1 - Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1156;
- ; SEMCAD X Version 14.4.5 (3634)

DASY5, SAM - System Performance Check Template, Rev.2 (12-Sept-11)/Daily SPC Check/Dipole Area Scan (5x15x1): Measurement grid: dx=10mm, dy=15mm
Maximum value of SAR (measured) = 2.050 mW/g

DASY5, SAM - System Performance Check Template, Rev.2 (12-Sept-11)/Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 48.170 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.067 W/kg
SAR(1 g) = 2.03 mW/g; SAR(10 g) = 1.32 mW/g
Maximum value of SAR (measured) = 2.191 mW/g

DASY5, SAM - System Performance Check Template, Rev.2 (12-Sept-11)/Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 2.197 mW/g


mW/g
2.197
1.758
1.318
0.879
0.439
0
X
Y
Z


SAR(x,y,z,f0)
SAR;Z-Axis Retraction:Value Along Z, X=0, Y=0
Markers
mW/g
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 8/23/2011 8:30:56 PM

Test Laboratory: Motorola - Aug-23-2011 1800 MHz Head

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 259TR; FCC ID: IHDP56ME5
Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 259TR; Input Power = 200 mW
Sim.Temp@meas = 18.6*C; Sim.Temp@SPC = 18.2*C; Room Temp @ SPC = 20.4*C
Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: Validation *HEAD Tissue*
Medium parameters used: f = 1800 MHz; σ = 1.38 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3

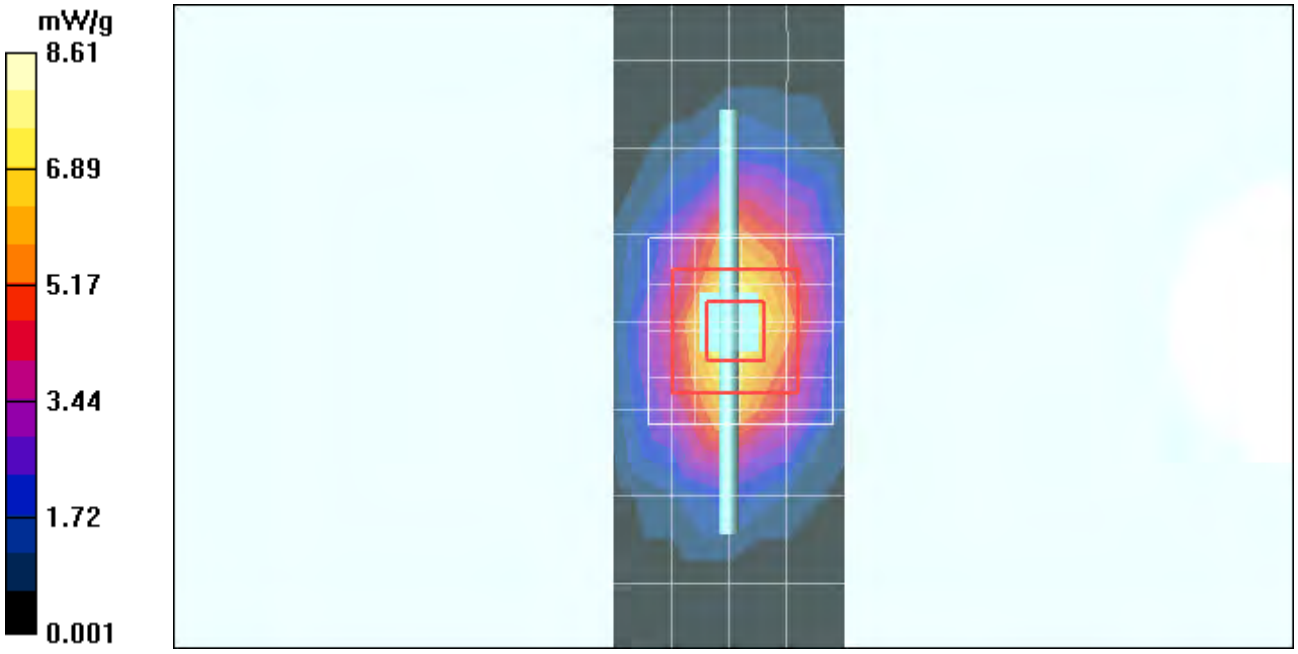
DASY4 Configuration:

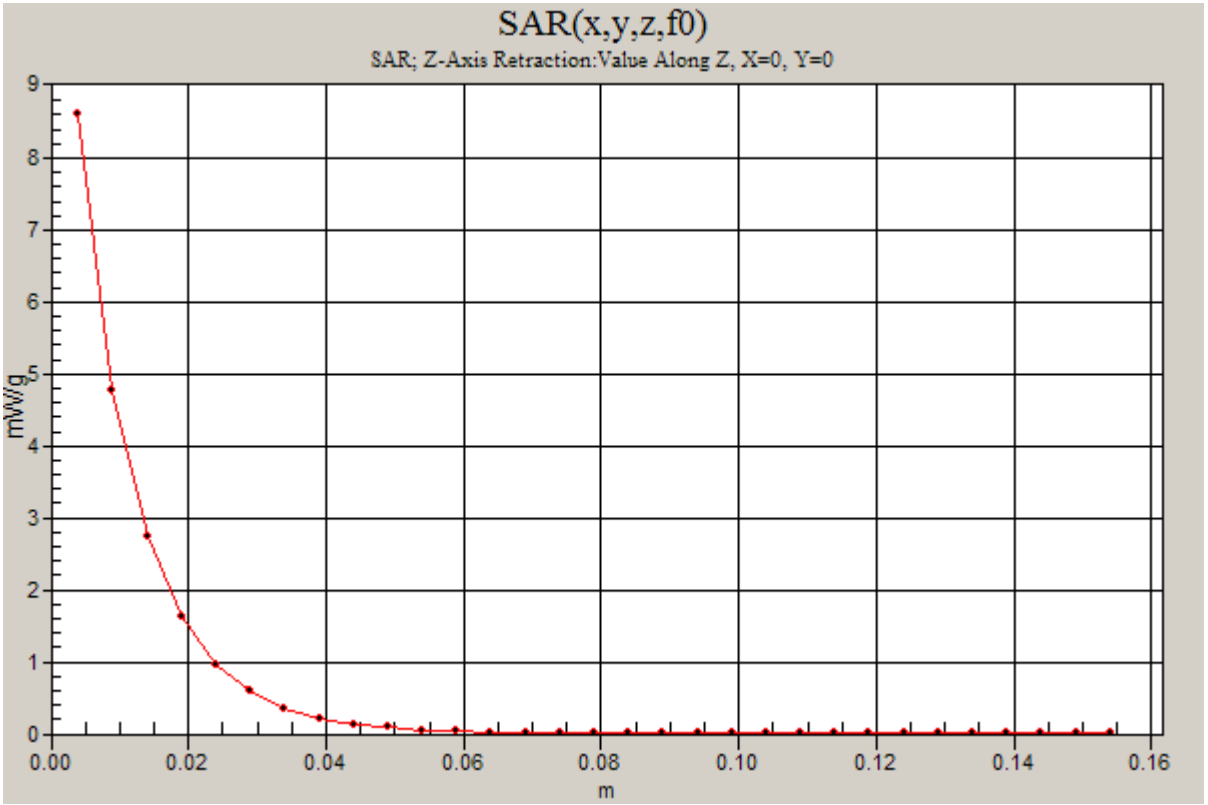
- Probe: ES3DV3 - SN3184; ConvF(5.11, 5.11, 5.11); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1136;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (5x15x1):
Measurement grid: dx=10mm, dy=15mm; Maximum value of SAR (measured) = 8.54 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 79.6 V/m; Power Drift = -0.034 dB; Peak SAR (extrapolated) = 14.3 W/kg
SAR(1 g) = 7.69 mW/g; SAR(10 g) = 4.02 mW/g; Maximum value of SAR (measured) = 8.62 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):
Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.61 mW/g


mW/g
8.61
6.89
5.17
3.44
1.72
0.001


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
0
1
2
3
4
5
6
7
8
9
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date/Time: 8/24/2011 3:22:22 PM

Test Laboratory: Motorola - Aug-24-2011 1800 MHz Head

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 259TR; FCC ID: IHDP56ME5
Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 259TR; Input Power = 200 mW
Sim.Temp@meas = 19.1*C; Sim.Temp@SPC = 19.3*C; Room Temp @ SPC = 21.0*C
Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: Validation *HEAD Tissue*
Medium parameters used: f = 1800 MHz; σ = 1.38 mho/m; ε_r = 39.9; ρ = 1000 kg/m^3

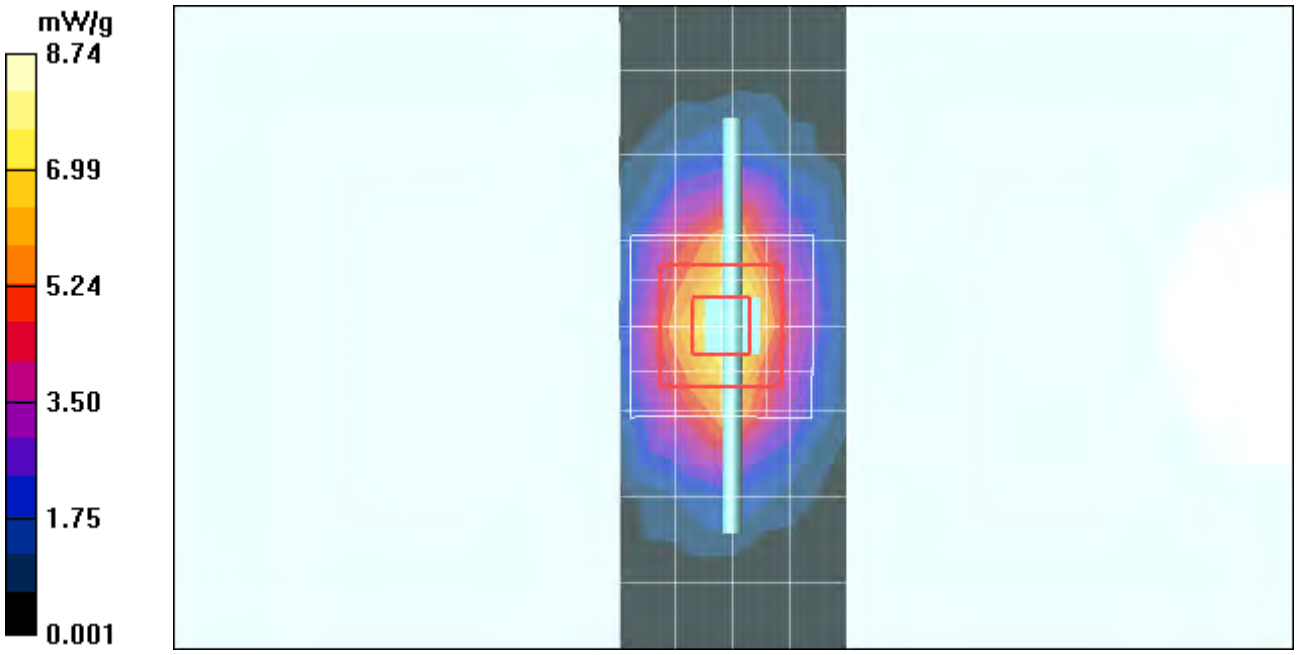
DASY4 Configuration:

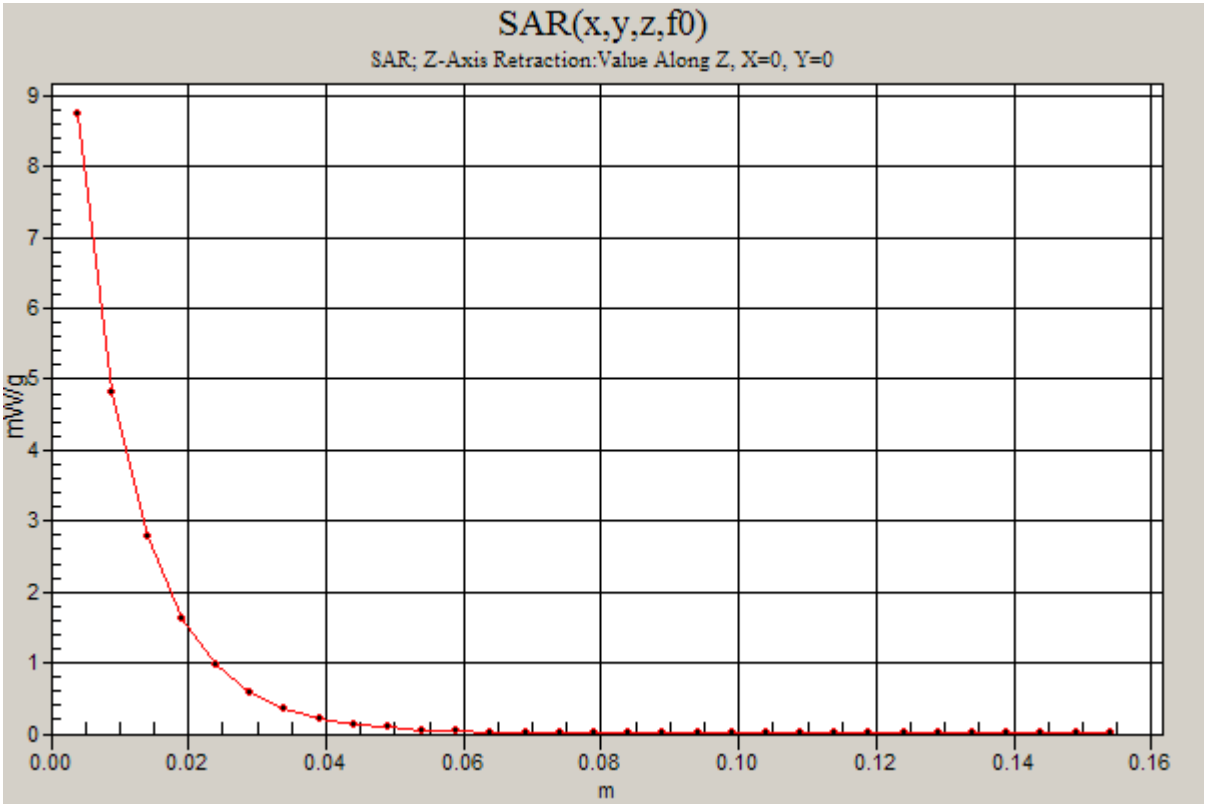
- Probe: ES3DV3 - SN3184; ConvF(5.11, 5.11, 5.11); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1136;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (5x15x1):
Measurement grid: dx=10mm, dy=15mm; Maximum value of SAR (measured) = 8.58 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 79.8 V/m; Power Drift = 0.001 dB; Peak SAR (extrapolated) = 14.5 W/kg
SAR(1 g) = 7.77 mW/g; SAR(10 g) = 4.06 mW/g; Maximum value of SAR (measured) = 8.71 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):
Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.74 mW/g


mW/g
8.74
6.99
5.24
3.50
1.75
0.001


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
0
1
2
3
4
5
6
7
8
9
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date/Time: 9/2/2011 7:03:01 AM

Test Laboratory: Motorola - Sep-02-2011 1800 MHz Head

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 259TR; FCC ID: IHDP56ME5
Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 259TR; Input Power = 200 mW
Sim.Temp@meas = 19.0□C; Sim.Temp@SPC = 19.0□C; Room Temp @ SPC = 20.8□C
Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: Validation *HEAD Tissue*
Medium parameters used: f = 1800 MHz; σ = 1.37 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3

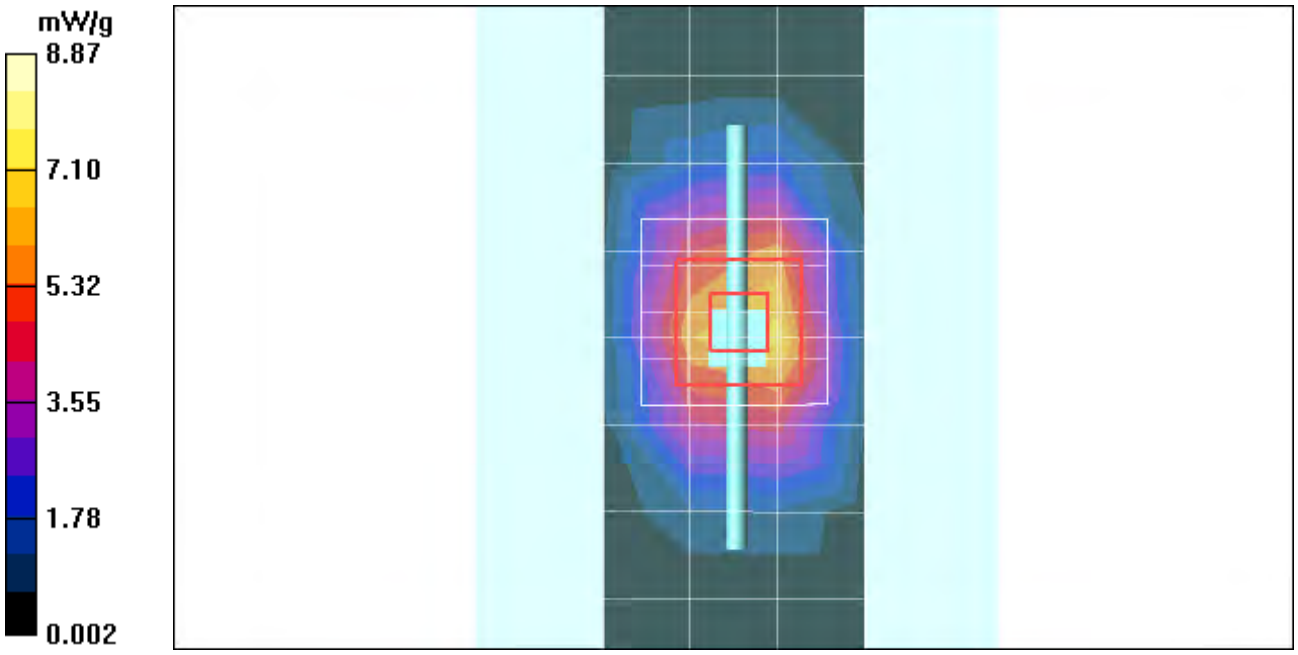
DASY4 Configuration:

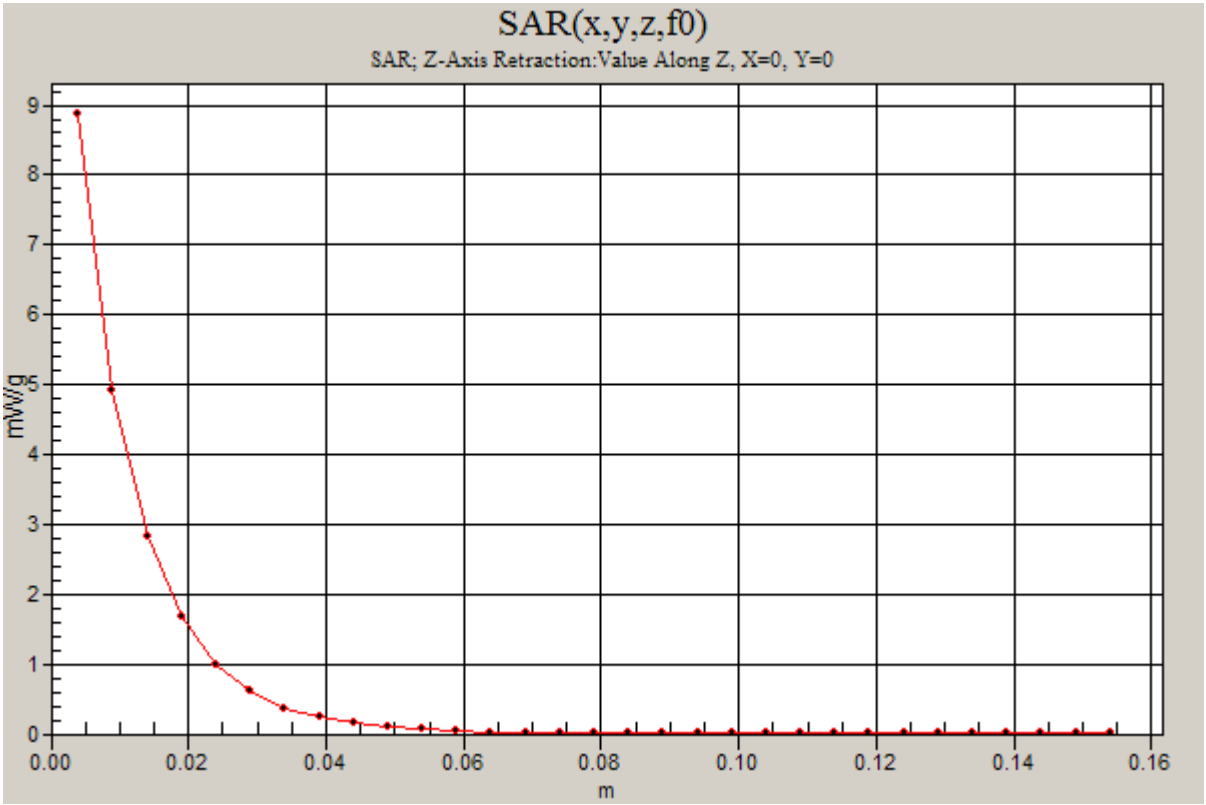
- Probe: ES3DV3 - SN3184; ConvF(5.11, 5.11, 5.11); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2_ Section 1, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (9x4x1):
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 6.80 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 81.4 V/m; Power Drift = -0.004 dB; Peak SAR (extrapolated) = 14.6 W/kg
SAR(1 g) = 7.95 mW/g; SAR(10 g) = 4.18 mW/g; Maximum value of SAR (measured) = 8.79 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):
Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.87 mW/g


mW/g
8.87
7.10
5.32
3.55
1.78
0.002


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
0
1
2
3
4
5
6
7
8
9
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date/Time: 10/19/2011 8:46:49 AM

Test Laboratory: Motorola Mobility 2450 MHz System Performance Check

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:863
Procedure Notes: PM1 Power = 200 mW Refl.Pwr PM3 = -19dB Sim.Temp@SPC = 20.5ºC Room Temp @ SPC = 21.5ºC
Communication System: CW - Dipole; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: Validation *HEAD Tissue* ; Medium parameters used: f = 2450 MHz; σ = 1.86 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3

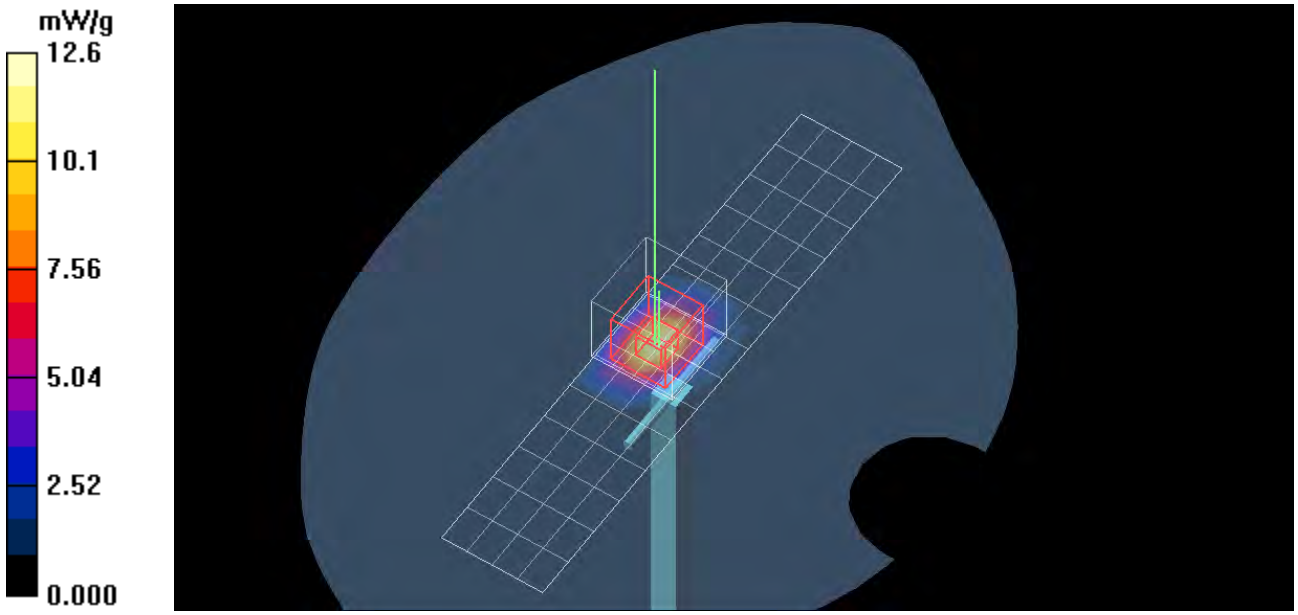
DASY4 Configuration:

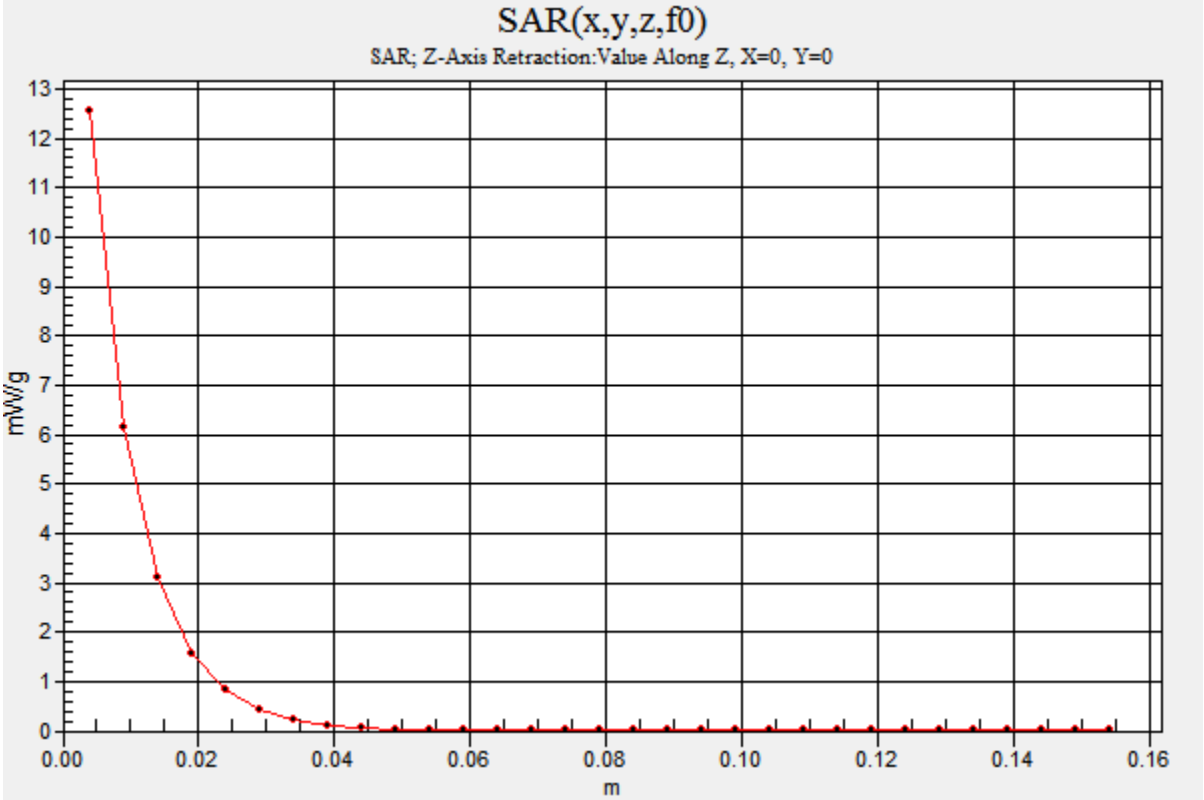
- Probe: ES3DV3 - SN3115; ConvF(4.39, 4.39, 4.39); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (5x15x1): Measurement grid: dx=10mm, dy=15mm
Maximum value of SAR (measured) = 11.1 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 73.5 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 24.2 W/kg
SAR(1 g) = 11.3 mW/g; SAR(10 g) = 5.17 mW/g
Maximum value of SAR (measured) = 12.7 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 12.6 mW/g




SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
0
1
2
3
4
5
6
7
8
9
10
11
12
13
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

System Accuracy Verification Measurements for Body SAR Measurements

Date/Time: 9/9/2011 9:10:57 AM

Test Laboratory: Motorola - Sep-09-2011 835 MHz Body

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 422TR; FCC ID: IHDP56ME5
Procedure Notes: 835 MHz System Performance Check; Dipole Sn# 422TR; Input Power = 200 mW
Sim.Temp@meas = 20.7□C; Sim.Temp@SPC = 19.7□C; Room Temp @ SPC = 21.2□C
Communication System: CW - Dipole; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Validation *BODY Tissue*
Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3

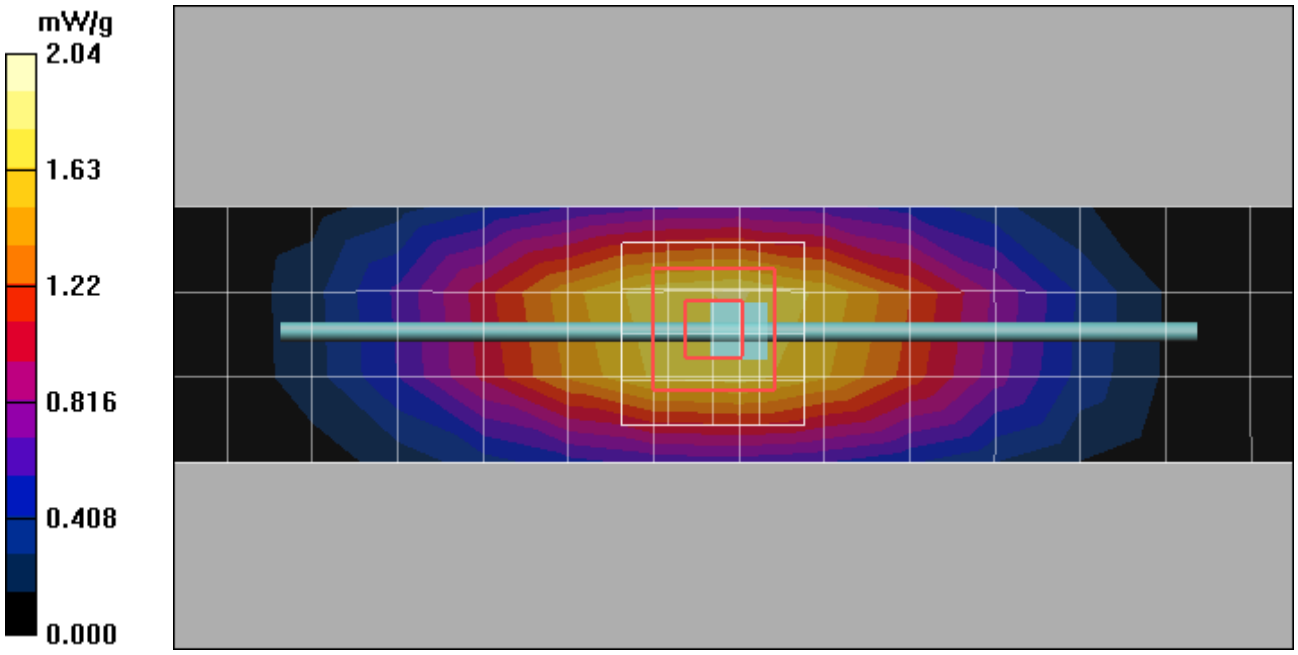
DASY4 Configuration:

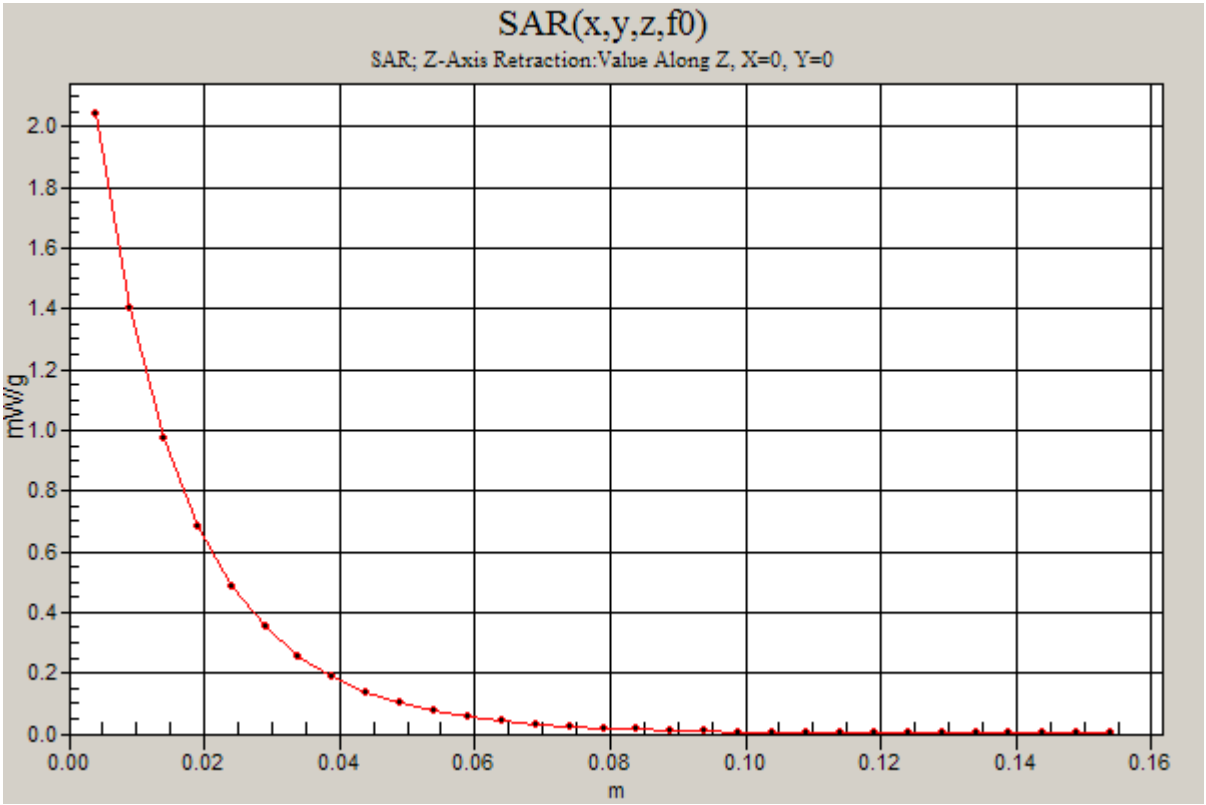
- Probe: ES3DV3 - SN3115; ConvF(5.88, 5.88, 5.88); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#_6 - Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: N/A;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x15x1):
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.79 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 46.4 V/m; Power Drift = -0.117 dB; Peak SAR (extrapolated) = 2.73 W/kg
SAR(1 g) = 1.9 mW/g; SAR(10 g) = 1.25 mW/g; Maximum value of SAR (measured) = 2.05 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):
Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.04 mW/g


mW/g
2.04
1.63
1.22
0.816
0.408
0.000


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 9/17/2011 5:35:07 AM

Test Laboratory: Motorola - Sep-17-2011 835 MHz Body

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 422TR; FCC ID: IHDP56ME5
Procedure Notes: 835 MHz System Performance Check; Dipole Sn# 422TR; Input Power = 200 mW
Sim.Temp@meas = 20.2□C; Sim.Temp@SPC = 20.2□C; Room Temp @ SPC = 21.1□C
Communication System: CW - Dipole; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Validation *BODY Tissue*
Medium parameters used: f = 835 MHz; σ = 0.97 mho/m; ε_r = 55.3; ρ = 1000 kg/m^3

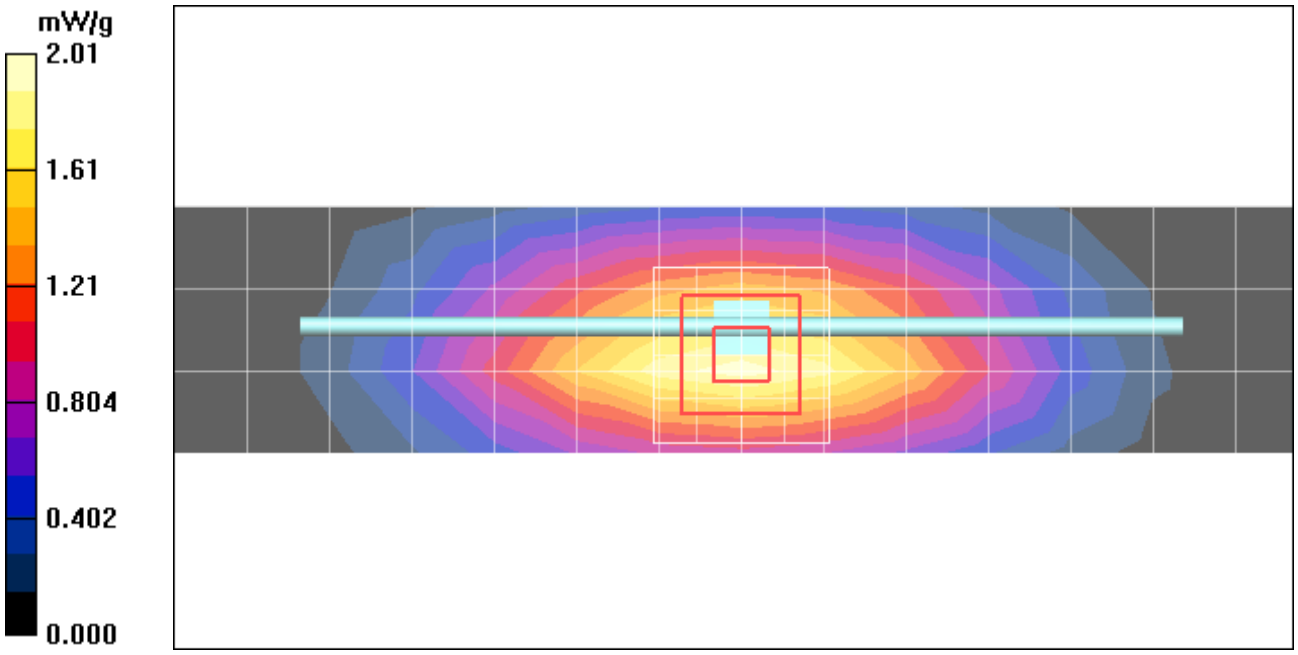
DASY4 Configuration:

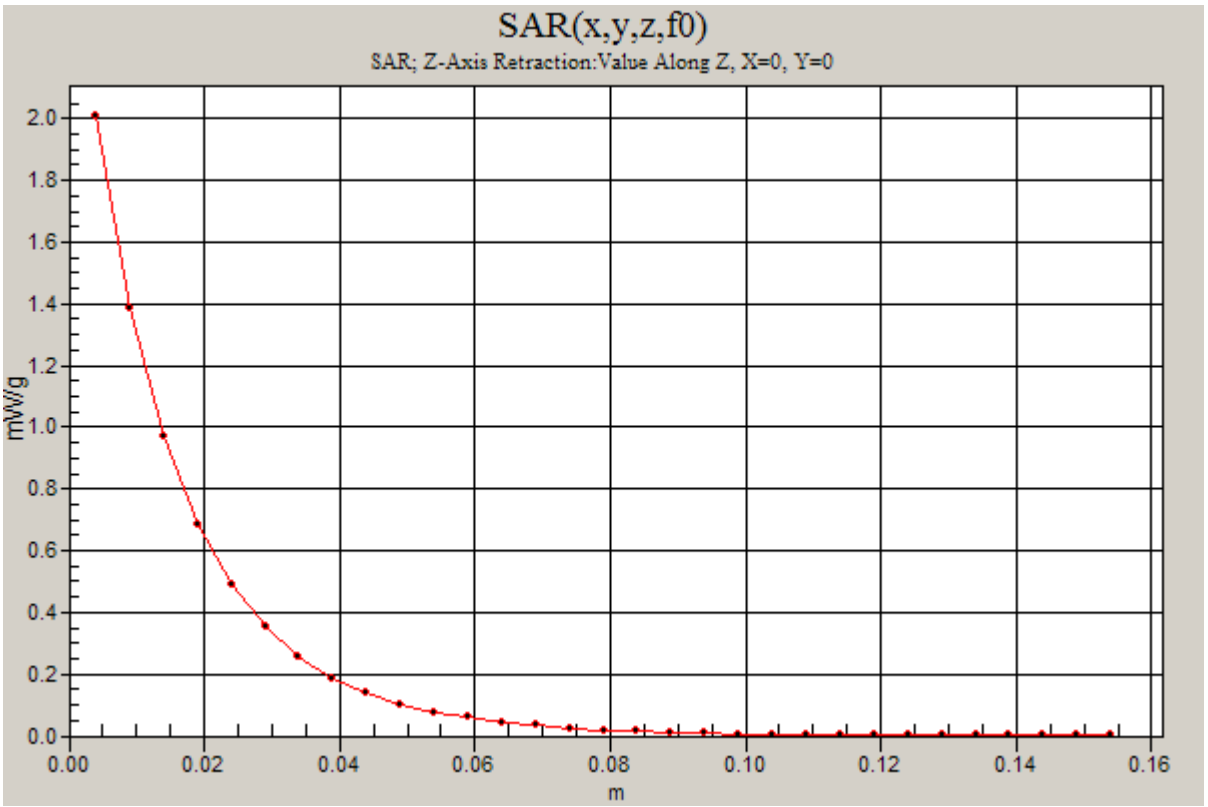
- Probe: ES3DV3 - SN3115; ConvF(5.88, 5.88, 5.88); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#6 - Triple Flat Phantom 5.1C (rev.2); Type: QD 000 P51 CA; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x15x1):
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.95 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 45.0 V/m; Power Drift = -0.018 dB; Peak SAR (extrapolated) = 2.68 W/kg
SAR(1 g) = 1.86 mW/g; SAR(10 g) = 1.23 mW/g; Maximum value of SAR (measured) = 2.01 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):
Measurement grid: dx=20mm, dy=20mm, dz=5mm


mW/g
2.01
1.61
1.21
0.804
0.402
0.000


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 10/24/2011 3:39:40 PM

Test Laboratory: Motorola Mobility 835 MHz System Performance Check

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:420
Procedure Notes: PM1 Power = 200 mW Refl.Pwr PM3 = -19.7dB Sim.Temp@SPC = 20.5ºC Room Temp @ SPC = 21.7ºC
Communication System: CW - Dipole; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: BIG BODY Low Freq Body; Medium parameters used: f = 835 MHz; σ = 0.97 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3

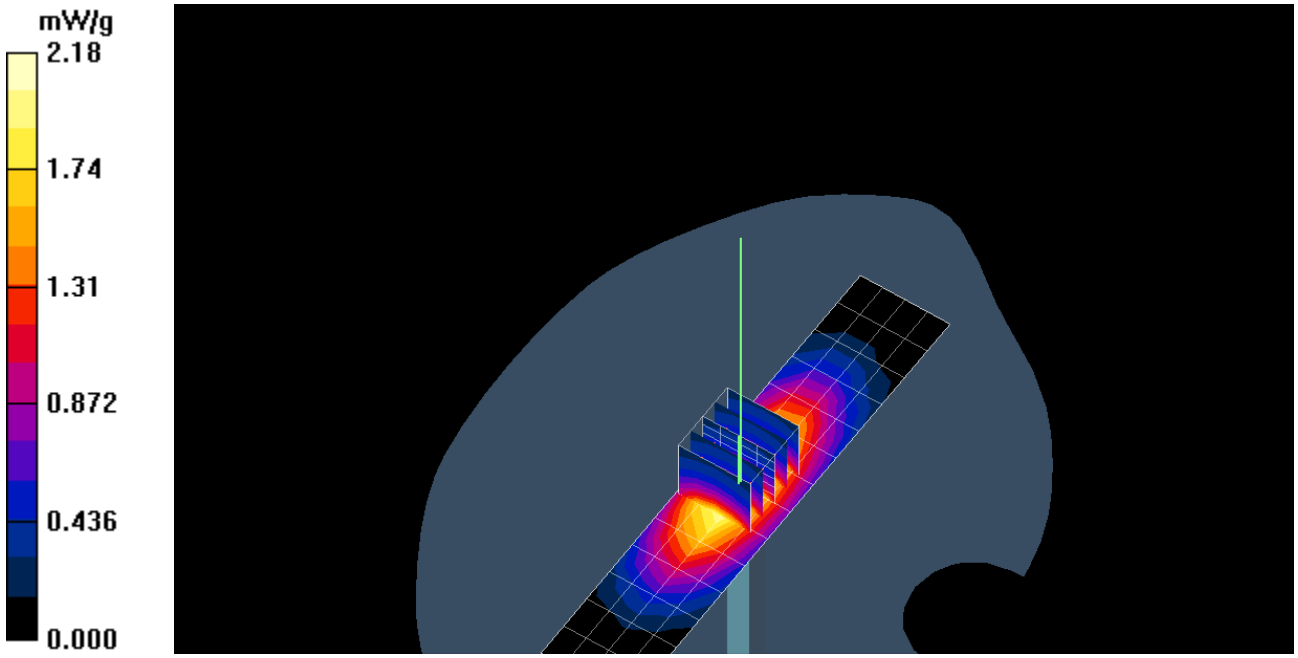
DASY4 Configuration:

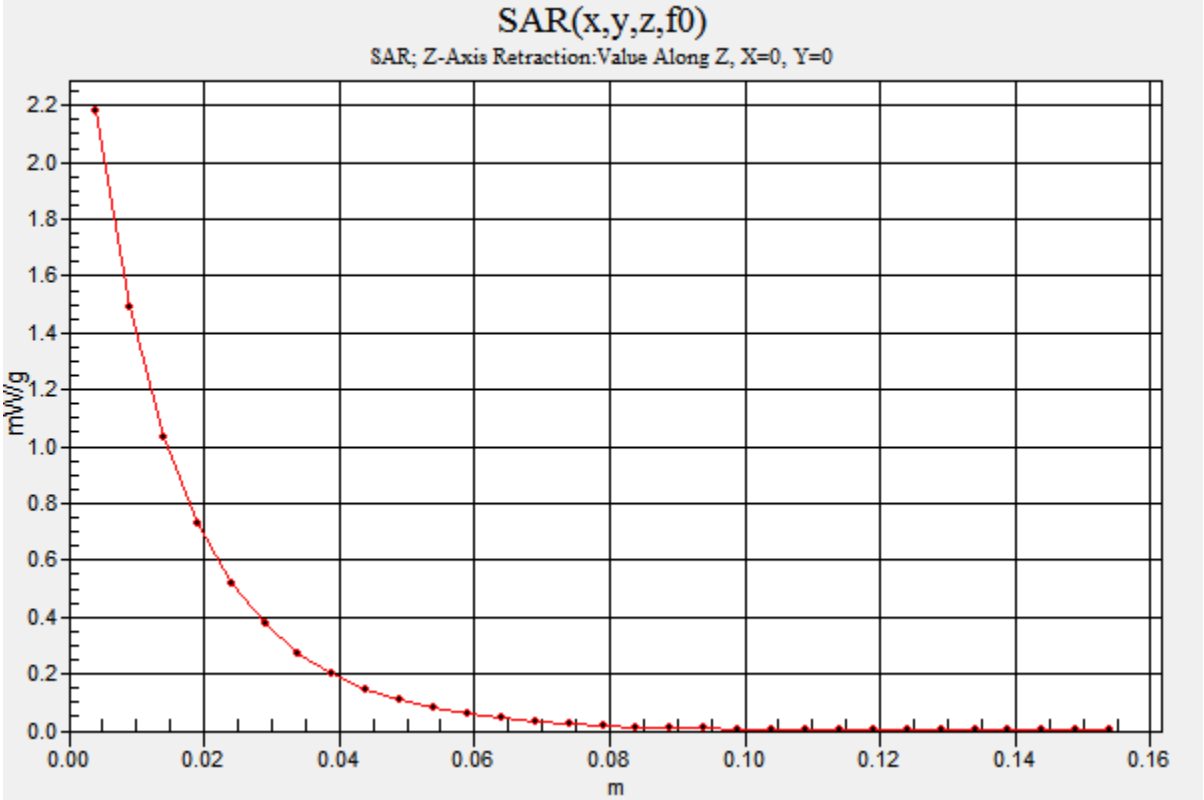
- Probe: ES3DV3 - SN3115; ConvF(5.88, 5.88, 5.88); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (5x15x1): Measurement grid: dx=10mm, dy=15mm
Maximum value of SAR (measured) = 2.19 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 48.8 V/m; Power Drift = -0.188 dB
Peak SAR (extrapolated) = 2.93 W/kg
SAR(1 g) = 2.02 mW/g; SAR(10 g) = 1.33 mW/g
Maximum value of SAR (measured) = 2.18 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm




SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 1/9/2012 10:14:27 AM

Test Laboratory: Motorola Mobility 835 MHz System Performance Check

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:434
Procedure Notes: PM1 Power = 200 mW Refl.Pwr PM3 = -22.30 dB Sim.Temp@SPC = 20.9 Room Temp @ SPC = 21.8
Communication System: _CW - Dipole; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: Validation *BODY Tissue* ; Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3

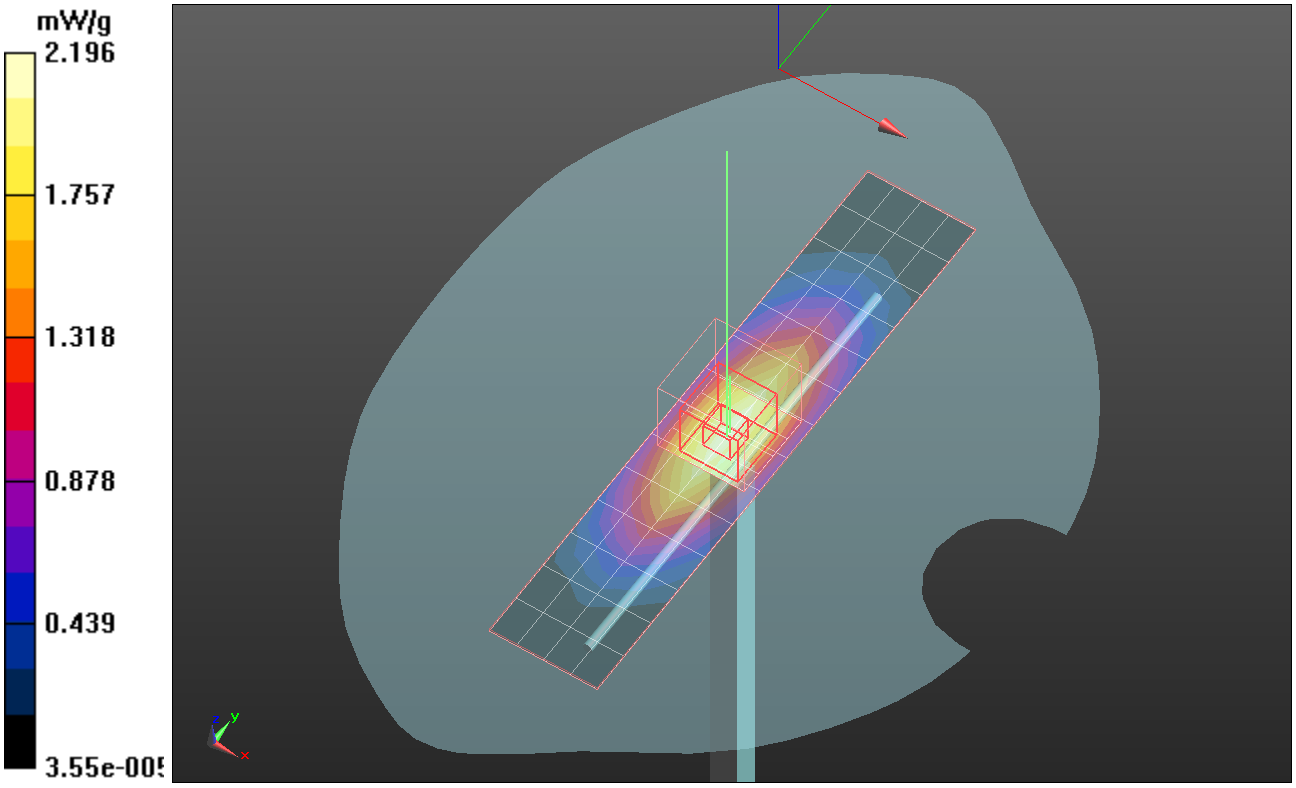
DASY4 Configuration:

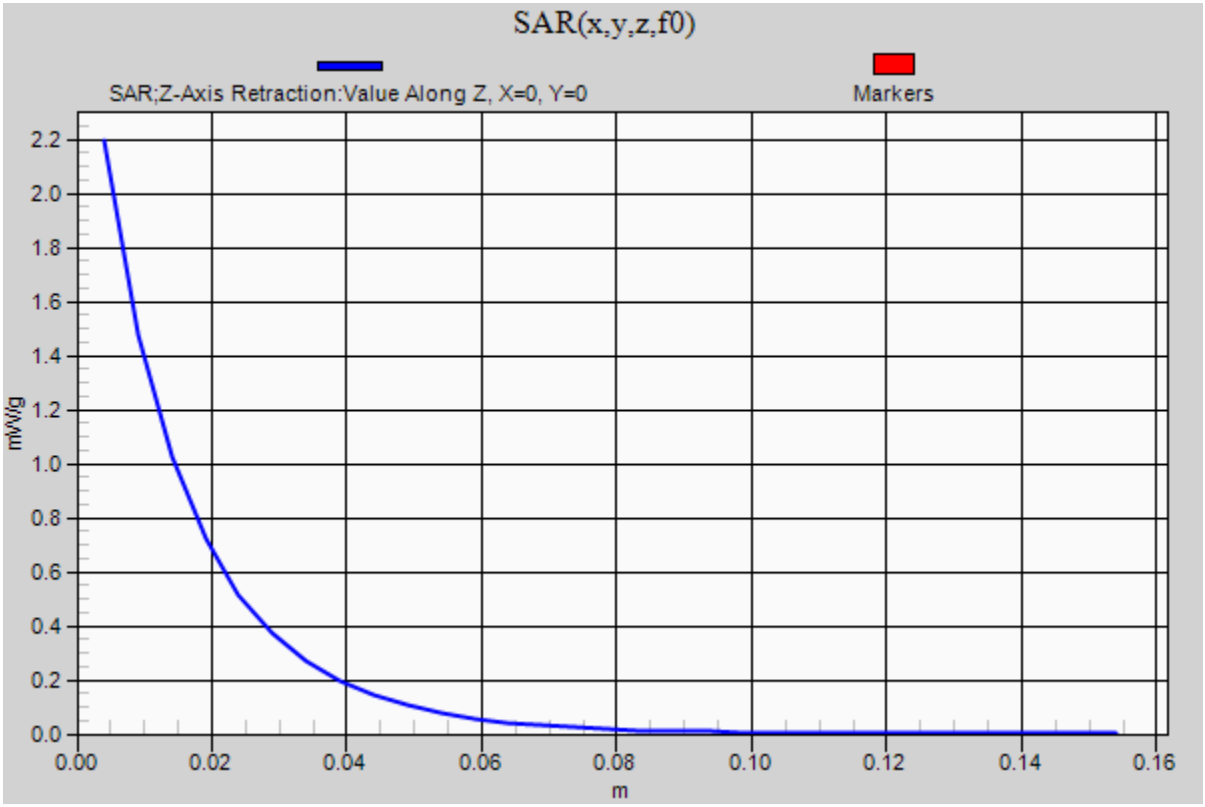
- Probe: ES3DV3 - SN3124; ConvF(6.04, 6.04, 6.04); Calibrated: 8/23/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 8/31/2011
- Phantom: R#1 - Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1319;
- SEMCAD X Version 14.4.5 (3634)

DASY5, SAM - System Performance Check Template, Rev.2 (12-Sept-11)/Daily SPC Check/Dipole Area Scan (5x15x1): Measurement grid: dx=10mm, dy=15mm
Maximum value of SAR (measured) = 2.173 mW/g

DASY5, SAM - System Performance Check Template, Rev.2 (12-Sept-11)/Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 47.532 V/m; Power Drift = 0.0091 dB
Peak SAR (extrapolated) = 3.029 W/kg
SAR(1 g) = 2.02 mW/g; SAR(10 g) = 1.32 mW/g
Maximum value of SAR (measured) = 2.181 mW/g

DASY5, SAM - System Performance Check Template, Rev.2 (12-Sept-11)/Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 2.196 mW/g


mW/g
2.196
1.757
1.318
0.878
0.439
3.55e-005


SAR(x,y,z,f0)
SAR;Z-Axis Retraction:Value Along Z, X=0, Y=0
Markers
mW/g
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 1/20/2012 5:21:06 PM

Test Laboratory: Motorola Mobility 835 MHz System Performance Check

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:434;
Procedure Notes: PM1 Power = 200 mW Refl.Pwr PM3 = -22.49 dB Sim.Temp@SPC = 20.5 Room Temp @ SPC = 21.8

Communication System: _CW - Dipole; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Validation *BODY Tissue* ; Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3

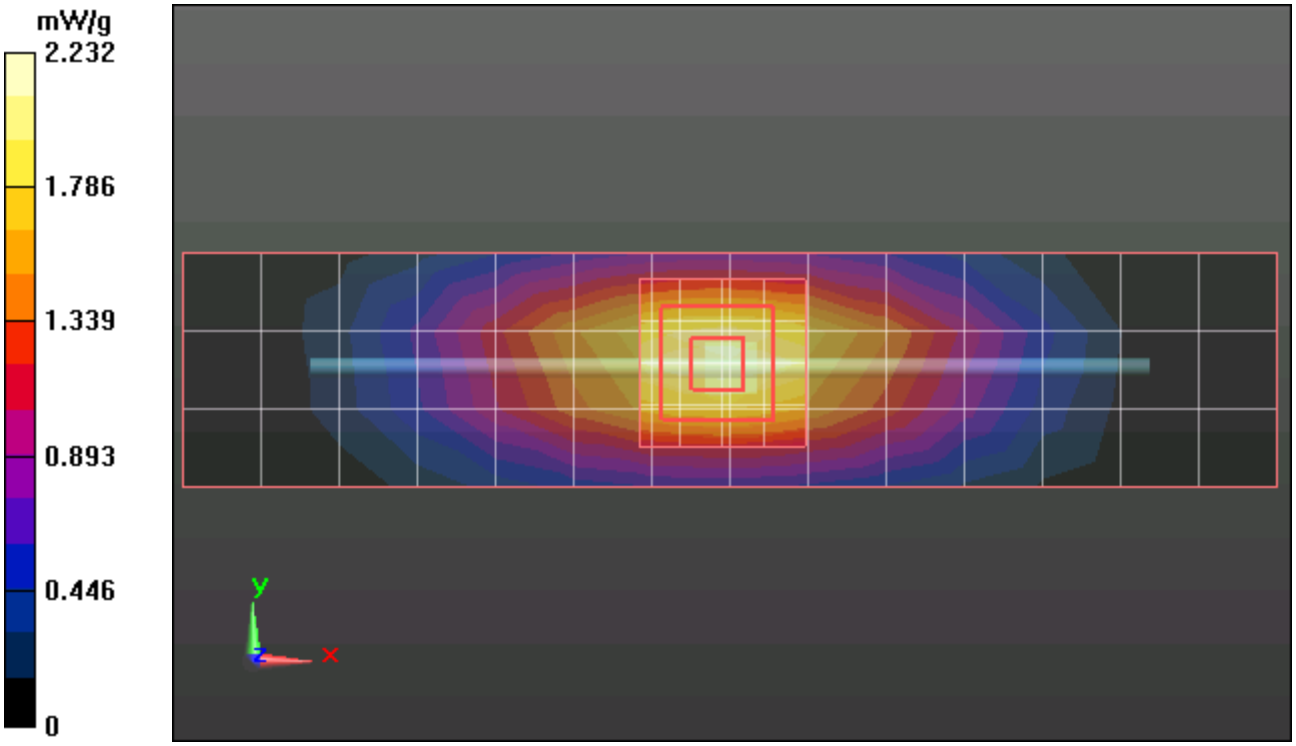
DASY4 Configuration:

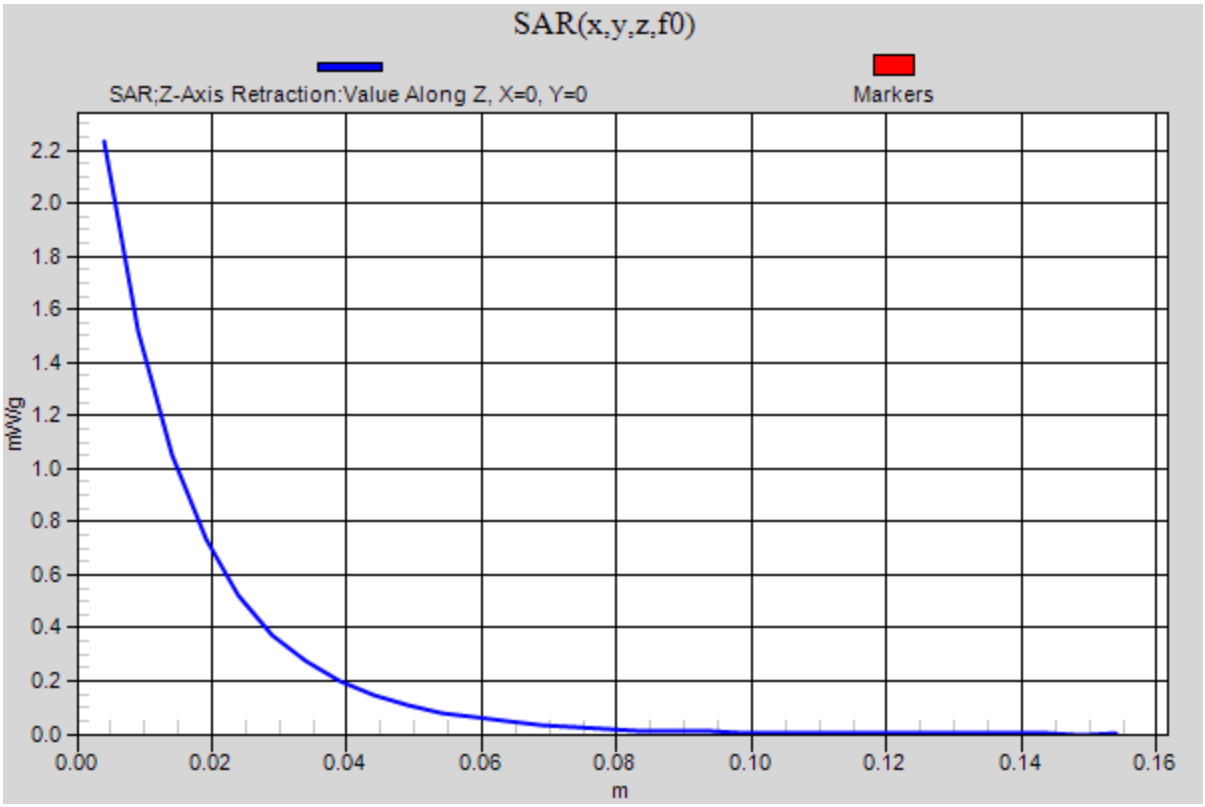
- Probe: ES3DV3 - SN3124; ConvF(6.04, 6.04, 6.04); Calibrated: 8/23/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 8/31/2011
- Phantom: R#-1, Triple Flat Phantom 5.1C (Rev.3); Type: QD 000 P51 CA; Serial: n/a;
- ; SEMCAD X Version 14.4.5 (3634)

DASY5, Triple Flat System Performance Check Template - Rev.3 (19-Sept-11)/Daily SPC Check/Dipole Area Scan (4x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.023 mW/g

DASY5, Triple Flat System Performance Check Template - Rev.3 (19-Sept-11)/Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 47.874 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.061 W/kg
SAR(1 g) = 2.07 mW/g; SAR(10 g) = 1.36 mW/g
Maximum value of SAR (measured) = 2.230 mW/g

DASY5, Triple Flat System Performance Check Template - Rev.3 (19-Sept-11)/Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 2.232 mW/g


mW/g
2.232
1.786
1.339
0.893
0.446
0
y
x


SAR(x,y,z,f0)
SAR;Z-Axis Retraction:Value Along Z, X=0, Y=0
Markers
mW/g
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 8/25/2011 12:18:05 AM

Test Laboratory: Motorola - Aug-25-2011 1800 MHz Body

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 271TR; FCC ID: IHDP56ME5
Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 271TR; Input Power = 200 mW
Sim.Temp@meas = 19.0*C; Sim.Temp@SPC = 18.5*C; Room Temp @ SPC = 21.2*C
Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: Validation *BODY Tissue*
Medium parameters used: f = 1800 MHz; σ = 1.5 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3

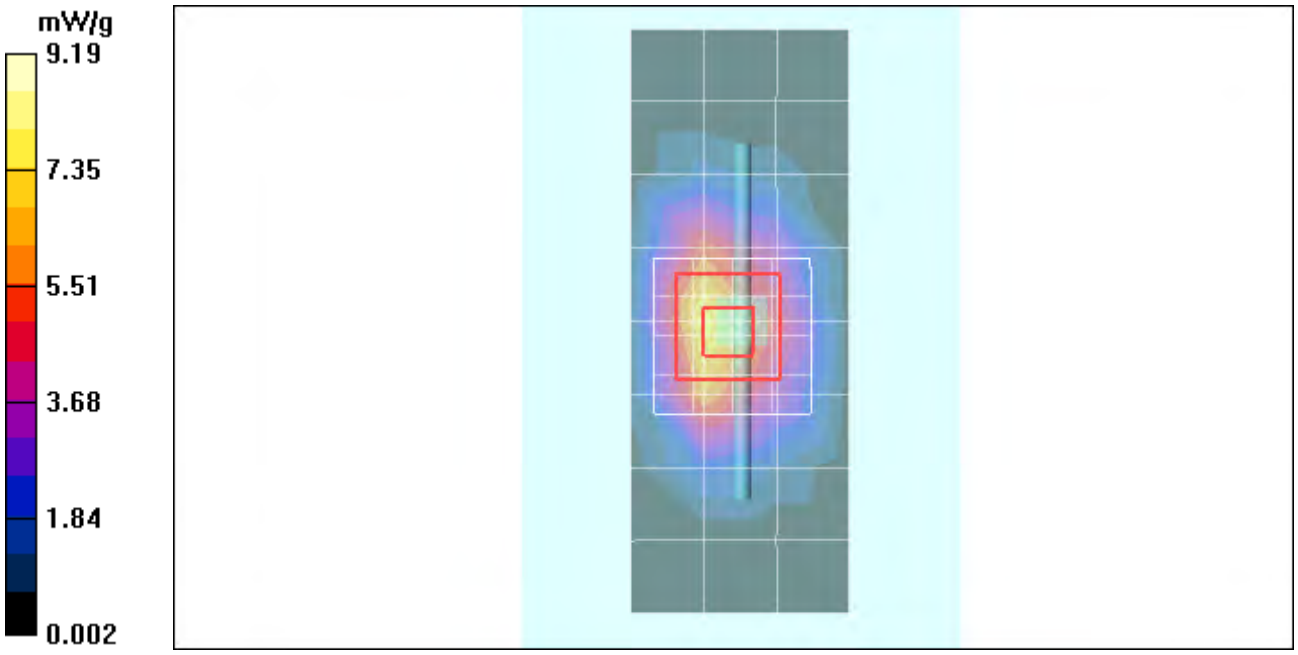
DASY4 Configuration:

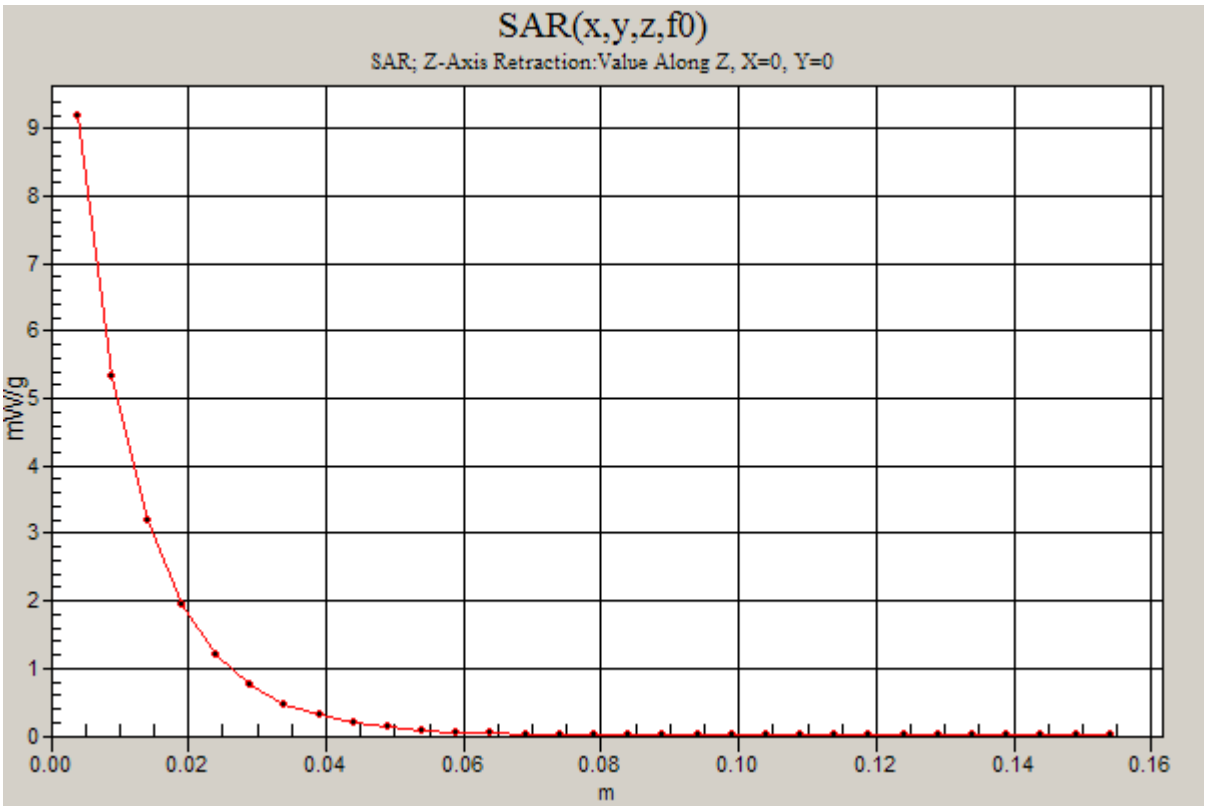
- Probe: ES3DV3 - SN3184; ConvF(4.9, 4.9, 4.9); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2_ Section 1, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (9x4x1):
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 7.73 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 77.2 V/m; Power Drift = -0.002 dB; Peak SAR (extrapolated) = 14.6 W/kg
SAR(1 g) = 8.23 mW/g; SAR(10 g) = 4.36 mW/g; Maximum value of SAR (measured) = 9.21 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):
Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 9.19 mW/g


mW/g
9.19
7.35
5.51
3.68
1.84
0.002


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
0
1
2
3
4
5
6
7
8
9
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date/Time: 9/3/2011 6:33:40 AM

Test Laboratory: Motorola - Sep-03-2011 1800 MHz Body

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 259TR; FCC ID: IHDP56ME5
Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 259TR; Input Power = 200 mW
Sim.Temp@meas = 19.2*C; Sim.Temp@SPC = 19.2*C; Room Temp @ SPC = 21.3*C
Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: Validation *BODY Tissue*
Medium parameters used: f = 1800 MHz; σ = 1.48 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3

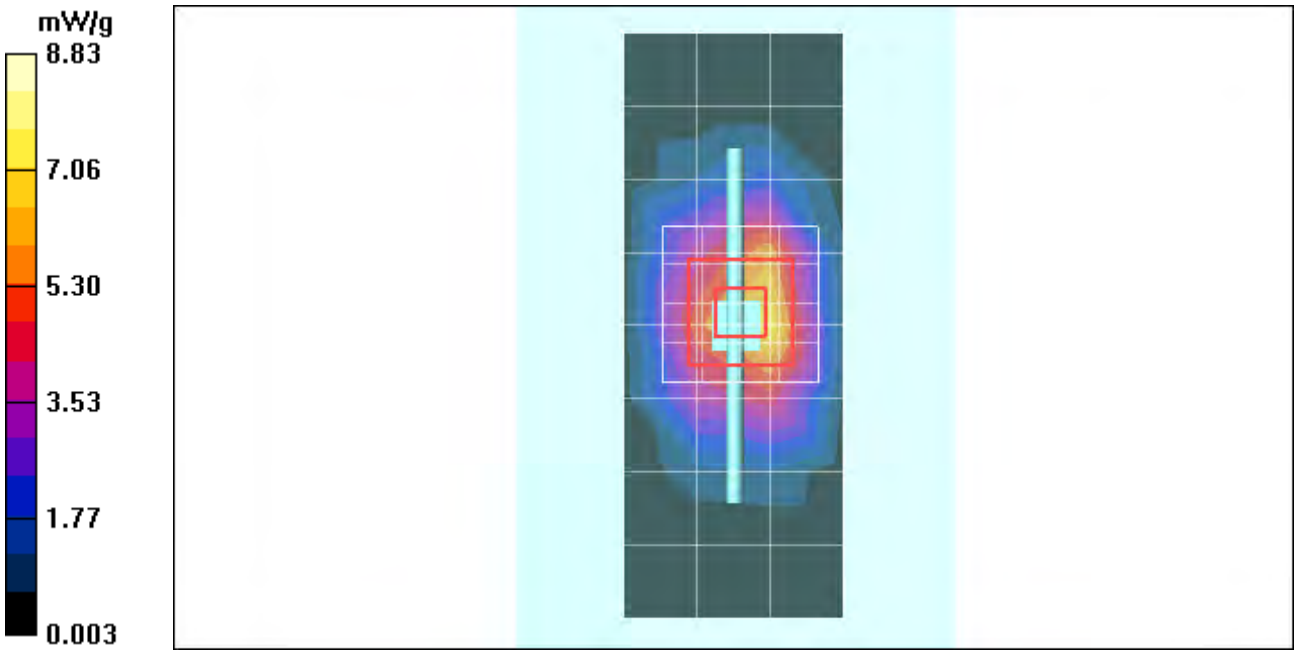
DASY4 Configuration:

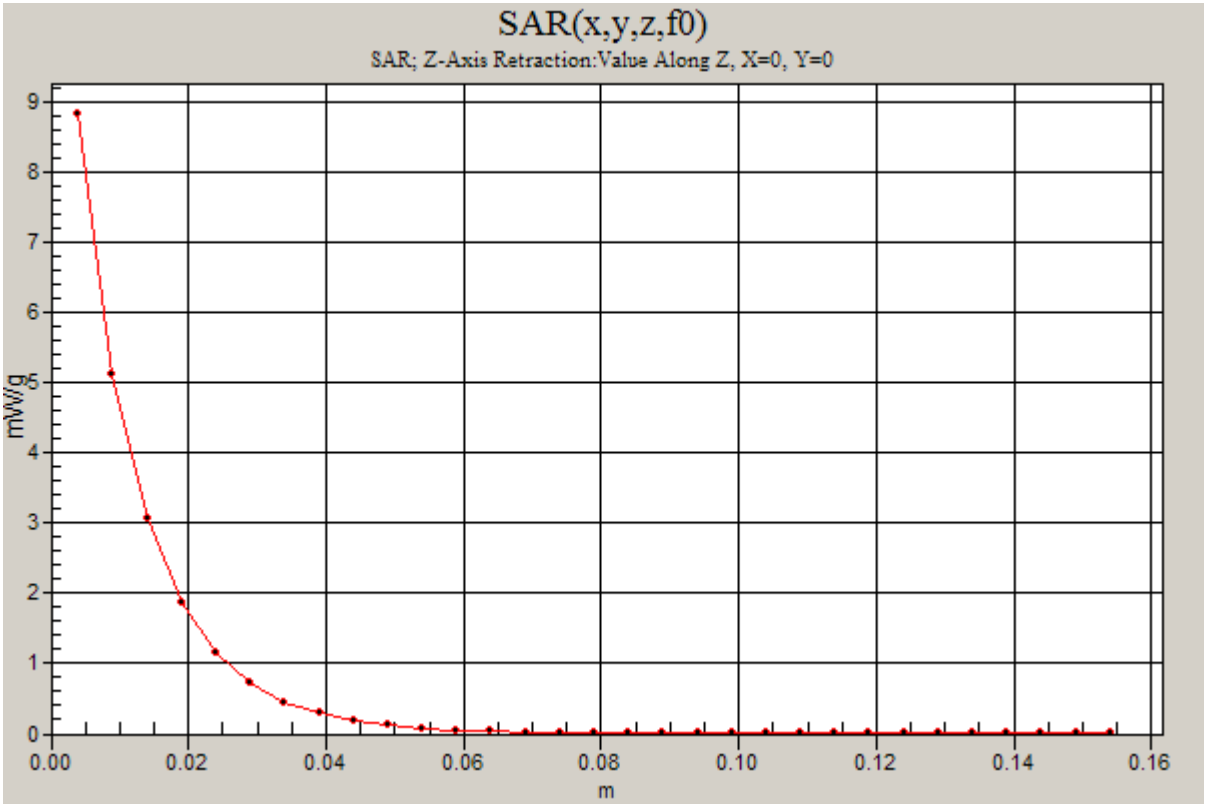
- Probe: ES3DV3 - SN3184; ConvF(4.9, 4.9, 4.9); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2_ Section 1, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (9x4x1):
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 7.04 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 78.4 V/m; Power Drift = 0.004 dB; Peak SAR (extrapolated) = 14.1 W/kg
SAR(1 g) = 7.92 mW/g; SAR(10 g) = 4.2 mW/g; Maximum value of SAR (measured) = 8.89 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):
Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.83 mW/g


mW/g
8.83
7.06
5.30
3.53
1.77
0.003


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
0
1
2
3
4
5
6
7
8
9
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date/Time: 10/24/2011 11:11:02 AM

Test Laboratory: Motorola Mobility 1800 MHz System Performance Check

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:250
Procedure Notes: PM1 Power = 200 mW Refl.Pwr PM3 = -23.7dB Sim.Temp@SPC = 20.6ºC Room Temp @ SPC = 21.2ºC
Communication System: CW - Dipole; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium: Validation *BODY Tissue* ; Medium parameters used: f = 1800 MHz; σ = 1.48 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3

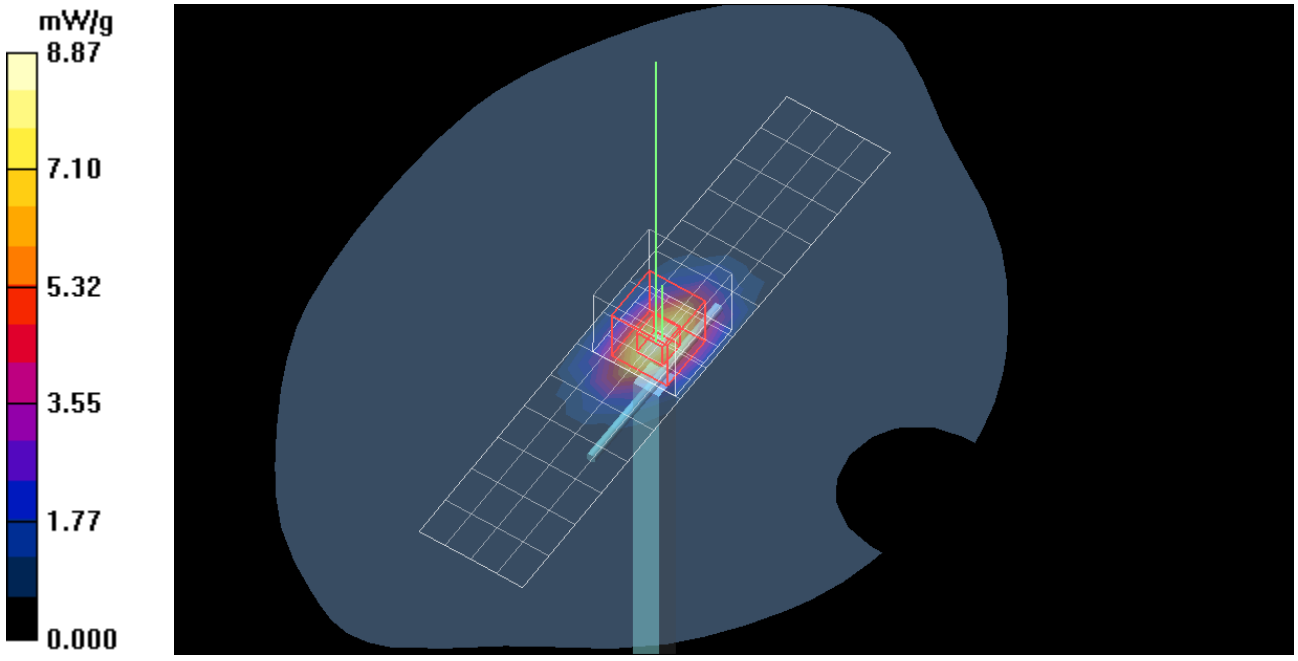
DASY4 Configuration:

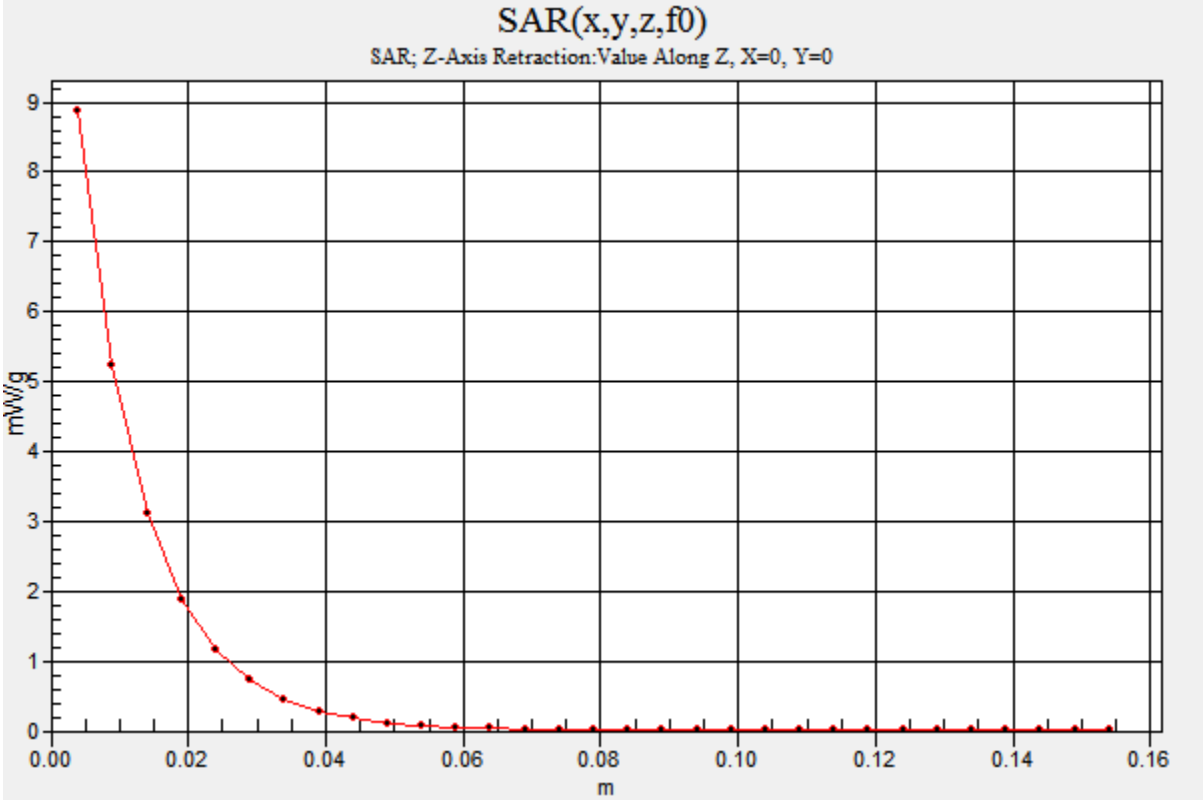
- Probe: ES3DV3 - SN3115; ConvF(4.61, 4.61, 4.61); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (5x15x1): Measurement grid: dx=10mm, dy=15mm
Maximum value of SAR (measured) = 8.78 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 79.5 V/m; Power Drift = -0.032 dB
Peak SAR (extrapolated) = 13.6 W/kg
SAR(1 g) = 7.94 mW/g; SAR(10 g) = 4.24 mW/g
Maximum value of SAR (measured) = 8.93 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 8.87 mW/g




SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
0
1
2
3
4
5
6
7
8
9
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date/Time: 10/17/2011 1:58:27 PM

Test Laboratory: Motorola Mobility 2450 MHz System Performance Check

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:863
Procedure Notes: PM1 Power = 200 mW Refl.Pwr PM3 = -18dB Sim.Temp@SPC = 20.8ºC Room Temp @ SPC = 21.4ºC
Communication System: CW - Dipole; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: Validation *BODY Tissue* ; Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3

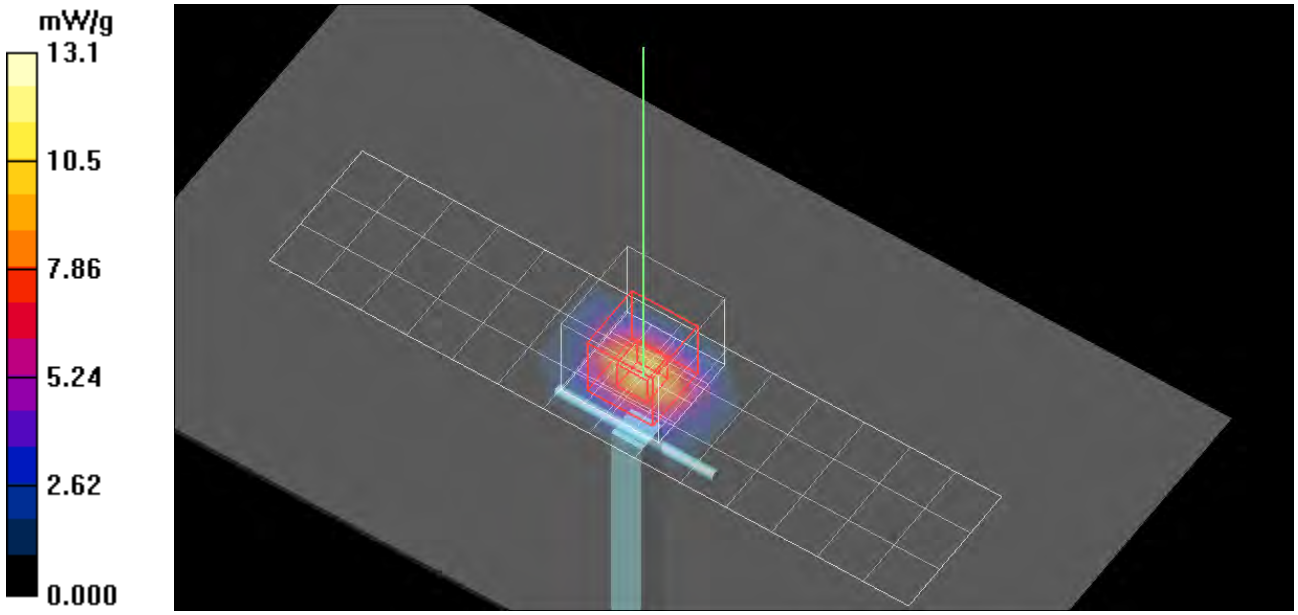
DASY4 Configuration:

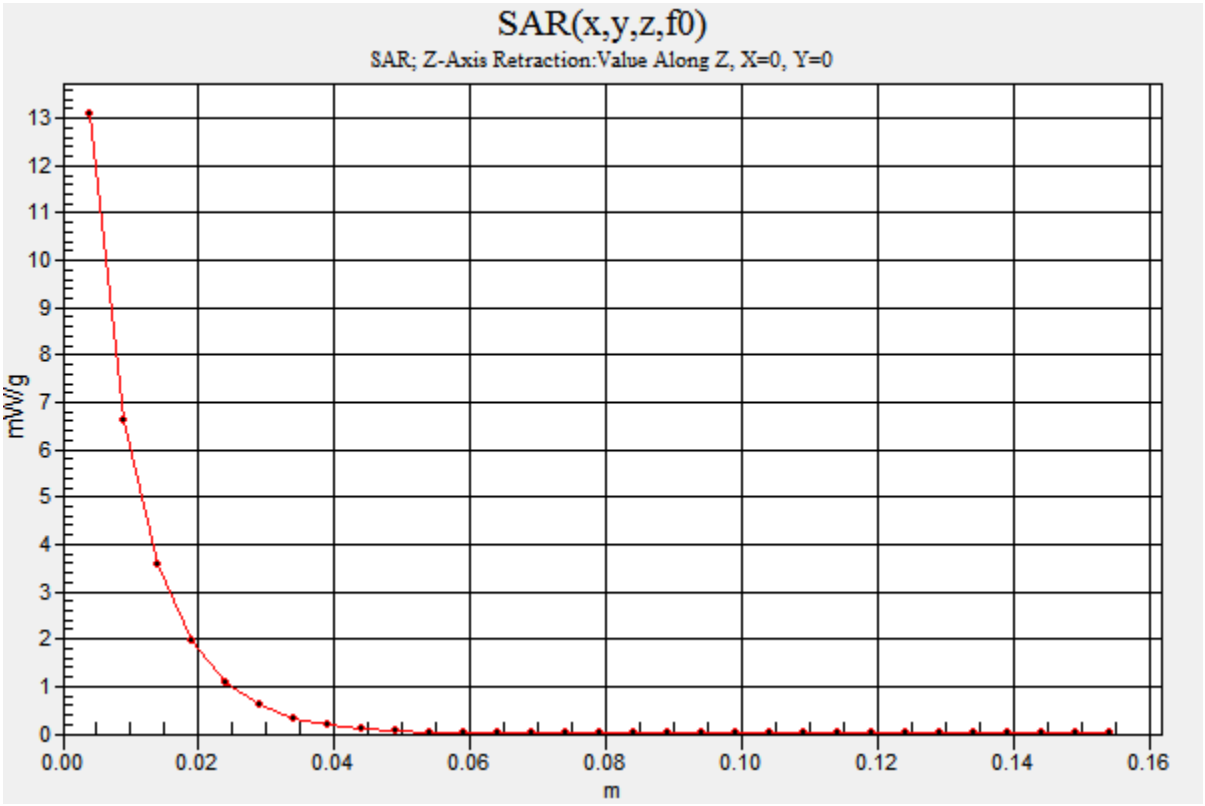
- Probe: ES3DV3 - SN3115; ConvF(4.12, 4.12, 4.12); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6, Triple Flat Phantom 5.1C (Rev.3); Type: QD 000 P51 CA; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 10.2 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 81.1 V/m; Power Drift = -0.041 dB
Peak SAR (extrapolated) = 24.1 W/kg
SAR(1 g) = 11.4 mW/g; SAR(10 g) = 5.3 mW/g
Maximum value of SAR (measured) = 12.8 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 13.1 mW/g




SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
0
1
2
3
4
5
6
7
8
9
10
11
12
13
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date/Time: 1/10/2012 9:35:43 AM

Test Laboratory: Motorola Mobility 2450 MHz System Performance Check

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:766
Procedure Notes: PM1 Power = 200 mW Refl.Pwr PM3 = -28.65 dB Sim.Temp@SPC = 20.2 Room Temp @ SPC = 22.1
Communication System: _CW - Dipole; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: Validation *BODY Tissue* ; Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3

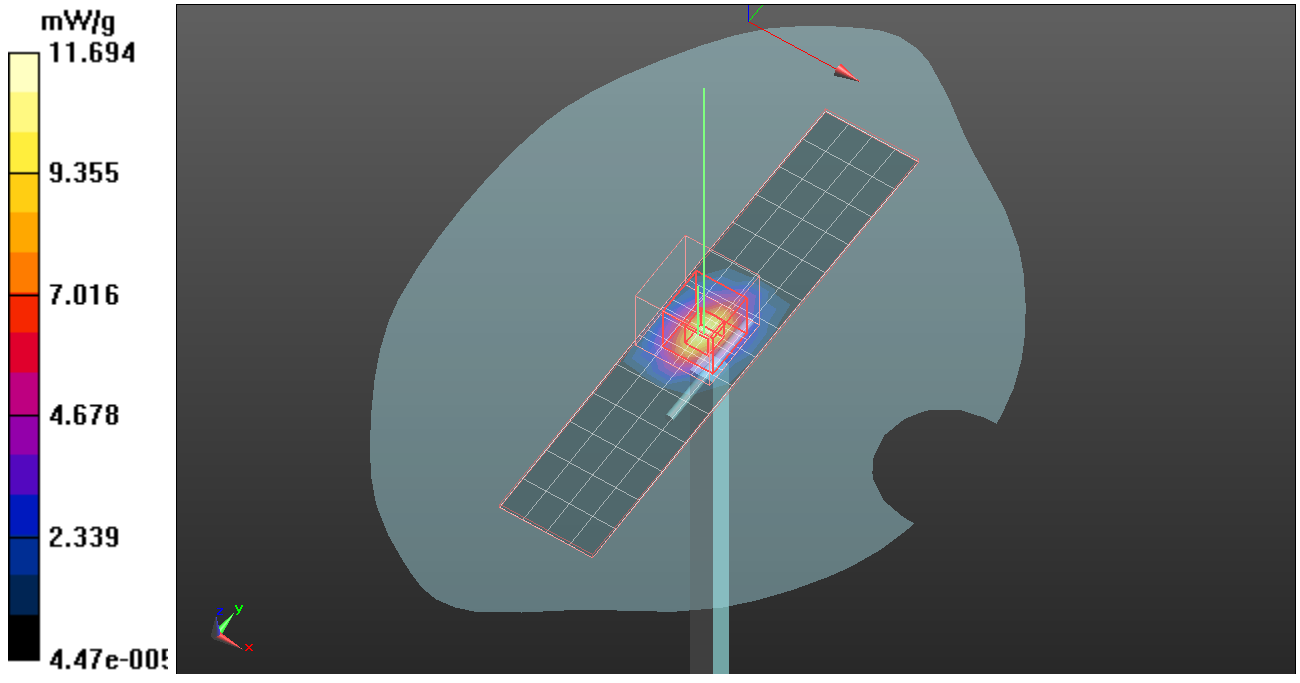
DASY4 Configuration:

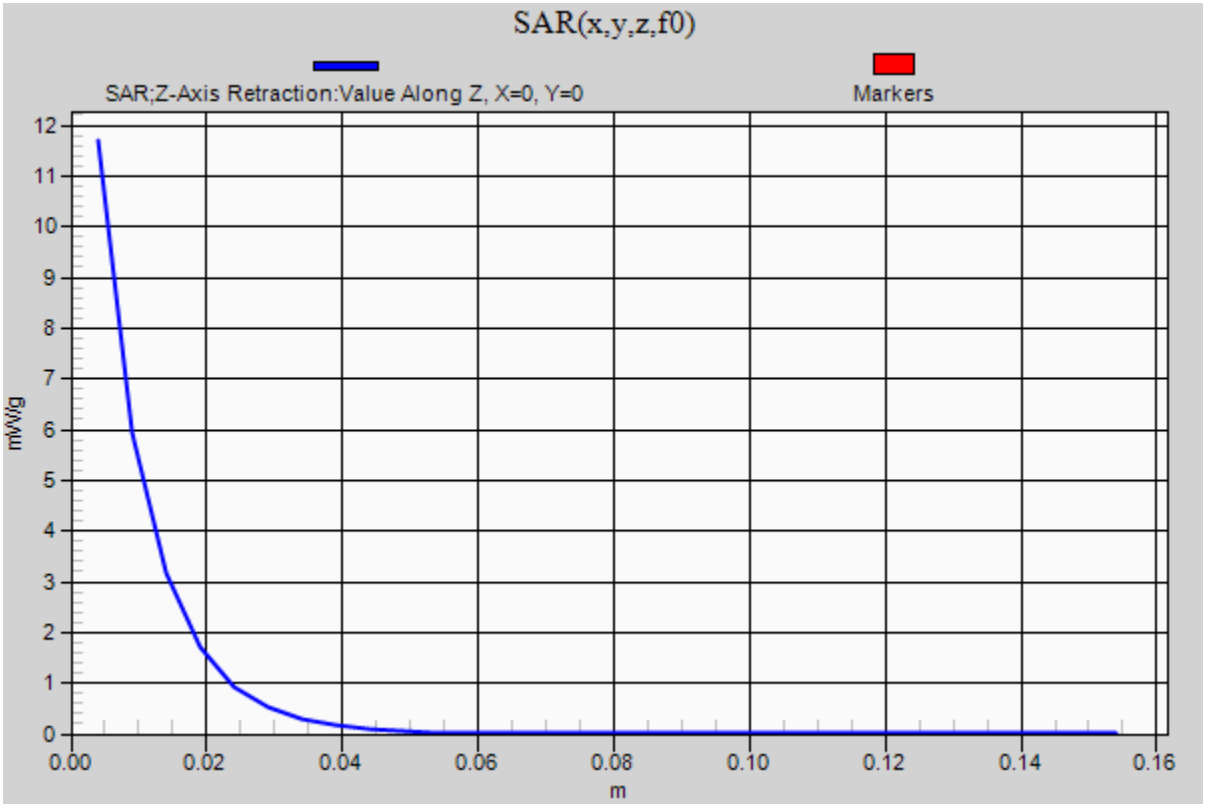
- Probe: ES3DV3 - SN3183; ConvF(4.31, 4.31, 4.31); Calibrated: 9/22/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn650; Calibrated: 6/20/2011
- Phantom: R#_ 4 Glycol,SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1162;
- SEMCAD X Version 14.4.5 (3634)

DASY5, SAM - System Performance Check Template, Rev.2 (12-Sept-11)/Daily SPC Check/Dipole Area Scan (5x15x1): Measurement grid: dx=10mm, dy=15mm
Maximum value of SAR (measured) = 11.462 mW/g

DASY5, SAM - System Performance Check Template, Rev.2 (12-Sept-11)/Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 77.545 V/m; Power Drift = 0.0038 dB
Peak SAR (extrapolated) = 21.712 W/kg
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 4.79 mW/g
Maximum value of SAR (measured) = 11.375 mW/g

DASY5, SAM - System Performance Check Template, Rev.2 (12-Sept-11)/Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 11.694 mW/g




SAR(x,y,z,f0)
SAR;Z-Axis Retraction:Value Along Z, X=0, Y=0
Markers
mW/g
m
0
1
2
3
4
5
6
7
8
9
10
11
12
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Appendix 2

SAR distribution plots for Head Adjacent Test Results

Date/Time: 1/20/2012 7:55:20 PM

Test Laboratory: Motorola Mobility CDMA 800 Cheeck Touch

DUT: Serial: TA594002JB; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: ALL UP Battery Model #: INTERNAL Test Configuration: CHEEK TESTER

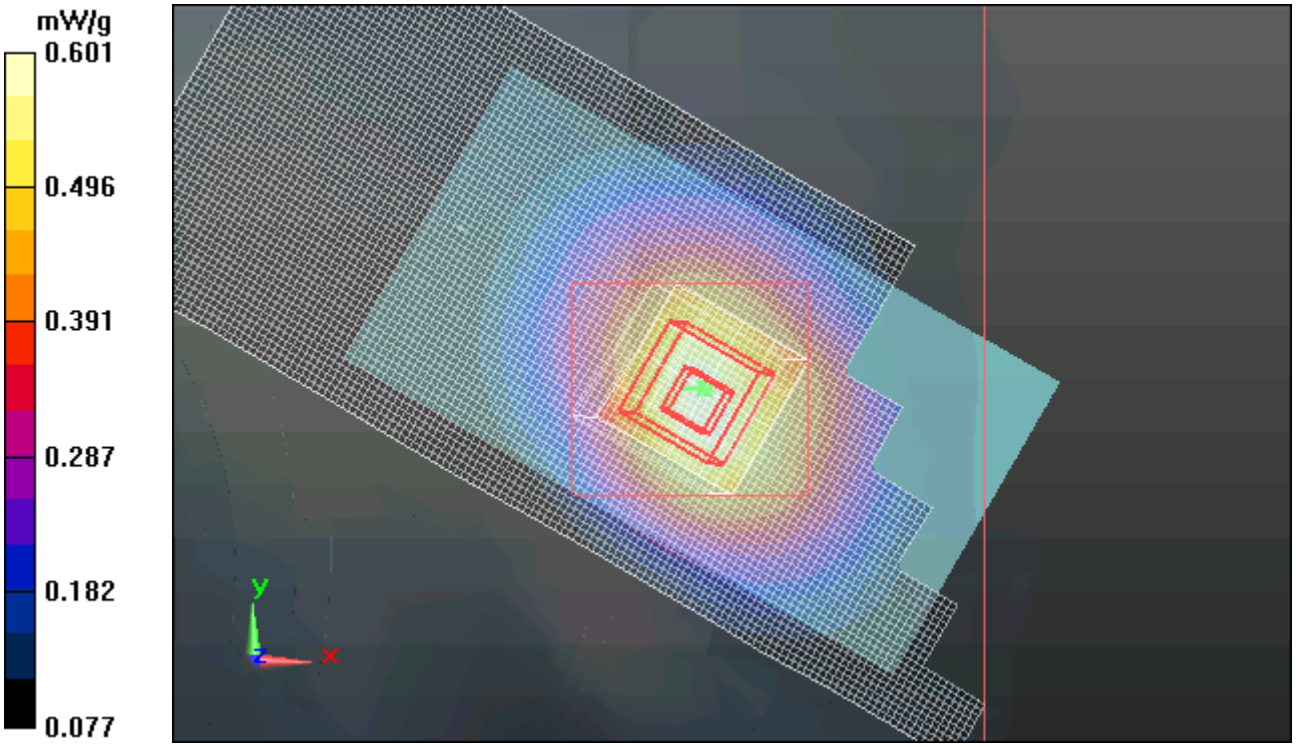
Communication System: _CDMA; Frequency: 836.52 MHz; Communication System Channel Number: 384; Duty Cycle: 1:1
Medium: Low Freq Head; Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3124; ConvF(6.08, 6.08, 6.08); Calibrated: 8/23/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 8/31/2011
- Phantom: R#1 - Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1156;
- ; SEMCAD X Version 14.4.5 (3634)

DASY5, SAM - Phone against Left Head Template, Rev.3 (29-Sept-11)/Left Head Template/Area Scan - Normal (15mm) (61x161x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.584 mW/g

DASY5, SAM - Phone against Left Head Template, Rev.3 (29-Sept-11)/Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.355 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.735 W/kg
SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.426 mW/g
Maximum value of SAR (measured) = 0.601 mW/g



Date/Time: 8/23/2011 4:46:08 PM

Test Laboratory: Motorola - GSM 850 Cheek

Serial: LS3A280035 ; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: 5; Antenna Position: Internal; Accessory Model #: N/A
Battery Model #: Internal; DEVICE POSITION (cheek or rotated): Cheek
Communication System: GSM 850; Frequency: 836.6 MHz; Channel Number: 190; Duty Cycle: 1:8.3

Medium: Low Freq Head
Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3

DASY4 Configuration:

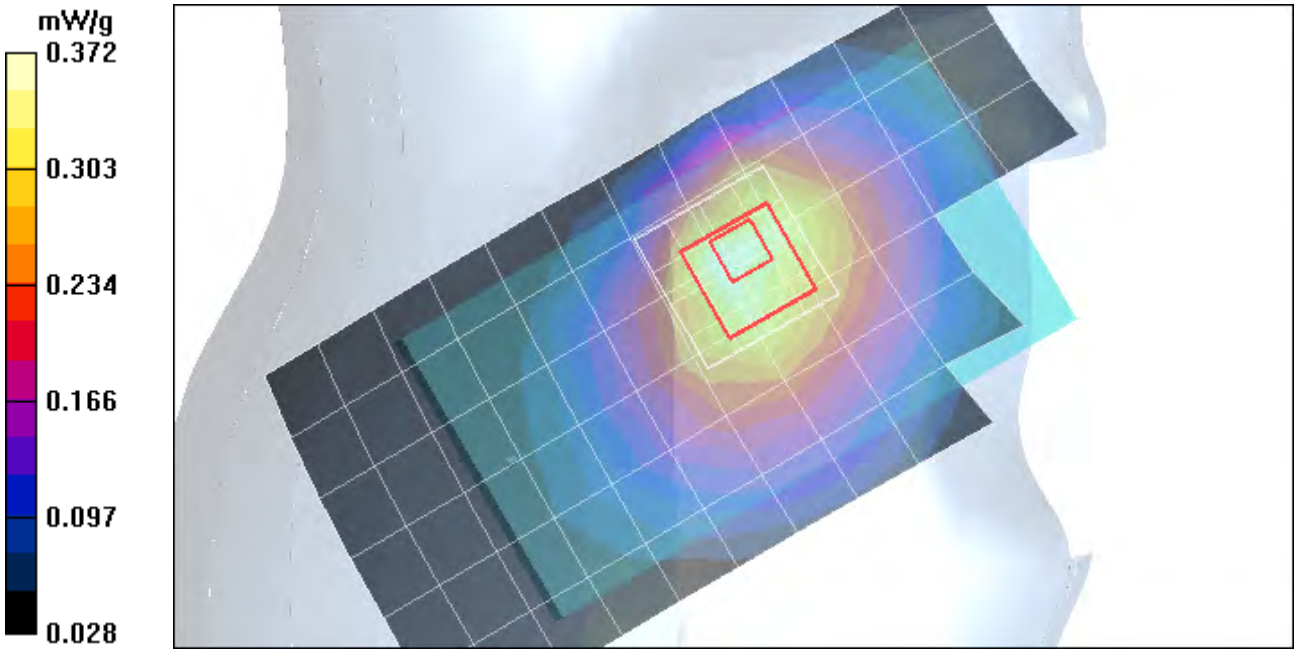
- Probe: ES3DV3 - SN3184; ConvF(6.11, 6.11, 6.11); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1235;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.375 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.2 V/m; Power Drift = -0.100 dB; Peak SAR (extrapolated) = 0.503 W/kg
SAR(1 g) = 0.357 mW/g; SAR(10 g) = 0.255 mW/g; Maximum value of SAR (measured) = 0.372 mW/g



Date/Time: 9/7/2011 10:42:08 PM

Test Laboratory: Motorola - WCDMA 850 Cheek

Serial: LS3A280035; FCC ID: IHDP56ME5

Procedure Notes: Pwr Step: All Up Bits; Antenna Position: Internal; Accessory Model #: N/A
Battery Model #: Internal; DEVICE POSITION (cheek or rotated): Cheek
Communication System: WCDMA 850; Frequency: 836 MHz; Channel Number: 4180; Duty Cycle: 1:1

Medium: Low Freq Head
Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3

DASY4 Configuration:

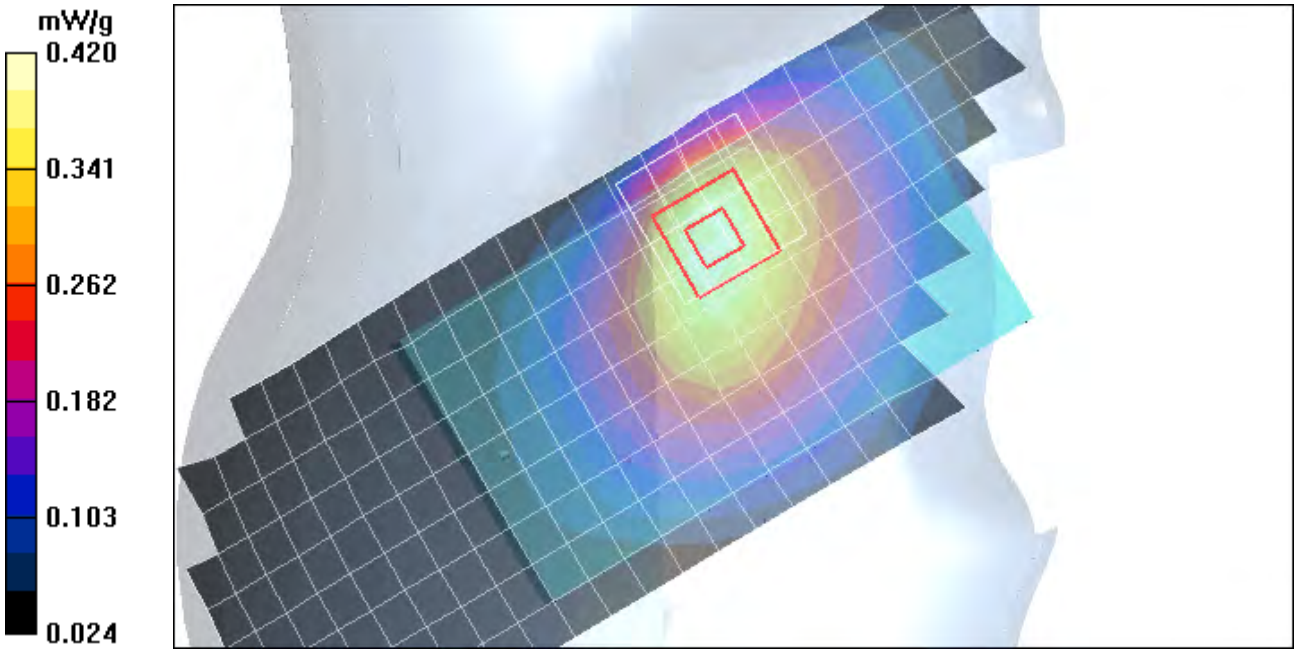
- Probe: ES3DV3 - SN3115; ConvF(5.87, 5.87, 5.87); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 SUGAR SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Template/Area Scan - Normal Extended (10mm) (10x25x1):

Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.417 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.9 V/m; Power Drift = 0.117 dB; Peak SAR (extrapolated) = 0.529 W/kg
SAR(1 g) = 0.400 mW/g; SAR(10 g) = 0.288 mW/g; Maximum value of SAR (measured) = 0.420 mW/g



Date/Time: 9/2/2011 9:40:11 PM

Test Laboratory: Motorola - GSM 1900 Cheek

Serial: LS3A280035; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: 0; Antenna Position: Internal; Accessory Model #: N/A
Battery Model #: Internal; DEVICE POSITION (cheek or rotated): Cheek
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8.3

Medium: Regular Glycol Head 1750/1880
Medium parameters used: f = 1880 MHz; σ = 1.46 mho/m; ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

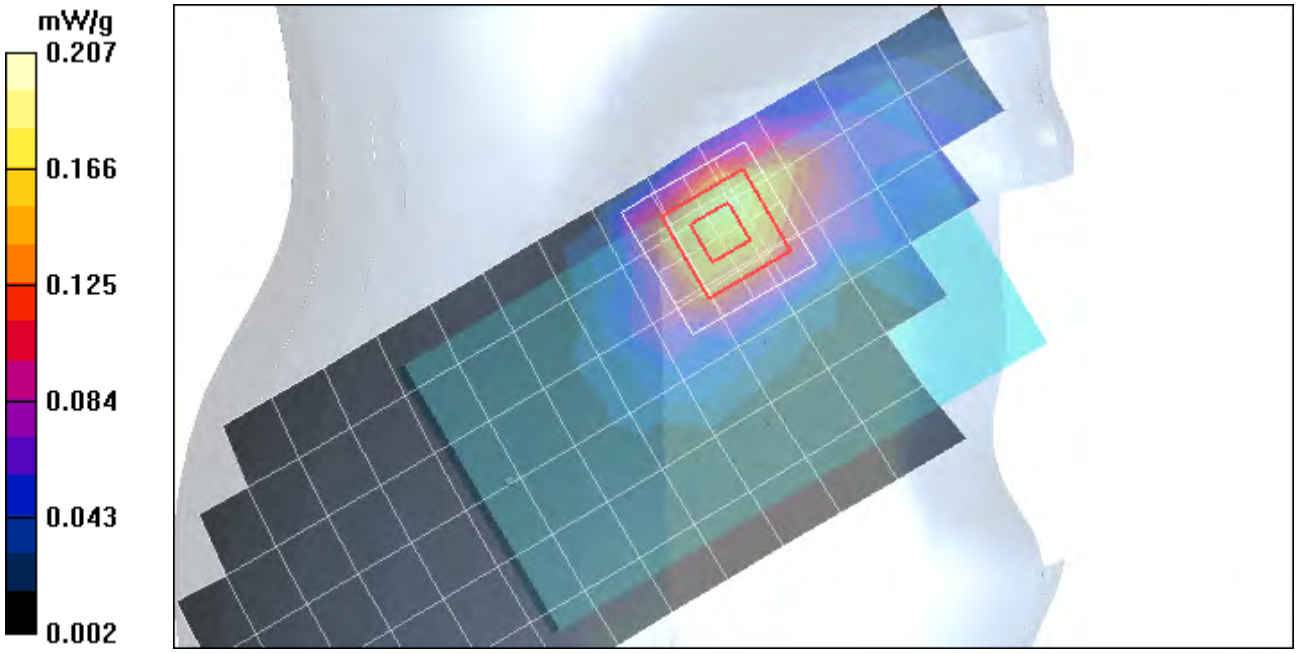
- Probe: ES3DV3 - SN3184; ConvF(5.11, 5.11, 5.11); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1136;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Template/Area Scan - Normal Extended (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.189 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.10 V/m; Power Drift = 0.098 dB; Peak SAR (extrapolated) = 0.305 W/kg
SAR(1 g) = 0.187 mW/g; SAR(10 g) = 0.109 mW/g; Maximum value of SAR (measured) = 0.207 mW/g



Date/Time: 8/24/2011 12:57:20 AM

Test Laboratory: Motorola - WCDMA 1900 Cheek

Serial: LS3A280035 ; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: All up Bits; Antenna Position: Internal; Accessory Model #: N/A
Battery Model #: Internal; DEVICE POSITION (cheek or rotated): Cheek
Communication System: WCDMA 1900; Frequency: 1880 MHz; Channel Number: 9400; Duty Cycle: 1:1

Medium: Regular Glycol Head 1750/1880
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 39.9; ρ = 1000 kg/m^3

DASY4 Configuration:

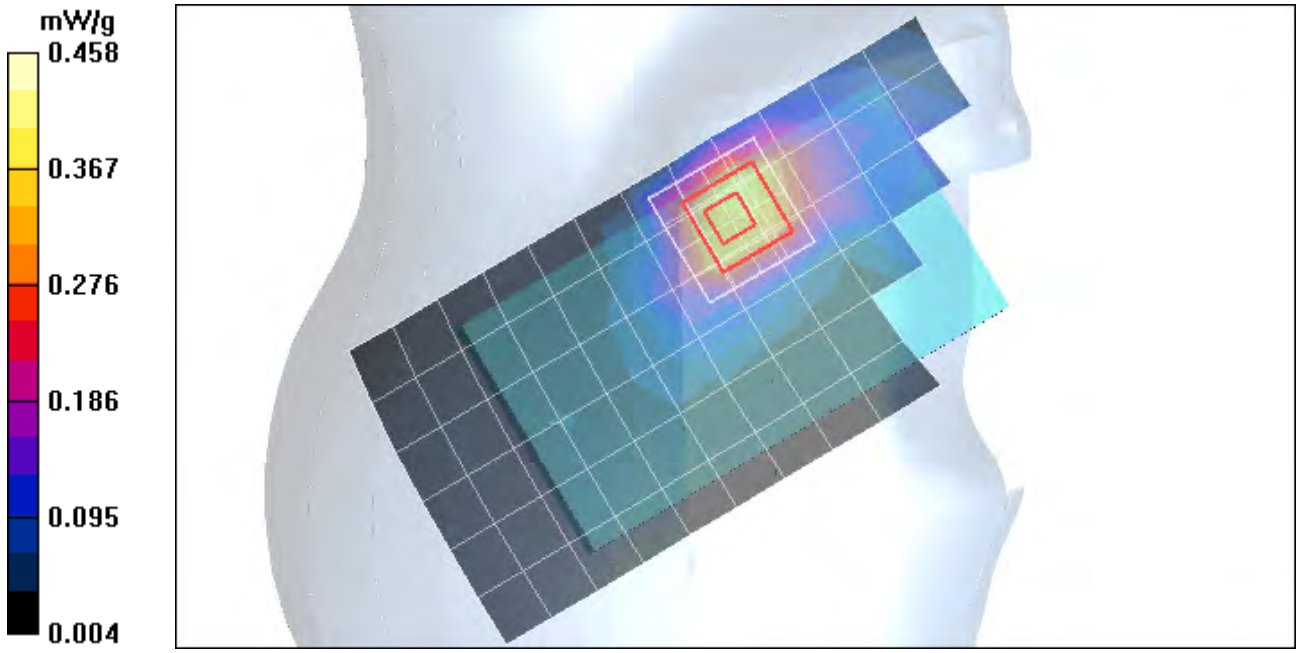
- Probe: ES3DV3 - SN3184; ConvF(5.11, 5.11, 5.11); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1136;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.383 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.7 V/m; Power Drift = 0.162 dB; Peak SAR (extrapolated) = 0.690 W/kg
SAR(1 g) = 0.417 mW/g; SAR(10 g) = 0.241 mW/g; Maximum value of SAR (measured) = 0.458 mW/g



Date/Time: 10/19/2011 10:40:32 AM

Test Laboratory: Motorola Mobility 2450 MHz WiFi Cheek Touch

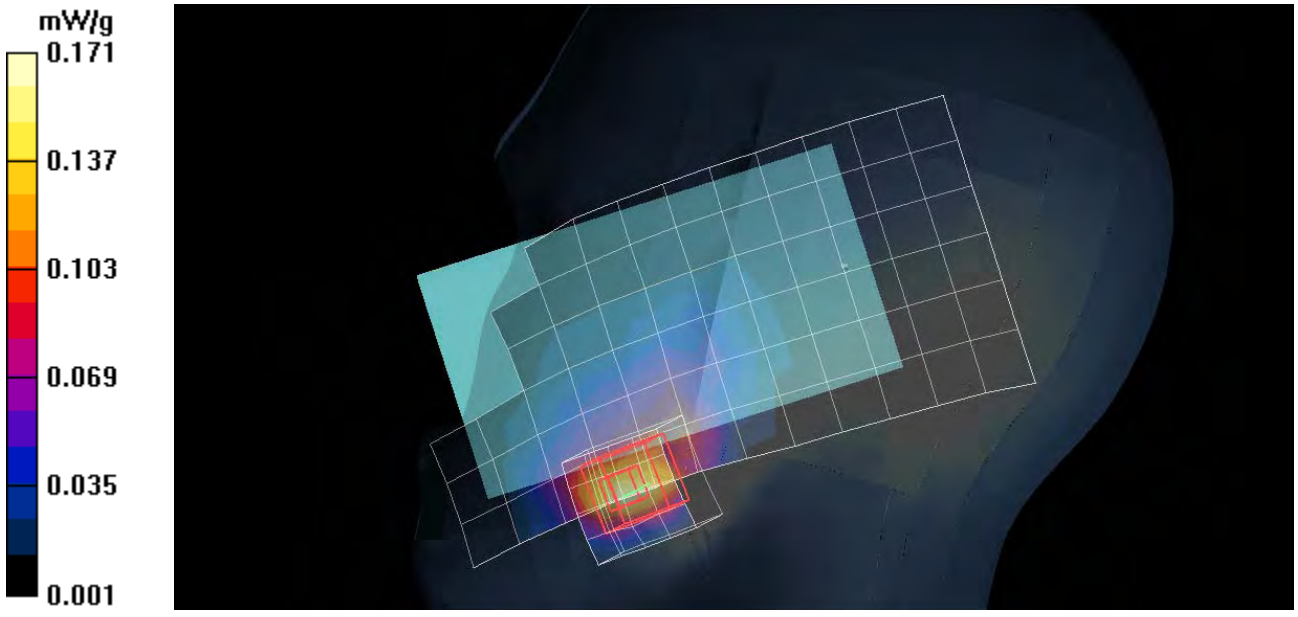
DUT: Serial: TA22300PPO, FCC ID: IHDP56ME5
Procedure Notes: 802.11b 1Mbps Chn 1 Battery Model #: INTERNAL DEVICE POSITION : CHEEK TESTER INITIALS: ron Power Level: 20 Duty Cycle: 98 Data Rate: 1 Mbps
Communication System: Wi-Fi 2450; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: 2450 Glycol Head; Medium parameters used: f = 2450 MHz; σ = 1.86 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(4.39, 4.39, 4.39); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.160 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.87 V/m; Power Drift = -0.194 dB
Peak SAR (extrapolated) = 0.307 W/kg
SAR(1 g) = 0.151 mW/g; SAR(10 g) = 0.078 mW/g
Maximum value of SAR (measured) = 0.171 mW/g



Date/Time: 8/23/2011 3:30:03 PM

Test Laboratory: Motorola - GSM 850 Tilt

Serial: LS3A280035 ; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: 5; Antenna Position: Internal; Accessory Model #: N/A
Battery Model #: Internal; DEVICE POSITION (cheek or rotated): Tilt
Communication System: GSM 850; Frequency: 836.6 MHz; Channel Number: 190; Duty Cycle: 1:8.3

Medium: Low Freq Head
Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3

DASY4 Configuration:

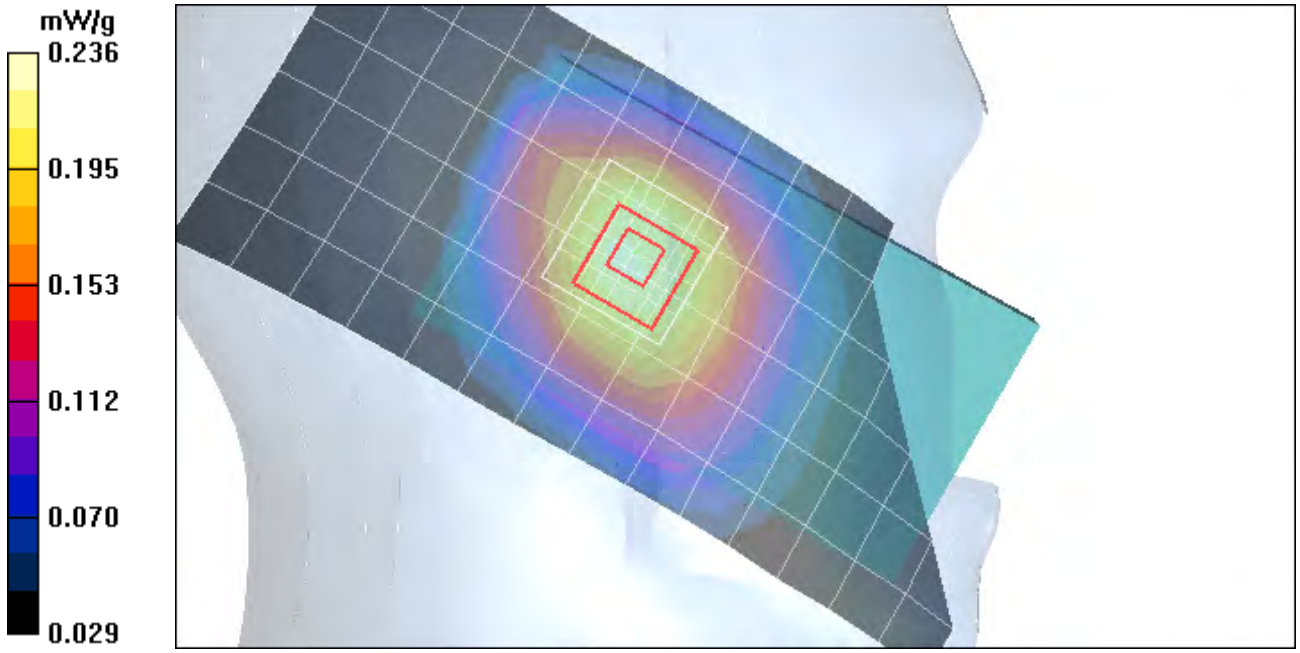
- Probe: ES3DV3 - SN3184; ConvF(6.11, 6.11, 6.11); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1235;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.230 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.6 V/m; Power Drift = -0.051 dB; Peak SAR (extrapolated) = 0.282 W/kg
SAR(1 g) = 0.223 mW/g; SAR(10 g) = 0.168 mW/g; Maximum value of SAR (measured) = 0.236 mW/g



Test Laboratory: Motorola GSM 1900 Tilt

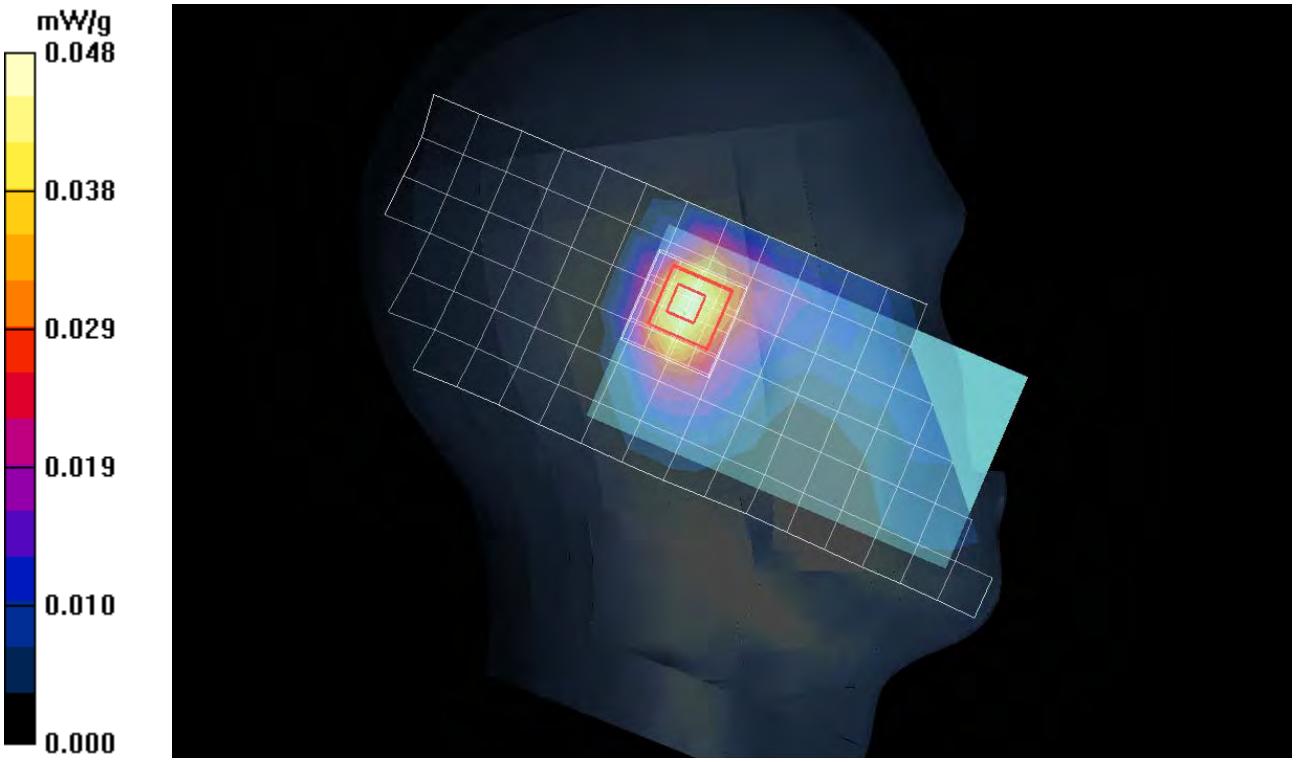
DUT: Serial: LS3A280035, FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: 0 Battery Model #: Internal DEVICE POSITION: 15 Degree Tilt
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Regular Glycol Head 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.46 mho/m; ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3184; ConvF(5.11, 5.11, 5.11); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1136;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Template/Area Scan - Normal Extended (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.049 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.41 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 0.076 W/kg
SAR(1 g) = 0.046 mW/g; SAR(10 g) = 0.026 mW/g
Maximum value of SAR (measured) = 0.048 mW/g



Date/Time: 8/24/2011 5:10:45 PM

Test Laboratory: Motorola - WCDMA 1900 Tilt

Serial: LS3A280035 ; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: All up Bits; Antenna Position: Internal; Accessory Model #: N/A
Battery Model #: Internal; DEVICE POSITION (cheek or rotated): Tilt
Communication System: WCDMA 1900; Frequency: 1880 MHz; Channel Number: 9400; Duty Cycle: 1:1

Medium: Regular Glycol Head 1750/1880
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 39.5; ρ = 1000 kg/m^3

DASY4 Configuration:

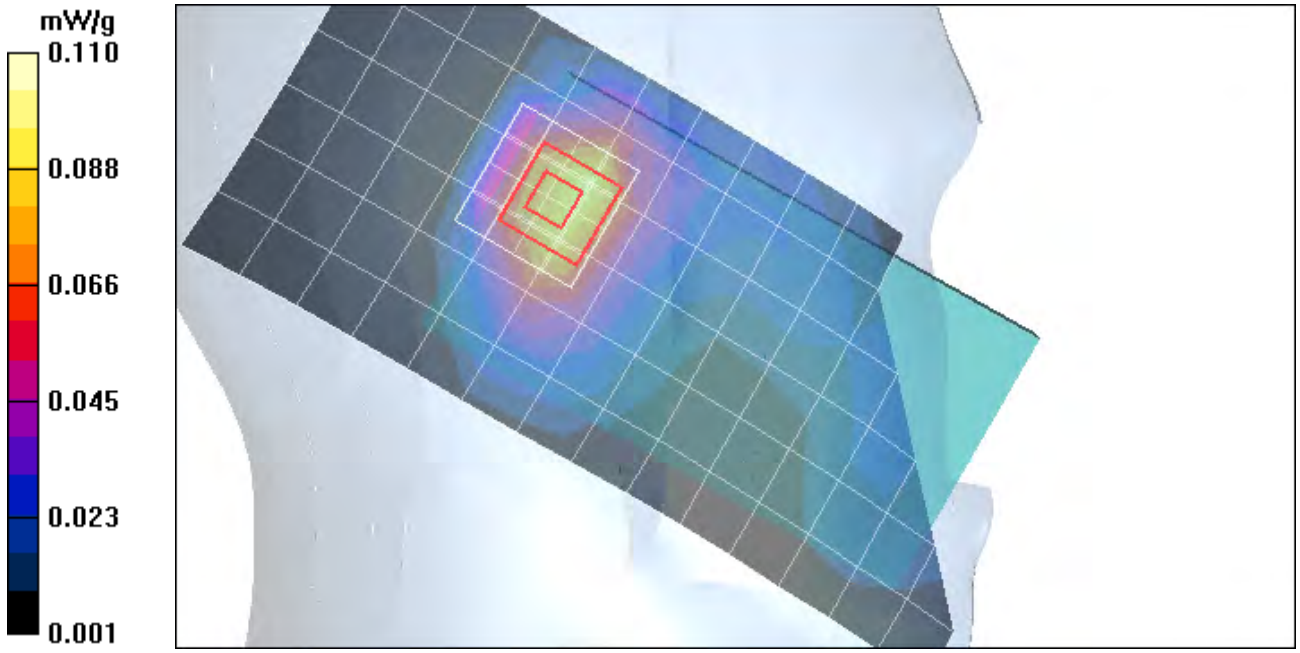
- Probe: ES3DV3 - SN3184; ConvF(5.11, 5.11, 5.11); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1136;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.095 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.43 V/m; Power Drift = 0.124 dB; Peak SAR (extrapolated) = 0.167 W/kg
SAR(1 g) = 0.099 mW/g; SAR(10 g) = 0.057 mW/g; Maximum value of SAR (measured) = 0.110 mW/g



Date/Time: 10/19/2011 9:19:42 AM

Test Laboratory: Motorola Mobility 2450 MHz 15 Degree Tilt

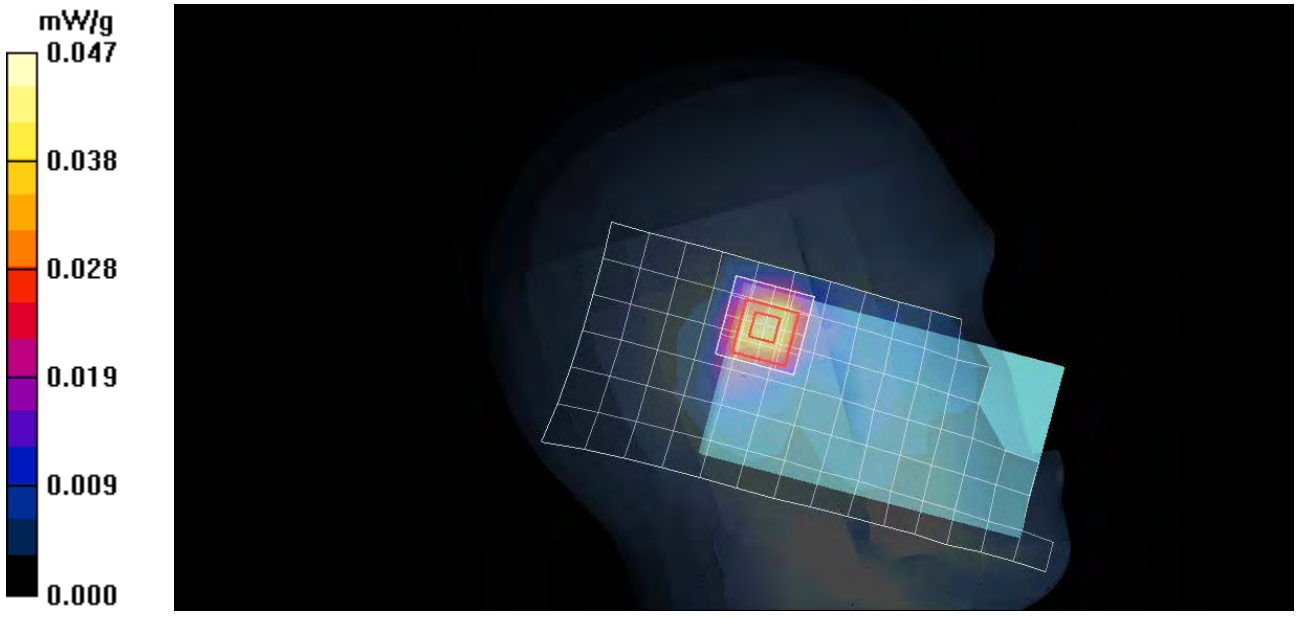
DUT: Serial: TA22300PPO, FCC ID: IHDP56ME5
Procedure Notes: 802.11b 1Mbps Chn 11 Battery Model #: INTERNAL Test Configuration = 15 Degree TILT
Communication System: Wi-Fi 2450; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Glycol Head; Medium parameters used: f = 2450 MHz; σ = 1.86 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(4.39, 4.39, 4.39); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.034 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.54 V/m; Power Drift = 0.021 dB
Peak SAR (extrapolated) = 0.084 W/kg
SAR(1 g) = 0.043 mW/g; SAR(10 g) = 0.022 mW/g
Maximum value of SAR (measured) = 0.047 mW/g



Date/Time: 9/7/2011 11:21:42 PM

Test Laboratory: Motorola - WCDMA 850 Tilt

Serial: LS3A280035; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: All Up Bits; Antenna Position: Internal; Accessory Model #: N/A
Battery Model #: Internal; DEVICE POSITION (cheek or rotated): Rotated
Communication System: WCDMA 850; Frequency: 836 MHz; Channel Number: 4180; Duty Cycle: 1:1

Medium: Low Freq Head
Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3

DASY4 Configuration:

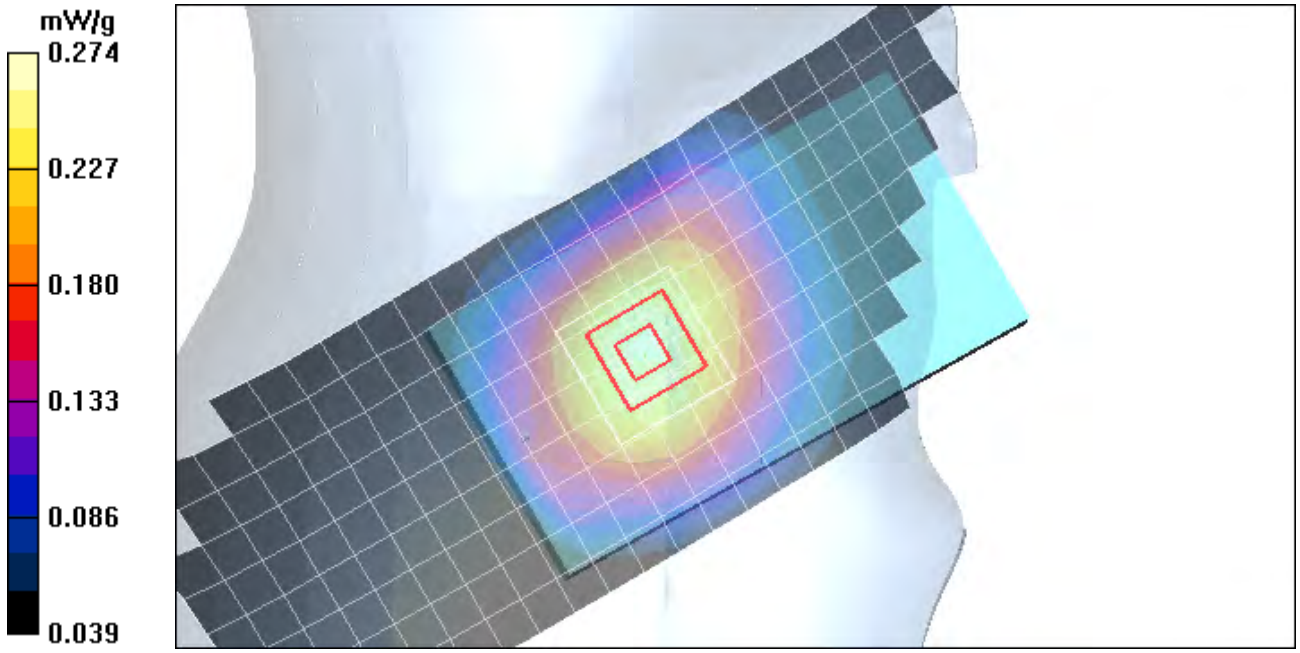
- Probe: ES3DV3 - SN3115; ConvF(5.87, 5.87, 5.87); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 SUGAR SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Template/Area Scan - Normal Extended (10mm) (10x25x1):

Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.265 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.8 V/m; Power Drift = 0.100 dB; Peak SAR (extrapolated) = 0.315 W/kg
SAR(1 g) = 0.259 mW/g; SAR(10 g) = 0.199 mW/g; Maximum value of SAR (measured) = 0.274 mW/g



Date/Time: 1/20/2012 7:00:33 PM

Test Laboratory: Motorola Mobility CDMA 800 15 Degree Tilt

DUT: Serial: TA594002JB; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: ALL UP Battery Model #: INTERNAL Test Configuration: 15 Degree Tilt

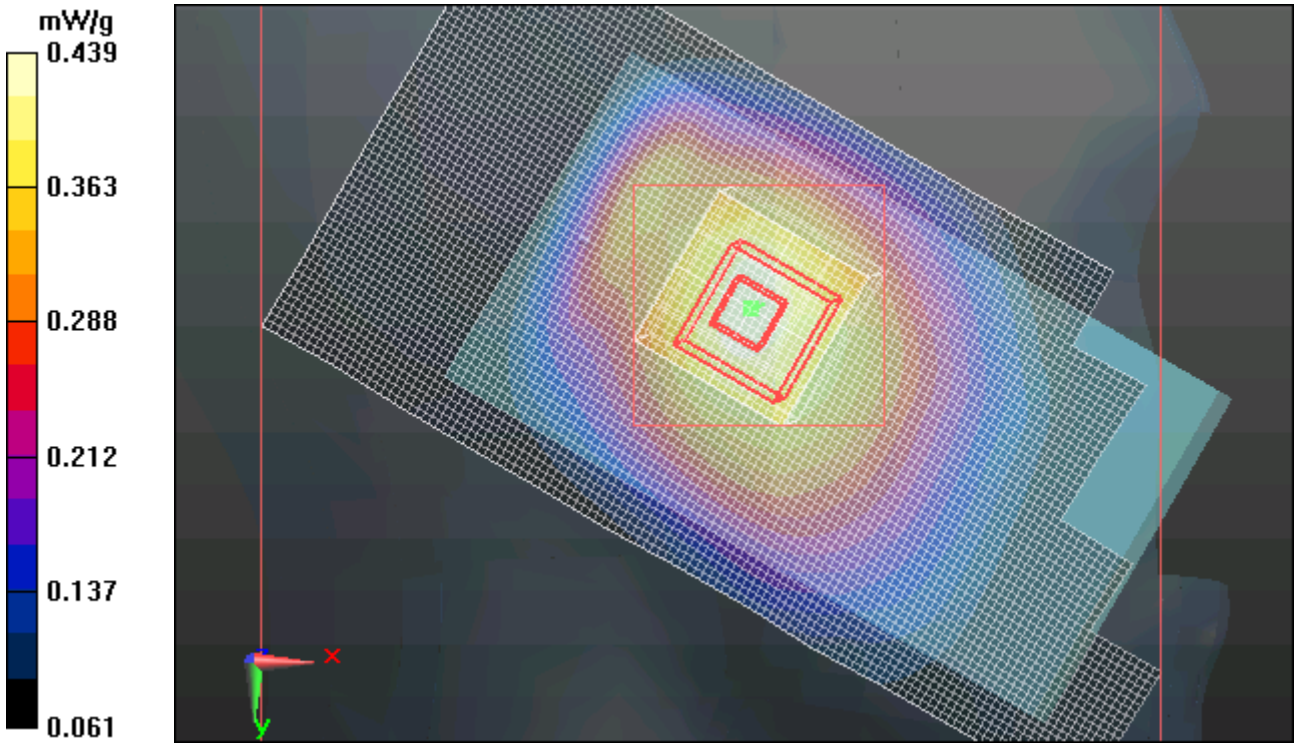
Communication System: _CDMA; Frequency: 836.52 MHz; Communication System Channel Number: 384; Duty Cycle: 1:1
Medium: Low Freq Head; Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3124; ConvF(6.08, 6.08, 6.08); Calibrated: 8/23/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 8/31/2011
- Phantom: R#1 - Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1156;
- ; SEMCAD X Version 14.4.5 (3634)

DASY5, SAM - Phone against RIGHT head template - Rev.2 (29-Sept-11)/Right Head Template/Area Scan - Normal (15mm) (61x161x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.432 mW/g

DASY5, SAM - Phone against RIGHT head template - Rev.2 (29-Sept-11)/Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.903 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.521 W/kg
SAR(1 g) = 0.417 mW/g; SAR(10 g) = 0.319 mW/g
Maximum value of SAR (measured) = 0.439 mW/g



Appendix 3

SAR distribution plots for Body Worn Test Results

Date/Time: 9/17/2011 8:10:27 AM

Test Laboratory: Motorola - GSM 850 Body-Worn

Serial: LS3A280035; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: 5; Antenna Position: Internal; Battery Model #: Internal
Device Position: Body Worn, Front of Phone 25 mm from Phantom
Communication System: GPRS 850 Cl 11; Frequency: 836.6 MHz; Channel Number: 190; Duty Cycle: 1:2.76

Medium: Low Freq Body
Medium parameters used: f = 835 MHz; σ = 0.97 mho/m; ε_r = 55.3; ρ = 1000 kg/m^3

DASY4 Configuration:

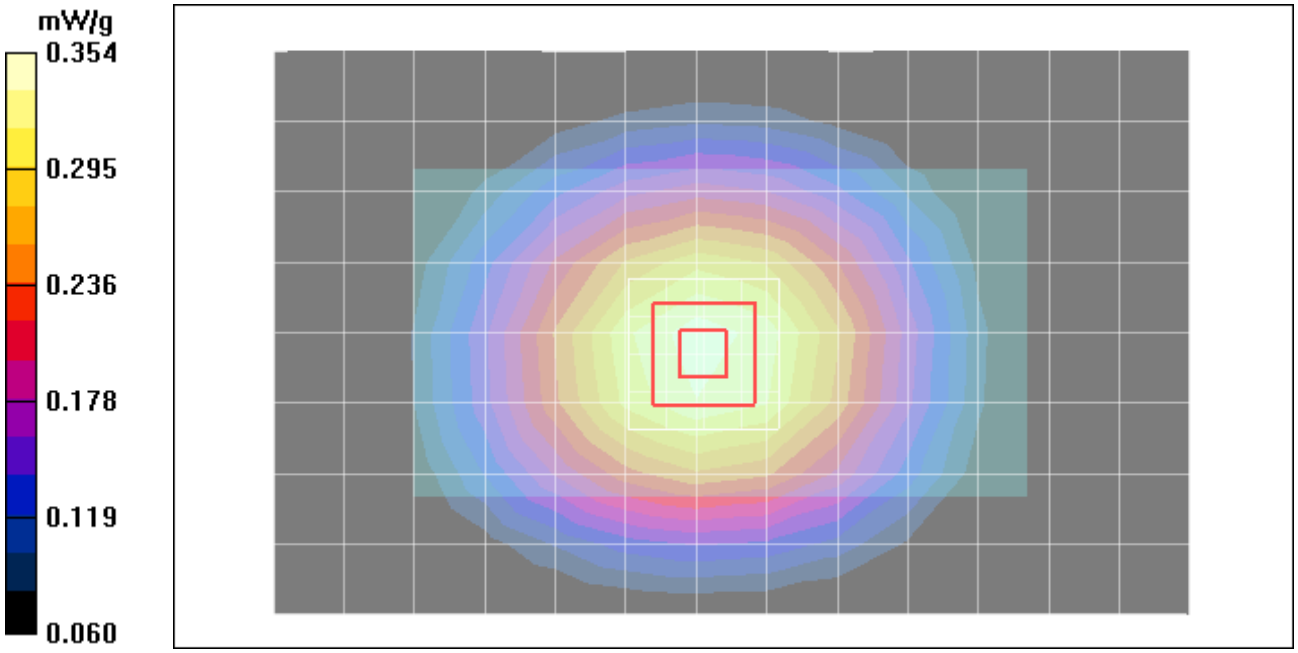
- Probe: ES3DV3 - SN3115; ConvF(5.88, 5.88, 5.88); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#6 - Triple Flat Phantom 5.1C (rev.2); Type: QD 000 P51 CA; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Triple Flat Phone Template/Area Scan - Normal Body (15mm) (14x9x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.347 mW/g

Triple Flat Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.6 V/m; Power Drift = 0.106 dB; Peak SAR (extrapolated) = 0.419 W/kg
SAR(1 g) = 0.336 mW/g; SAR(10 g) = 0.254 mW/g; Maximum value of SAR (measured) = 0.354 mW/g



Date/Time: 9/9/2011 9:47:01 AM

Test Laboratory: Motorola - WCDMA 850 Body-Worn

Serial: LS3A280035; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: All up Bits; Antenna Position: Internal; Battery Model #: Internal
Device Position: Body Worn, Front of Phone 25 mm from Phantom
Communication System: WCDMA 850; Frequency: 836 MHz; Channel Number: 4180; Duty Cycle: 1:1

Medium: Low Freq Body
Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3

DASY4 Configuration:

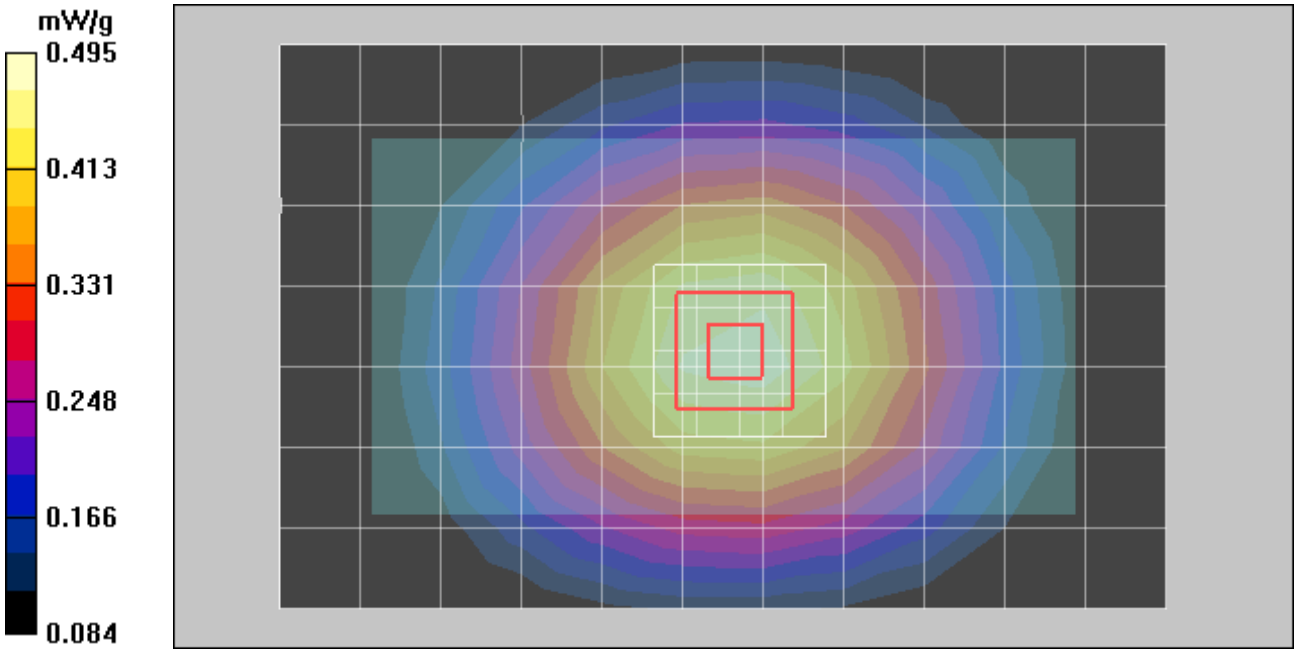
- Probe: ES3DV3 - SN3115; ConvF(5.88, 5.88, 5.88); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#_6 - Triple Flat Phantom 5.1; Type: Triple Flat Phantom 5.1; Serial: N/A;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Triple Flat Phone Template/Area Scan - Normal Body (15mm) (12x8x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.489 mW/g

Triple Flat Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.3 V/m; Power Drift = -0.056 dB; Peak SAR (extrapolated) = 0.589 W/kg
SAR(1 g) = 0.470 mW/g; SAR(10 g) = 0.352 mW/g; Maximum value of SAR (measured) = 0.495 mW/g



Date/Time: 1/20/2012 9:41:23 PM

Test Laboratory: Motorola Mobility CDMA 800 Body Worn

DUT: Serial: TA594002JB; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: ALL UP Battery Model #: INTERNAL Test Configuration: BODY WORN, BACK OF PHONE 25MM FROM PHANTOM

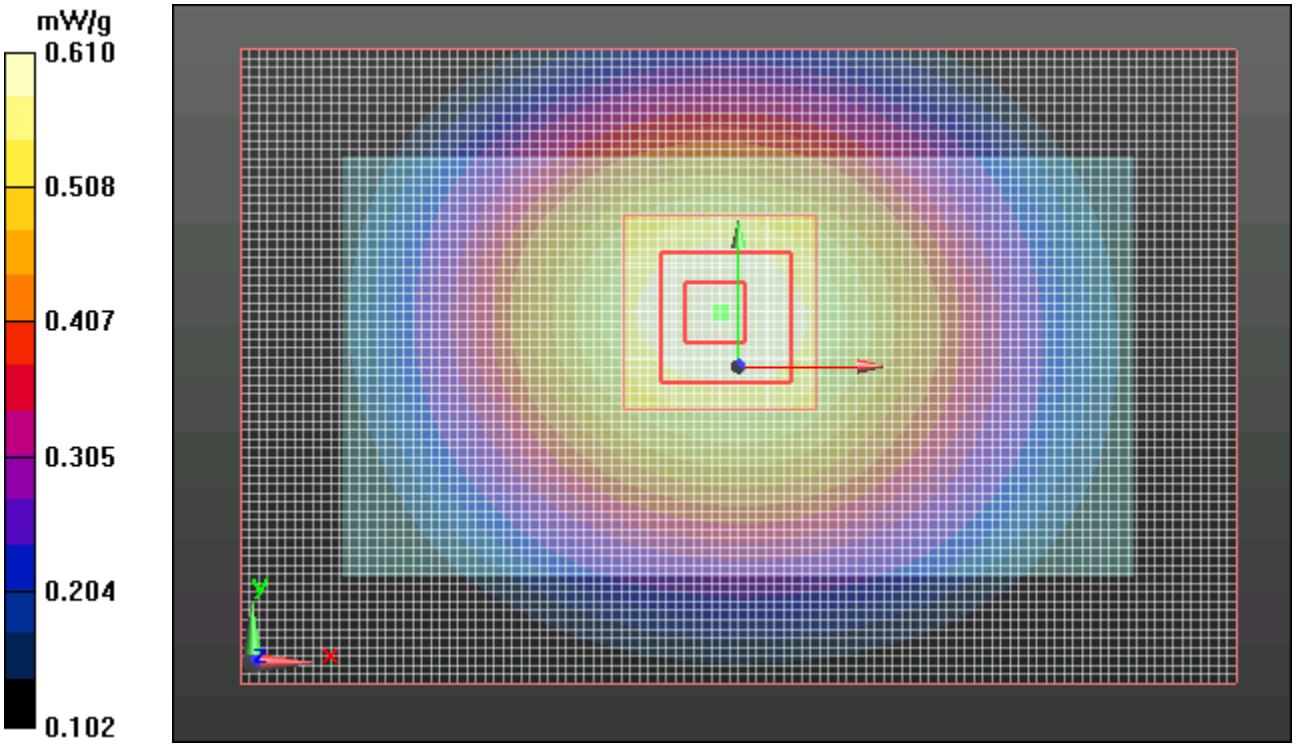
Communication System: _CDMA; Frequency: 836.52 MHz; Communication System Channel Number: 384; Duty Cycle: 1:1
Medium: Low Freq Body; Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3124; ConvF(6.04, 6.04, 6.04); Calibrated: 8/23/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 8/31/2011
- Phantom: R#-1, Triple Flat Phantom 5.1C (Rev.3); Type: QD 000 P51 CA; Serial: n/a;
- ; SEMCAD X Version 14.4.5 (3634)

DASY5, Triple Flat Phone Template - Rev.4 (7-Oct-11)/Triple Flat Phone Template/Area Scan - Normal Body (15mm) (111x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.612 mW/g

DASY5, Triple Flat Phone Template - Rev.4 (7-Oct-11)/Triple Flat Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.281 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.759 W/kg
SAR(1 g) = 0.584 mW/g; SAR(10 g) = 0.441 mW/g
Maximum value of SAR (measured) = 0.610 mW/g



Date/Time: 9/3/2011 9:04:08 AM

Test Laboratory: Motorola - GSM 1900 Body-Worn

Serial: LS3A280035 ; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: 0; Antenna Position: Internal; Battery Model #: Internal
Device Position: Body worn, Back of Phone 25 mm from Phantom
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8.3

Medium: Regular Glycol Body 1750/1880
Medium parameters used: f = 1880 MHz; σ = 1.57 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3

DASY4 Configuration:

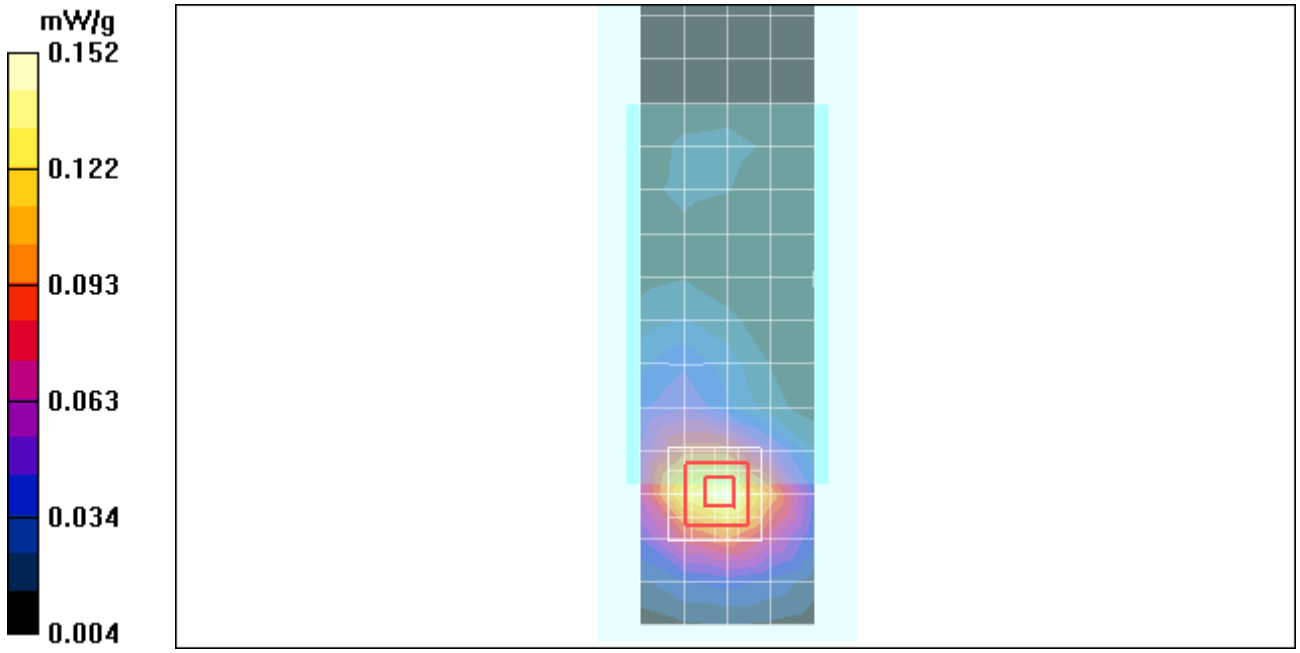
- Probe: ES3DV3 - SN3184; ConvF(4.9, 4.9, 4.9); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2_ Section 1, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Amy Twin Phone Template/Area Scan - Normal Extended Body (15mm) (16x7x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.152 mW/g

Amy Twin Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.71 V/m; Power Drift = -0.115 dB; Peak SAR (extrapolated) = 0.216 W/kg
SAR(1 g) = 0.140 mW/g; SAR(10 g) = 0.086 mW/g



Date/Time: 8/25/2011 8:54:25 AM

Test Laboratory: Motorola - WCDMA 1900 Body-Worn

Serial: LS3A280035 ; FCC ID: IHDP56ME5
Procedure Notes: Pwr Step: All up Bits; Antenna Position: Internal; Battery Model #: Internal
Device Position: Body Worn, Back of Phone 25 mm from Phantom
Communication System: WCDMA 1900; Frequency: 1880 MHz; Channel Number: 9400; Duty Cycle: 1:1

Medium: Regular Glycol Body 1750/1880
Medium parameters used: f = 1880 MHz; σ = 1.57 mho/m; ε_r = 51; ρ = 1000 kg/m^3

DASY4 Configuration:

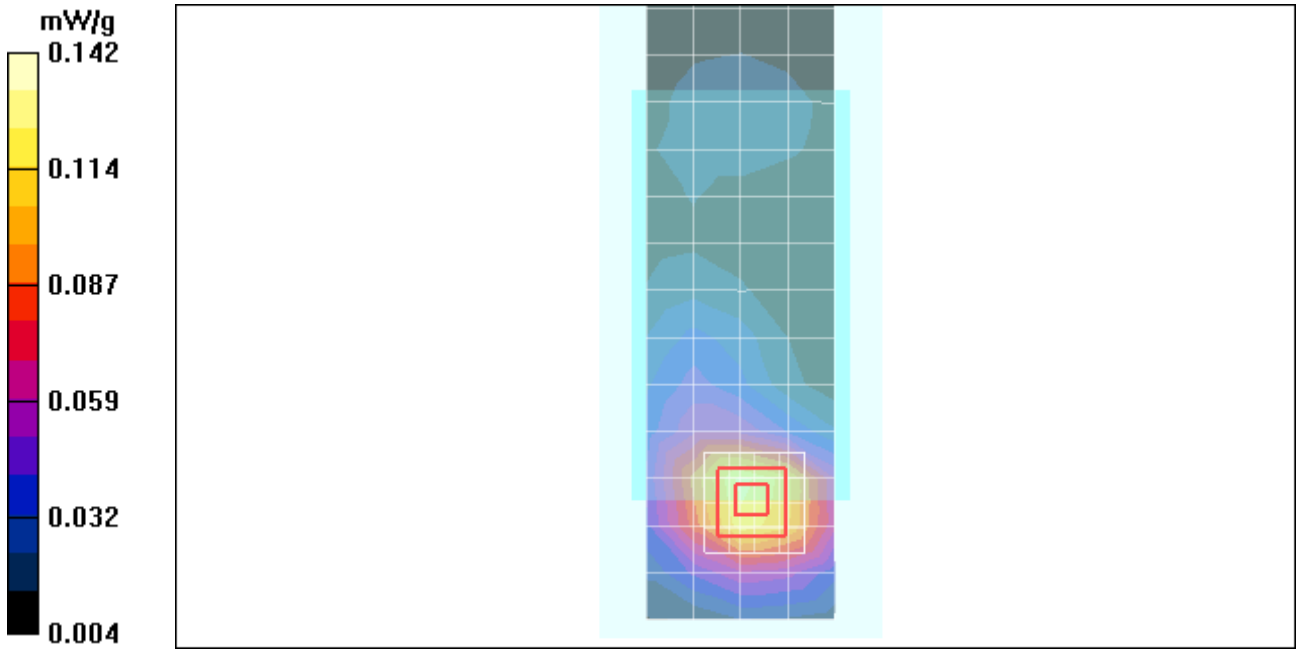
- Probe: ES3DV3 - SN3184; ConvF(4.9, 4.9, 4.9); Calibrated: 3/11/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 9/20/2010
- Phantom: R#2_ Section 1, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Amy Twin Phone Template/Area Scan - Normal Extended Body (15mm) (16x7x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.128 mW/g

Amy Twin Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.38 V/m; Power Drift = 0.049 dB; Peak SAR (extrapolated) = 0.200 W/kg
SAR(1 g) = 0.132 mW/g; SAR(10 g) = 0.082 mW/g; Maximum value of SAR (measured) = 0.142 mW/g



Date/Time: 10/17/2011 3:08:40 PM

Test Laboratory: Motorola Mobility 2450 MHz WiFi Body Worn

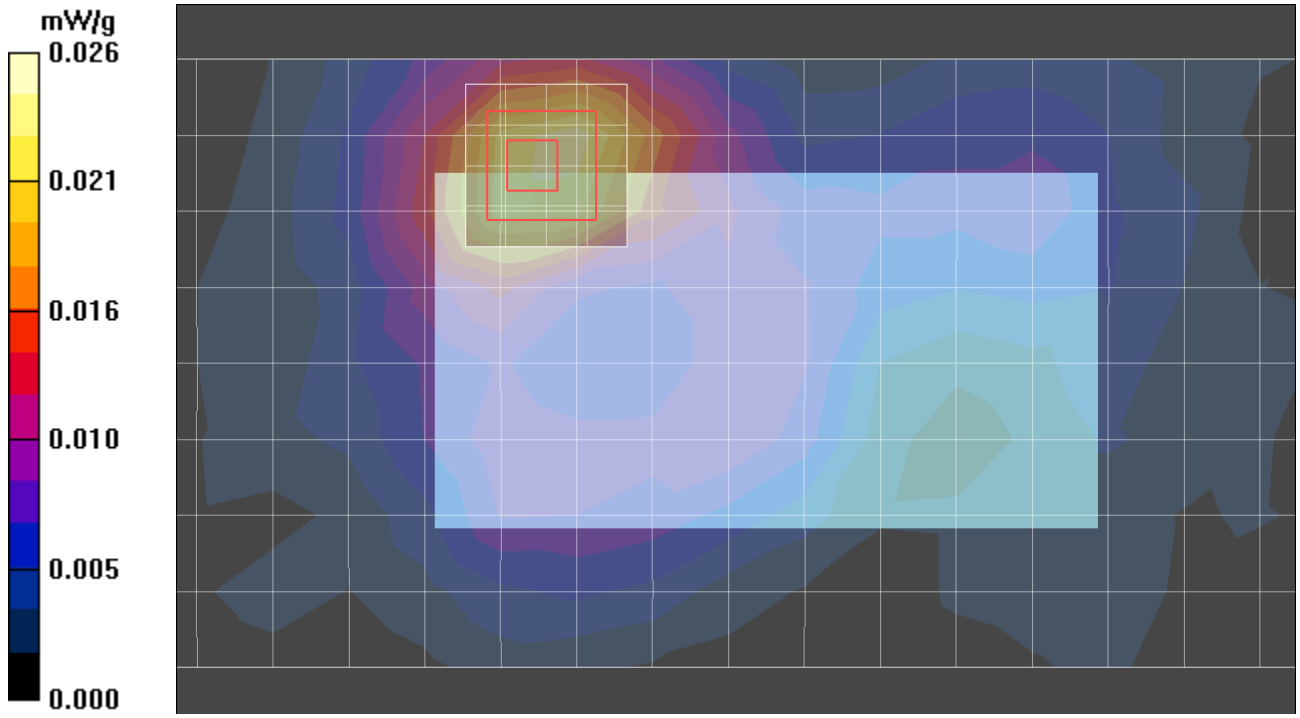
DUT: Tablet; Serial: TA22300PPO, FCC ID: IHDP56ME5
Procedure Notes: 802.11b 1Mbps Chn 1 Battery Model #: INTERNAL Test Configuration = Back Surface 25mm from Phantom
Communication System: Wi-Fi 2450; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: 2450 Glycol Body; Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 50.7; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(4.12, 4.12, 4.12); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6, Triple Flat Phantom 5.1C (Rev.3); Type: QD 000 P51 CA; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Triple Flat Phone Template/Area Scan - Extended Phone (15mm) (18x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.024 mW/g

Triple Flat Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.02 V/m; Power Drift = 0.002 dB
Peak SAR (extrapolated) = 0.044 W/kg
SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.014 mW/g
Maximum value of SAR (measured) = 0.026 mW/g



Appendix 4

SAR distribution plots for Lapdock™ 500 Accessory Test Results

Date/Time: 10/24/2011 9:26:14 PM

Test Laboratory: Motorola Mobility GPRS 850 with Lapdock 500

DUT: Type: Motorola Lapdock 500; Phone Serial: LS3A280035
Procedure Notes: Pwr Step: 5, Battery Model #: INTERNAL Test Configuration = Display oepn 90 degrees, Lapdock 0mm separation from phantom
Communication System: GPRS 850 - Class 11; Frequency: 836.6 MHz;Duty Cycle: 1:2.76
Medium: Low Freq Body; Medium parameters used: f = 835 MHz; σ = 0.97 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3

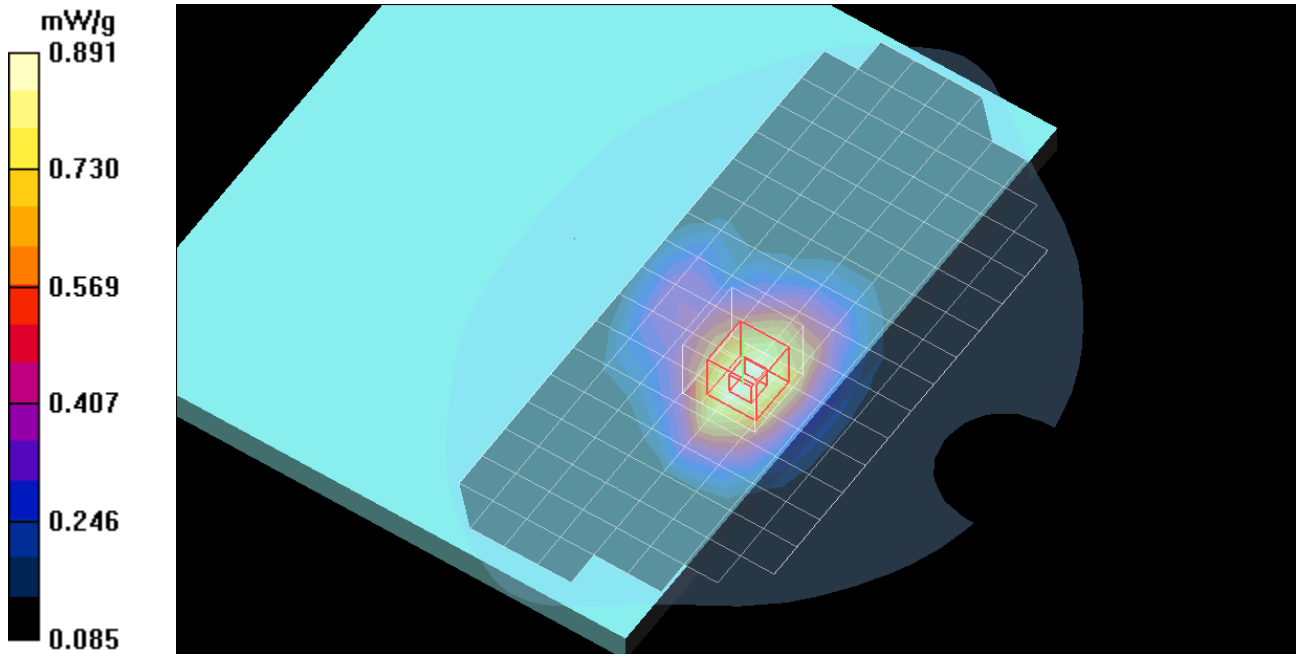
DASY4 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(5.88, 5.88, 5.88); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (15mm) 2 (21x9x1):

Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.897 mW/g

SAM Phone Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.7 V/m; Power Drift = -0.482 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.836 mW/g; SAR(10 g) = 0.571 mW/g
Maximum value of SAR (measured) = 0.891 mW/g



Date/Time: 10/24/2011 6:39:13 PM

Test Laboratory: Motorola Mobility WCDMA 850 with Lapdock 500

DUT: Type: Motorola Lapdock 500; Phone Serial: LS3A280035
Procedure Notes: Pwr Step: ALL UP BITS Battery Model #: INTERNAL Test Configuration = Display open 90 degrees, Lapdock 0mm separation from phantom
Communication System: 3G-WCDMA 850; Frequency: 836 MHz;Duty Cycle: 1:1
Medium: Low Freq Body; Medium parameters used: f = 835 MHz; σ = 0.97 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3

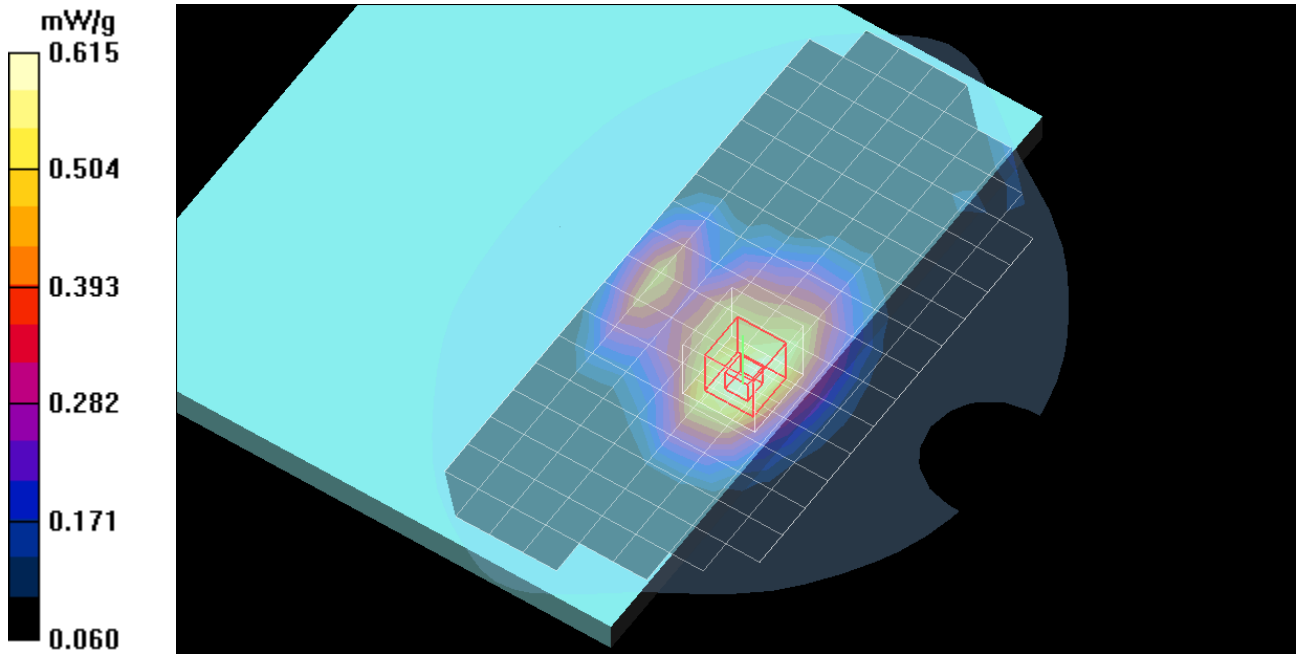
DASY4 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(5.88, 5.88, 5.88); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (15mm) 2 (21x9x1):

Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.580 mW/g

SAM Phone Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.8 V/m; Power Drift = -0.043 dB
Peak SAR (extrapolated) = 0.823 W/kg
SAR(1 g) = 0.578 mW/g; SAR(10 g) = 0.398 mW/g
Maximum value of SAR (measured) = 0.615 mW/g



Date/Time: 1/9/2012 11:42:32 AM

Test Laboratory: Motorola Mobility CDMA 800 MHz with Lapdock 500

DUT: Type: Motorola Lapdock 500; Phone Serial: TA594000CF
Procedure Notes: Pwr Step: All Up Battery Model #: Internal Test Configuration = Display open 90 degrees, lapdock 0mm separation from phantom
Communication System: _CDMA; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: Low Freq Body; Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3

DASY4 Configuration:

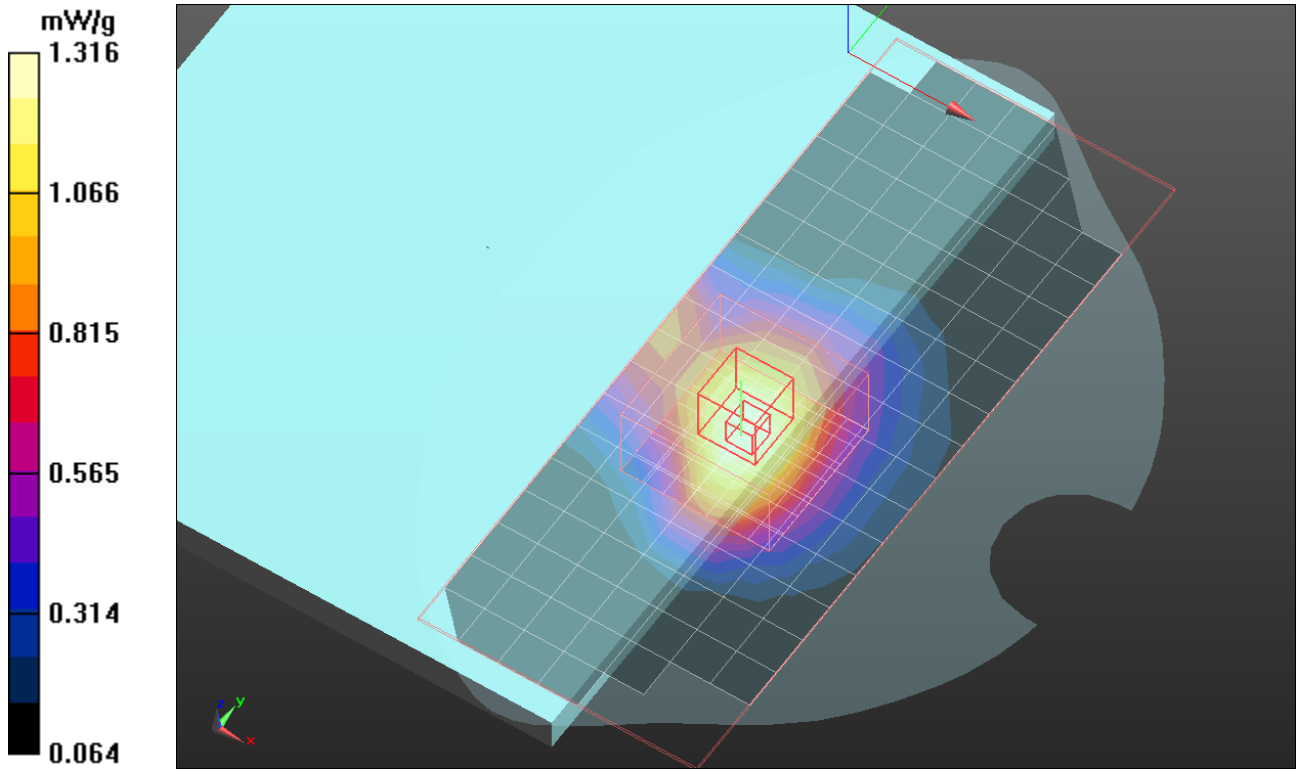
- Probe: ES3DV3 - SN3124; ConvF(6.04, 6.04, 6.04); Calibrated: 8/23/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 8/31/2011
- Phantom: R#1 - Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1319;
- SEMCAD X Version 14.4.5 (3634)

MegaZoom Template, DASY5, SAM Flat Lapdock Template/Lapdock Area Scan - Body (15mm) (21x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.363 mW/g

MegaZoom Template, DASY5, SAM Flat Lapdock Template/Lapdock Zoom Scan (<=3GHz) (8x8x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 36.264 V/m; Power Drift = -0.24 dB
Peak SAR (extrapolated) = 1.780 W/kg
SAR(1 g) = 1.25 mW/g; SAR(10 g) = 0.910 mW/g
Maximum value of SAR (measured) = 1.316 mW/g



Date/Time: 10/24/2011 12:27:03 PM

Test Laboratory: Motorola Mobility GPRS 1900 with Lapdock 500

DUT: Type: Motorola Lapdock 500; Phone Serial: LS3A280035
Procedure Notes: Pwr Step: 0 Battery Model #: INTERNAL Test Configuration = Display open 90 degrees, lapdock 0mm separation
Communication System: GPRS 1900 - Class 11; Frequency: 1880 MHz;Duty Cycle: 1:2.76
Medium: Regular Glycol Body 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.58 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3

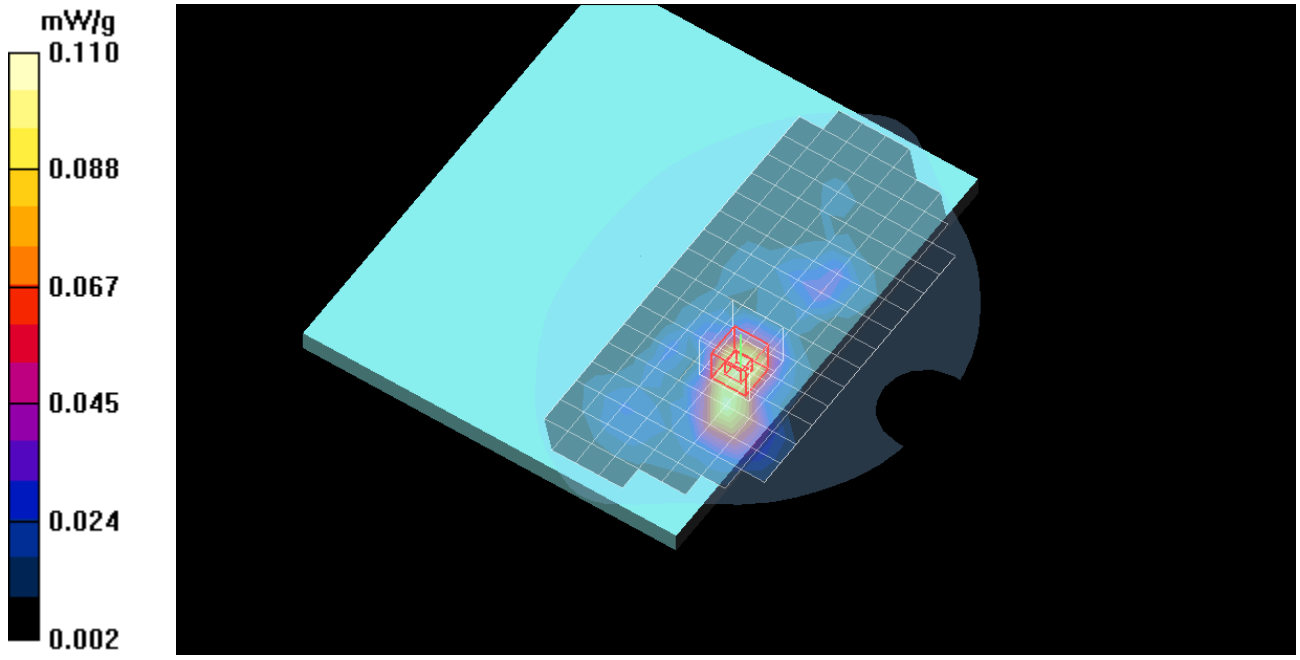
DASY4 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(4.61, 4.61, 4.61); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (15mm) 2 (21x9x1):

Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.103 mW/g

SAM Phone Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.31 V/m; Power Drift = -0.186 dB
Peak SAR (extrapolated) = 0.154 W/kg
SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.060 mW/g
Maximum value of SAR (measured) = 0.110 mW/g



Date/Time: 10/24/2011 1:22:25 PM

Test Laboratory: Motorola Mobility WCDMA 1900 with Lapdock 500

DUT: Type: Motorola Lapdock 500; Phone Serial: LS3A280035
Procedure Notes: Pwr Step: ALL UP BITS Battery Model #: INTERNAL Test Configuration = Display open 90 degrees, lapdock 0mm from separation from phantom
Communication System: 3G/WCDMA 1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Regular Glycol Body 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.58 mho/m; ε_r = 50.9; ρ = 1000 kg/m^3

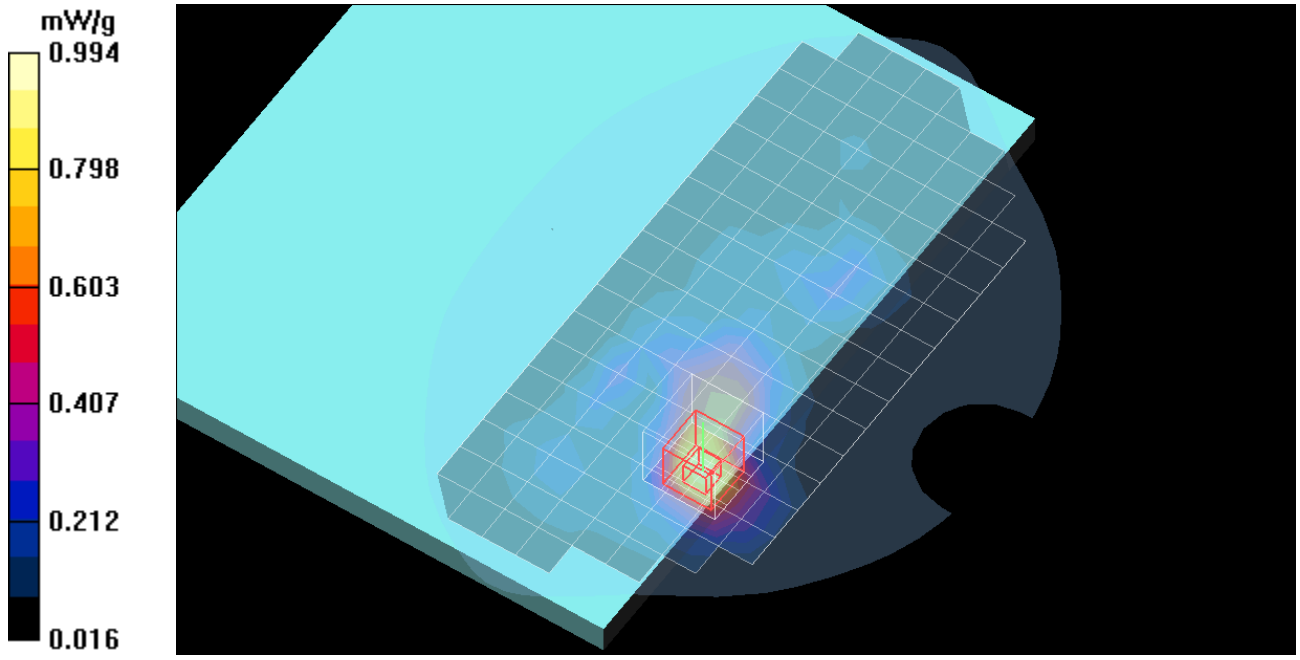
DASY4 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(4.61, 4.61, 4.61); Calibrated: 1/12/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#-6 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (15mm) 2 (21x9x1):

Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.907 mW/g

SAM Phone Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.2 V/m; Power Drift = -0.020 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.891 mW/g; SAR(10 g) = 0.506 mW/g
Maximum value of SAR (measured) = 0.994 mW/g



Test Laboratory: Motorola Mobility 2450 MHz WiFi with Lapdock 500

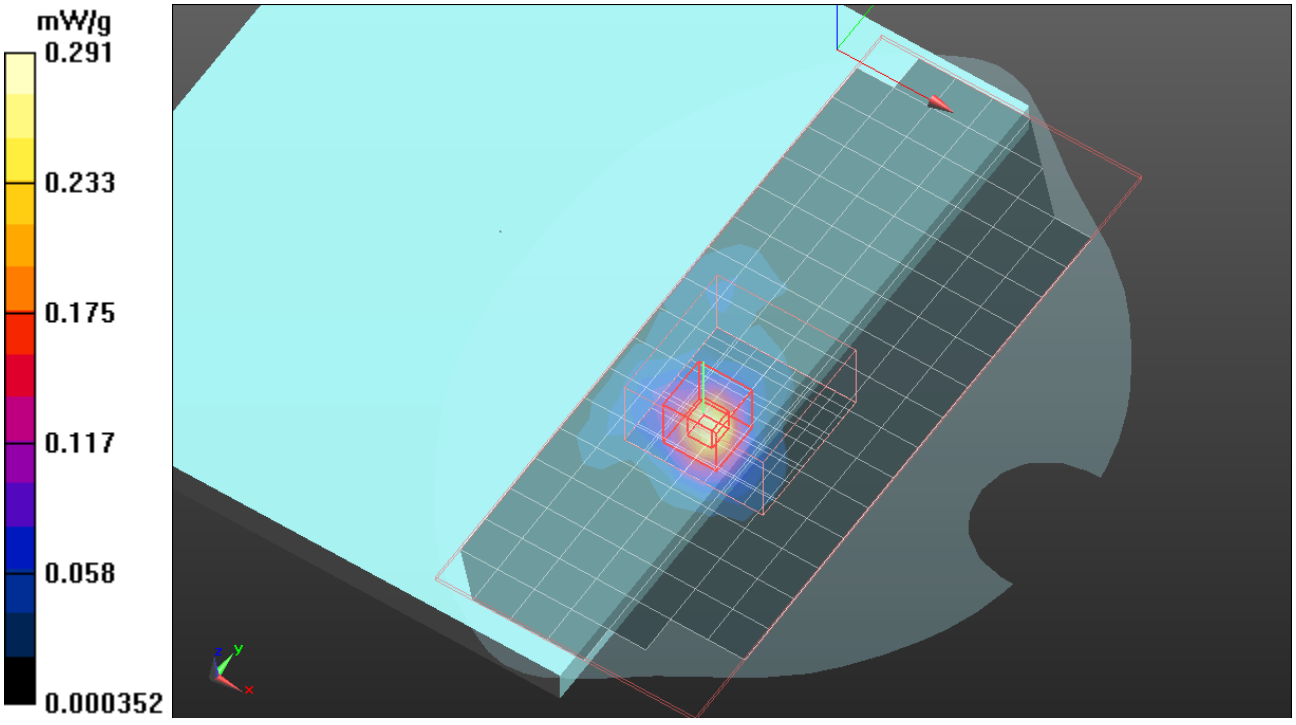
DUT: Type: Motorola Lapdock 500; Phone Serial: LS3A280035
Procedure Notes: Pwr Step: 802.11b 1Mbps Battery Model #: INTERNAL Test Configuration:= Display Open 90 degrees, lapdock 0mm separation from phantom
Communication System: _Wi-Fi 2450MHz; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: 2450 Glycol Body; Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.31, 4.31, 4.31); Calibrated: 9/22/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn650; Calibrated: 6/20/2011
- Phantom: R#_ 4 Glycol,SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1162;
- SEMCAD X Version 14.4.5 (3634)

MegaZoom Template, DASY5, SAM Flat Lapdock Template/Lapdock Area Scan - Body (15mm) (21x8x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.240 mW/g

MegaZoom Template, DASY5, SAM Flat Lapdock Template/Lapdock Zoom Scan (<=3GHz) (8x8x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.352 V/m; Power Drift = 0.70 dB
Peak SAR (extrapolated) = 0.609 W/kg
SAR(1 g) = 0.279 mW/g; SAR(10 g) = 0.125 mW/g
Maximum value of SAR (measured) = 0.291 mW/g



Appendix 5

Measurement Uncertainty Budget

Uncertainty Budget for Device Under Test, for 735 MHz to 2 GHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	Description IEEE1528(2003) / IEC62209-1(2005)	**Tol. (± %)**	**Prob Dist**	**Div.**	c_i **(1 g)**	c_i **(10 g)**	**1 g** u_i **(±%)**	**10 g** u_i **(±%)**	v_i
Measurement System									
Probe Calibration [ES3DV3]	E.2.1 / 7.2.1	5.5	N	1.00	1	1	5.5	5.5	∞
Axial Isotropy	E.2.2 / 7.2.1.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2 / 7.2.1.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3 / 7.2.1.5	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4 / 7.2.1.3	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5 / 7.2.1.4	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6 / 7.2.1.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7 / 7.2.1.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8 / 7.2.1.8	1.1	R	1.73	1	1	0.6	0.6	∞
RF Ambient Conditions - Noise	E.6.1 / 7.2.3.6	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1 / 7.2.3.6	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mech. Tolerance	E.6.2 / 7.2.2.1	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t Phantom	E.6.3 / 7.2.2.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5 / 7.2.4	3.4	R	1.73	1	1	2.0	2.0	∞
Test sample Related									
Test Sample Positioning	E.4.2 / 7.2.2.4	3.4	N	1.00	1	1	3.4	3.4	79
Device Holder Uncertainty	E.4.1 / 7.2.2.4.2	4.5	N	1.00	1	1	4.5	4.5	11
SAR drift	6.6.2 / 7.2.3.5	0.0	R	1.73	1	1	0.0	0.0	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1 / 7.2.2.2	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2 / 7.2.3.3	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3 / 7.2.3.3	2.5	N	1.00	0.64	0.43	1.6	1.1	6
Liquid Permittivity (target)	E.3.2 / 7.2.3.4	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.2 / 7.2.3.4	2.3	N	1.00	0.6	0.49	1.4	1.1	6
Combined Standard Uncertainty			RSS				11	11	338
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				22	21	

Uncertainty Budget for Device Under Test, for 2 GHz to 3 GHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	Description IEEE1528(2003) / IEC62209-1(2005)	**Tol. (± %)**	**Prob Dist**	**Div.**	c_i **(1 g)**	c_i **(10 g)**	**1 g** u_i **(±%)**	**10 g** u_i **(±%)**	v_i
Measurement System									
Probe Calibration [ES3DV3]	E.2.1 / 7.2.1	5.5	N	1.00	1	1	5.5	5.5	∞
Axial Isotropy	E.2.2 / 7.2.1.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2 / 7.2.1.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3 / 7.2.1.5	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4 / 7.2.1.3	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5 / 7.2.1.4	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6 / 7.2.1.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7 / 7.2.1.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8 / 7.2.1.8	1.1	R	1.73	1	1	0.6	0.6	∞
RF Ambient Conditions - Noise	E.6.1 / 7.2.3.6	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1 / 7.2.3.6	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mech. Tolerance	E.6.2 / 7.2.2.1	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t Phantom	E.6.3 / 7.2.2.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5 / 7.2.4	3.4	R	1.73	1	1	2.0	2.0	∞
Test sample Related									
Test Sample Positioning	E.4.2 / 7.2.2.4	3.4	N	1.00	1	1	3.4	3.4	79
Device Holder Uncertainty	E.4.1 / 7.2.2.4.2	4.5	N	1.00	1	1	4.5	4.5	11
SAR drift	6.6.2 / 7.2.3.5	0.0	R	1.73	1	1	0.0	0.0	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1 / 7.2.2.2	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2 / 7.2.3.3	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3 / 7.2.3.3	2.5	N	1.00	0.64	0.43	1.6	1.1	6
Liquid Permittivity (target)	E.3.2 / 7.2.3.4	10.0	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity (measurement)	E.3.2 / 7.2.3.4	2.3	N	1.00	0.6	0.49	1.4	1.1	6
Combined Standard Uncertainty			RSS				11	11	392
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				22	22	

Appendix 6

Probe Calibration Certificate

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

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

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

Accreditation No.: SCS 108

Client **Motorola MDb**

Certificate No: ES3-3115_Jan11

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3115
Calibration procedure(s)	QA CAL-01.v7, QA CAL-23.v4 and QA CAL-25.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	January 12, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: January 13, 2011

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

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

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

Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

Probe ES3DV3

SN:3115

Manufactured:	March 6, 2006
Last calibrated:	January 19, 2010
Recalibrated:	January 12, 2011

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 SN:3115

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.29	1.30	1.18	± 10.1%
DCP (mV)[B]	100.2	102.3	101.3	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	113.4	± 2.4 %
			Y	0.00	0.00	1.00	150.5	
			Z	0.00	0.00	1.00	142.6	

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 E²-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

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

DASY/EASY - Parameters of Probe: ES3DV3 SN:3115

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	5.87	5.87	5.87	0.34	1.74 ± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.02	5.02	5.02	0.43	1.62 ± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.80	4.80	4.80	0.62	1.36 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.39	4.39	4.39	0.94	1.13 ± 11.0%

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

DASY/EASY - Parameters of Probe: ES3DV3 SN:3115

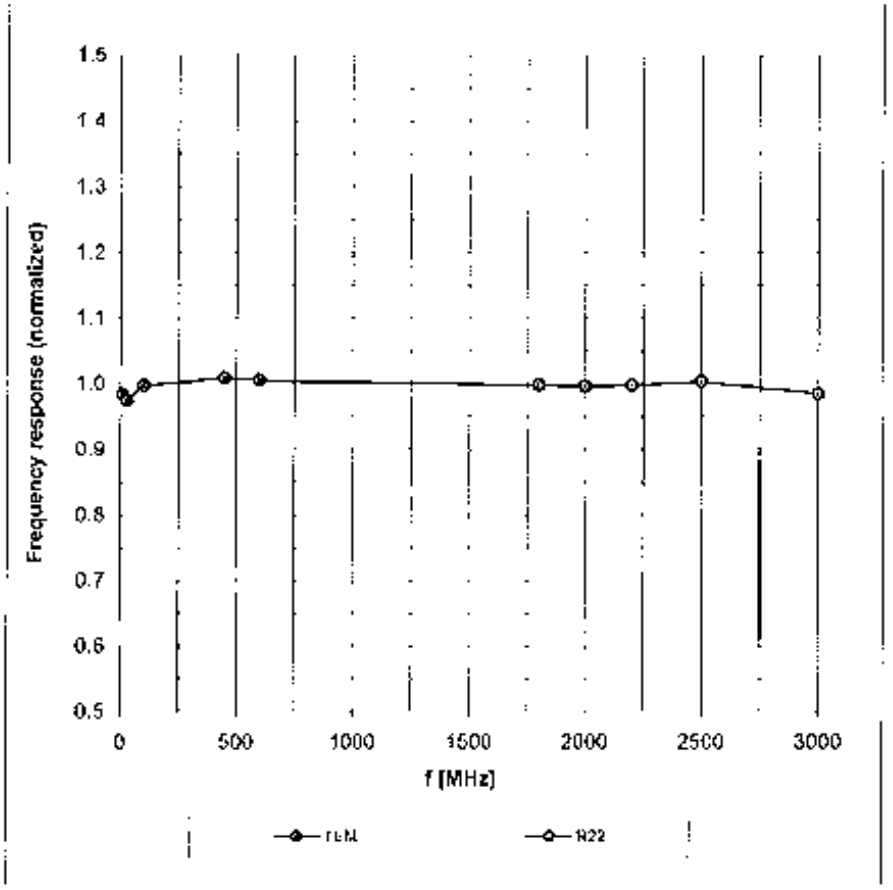
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	5.88	5.88	5.88	0.57	1.41	± 11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.61	4.61	4.61	0.33	2.26	± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.57	4.57	4.57	0.36	2.19	± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.12	4.12	4.12	0.99	0.75	± 11.0%

[C] The validity of ± 100 MHz only applies for DASY V4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

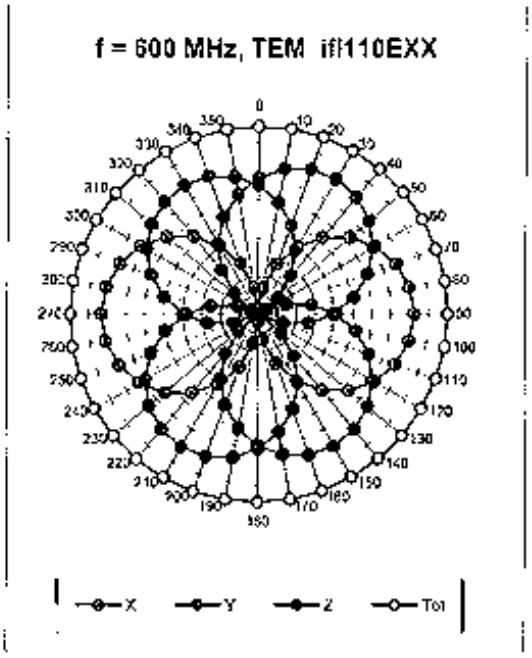
Frequency Response of E-Field

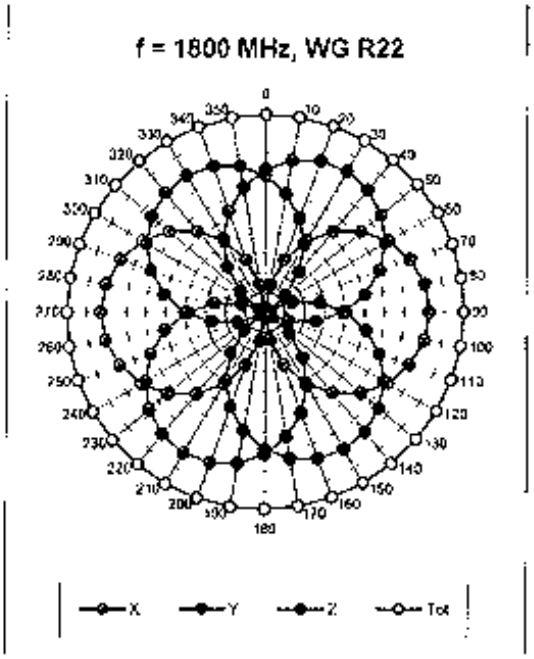
(TEM-Cell:ifi110 EXX, Waveguide: R22)

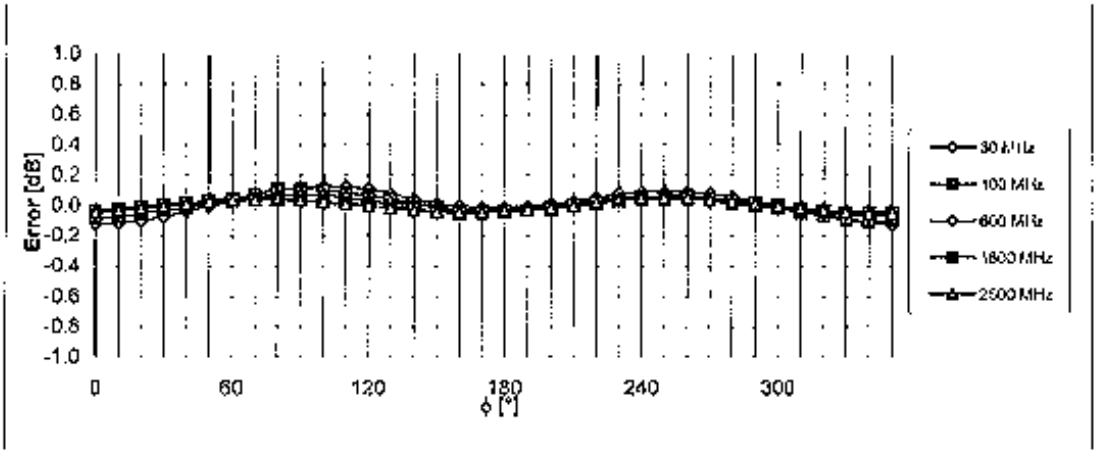


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



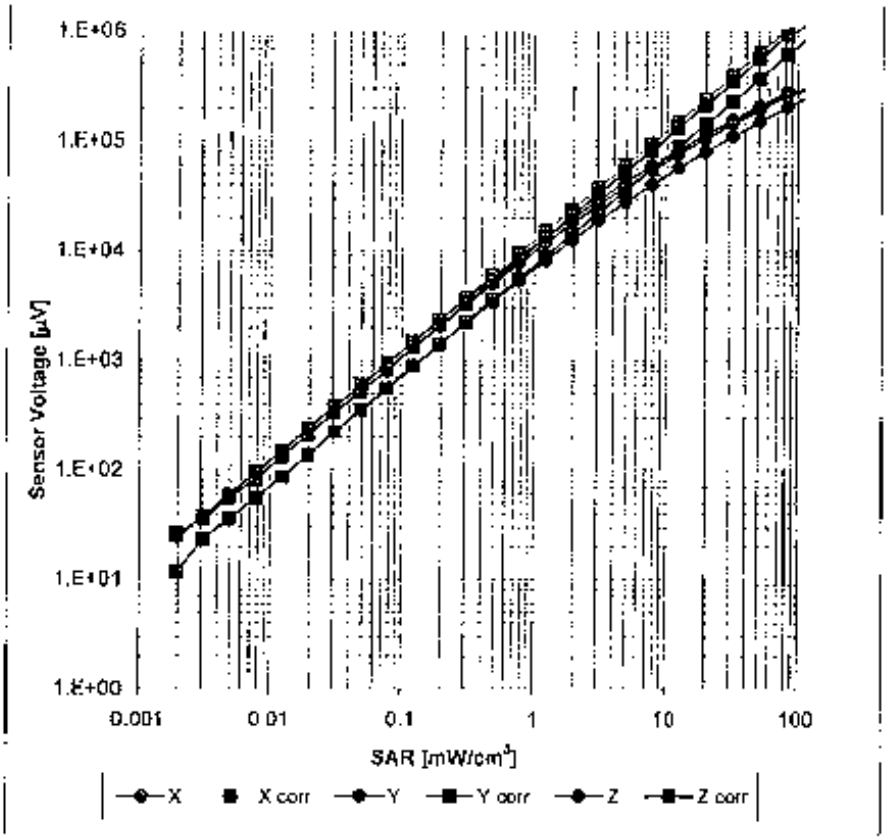


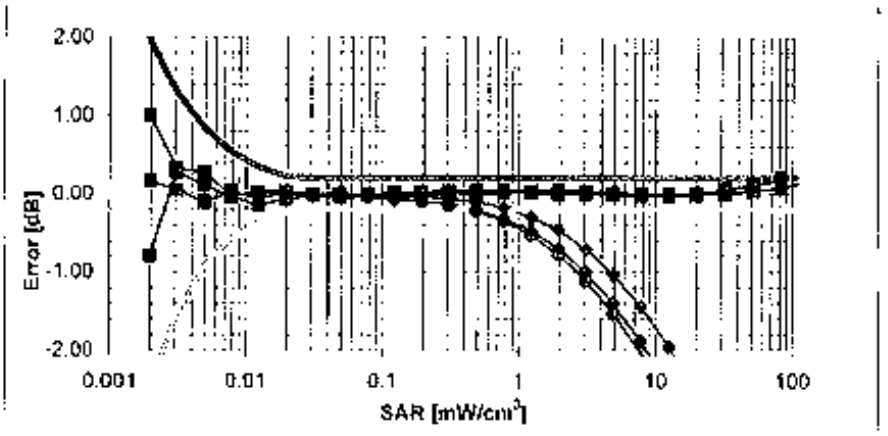


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

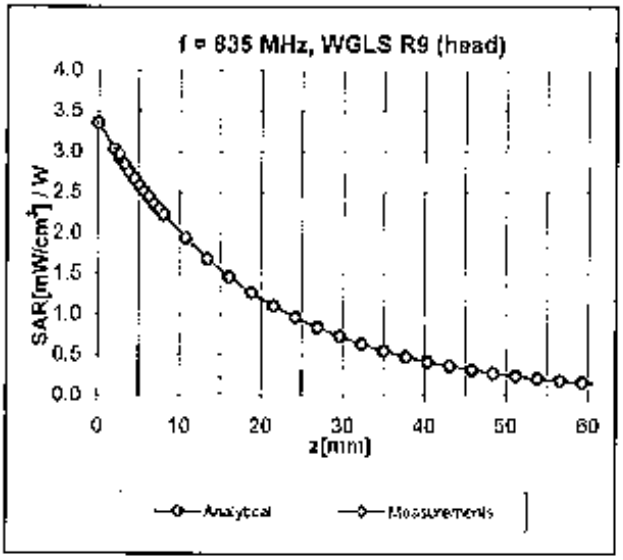
(TEM cell, f = 900 MHz)

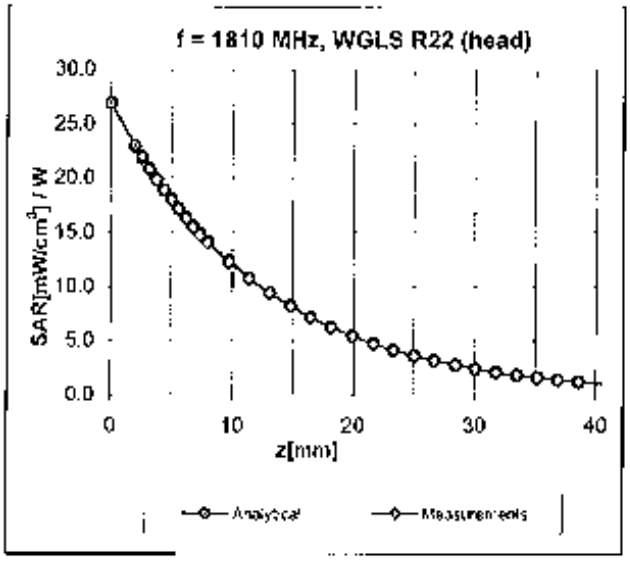




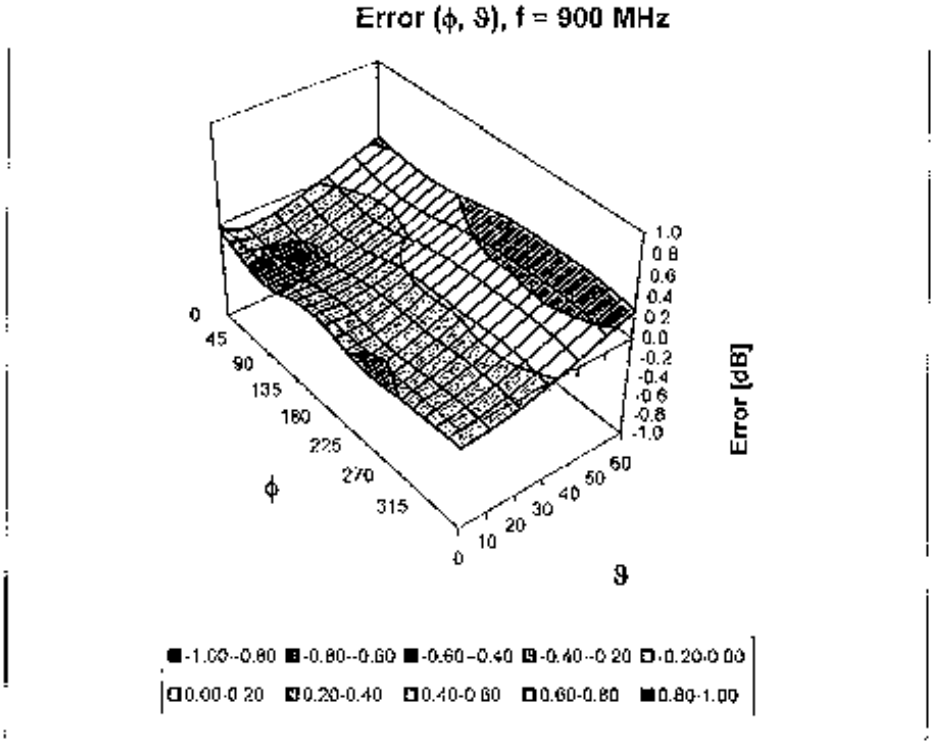
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment





Deviation from Isotropy in HSL



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

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 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

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

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

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

Accreditation No.: SCS 108

Client Motorola MDb

Certificate No: ES3-3184_Mar11

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3184
Calibration procedure(s)	QA CAL-01.v7, QA CAL-23.v4, QA CAL-25.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	March 11, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	01-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	01-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	01-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	23-Apr-10 (No. DAE4-654_Apr10)	Apr-11
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: March 16, 2011

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

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

Accredited by the Swiss Accreditation Service (SAS) Accreditation No.: **SCS 108**
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

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* are numerical linearization parameters in dB assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media.
- *VR:* VR is the validity range of the calibration related to the average diode voltage or DAE voltage in mV.
- *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:3184

Manufactured: August 19, 2008
Calibrated: March 11, 2011

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3184

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.27	1.40	1.27	± 10.1 %
DCP (mV)[B]	96.8	98.9	99.5	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	110.8	±3.0 %
			Y	0.00	0.00	1.00	117.2	
			Z	0.00	0.00	1.00	107.9	

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:3184

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	6.11	6.11	6.11	1.00	1.04	± 12.0 %
1810	40.0	1.40	5.11	5.11	5.11	0.93	1.08	± 12.0 %
1950	40.0	1.40	4.93	4.93	4.93	0.96	1.07	± 12.0 %
2450	39.2	1.80	4.48	4.48	4.48	0.73	1.28	± 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:3184

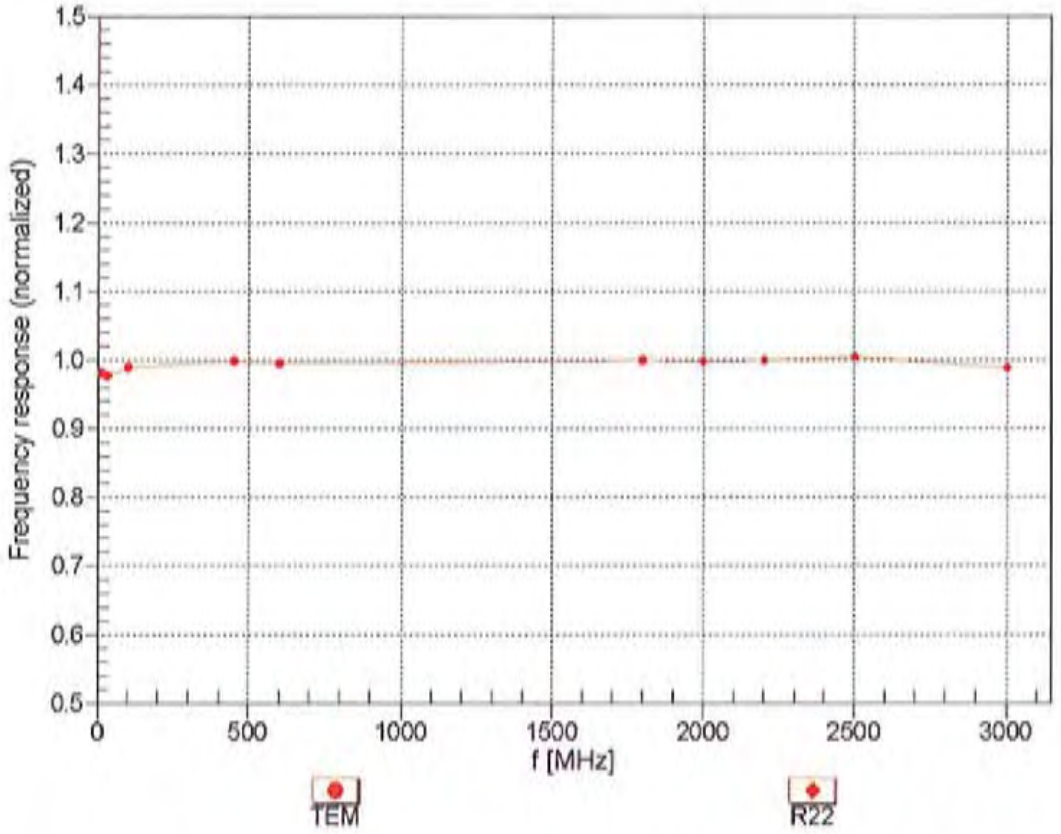
Calibration Parameter Determined in Body Tissue Simulating Media

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	6.10	6.10	6.10	1.00	1.00	± 12.0 %
1810	53.3	1.52	4.90	4.90	4.90	0.87	1.26	± 12.0 %
1950	53.3	1.52	4.86	4.86	4.86	0.73	1.38	± 12.0 %
2450	52.7	1.95	4.33	4.33	4.33	1.00	1.03	± 12.0 %

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

Frequency Response of E-Field

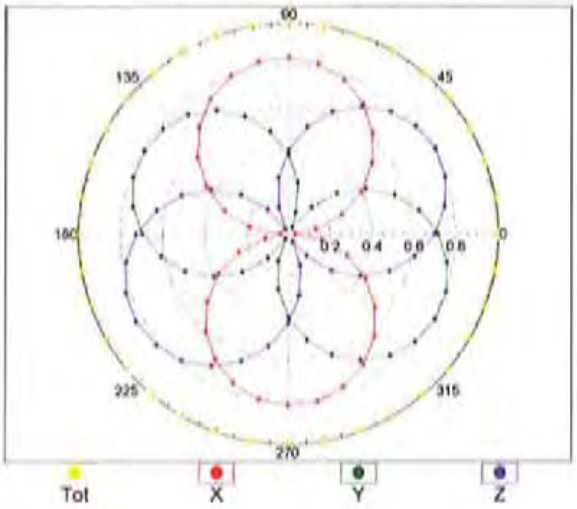
(TEM-Cell:ifi110 EXX, Waveguide: R22)



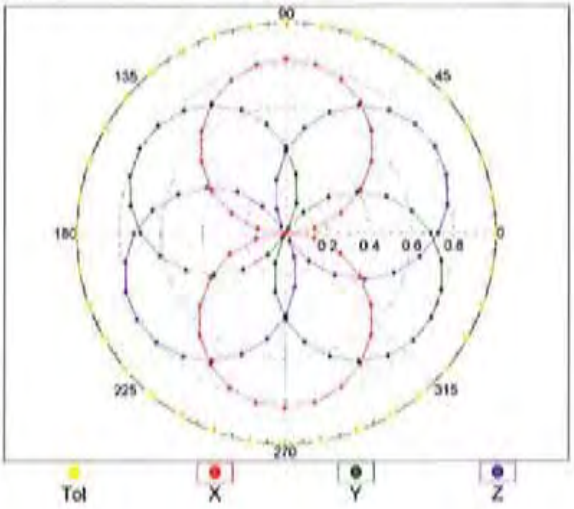
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

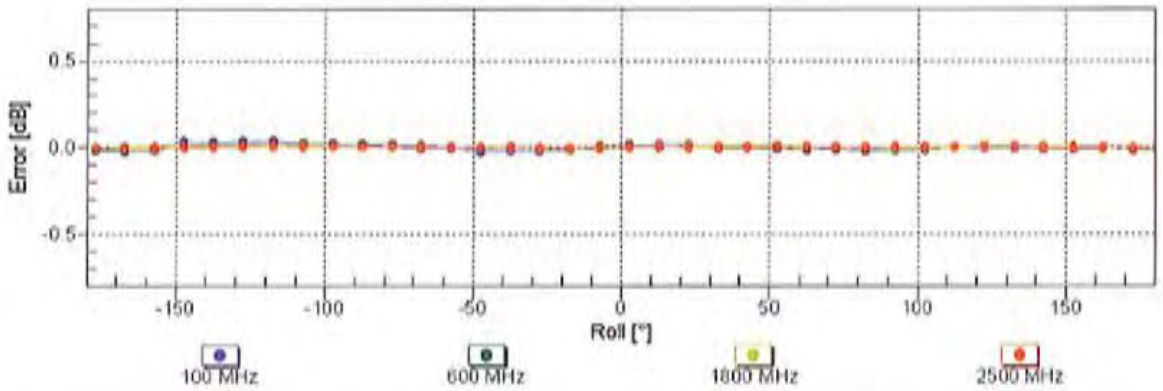
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



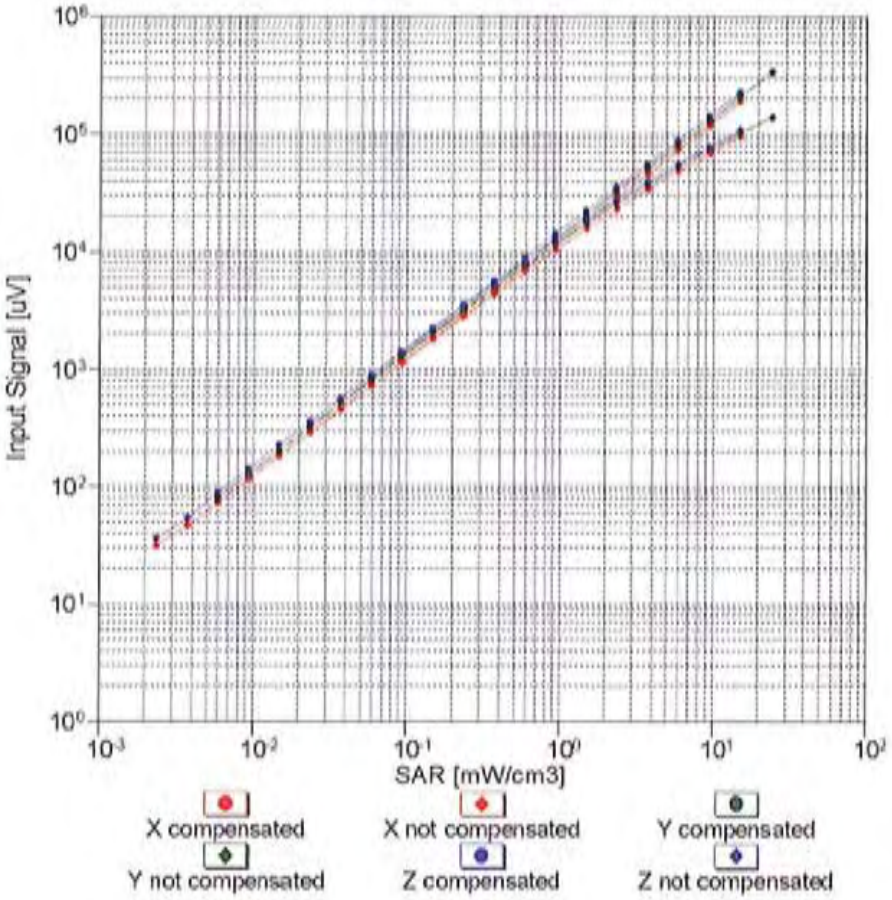
f=1800 MHz,R22

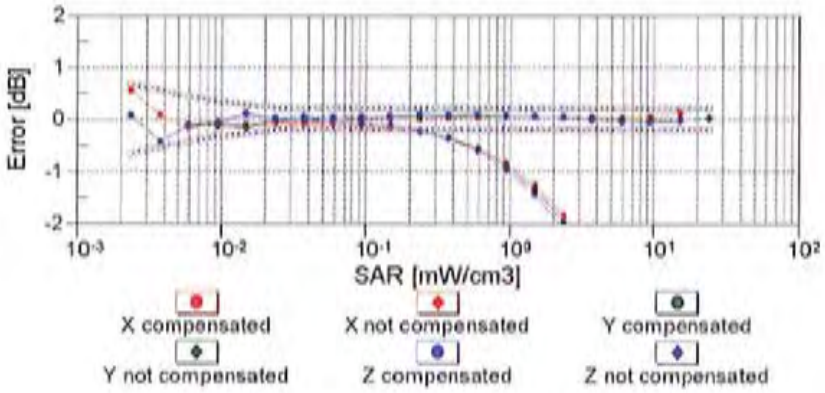




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

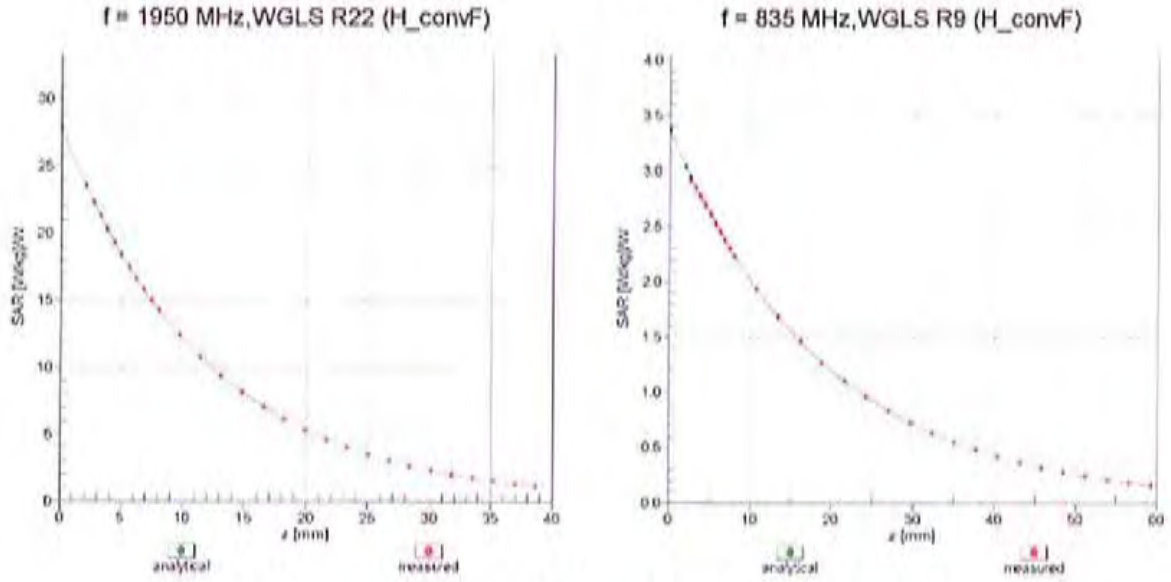
Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)





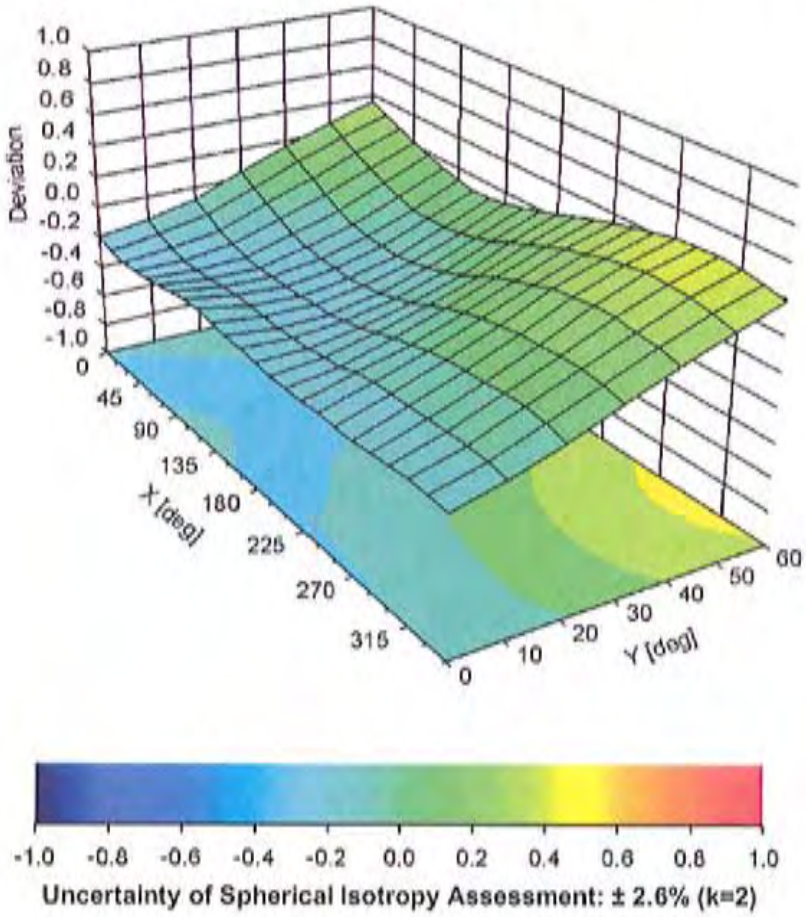
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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: ES3DV3 - SN:3184

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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

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

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

Accreditation No.: **SCS 108**

Client **Motorola MDb**

Certificate No: **ES3-3124_Aug11**

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3124

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

Calibration date: August 23, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: August 23, 2011

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

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

Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 108**
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

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:3124

Manufactured: July 11, 2006
Calibrated: August 23, 2011

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3124

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.26	1.30	1.30	± 10.1 %
DCP (mV)[B]	100.9	98.2	100.9	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	116.0	±2.7 %
			Y	0.00	0.00	1.00	109.7	
			Z	0.00	0.00	1.00	115.4	

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:3124

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)
750	41.9	0.89	6.26	6.26	6.26	1.00	1.00	± 12.0 %
835	41.5	0.90	6.08	6.08	6.08	1.00	1.00	± 12.0 %
1810	40.0	1.40	5.03	5.03	5.03	1.00	1.12	± 12.0 %
1950	40.0	1.40	4.83	4.83	4.83	1.00	1.12	± 12.0 %
2450	39.2	1.80	4.40	4.40	4.40	1.00	1.12	± 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:3124

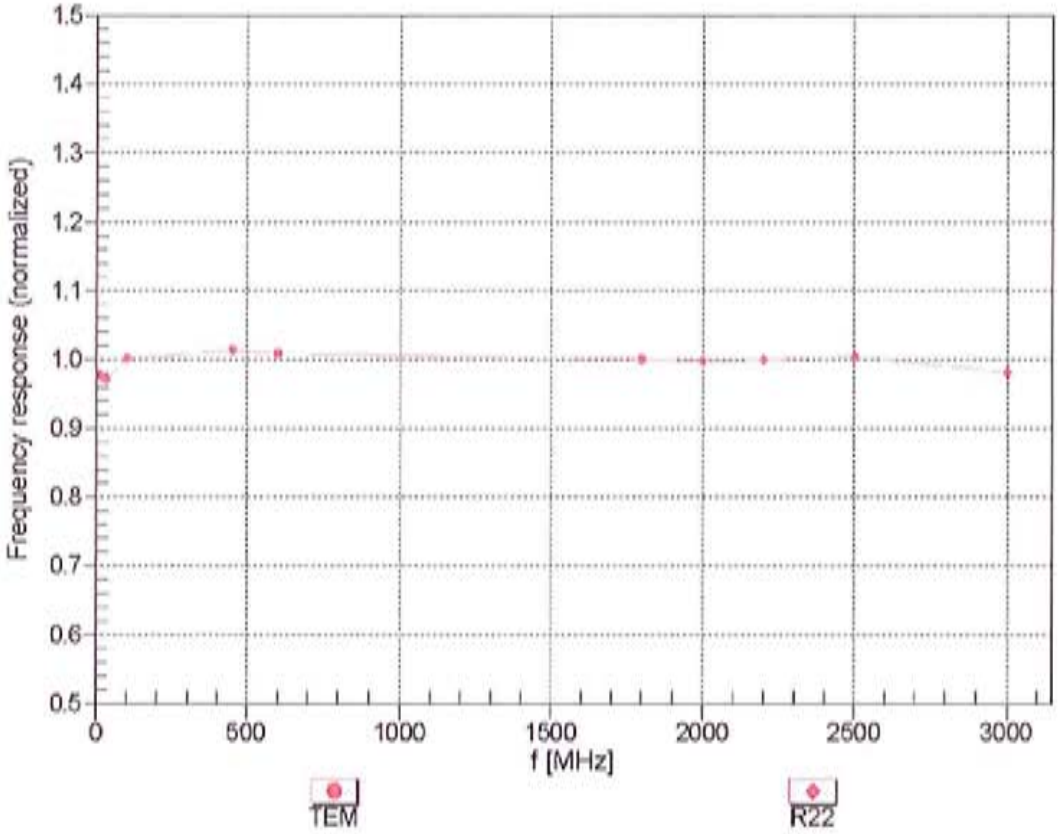
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.09	6.09	6.09	1.00	1.00	± 12.0 %
835	55.2	0.97	6.04	6.04	6.04	1.00	1.00	± 12.0 %
1810	53.3	1.52	4.69	4.69	4.69	1.00	1.18	± 12.0 %
1950	53.3	1.52	4.70	4.70	4.70	1.00	1.16	± 12.0 %
2450	52.7	1.95	4.21	4.21	4.21	1.00	1.00	± 12.0 %

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

Frequency Response of E-Field

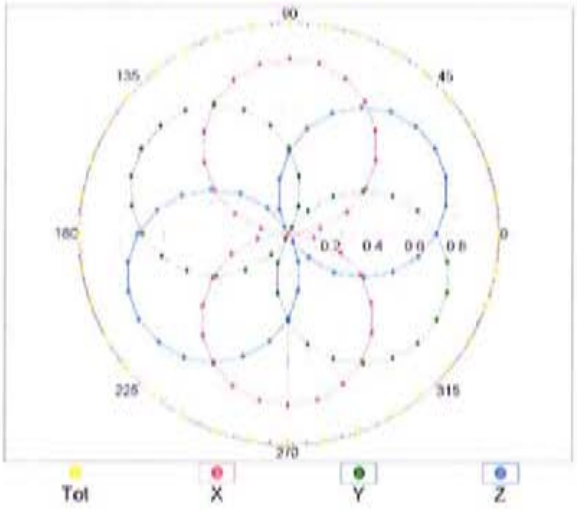
(TEM-Cell:ifi110 EXX, Waveguide: R22)



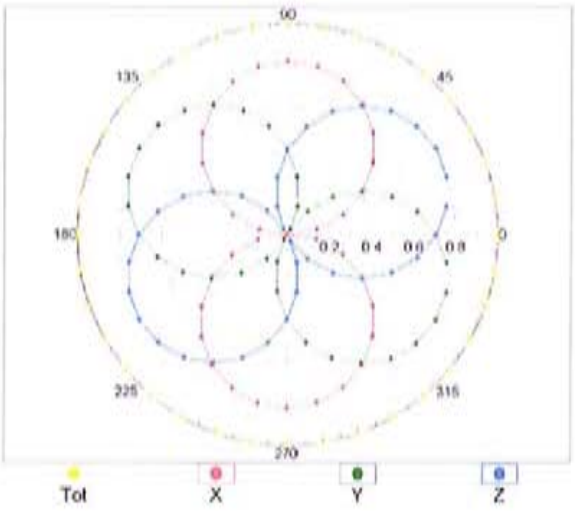
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

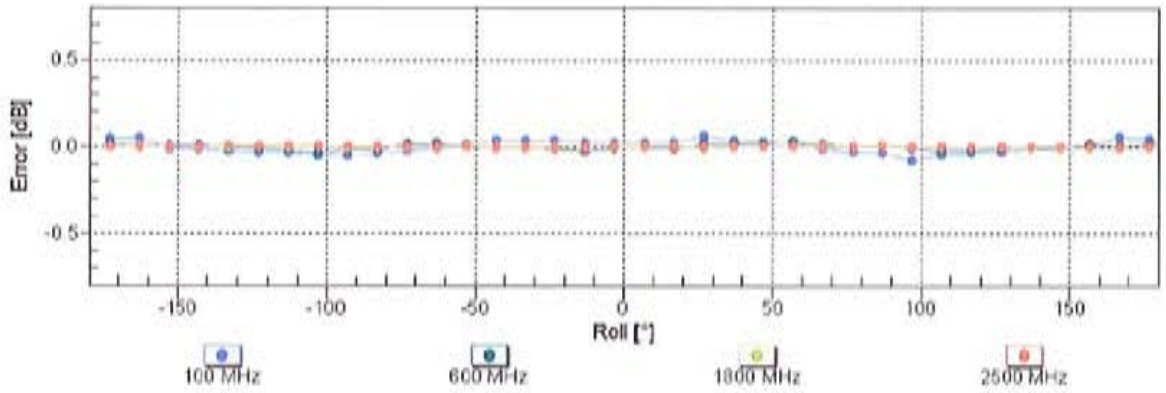
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



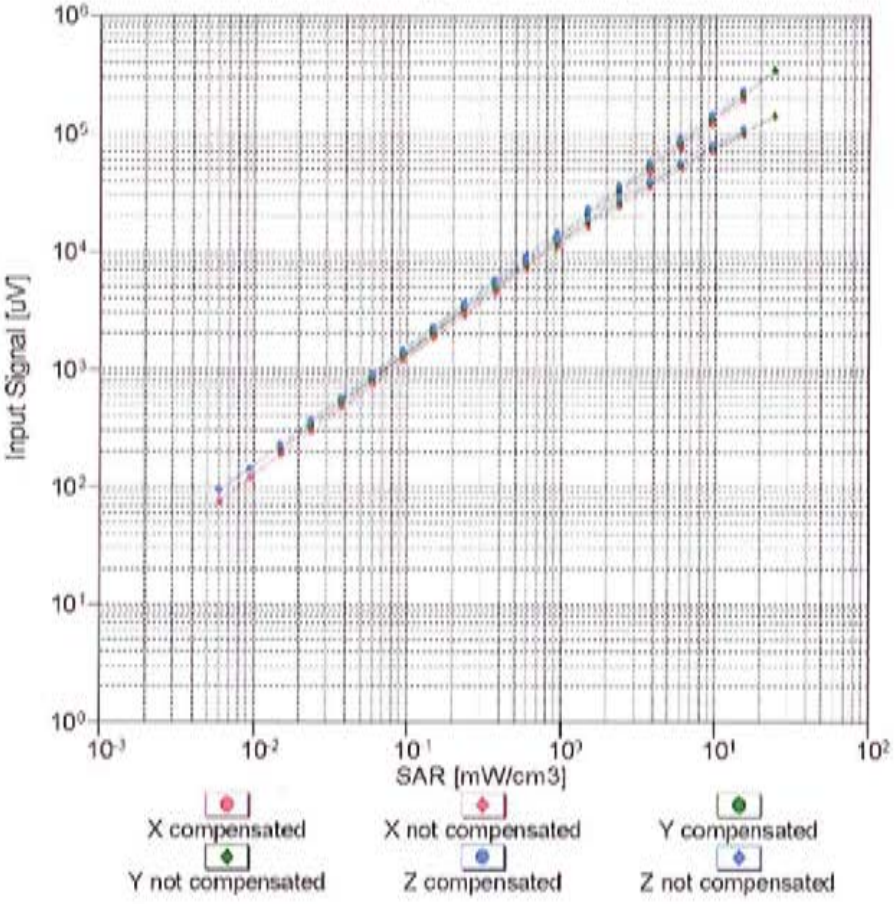
f=1800 MHz,R22

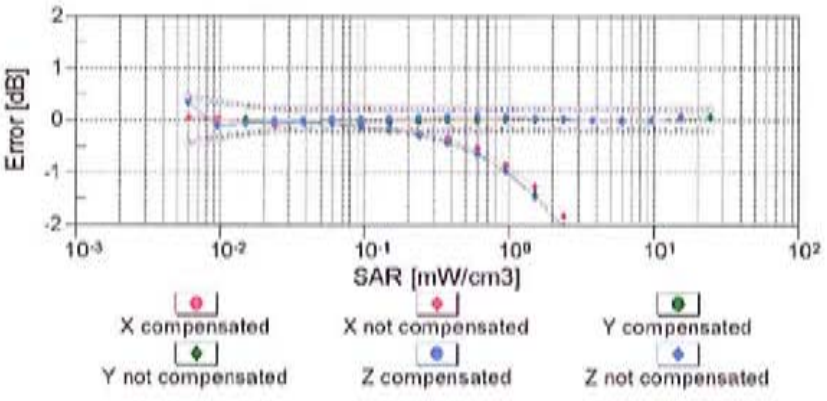




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR$_{head}$)
(TEM cell , f = 900 MHz)

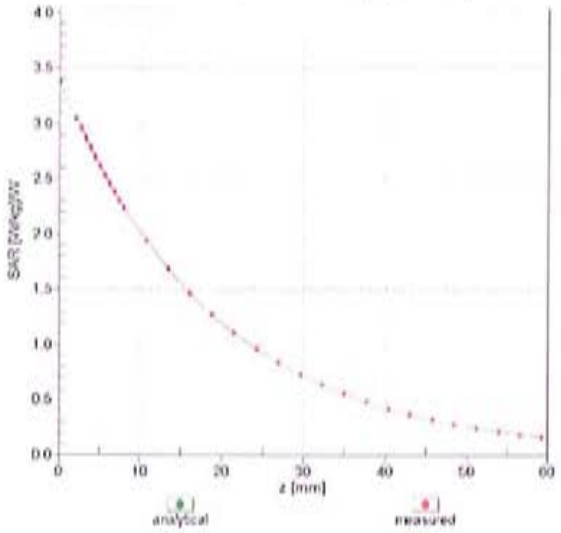




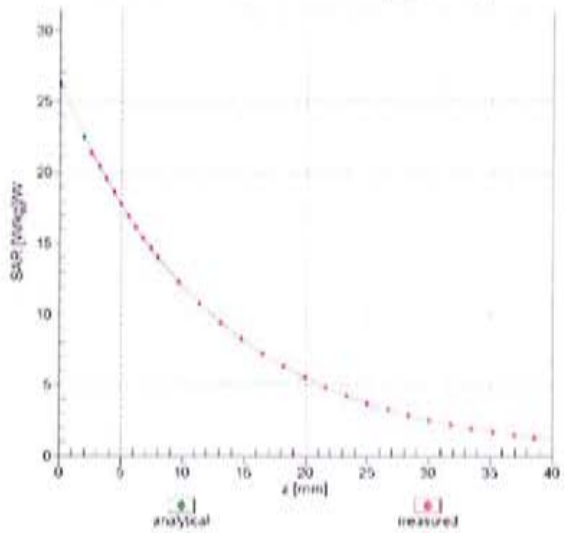
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

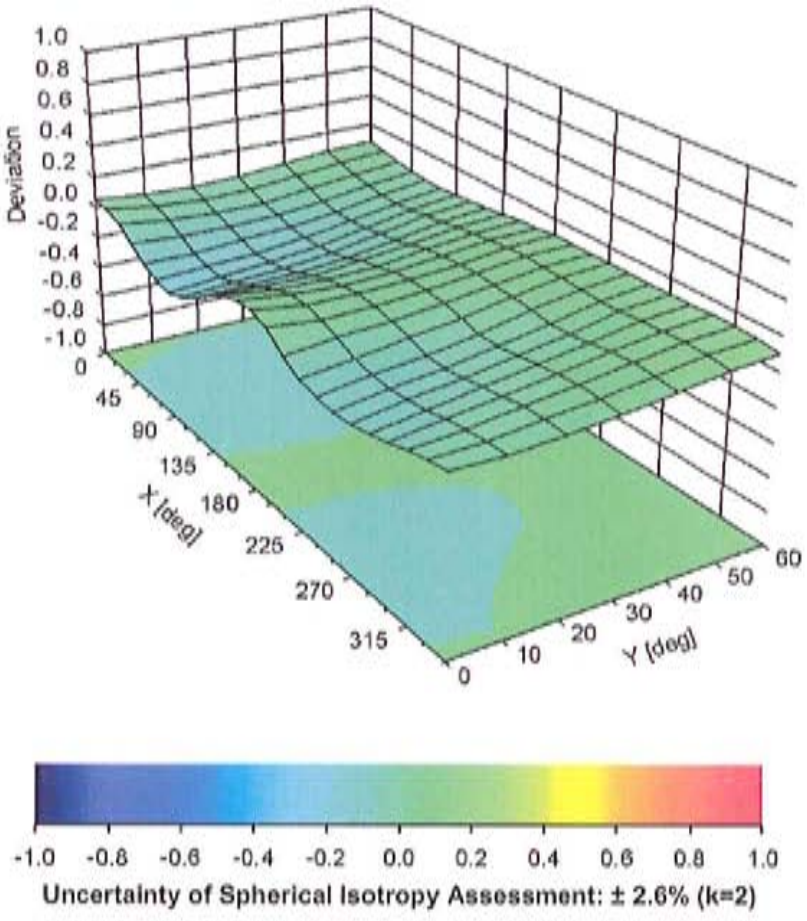


f = 1810 MHz,WGLS R22 (H_convF)



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:3124

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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

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

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

Accreditation No.: SCS 108

Client Motorola MDb

Certificate No: ES3-3183_Sep11

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3183
Calibration procedure(s)	QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4 Calibration procedure for dosimetric E-field probes
Calibration date:	September 22, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: September 23, 2011

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

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

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

Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not 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:3183

Manufactured: March 25, 2008
Calibrated: September 22, 2011

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3183

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.20	1.13	1.08	± 10.1 %
DCP (mV)[B]	96.5	94.5	96.6	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	108.9	±2.5 %
			Y	0.00	0.00	1.00	102.1	
			Z	0.00	0.00	1.00	100.8	

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:3183

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)
750	41.9	0.89	6.27	6.27	6.27	0.80	1.00	± 12.0 %
835	41.5	0.90	6.04	6.04	6.04	0.80	1.00	± 12.0 %
1810	40.0	1.40	5.15	5.15	5.15	0.80	1.26	± 12.0 %
1950	40.0	1.40	4.95	4.95	4.95	0.80	1.26	± 12.0 %
2450	39.2	1.80	4.45	4.45	4.45	0.78	1.28	± 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.

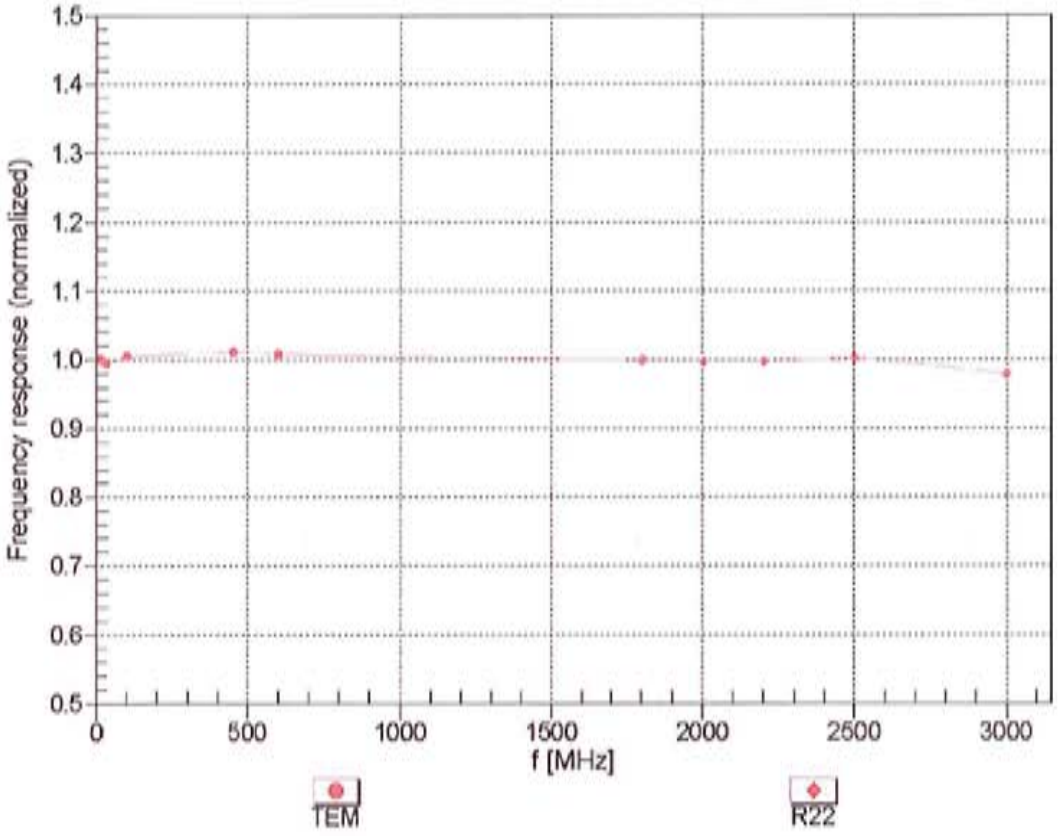
DASY/EASY - Parameters of Probe: ES3DV3- SN:3183

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)
750	55.5	0.96	6.09	6.09	6.09	0.80	1.31	± 12.0 %
835	55.2	0.97	6.05	6.05	6.05	0.80	1.28	± 12.0 %
1810	53.3	1.52	4.75	4.75	4.75	0.80	1.29	± 12.0 %
1950	53.3	1.52	4.80	4.80	4.80	0.80	1.34	± 12.0 %
2450	52.7	1.95	4.31	4.31	4.31	0.80	1.00	± 12.0 %

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

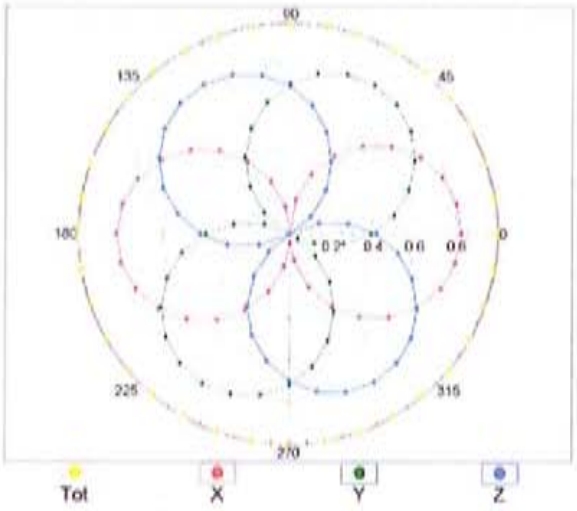
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



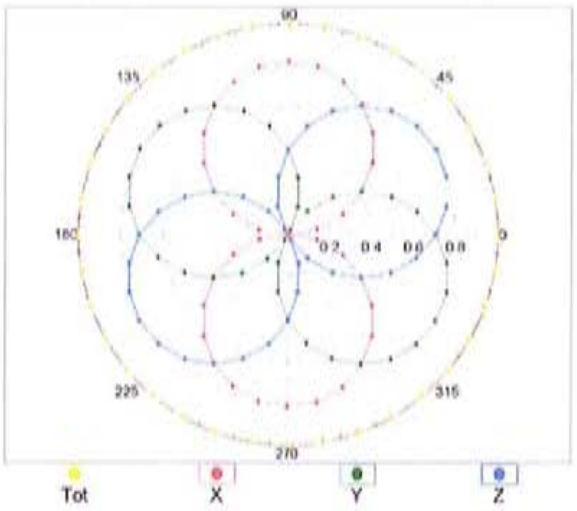
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

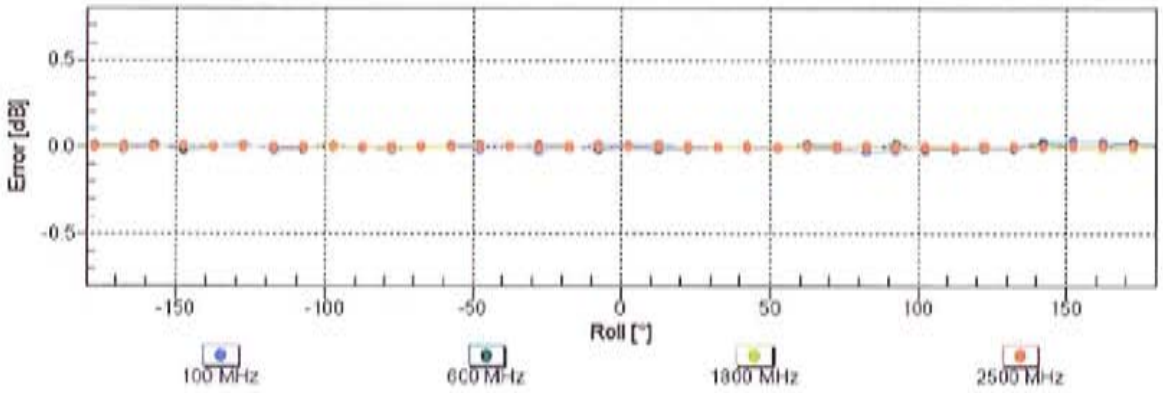
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



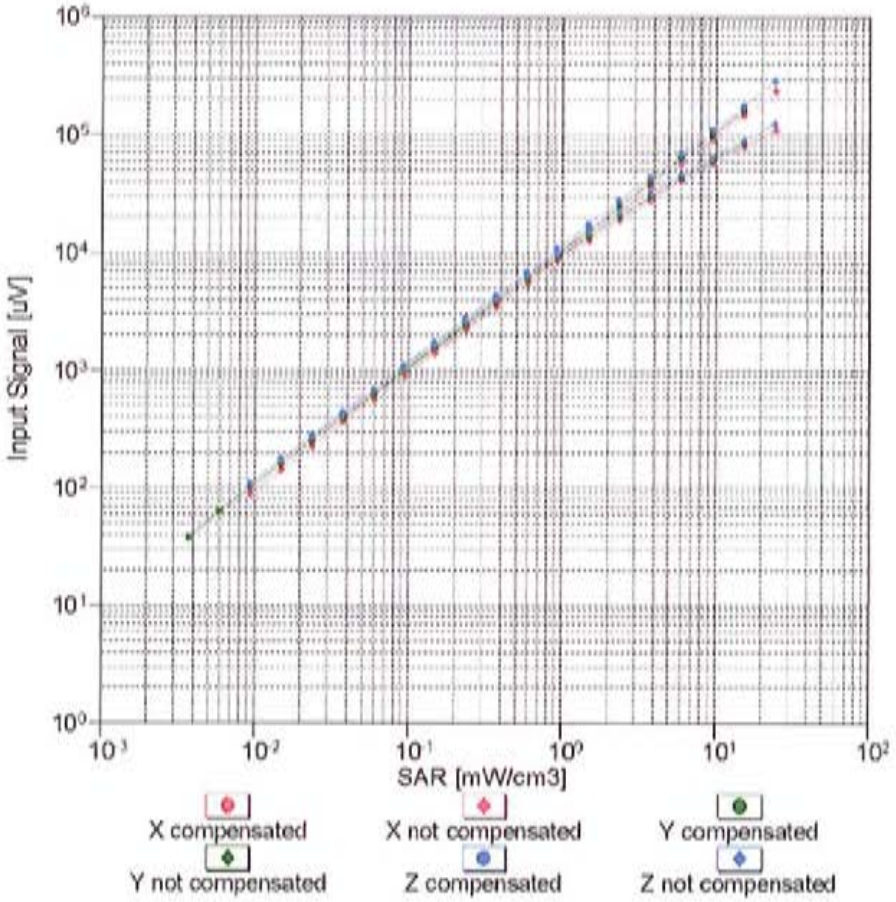
f=1800 MHz,R22

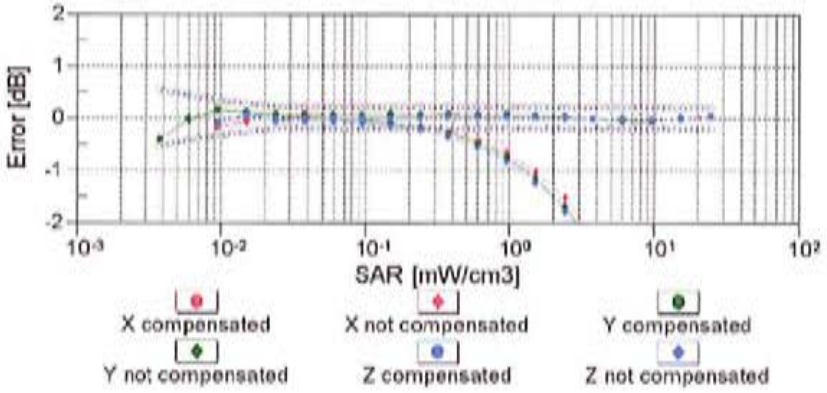




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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

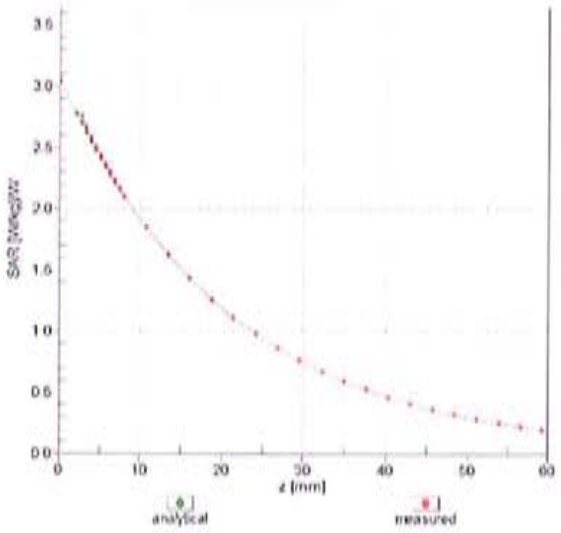




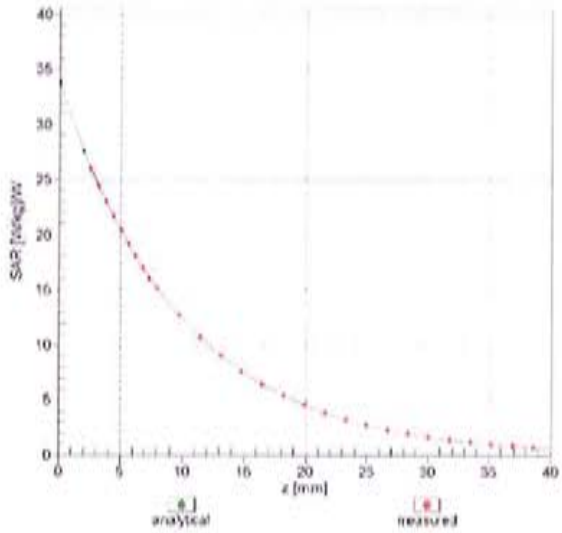
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 750 MHz,WGLS R9 (H_convF)

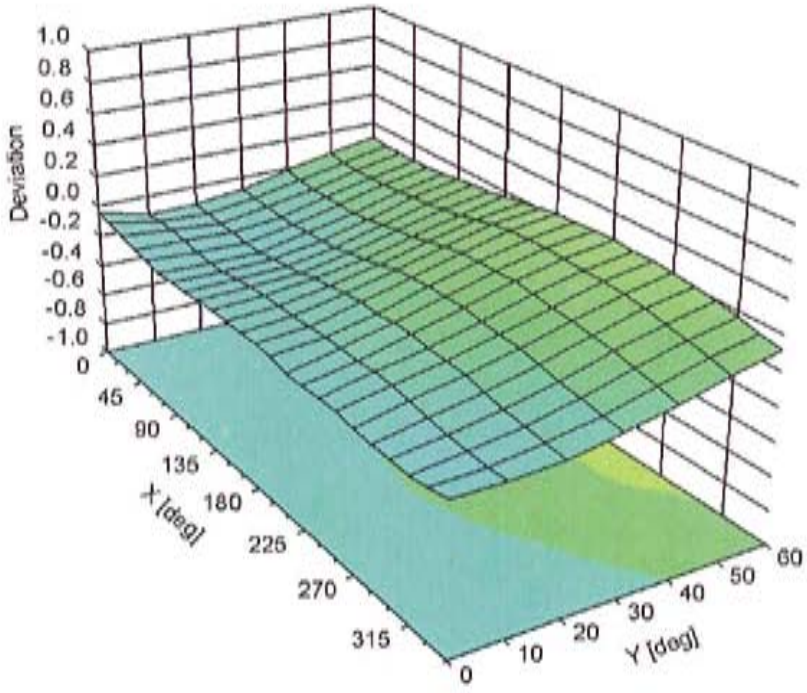


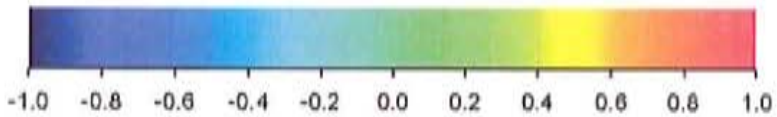
f = 2450 MHz,WGLS R22 (H_convF)



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:3183

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm