MOTOROLA

Portable Cellular Phone SAR Test Report

Tests Requested By:	Motorola Mobile Devices 8000 West Sunrise Boulevard, Plantation, Florida, 33322-9947 United States
Test Report #:	22707-2F
Date of Report:	23-Jan-2009
Date of Test:	5-Jan-2009 through 19-Jan-2009
FCC ID #:	IHDT56KE1
Generic Name:	MRQ6-334411C11
Test Laboratory:	Motorola Mobile Devices Business Product Safety & Compliance Laboratory 11th Floor, Hibrand Living Hall, 215, Yanjae-Dong, Seocho-Gu, Seoul, 137-130, South Korea
Report Author:	Jon Park Senior Staff Engineer

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)

ACCREDITED

TESTING CERT #2518-03

Statement of Compliance:

On the following products or types of products:

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

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:

(none)

Table of Contents

1. Introduction

The Motorola Mobile Devices Business Product Safety 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 1g average set in [3] and 2.0W/kg in a 10g average set in [2].

For ANSI / IEEE C95.1 (1g), the final SAR reading for this phone is 0.55 W/kg for head adjacent use and 1.25 W/kg for body worn use. These measurements were performed using a Dasy4™ v4.7 system manufactured by Schmid & Partner Engineering AG (SPEAG), of Zurich Switzerland.

2. Description of the Device Under Test

2.1 Antenna description

Type	Internal Antenna	
Location	Bottom of the transceiver	
Dimensions	Width	59 mm
	Length	22 mm
Configuration	SE-FICA	

2.2 Device description

Serial number	**004401029206899**							
Mode(s) of Operation	GSM 850	GSM 900	GSM 1800	GSM 1900			WCDMA 850	WCDMA 1900	Blue Tooth
Modulation Mode(s)	GMSK	GMSK	GMSK	GMSK			QPSK	QPSK	GFSK
Maximum Output Power Setting	32.5 dBm	32.5 dBm	29.5 dBm	30.0 dBm	29.5 dBm	29.0 dBm	24.0 dBm	24.0 dBm	9.0 dBm
Duty Cycle	1:8	1:8	1:8	1:8			1:1	1:1	1:1
Transmitting Frequency Range(s)	824.2 - 848.8 MHz	880.2 - 914.8 MHz	1710.2-1784.8 MHz	1710.2-1784.8 MHz			826.4 - 846.6 MHz	1852.4-1907.6 MHz	2400 - 2483.5 MHz
Production Unit or Identical Prototype (47 CFR §2..908)	Identical Prototype								
Device Category	Portable								
RF Exposure Limits	General Population / Uncontrolled								

Mode(s) of Operation	GPRS 850		GPRS 900		GPRS 1800		GPRS 1900					
Modulation Mode(s)	GMSK		GMSK		GMSK		GMSK					
Maximum Output Power Setting	32.5 dBm	**30.6 dBm**	32.5 dBm	**30.6 dBm**	29.5 dBm	**27.8 dBm**	30.0 dBm	29.5 dBm	29.0 dBm	**28.2 dBm**	**27.8 dBm**	**27.3 dBm**
Duty Cycle	1:8	**2:8**	1:8	**2:8**	1:8	**2:8**	1:8			**2:8**		
Transmitting Frequency Range(s)	824.2 - 848.8 MHz		880.2 - 914.8 MHz		1710.2 - 1784.8 MHz		1850.2 - 1909.8 MHz					

Mode(s) of Operation	EDGE 850		EDGE 900		EDGE 1800		EDGE 1900	
Modulation Mode(s)	8PSK		8PSK		8PSK		8PSK	
Maximum Output Power Setting	27.5 dBm	**25.6 dBm**	27.5 dBm	**25.6 dBm**	26.5 dBm	**24.7 dBm**	26.5 dBm	**24.7 dBm**
Duty Cycle	1:8	**2:8**	1:8	**2:8**	1:8	**2:8**	1:8	**2:8**
Transmitting Frequency Range(s)	824.2 - 848.8 MHz		880.2 - 914.8 MHz		1710.2 - 1784.8 MHz		1850.2 - 1909.8 MHz	

Note: Bolded entries indicate data mode of highest time-average power per band and data mode type.

3. Test Equipment Used

3.1 Dosimetric System

The Motorola Mobile Devices Business Product Safety & Compliance 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 10g RSS uncertainty of the measurement system is ±10.8% (K=1) with an expanded uncertainty of ±21.6% (K=2). The overall 1g 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 5. Per IEEE 1528, this uncertainty budget is applicable to the SAR range of 0.4W/kg to 10W/kg.

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

Description	Serial Number	Cal Due Date
DASY4™ DAE3	386	4/22/2009
E-Field Probe ES3DV3	3180	7/14/2009
S.A.M. Phantom used for 800/900MHz	TP-1155	
S.A.M. Phantom used for 1800/1900/2450MHz	TP-1086	
Dipole Validation Kit, DV900V2	77	4/08/2009
Dipole Validation Kit, DV1800V2	280tr	4/08/2009
Dipole Validation Kit, DV2450V2	767	4/08/2009

3.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04630	1/28/2009
Power Meter E4419B	US39250623	1/28/2009
Power Sensor #1 - 8481A	US37296472	1/29/2009
Power Sensor #2 - 8481A	3318A86935	1/29/2009
Network Analyzer HP8753ES	US39172714	7/30/2009
Dielectric Probe Kit HP85070C	US99360207	

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 ρ=1g/cm3 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].

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		
			ε_r	σ (S/m)	Temp (°C)
835	Head	**Measured,** 5-Jan-2009	41.8	0.90	21.5
		Measured, 6-Jan-2009	42.7	0.91	21.4
		Measured, 15-Jan-2009	41.9	0.90	20.9
		Recommended Limits	41.5 ±5%	0.90 ±5%	18-25
	Body	**Measured,** 6-Jan-2009	55.1	1.01	21.7
		Measured, 15-Jan-2009	54.9	1.01	21.1
		Recommended Limits	55.2 ±5%	0.97 ±5%	18-25
1880	Head	**Measured,** 6-Jan-2009	39.1	1.45	21.3
		Measured, 7-Jan-2009	39.1	1.45	21.8
		Measured, 9-Jan-2009	38.3	1.46	20.4
		Measured, 12-Jan-2009	38.3	1.46	21.2
		Recommended Limits	40.0 ±5%	1.40 ±5%	18-25
	Body	**Measured,** 12-Jan-2009	51.8	1.59	21.0
		Measured, 13-Jan-2009	51.8	1.59	21.1
		Recommended Limits	53.3 ±5%	1.52 ±5%	18-25
2450	Body	**Measured,** 16-Jan-2009	48.2	2.04	21.5
		Recommended Limits	52.7 ±10%	1.95 ±5%	18-25

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

Ingredient	835MHz / 900 MHz Head	835MHz / 900 MHz Body	1800MHz / 1900 MHz Head	1800 MHz / 1900 MHz Body	2450MHz 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 Verification

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 6. 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 1W 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 tissue stimulant depth was verified to be 15.0cm ±0.5cm. Z-axis scans showing the SAR penetration are also included in Appendix 1.

f (MHz)	Description	SAR (W/kg), 1gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
			ε_r	σ (S/m)		
900	**Measured,** 5-Jan-2009	11.30	41.1	0.97	21.7	21.9
	Measured, 6-Jan-2009	11.53	42.0	0.98	20.9	21.6
	Measured, 15-Jan-2009	11.25	41.2	0.96	20.6	21.1
	Recommended Limits	11.29	41.5 ±5%	0.97 ±5%	18-25	18-25
1800	**Measured,** 6-Jan-2009	38.18	39.5	1.36	21.8	22.7
	Measured, 7-Jan-2009	37.98	39.2	1.37	21.7	21.4
	Measured, 9-Jan-2009	38.38	38.6	1.38	21.1	20.8
	Measured, 12-Jan-2009	38.05	39.5	1.37	21.2	21.0
	Measured, 13-Jan-2009	37.65	39.4	1.36	21.2	21.2
	Recommended Limits	37.7	40.0 ±5%	1.4 ±5%	18-25	18-25
2450	**Measured,** 16-Jan-2009	56.5	37.7	1.89	21.7	21.9
	Recommended Limits	56.5	39.2 ±10%	1.80 ±5%	18-25	18-25

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

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	SN3180	900	5.91	8 of 9
		1810	5.15	8 of 9
		2450	4.47	8 of 9

6. Test Results

The test sample was operated using an actual transmission through a base station simulator. The base station simulator was setup to the proper channel, transmitter power level and transmit mode 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 measured dielectric constant of the material used for the device holder is less than 2.9 and the loss tangent is less than 0.02 (± 30%) at 850MHz. The default settings for the "coarse" and "cube" scans were chosen and used for measurements. The grid spacing of the course scan was set to 15 mm as shown in the SAR plots included in Appendix 2 and 3. 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:
SNN5837A - 1140 mAH BN70 Battery
SNN5833A - 950 mAH BN60 Battery

The battery with the highest capacity is the SNN5837A Battery. This battery was used to do most of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery. The configuration that resulted in the highest SAR values were tested using the other batteries listed above.

Per the "SAR Measurement Procedures for 3G Devices" released in October, 2007, 12.2kbps RMC, 12.2kbps AMR, HS-DPCCH Sub-test 1-4, 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			
		RMC	AMR	Subtest 1	Subtest 2	Subtest 3	Subtest 4
WCDMA 850	4132	23.83	23.83	23.86	23.86	23.86	23.86
	4180	24.09	24.09	24.05	24.06	24.06	24.05
	4233	23.82	23.82	23.93	23.93	23.93	23.93
WCDMA 1900	9262	24.05	24.05	24.01	24.01	24.01	24.00
	9400	23.89	23.88	23.93	23.93	23.93	23.93
	9538	23.80	23.78	23.83	23.80	23.81	23.79

6.1 Head Adjacent Test Results

The SAR results shown in tables 1 through 12 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 the [6]. Also shown are the measured conducted output power levels, the temperature of the simulated tissue after the test, the measured drift and the extrapolated SAR. The exact method of extrapolation is New SAR = Old 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. Note that 800MHz digital mode SAR measurements were performed in accordance with [4].

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 to be 15.0cm ±0.5cm.

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

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	SN3180	900	5.91	8 of 9
		1810	5.15	8 of 9

Left Head Cheek Position (Slider Down)								
f (MHz)	Description	Conducted Output Power (dBm)	Temp (°C)	Drift (dB)	*10g SAR value*		*1g SAR value*	
					Measured (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Extrapolated (W/kg)
GSM 850MHz	**Channel 128**	32.55						
	Channel 190	32.47	**20.9**	**0.04**	**0.195**	**0.20**	**0.273**	**0.27**
	Channel 251	32.50						
GSM 1900MHz	**Channel 512**	29.95						
	Channel 661	29.48	20.7	0.09	0.0814	0.08	0.134	0.13
	Channel 810	28.99						
WCDMA 850MHz	**Channel 4132**	23.83						
	Channel 4180	24.09	21.7	-0.04	0.229	0.23	0.317	0.32
	Channel 4233	23.82						
WCDMA 1900MHz	**Channel 9262**	24.05						
	Channel 9400	23.89	21.9	-0.04	0.184	0.19	0.302	0.30
	Channel 9538	23.80						

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 (Slider Down)								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz	**Channel 128**	32.55						
	Channel 190	32.47	21.0	-0.05	0.184	0.19	0.263	0.27
	Channel 251	32.50						
GSM 1900MHz	**Channel 512**	29.95						
	Channel 661	29.48	21.7	-0.08	0.11	0.11	0.183	0.19
	Channel 810	28.99						
WCDMA 850MHz	**Channel 4132**	23.83						
	Channel 4180	24.09	**21.5**	**-0.06**	**0.232**	**0.24**	**0.325**	**0.33**
	Channel 4233	23.82						
WCDMA 1900MHz	**Channel 9262**	24.05						
	Channel 9400	23.89	21.2	-0.13	0.261	0.27	0.435	0.45
	Channel 9538	23.80						

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

The noted Highest Head Cheek Position **with SNN5833A Battery (Slider Down)**								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz *Left*	**Channel 128**	32.55						
	Channel 190	32.47	20.9	0.08	0.195	0.20	0.272	0.27
	Channel 251	32.50						
GSM 1900MHz *Right*	**Channel 512**	29.95						
	Channel 661	29.48	**21.2**	**-0.15**	**0.114**	**0.12**	**0.191**	**0.20**
	Channel 810	28.99						
WCDMA 850MHz *Right*	**Channel 4132**	23.83						
	Channel 4180	24.09	21.2	-0.12	0.228	0.23	0.324	0.33
	Channel 4233	23.82						
WCDMA 1900MHz *Right*	**Channel 9262**	24.05						
	Channel 9400	23.89	**21.8**	**-0.20**	**0.266**	**0.28**	**0.445**	**0.47**
	Channel 9538	23.80						

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

Left Head Cheek Position (Slider Up)								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz	**Channel 128**	32.55						
	Channel 190	32.47	**20.7**	**-0.06**	**0.255**	**0.26**	**0.34**	**0.34**
	Channel 251	32.50						
GSM 1900MHz	**Channel 512**	29.95						
	Channel 661	29.48	20.5	0.04	0.083	0.08	0.14	0.14
	Channel 810	28.99						
WCDMA 850MHz	**Channel 4132**	23.83						
	Channel 4180	24.09	21.6	-0.07	0.254	0.26	0.341	0.35
	Channel 4233	23.82						
WCDMA 1900MHz	**Channel 9262**	24.05						
	Channel 9400	23.89	21.1	-0.04	0.2	0.20	0.337	0.34
	Channel 9538	23.80						

Table 4: 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 (Slider Up)								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz	**Channel 128**	32.55						
	Channel 190	32.47	20.8	-0.08	0.225	0.23	0.301	0.31
	Channel 251	32.50						
GSM 1900MHz	**Channel 512**	29.95						
	Channel 661	29.48	21.5	-0.15	0.133	0.14	0.218	0.23
	Channel 810	28.99						
WCDMA 850MHz	**Channel 4132**	23.83						
	Channel 4180	24.09	21.4	-0.08	0.234	0.24	0.314	0.32
	Channel 4233	23.82						
WCDMA 1900MHz	**Channel 9262**	24.05						
	Channel 9400	23.89	**21.3**	**-0.16**	**0.323**	**0.34**	**0.528**	**0.55**
	Channel 9538	23.80						

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

***The noted Highest Head Cheek Position* with SNN5833A Battery (Slider Up)**								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz *Left*	**Channel 128**	32.55						
	Channel 190	32.47	20.8	0.07	0.238	0.24	0.319	0.32
	Channel 251	32.50						
GSM 1900MHz *Right*	**Channel 512**	29.95						
	Channel 661	29.48	**21.3**	**-0.09**	**0.138**	**0.14**	**0.228**	**0.23**
	Channel 810	28.99						
WCDMA 850MHz *Left*	**Channel 4132**	23.83						
	Channel 4180	24.09	**21.4**	**-0.18**	**0.327**	**0.34**	**0.43**	**0.45**
	Channel 4233	23.82						
WCDMA 1900MHz *Right*	**Channel 9262**	24.05						
	Channel 9400	23.89	21.9	-0.08	0.324	0.33	0.53	0.54
	Channel 9538	23.80						

Table 6: 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 (Slider Down)								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz	**Channel 128**	32.55						
	Channel 190	32.47	**20.8**	**0.12**	**0.126**	**0.13**	**0.163**	**0.16**
	Channel 251	32.50						
GSM 1900MHz	**Channel 512**	29.95						
	Channel 661	29.48	20.6	0.00	0.0988	0.10	0.183	0.18
	Channel 810	28.99						
WCDMA 850MHz	**Channel 4132**	23.83						
	Channel 4180	24.09	21.7	0.02	0.153	0.15	0.199	0.20
	Channel 4233	23.82						
WCDMA 1900MHz	**Channel 9262**	24.05						
	Channel 9400	23.89	21.3	0.01	0.231	0.23	0.42	0.42
	Channel 9538	23.80						

Table 7: SAR measurement results at the highest possible output power, measured in a head 15° Tilt position against the ICNIRP and ANSI SAR Limit.

Right Head 15° Tilt Position (Slider Down)								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz	**Channel 128**	32.55						
	Channel 190	32.47	20.9	0.05	0.121	0.12	0.158	0.05
	Channel 251	32.50						
GSM 1900MHz	**Channel 512**	29.95						
	Channel 661	29.48	21.5	-0.04	0.0885	0.09	0.159	0.16
	Channel 810	28.99						
WCDMA 850MHz	**Channel 4132**	23.83						
	Channel 4180	24.09	21.4	-0.01	0.161	0.16	0.209	0.21
	Channel 4233	23.82						
WCDMA 1900MHz	**Channel 9262**	24.05						
	Channel 9400	23.89	21.1	-0.12	0.213	0.22	0.381	0.39
	Channel 9538	23.80						

Table 8: SAR measurement results at the highest possible output power, measured in a head 15° Tilt position against the ICNIRP and ANSI SAR Limit.

The noted Highest Head 15° Tilt Position with **SNN5833A Battery (Slider Down)**								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz *Left*	**Channel 128**	32.55						
	Channel 190	32.47	20.9	0.11	0.0934	0.09	0.146	0.15
	Channel 251	32.50						
GSM 1900MHz *Left*	**Channel 512**	29.95						
	Channel 661	29.48	**21.1**	**-0.04**	**0.111**	**0.11**	**0.204**	**0.21**
	Channel 810	28.99						
WCDMA 850MHz *Right*	**Channel 4132**	23.83						
	Channel 4180	24.09	**21.5**	**-0.35**	**0.18**	**0.20**	**0.235**	**0.25**
	Channel 4233	23.82						
WCDMA 1900MHz *Left*	**Channel 9262**	24.05						
	Channel 9400	23.89	**21.8**	**-0.12**	**0.244**	**0.25**	**0.447**	**0.46**
	Channel 9538	23.80						

Table 9: SAR measurement results at the highest possible output power, measured in a head 15° Tilt position against the ICNIRP and ANSI SAR Limit.

Left Head 15° Tilt Position (Slider Up)								
f (MHz)	Description	Conducted Output Power (dBm)	Temp (°C)	Drift (dB)	*10g SAR value*		*1g SAR value*	
					Measured (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Extrapolated (W/kg)
GSM 850MHz	Channel 128	32.55						
	Channel 190	32.47	20.8	0.09	0.195	0.20	0.251	0.25
	Channel 251	32.50						
GSM 1900MHz	Channel 512	29.95						
	Channel 661	29.48	20.4	-0.03	0.112	0.11	0.209	0.21
	Channel 810	28.99						
WCDMA 850MHz	Channel 4132	23.83						
	Channel 4180	24.09	21.5	0.10	0.204	0.20	0.261	0.26
	Channel 4233	23.82						
WCDMA 1900MHz	Channel 9262	24.05						
	Channel 9400	23.89	21.2	0.04	0.296	0.30	0.545	0.55
	Channel 9538	23.80						

Table 10: SAR measurement results at the highest possible output power, measured in a head 15° Tilt position against the ICNIRP and ANSI SAR Limit.

Right Head 15° Tilt Position (Slider Up)								
f (MHz)	Description	Conducted Output Power (dBm)	Temp (°C)	Drift (dB)	*10g SAR value*		*1g SAR value*	
					Measured (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Extrapolated (W/kg)
GSM 850MHz	Channel 128	32.55						
	Channel 190	32.47	20.9	0.07	0.182	0.18	0.234	0.23
	Channel 251	32.50						
GSM 1900MHz	Channel 512	29.95						
	Channel 661	29.48	21.4	-0.14	0.108	0.11	0.192	0.20
	Channel 810	28.99						
WCDMA 850MHz	Channel 4132	23.83						
	Channel 4180	24.09	21.3	0.04	0.158	0.16	0.229	0.23
	Channel 4233	23.82						
WCDMA 1900MHz	Channel 9262	24.05						
	Channel 9400	23.89	21.3	-0.12	0.27	0.28	0.476	0.49
	Channel 9538	23.80						

Table 11: SAR measurement results at the highest possible output power, measured in a head 15° Tilt position against the ICNIRP and ANSI SAR Limit.

***The noted Highest Head 15° Tilt Position with* SNN5833A Battery (Slider Up)**								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz *Left*	**Channel 128**	32.55						
	Channel 190	32.47	20.6	0.01	0.192	0.19	0.247	0.25
	Channel 251	32.50						
GSM 1900MHz *Left*	**Channel 512**	29.95						
	Channel 661	29.48	21.1	0.02	0.113	0.11	0.209	0.21
	Channel 810	28.99						
WCDMA 850MHz *Left*	**Channel 4132**	23.83						
	Channel 4180	24.09	21.5	0.00	0.2	0.20	0.254	0.25
	Channel 4233	23.82						
WCDMA 1900MHz *Left*	**Channel 9262**	24.05						
	Channel 9400	23.89	21.8	0.04	0.284	0.28	0.526	0.53
	Channel 9538	23.80						

Table 12: SAR measurement results at the highest possible output power, measured in a head 15° Tilt position against the ICNIRP and ANSI SAR Limit.

6.2 Body Worn Test Results

The SAR results shown in tables 13 through 19 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 the [6]. Also shown are the measured conducted output power levels, the temperature of the test facility during the test, the temperature of the tissue simulate after the test, the measured drift and the extrapolated SAR. The exact method of extrapolation is New SAR = Old 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. Note that 800MHz digital mode SAR measurements were performed in accordance with [4].

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 “flat” phantom was for the body-worn tests. This “flat” phantom is made out of 1” thick natural High Density Polyethylene with a thickness at the bottom equal to 2.0mm. It measures 52.7cm(long) x 26.7cm(wide) x 21.2cm(tall). The measured dielectric constant of the material used is less than 2.3 and the loss tangent is less than 0.0046 all the way up to 2.184GHz.

The tissue stimulant depth was verified to be 15.0cm ±0.5cm. The same device holder described in section 6 was used for positioning the phone. The 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 hence the device was tested per the supplement C testing guidelines for devices that do not have body worn accessories. A separation distance of 15mm on GSM modes and WCDMA850 mode and 25mm on WCDMA1900 mode of between the device and the flat phantom was used for testing body-worn SAR. The device was tested with the front and back of the device facing the phantom.

In addition to accessory testing, the cellular phone was tested in data mode operations with the front and back of the phone facing the phantom. For these tests, a separation distance of 25mm between the device and the flat phantom was used. The device was tested with the front and back of the device facing the phantom.

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	SN3180	900	5.93	8 of 9
		1810	4.76	8 of 9
		2450	4.15	8 of 9

Body-Worn; Front of Phone *noted distance(mm)* from Phantom								
***f* (MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz *15mm*	**Channel 128**	32.55						
	Channel 190	32.47	20.8	0.00	0.0749	0.07	0.101	0.10
	Channel 251	32.50						
GSM 1900MHz *15mm*	**Channel 512**	29.95						
	Channel 661	29.48	21.8	0.05	0.034	0.03	0.0521	0.05
	Channel 810	28.99						
WCDMA 850MHz *15mm*	**Channel 4132**	23.83						
	Channel 4180	24.09	21.3	-0.29	0.0984	0.11	0.133	0.14
	Channel 4233	23.82						
WCDMA 1900MHz *25mm*	**Channel 9262**	24.05						
	Channel 9400	23.89	21.6	-0.01	0.0327	0.03	0.0499	0.05
	Channel 9538	23.80						

Table 13: 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 *noted the distance(mm)* from Phantom								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GSM 850MHz *15mm*	**Channel 128**	32.55						
	Channel 190	32.47	**21.1**	**-0.04**	**0.292**	**0.29**	**0.41**	**0.41**
	Channel 251	32.50						
GSM 1900MHz *15mm*	**Channel 512**	29.95	21.6	-0.02	0.578	0.58	1.11	1.12
	Channel 661	29.48	21.7	-0.03	0.533	0.54	1.02	1.03
	Channel 810	28.99	21.2	0.02	0.52	0.52	0.993	0.99
WCDMA 850MHz *15mm*	**Channel 4132**	23.83						
	Channel 4180	24.09	21.5	-0.04	0.312	0.31	0.441	0.45
	Channel 4233	23.82						
WCDMA 1900MHz *25mm*	**Channel 9262**	24.05	**21.1**	**-0.01**	**0.534**	**0.54**	**0.914**	**0.92**
	Channel 9400	23.89	21.7	-0.08	0.477	0.49	0.817	0.83
	Channel 9538	23.80	21.0	0.00	0.434	0.43	0.744	0.74

Table 14: 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 25mm from Phantom (GPRS Class 10 Mode)								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
GPRS Class10 850MHz	**Channel 128**	30.67						
	Channel 190	30.62	21.0	-0.01	0.15	0.15	0.207	0.21
	Channel 251	30.62						
GPRS Class10 1900MHz	**Channel 512**	28.33						
	Channel 661	27.89	21.2	-0.02	0.249	0.25	0.426	0.43
	Channel 810	27.39						

Table 15: 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 25mm from Phantom (EDGE Class 10 Mode)								
f (MHz)	Description	Conducted Output Power (dBm)	Temp (°C)	Drift (dB)	*10g SAR value*		*1g SAR value*	
					Measured (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Extrapolated (W/kg)
EDGE Class 10 850MHz	Channel 128	25.76						
	Channel 190	25.68	20.9	-0.17	0.0458	0.05	0.0635	0.07
	Channel 251	25.70						
EDGE Class 10 1900MHz	Channel 512	24.60						
	Channel 661	24.58	21.1	0.01	0.109	0.11	0.188	0.19
	Channel 810	24.60						

Table 16: SAR measurement results at the highest possible output power, measured in a body-worn position against the ICNIRP and ANSI SAR Limit.

Noted Highest Body-Worn Position with SNN5833A Battery								
f (MHz)	Description	Conducted Output Power (dBm)	Temp (°C)	Drift (dB)	*10g SAR value*		*1g SAR value*	
					Measured (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Extrapolated (W/kg)
GSM 850MHz *Back 15mm*	Channel 128	32.55						
	Channel 190	32.47	20.9	0.01	0.25	0.25	0.353	0.35
	Channel 251	32.50						
GSM 1900MHz *Back 15mm*	**Channel 512**	29.95	**21.0**	**0.01**	**0.647**	**0.65**	**1.25**	**1.25**
	Channel 661	29.48						
	Channel 810	28.99						
WCDMA 850MHz *Back 15mm*	Channel 4132	23.83						
	Channel 4180	24.09	**21.7**	**-0.08**	**0.349**	**0.36**	**0.489**	**0.50**
	Channel 4233	23.82						
WCDMA 1900MHz *Back 25mm*	Channel 9262	24.05	20.9	-0.01	0.525	0.53	0.896	0.90
	Channel 9400	23.89						
	Channel 9538	23.80						

Table 17: SAR measurement results at the highest possible output power, measured in a body-worn position against the ICNIRP and ANSI SAR Limit.

Bluetooth; ***Noted highest Body-Worn with highest battery***								
f **(MHz)**	**Description**	**Conducted Output Power (dBm)**	**Temp (°C)**	**Drift (dB)**	***10g SAR value***		***1g SAR value***	
					Measured (W/kg)	**Extrapolated (W/kg)**	**Measured (W/kg)**	**Extrapolated (W/kg)**
Bluetooth 2450MHz *Back 15mm with SNN5837A Battery*	**Channel 0**							
	Channel 39		**21.5**	**-3.34**	**0.000854**	**0.00**	**0.00372**	**0.01**
	Channel 78							
Bluetooth 2450MHz *Back 15mm with SNN5883A Battery*	**Channel 0**							
	Channel 39		21.3	-1.84	0.000161	0.00	0.000633	0.00
	Channel 78							
Bluetooth 2450MHz *Back 25mm with SNN5837A Battery*	**Channel 0**							
	Channel 39		21.4	-2.75	0.0000437	0.00	0.000327	0.00
	Channel 78							

Table 18: SAR measurement results at the highest possible output power, measured in a body-worn position against the ICNIRP and ANSI SAR Limit.

Highest Extrapolated SAR Values (including Bluetooth summation)							
f **(MHz)**	**Description**	***10 g SAR value***			***1 g SAR value***		
		Original Measurement (W/kg)	**Bluetooth Measurement (W/kg)**	**Summation (W/kg)**	**Original Measurement (W/kg)**	**Bluetooth Measurement (W/kg)**	**Summation (W/kg)**
GSM 850 MHz	Back of phone 15mm from phantom with SNN5837A Battery	0.29	0.00	**0.29**	0.41	0.01	**0.42**
GSM 1900 MHz	Back of phone 15mm from phantom with SNN5833A Battery	0.65	0.00	**0.65**	1.25	0.00	**1.25**
WCDMA 850 MHz	Back of phone 15mm from phantom with SNN5833A Battery	0.36	0.00	**0.36**	0.50	0.00	**0.50**
WCDMA 1900 MHz	Back of phone 25mm from phantom with SNN5837A Battery	0.54	0.00	**0.54**	0.92	0.00	**0.92**

Table 19: SAR measurement results at the highest possible output power, calculated for the body-worn position against the ICNIRP and ANSI SAR Limit.

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 (300MHz – 3GHz)”.

[3] ANSI / IEEE, C95.1 1999 Edition “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300GHz”

[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 comparison for the system accuracy verification

Date/Time: 01/05/2009 AM 10:27:00

Test Laboratory: Motorola 20090105_900MHz_+0.1%

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 077 PM1 Power = 200 mW
Sim.Temp@meas = 21.9 ▪ C Sim.Temp@SPC = 21.9 ▪ C Room Temp @ SPC = 21.7 ▪ C
Communication System: CW - Dipole; Frequency: 900 MHz; Channel Number: 4; Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: f = 900 MHz; σ = 0.97 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3

DASY4 Configuration:

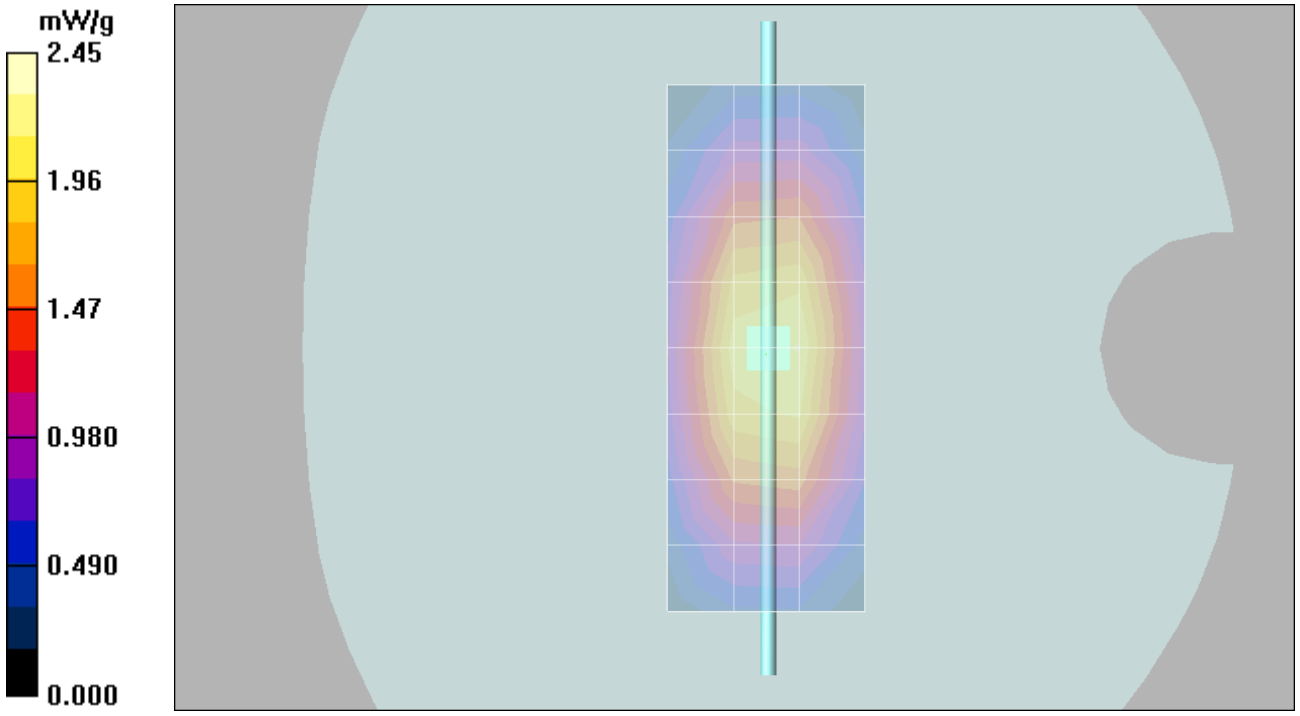
- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

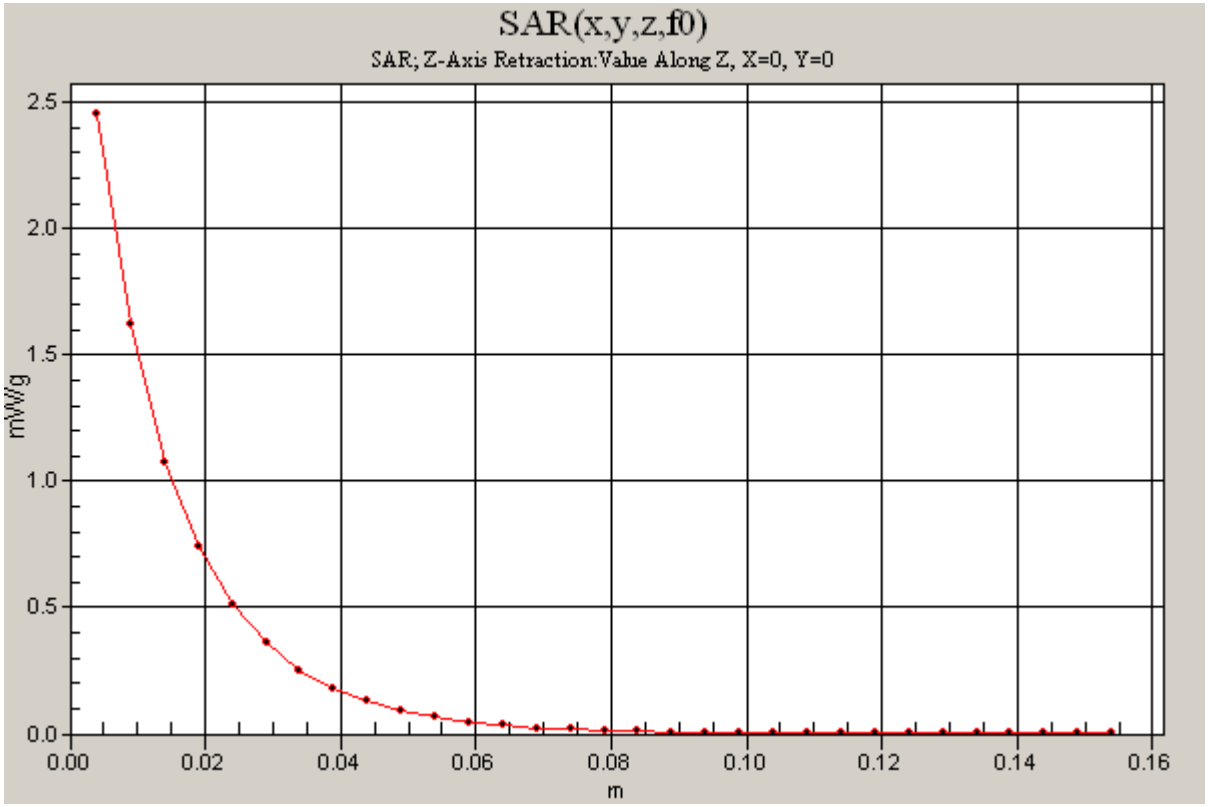
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.14 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.9 V/m; Power Drift = -0.138 dB
Peak SAR (extrapolated) = 3.36 W/kg
SAR(1 g) = 2.26 mW/g; SAR(10 g) = 1.45 mW/g
Maximum value of SAR (measured) = 2.44 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.9 V/m; Power Drift = -0.138 dB
Peak SAR (extrapolated) = 3.39 W/kg
SAR(1 g) = 2.26 mW/g; SAR(10 g) = 1.44 mW/g
Maximum value of SAR (measured) = 2.36 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 2.45 mW/g




SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 01/06/2009 AM 09:37:32

Test Laboratory: Motorola 20090106_900MHz_+2.1%

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 077 PM1 Power = 200 mW
Sim.Temp@meas = 22 ▪ C Sim.Temp@SPC = 21.6 ▪ C Room Temp @ SPC = 20.9 ▪ C
Communication System: CW - Dipole; Frequency: 900 MHz; Channel Number: 4; Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: f = 900 MHz; σ = 0.98 mho/m; ε_r = 42; ρ = 1000 kg/m^3

DASY4 Configuration:

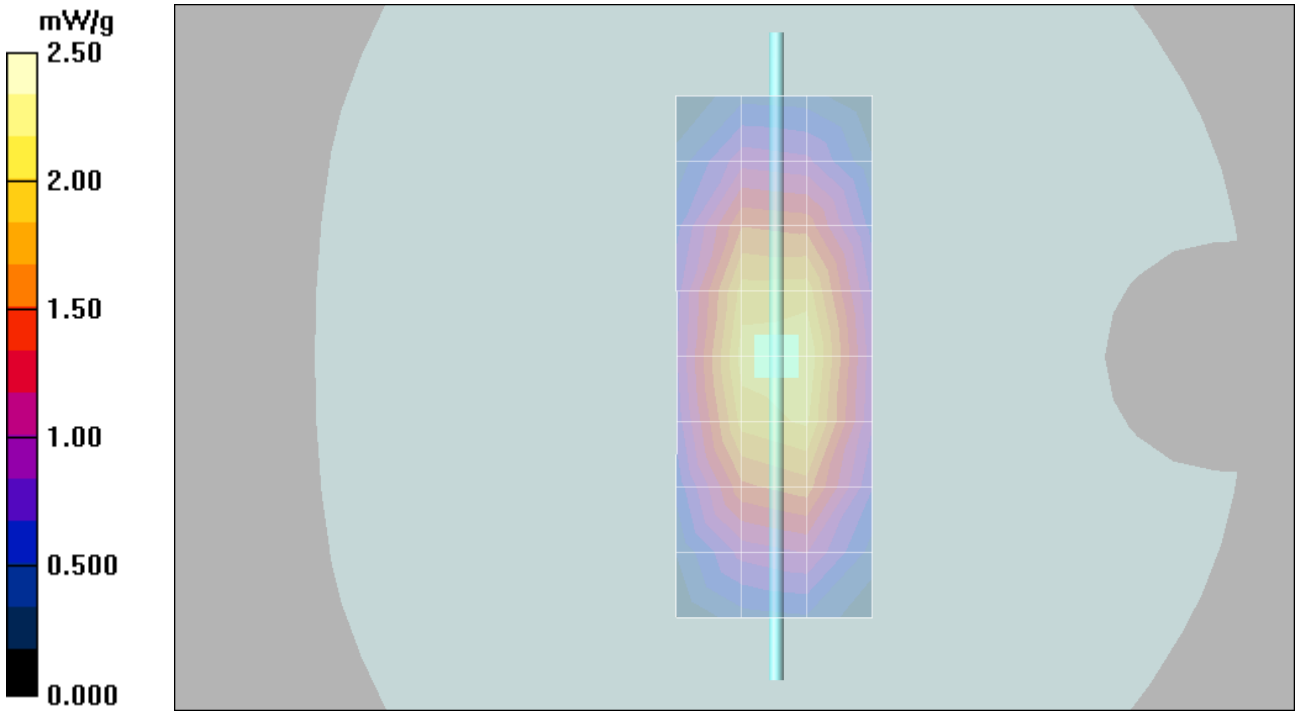
- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

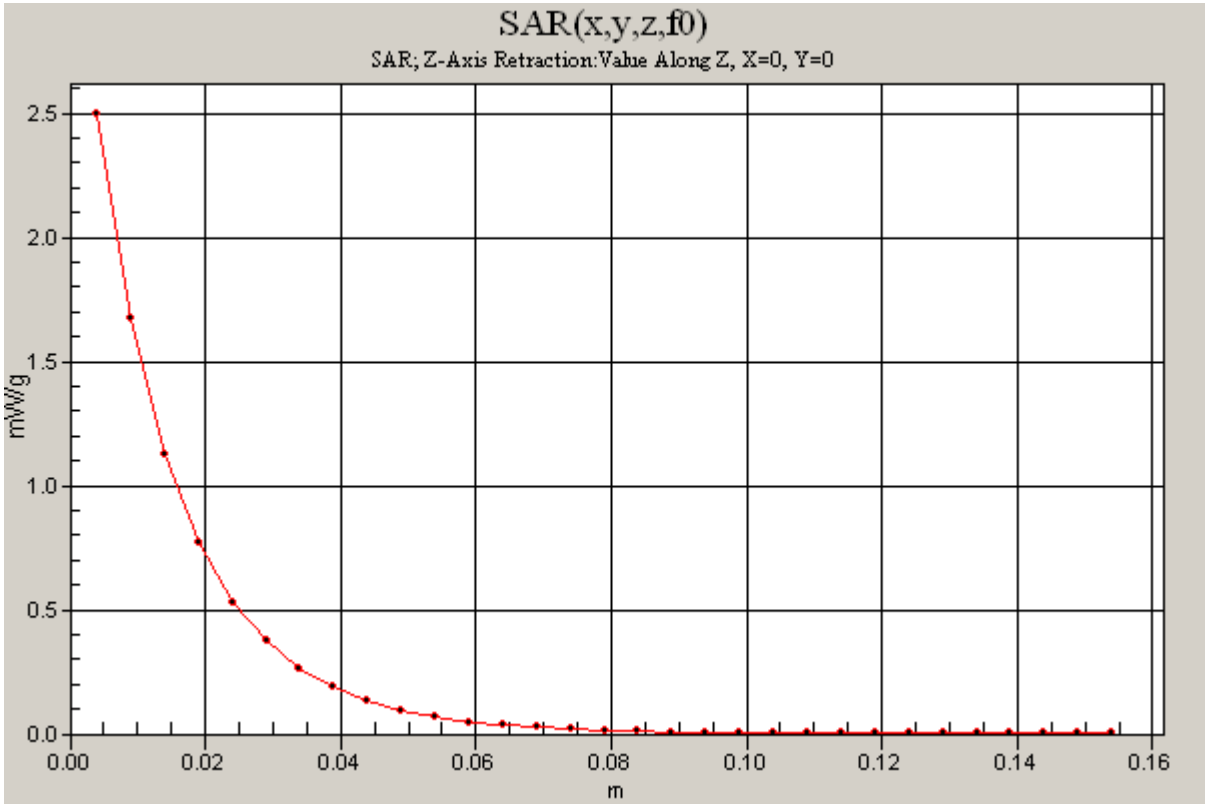
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.16 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 52.0 V/m; Power Drift = -0.058 dB
Peak SAR (extrapolated) = 3.39 W/kg
SAR(1 g) = 2.3 mW/g; SAR(10 g) = 1.49 mW/g
Maximum value of SAR (measured) = 2.46 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 52.0 V/m; Power Drift = -0.058 dB
Peak SAR (extrapolated) = 3.44 W/kg
SAR(1 g) = 2.31 mW/g; SAR(10 g) = 1.48 mW/g
Maximum value of SAR (measured) = 2.42 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 2.50 mW/g




SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 01/15/2009 AM 09:34:51

Test Laboratory: Motorola 20090115_900MHz_-1.0%

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 077 PM1 Power = 200 mW
Sim.Temp@meas = 21.4 ▪ C Sim.Temp@SPC = 21.1 ▪ C Room Temp @ SPC = 20.6 ▪ C
Communication System: CW - Dipole; Frequency: 900 MHz; Channel Number: 4; Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: f = 900 MHz; σ = 0.96 mho/m; ε_r = 41.2; ρ = 1000 kg/m^3

DASY4 Configuration:

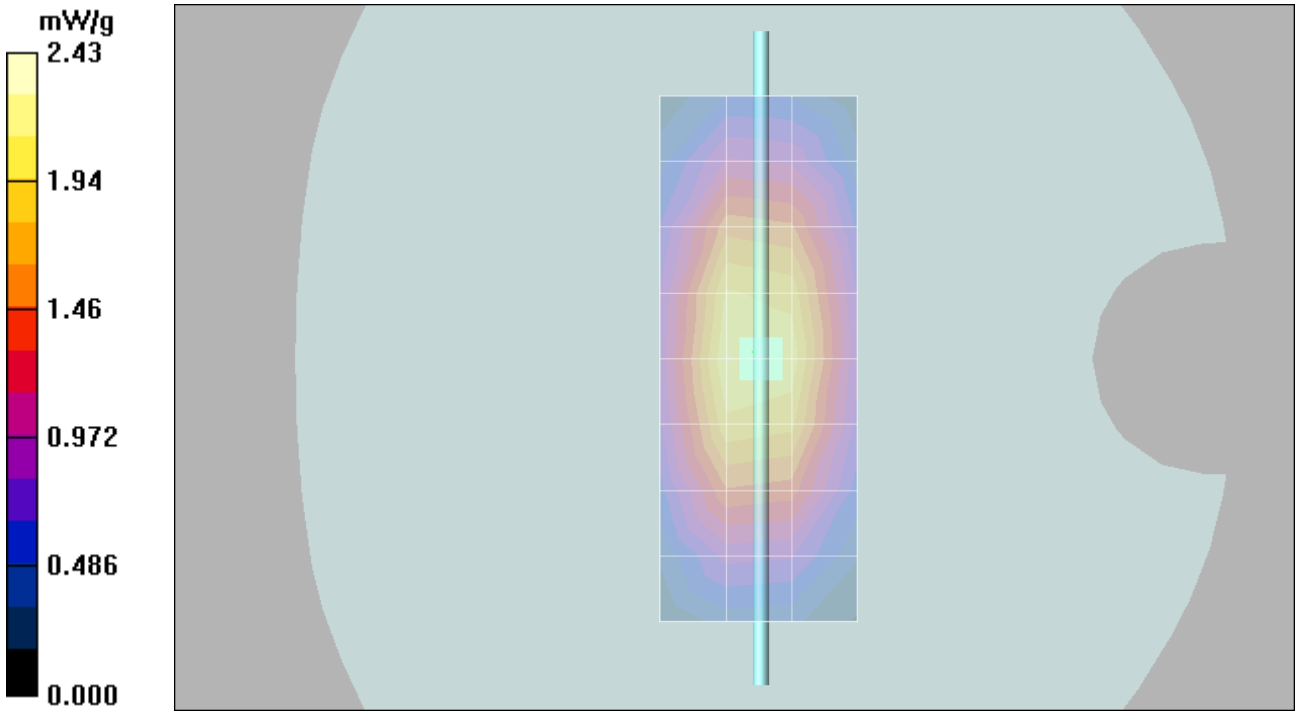
- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

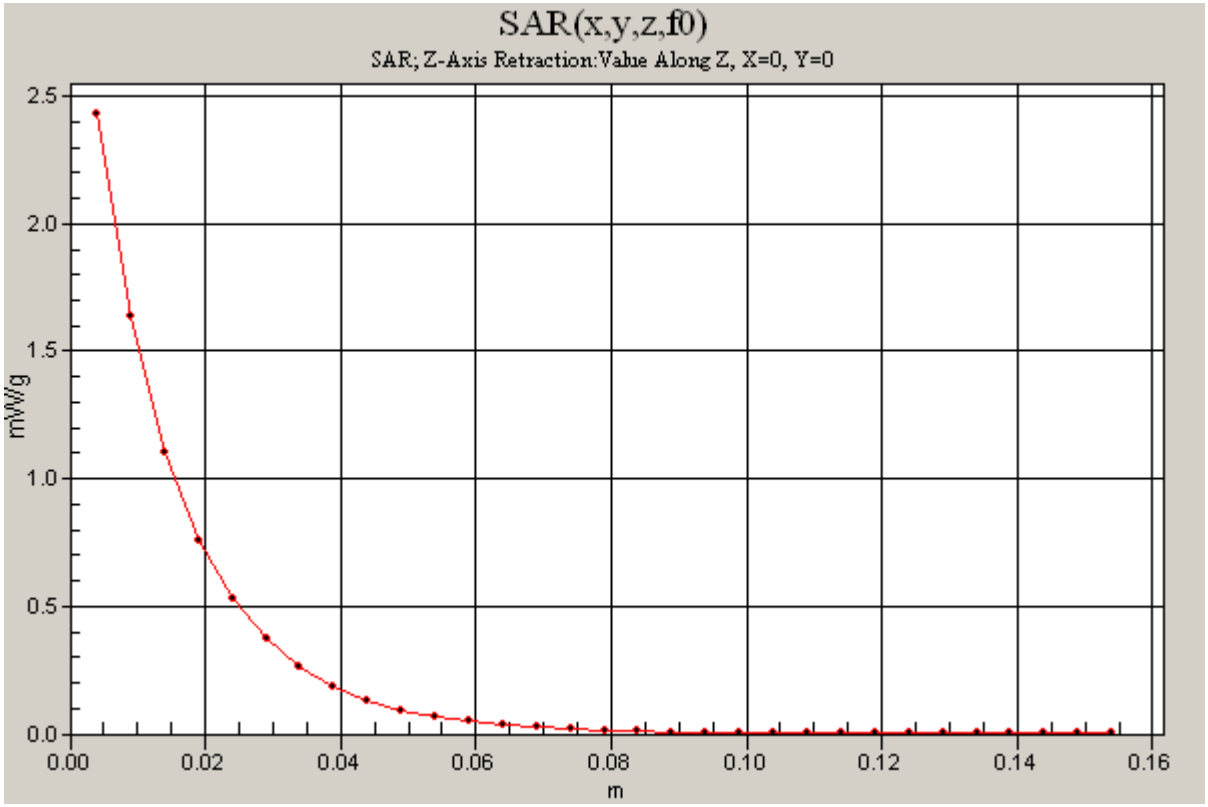
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.12 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.8 V/m; Power Drift = -0.071 dB
Peak SAR (extrapolated) = 3.28 W/kg
SAR(1 g) = 2.24 mW/g; SAR(10 g) = 1.45 mW/g
Maximum value of SAR (measured) = 2.43 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.8 V/m; Power Drift = -0.071 dB
Peak SAR (extrapolated) = 3.27 W/kg
SAR(1 g) = 2.23 mW/g; SAR(10 g) = 1.44 mW/g
Maximum value of SAR (measured) = 2.40 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
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 01/06/2009 PM 01:48:49

Test Laboratory: Motorola 20090106_1800MHz_+1.3%

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 280tr PM1 Power = 200mW
Sim.Temp@meas = 21.9 ▪ C Sim.Temp@SPC = 22.7 ▪ C Room Temp @ SPC = 21.8 ▪ C
Communication System: CW - Dipole; Frequency: 1800 MHz; Channel Number: 8; Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: f = 1800 MHz; σ = 1.36 mho/m; ε_r = 39.5; ρ = 1000 kg/m^3

DASY4 Configuration:

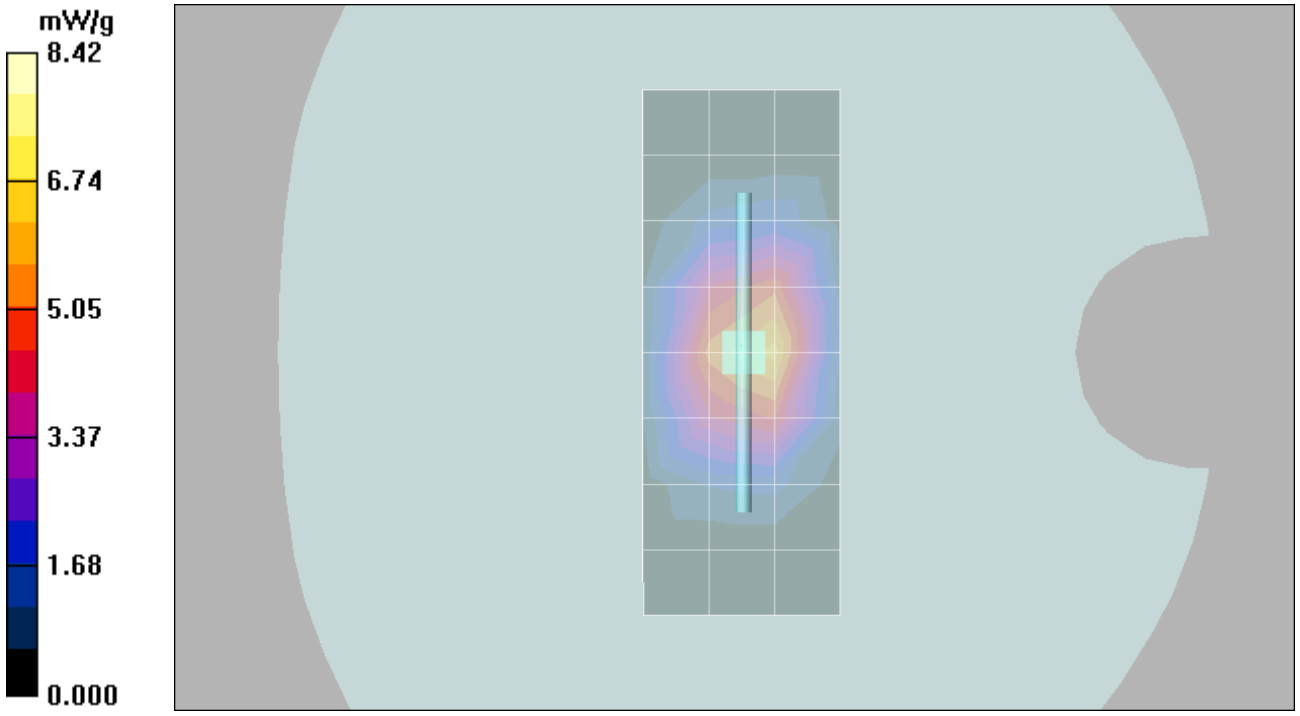
- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

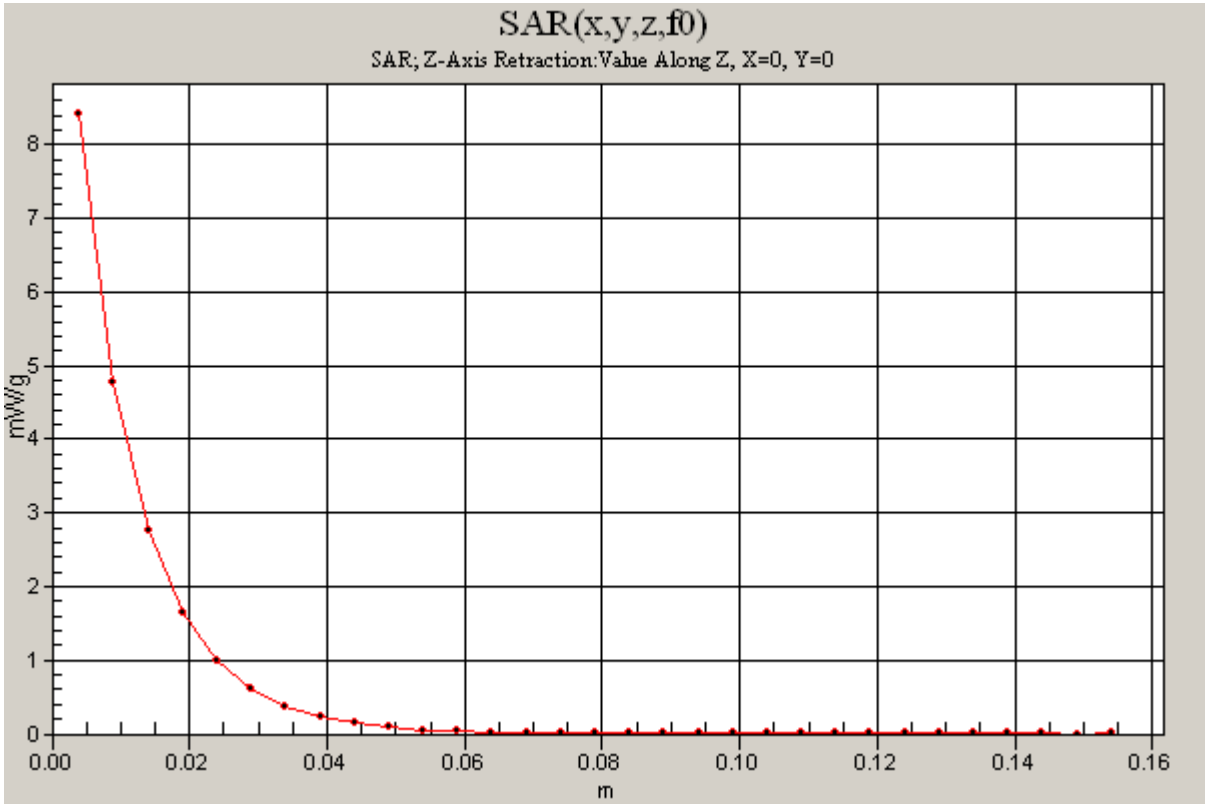
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.42 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 80.3 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 13.7 W/kg
SAR(1 g) = 7.59 mW/g; SAR(10 g) = 3.99 mW/g
Maximum value of SAR (measured) = 8.50 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 80.3 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 14.1 W/kg
SAR(1 g) = 7.68 mW/g; SAR(10 g) = 3.98 mW/g
Maximum value of SAR (measured) = 7.92 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 8.42 mW/g




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

Date/Time: 01/07/2009 PM 01:33:32

Test Laboratory: Motorola 20090107_1800MHz_+0.7%

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 280tr PM1 Power = 200mW
Sim.Temp@meas = 21.5 ▪ C Sim.Temp@SPC = 21.4 ▪ C Room Temp @ SPC = 21.7 ▪ C
Communication System: CW - Dipole; Frequency: 1800 MHz; Channel Number: 8; Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: f = 1800 MHz; σ = 1.37 mho/m; ε_r = 39.2; ρ = 1000 kg/m^3

DASY4 Configuration:

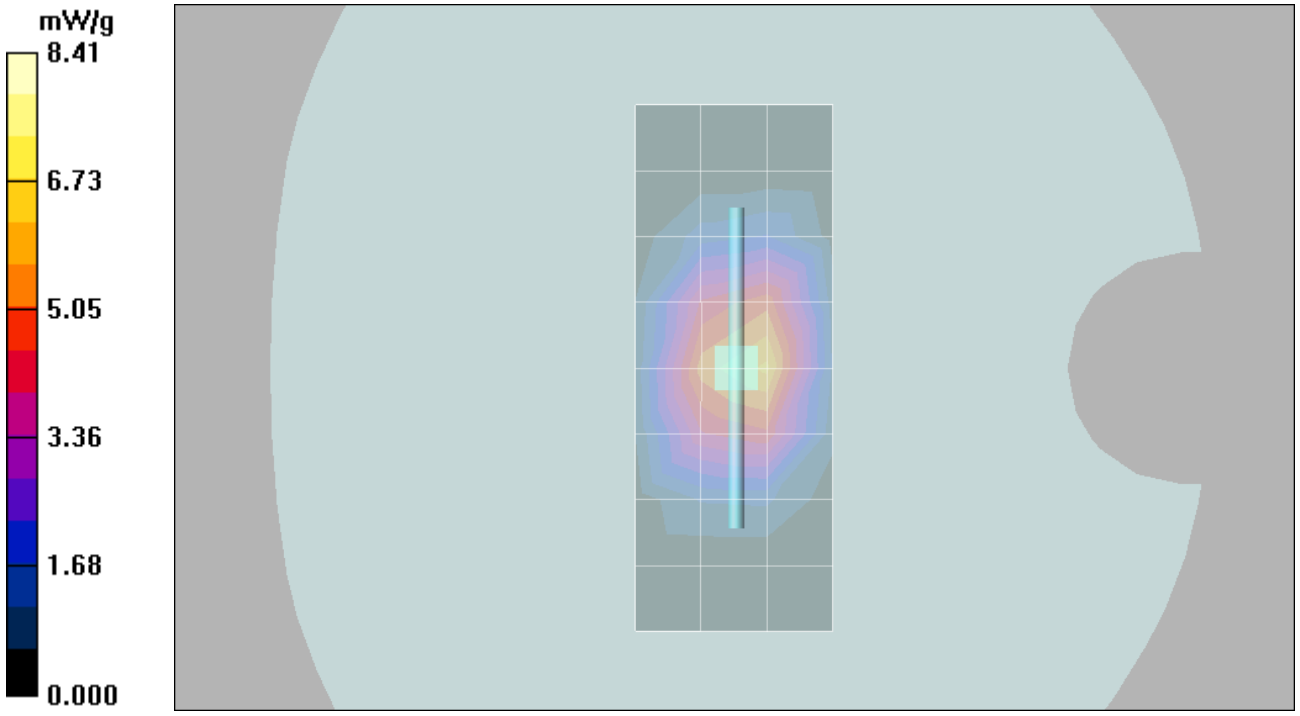
- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

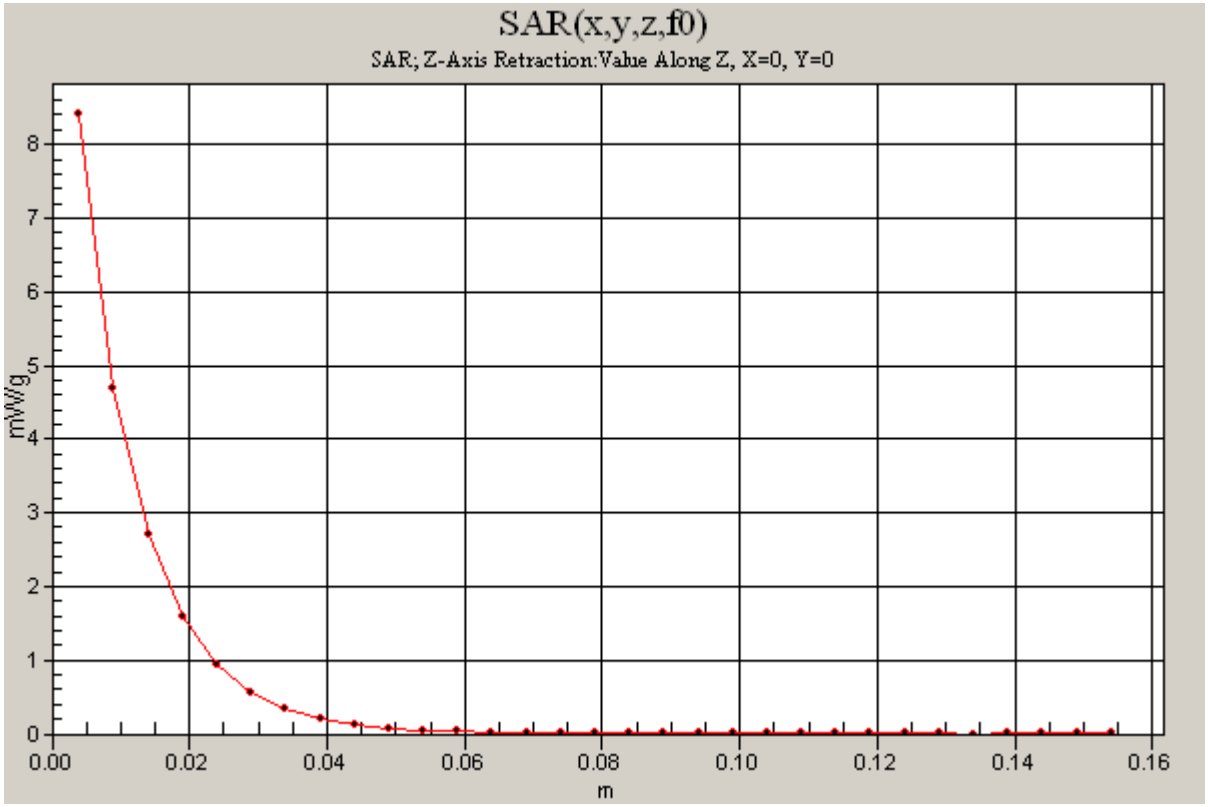
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.34 mW/g

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 = -0.015 dB
Peak SAR (extrapolated) = 13.8 W/kg
SAR(1 g) = 7.56 mW/g; SAR(10 g) = 3.96 mW/g
Maximum value of SAR (measured) = 8.42 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 79.8 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 14.1 W/kg
SAR(1 g) = 7.63 mW/g; SAR(10 g) = 3.94 mW/g
Maximum value of SAR (measured) = 7.94 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 8.41 mW/g




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

Date/Time: 01/09/2009 PM 01:43:58

Test Laboratory: Motorola 20090109_1800MHz +1.8%

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 280tr PM1 Power = 200 mW
Sim.Temp@meas = 21 ▪ C Sim.Temp@SPC = 20.8 ▪ C Room Temp @ SPC = 21.1 ▪ C
Communication System: CW - Dipole; Frequency: 1800 MHz; Channel Number: 8; Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: f = 1800 MHz; σ = 1.38 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3

DASY4 Configuration:

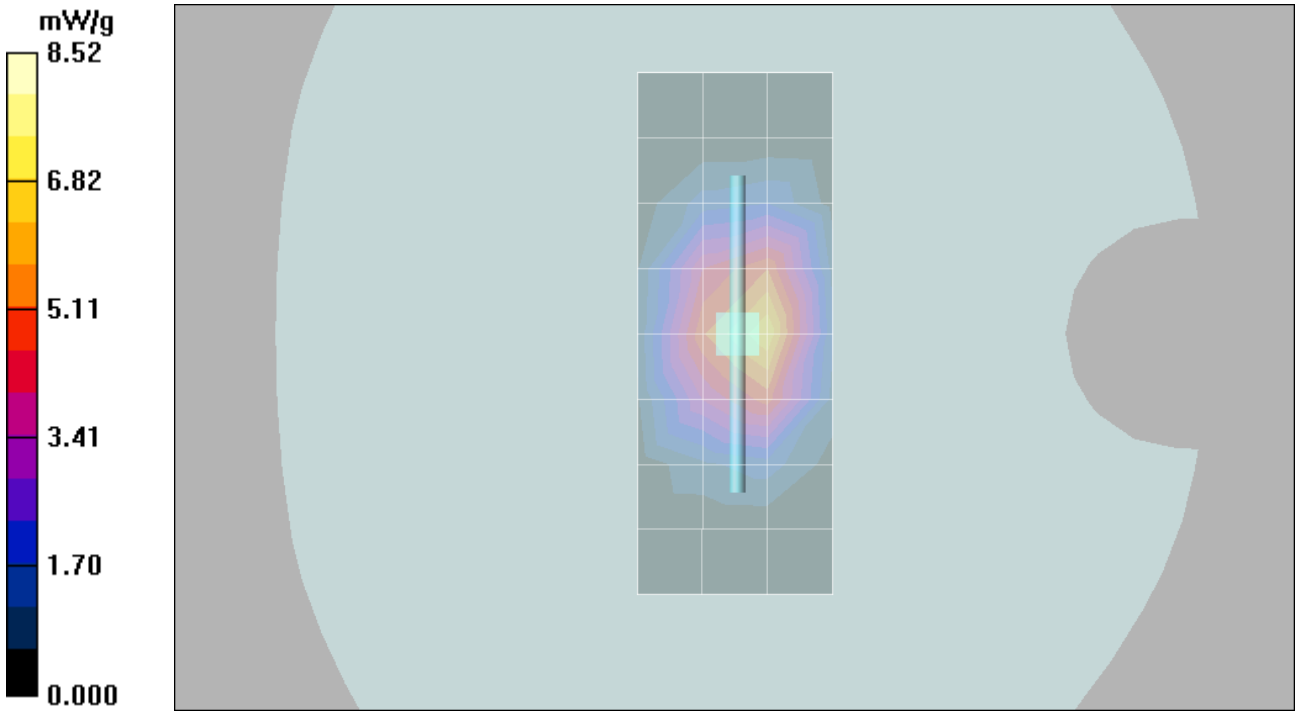
- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

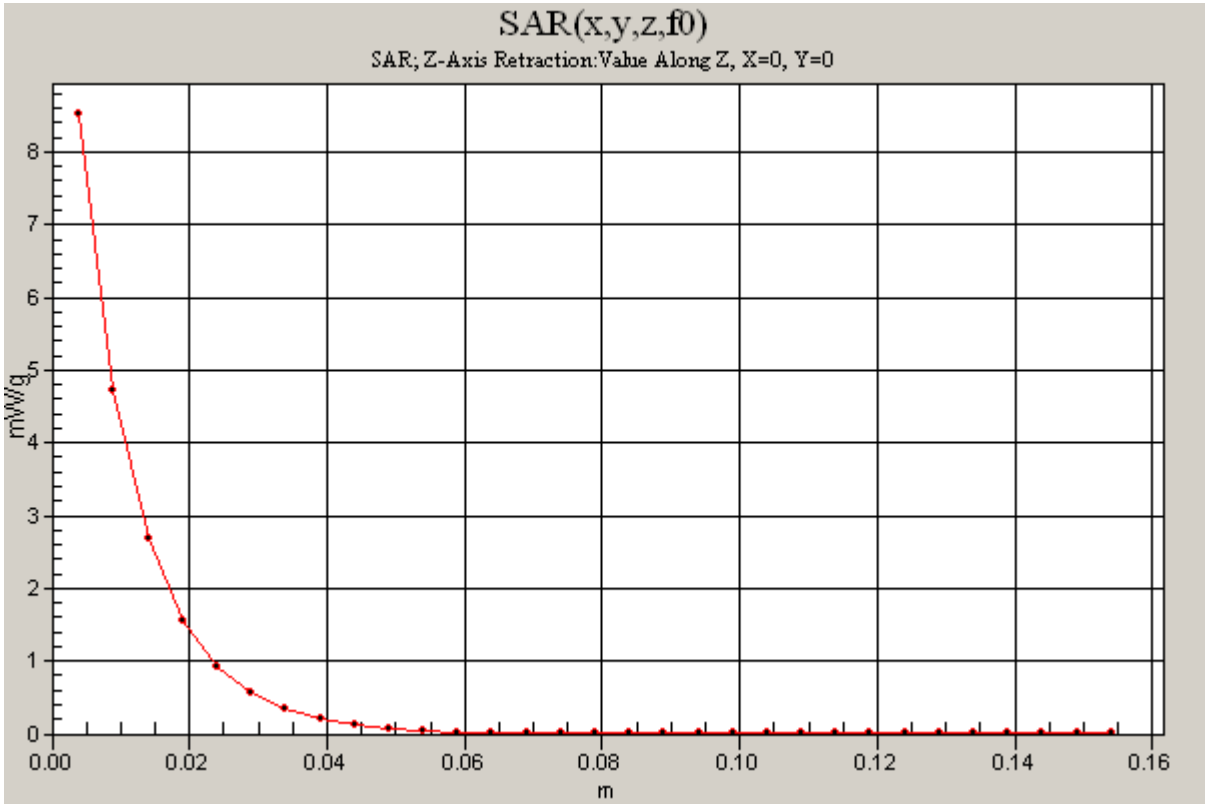
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.78 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 80.1 V/m; Power Drift = -0.034 dB
Peak SAR (extrapolated) = 13.9 W/kg
SAR(1 g) = 7.59 mW/g; SAR(10 g) = 3.99 mW/g
Maximum value of SAR (measured) = 8.48 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 80.1 V/m; Power Drift = -0.034 dB
Peak SAR (extrapolated) = 14.5 W/kg
SAR(1 g) = 7.76 mW/g; SAR(10 g) = 3.99 mW/g
Maximum value of SAR (measured) = 8.03 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 8.52 mW/g




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

Date/Time: 01/12/2009 PM 01:32:26

Test Laboratory: Motorola 20090112_1800MHz_+0.9%

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 280tr PM1 Power = 200 mW
Sim.Temp@meas = 21.1 ▪ C Sim.Temp@SPC = 21 ▪ C Room Temp @ SPC = 21.2 ▪ C
Communication System: CW - Dipole; Frequency: 1800 MHz; Channel Number: 8; Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: f = 1800 MHz; σ = 1.37 mho/m; ε_r = 39.5; ρ = 1000 kg/m^3

DASY4 Configuration:

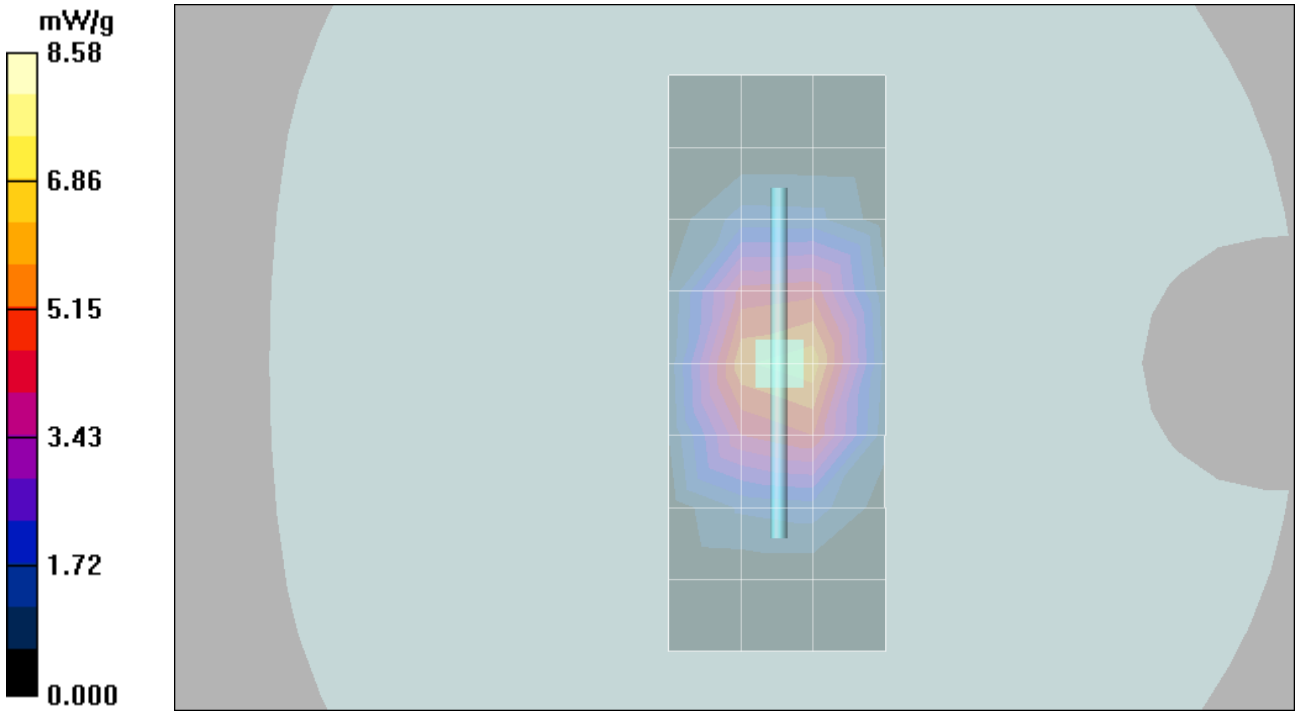
- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

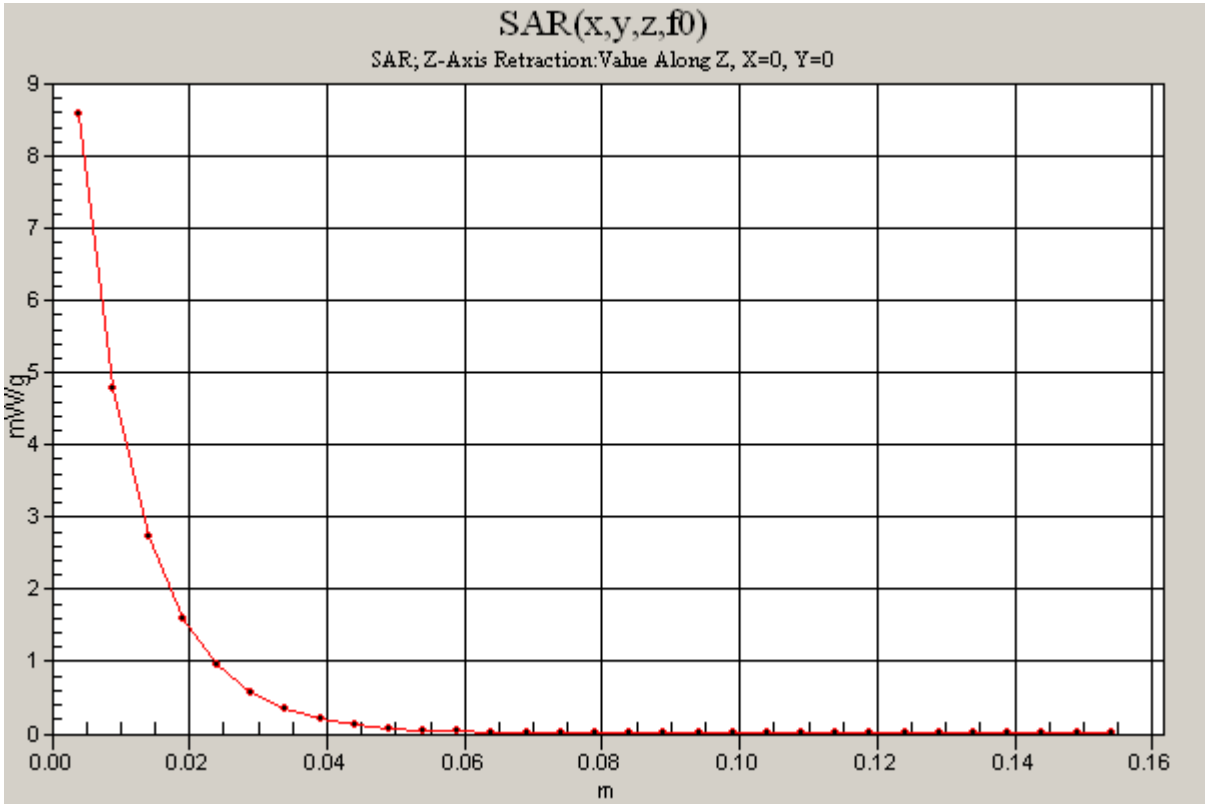
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.17 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 80.3 V/m; Power Drift = 0.007 dB
Peak SAR (extrapolated) = 13.6 W/kg
SAR(1 g) = 7.51 mW/g; SAR(10 g) = 3.96 mW/g
Maximum value of SAR (measured) = 8.43 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 80.3 V/m; Power Drift = 0.007 dB
Peak SAR (extrapolated) = 14.4 W/kg
SAR(1 g) = 7.71 mW/g; SAR(10 g) = 3.98 mW/g
Maximum value of SAR (measured) = 8.18 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 8.58 mW/g




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

Date/Time: 01/13/2009 PM 01:27:20

Test Laboratory: Motorola 20090113_1800MHz_-0.1%

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 280tr PM1 Power = 200 mW
Sim.Temp@meas = 21.8 ▪ C Sim.Temp@SPC = 21.2 ▪ C Room Temp @ SPC = 21.2 ▪ C
Communication System: CW - Dipole; Frequency: 1800 MHz; Channel Number: 8; Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: f = 1800 MHz; σ = 1.36 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3

DASY4 Configuration:

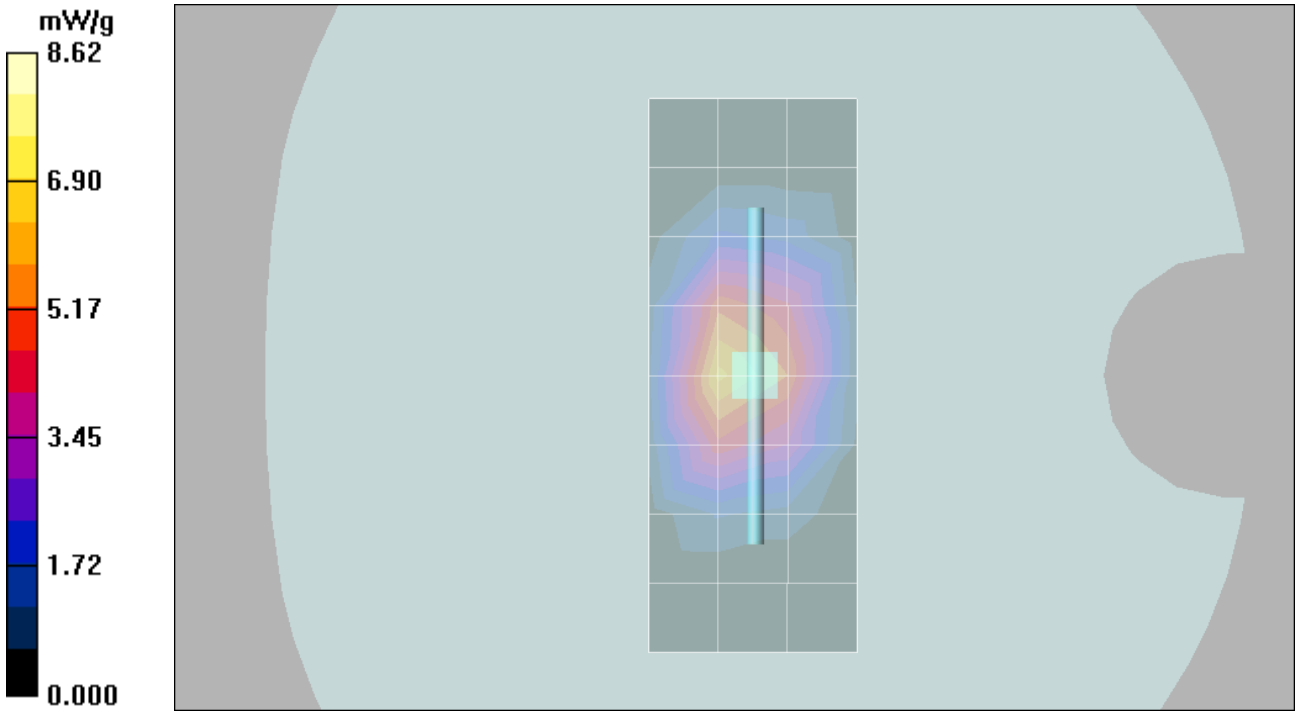
- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

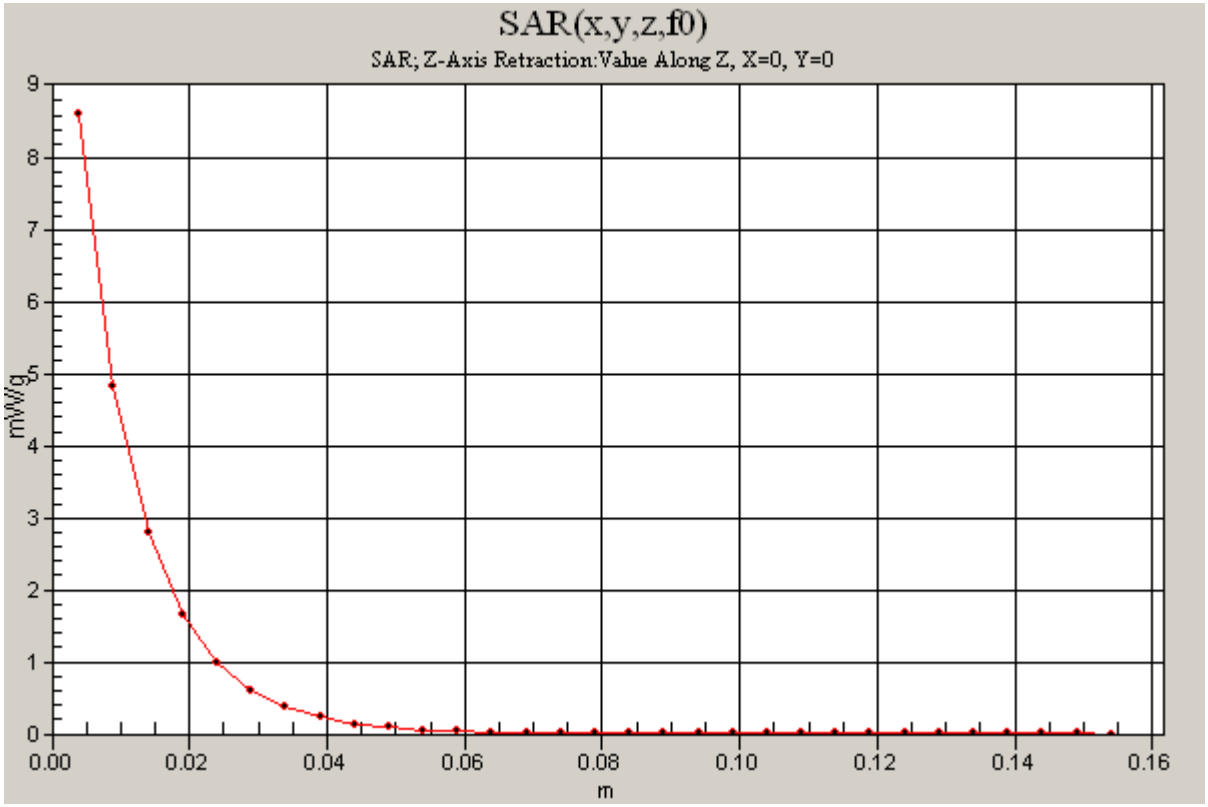
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.52 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 79.2 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 13.7 W/kg
SAR(1 g) = 7.58 mW/g; SAR(10 g) = 4 mW/g
Maximum value of SAR (measured) = 8.53 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 79.2 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 13.5 W/kg
SAR(1 g) = 7.48 mW/g; SAR(10 g) = 3.97 mW/g
Maximum value of SAR (measured) = 8.41 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 8.62 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: 01/16/2009 PM 02:50:50

Test Laboratory: Motorola 20090116_2450MHz +0.0%

Procedure Notes: 2450 MHz System Performance Check/Dipole Sn# 767 PM1 Power = 200 mW
Sim.Temp@meas = 22.4 ▪ C Sim.Temp@SPC = 21.9 ▪ C Room Temp @ SPC = 21.7 ▪ C
Communication System: CW - Dipole; Frequency: 2450 MHz; Channel Number: 11; Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: f = 2450 MHz; σ = 1.89 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3

DASY4 Configuration:

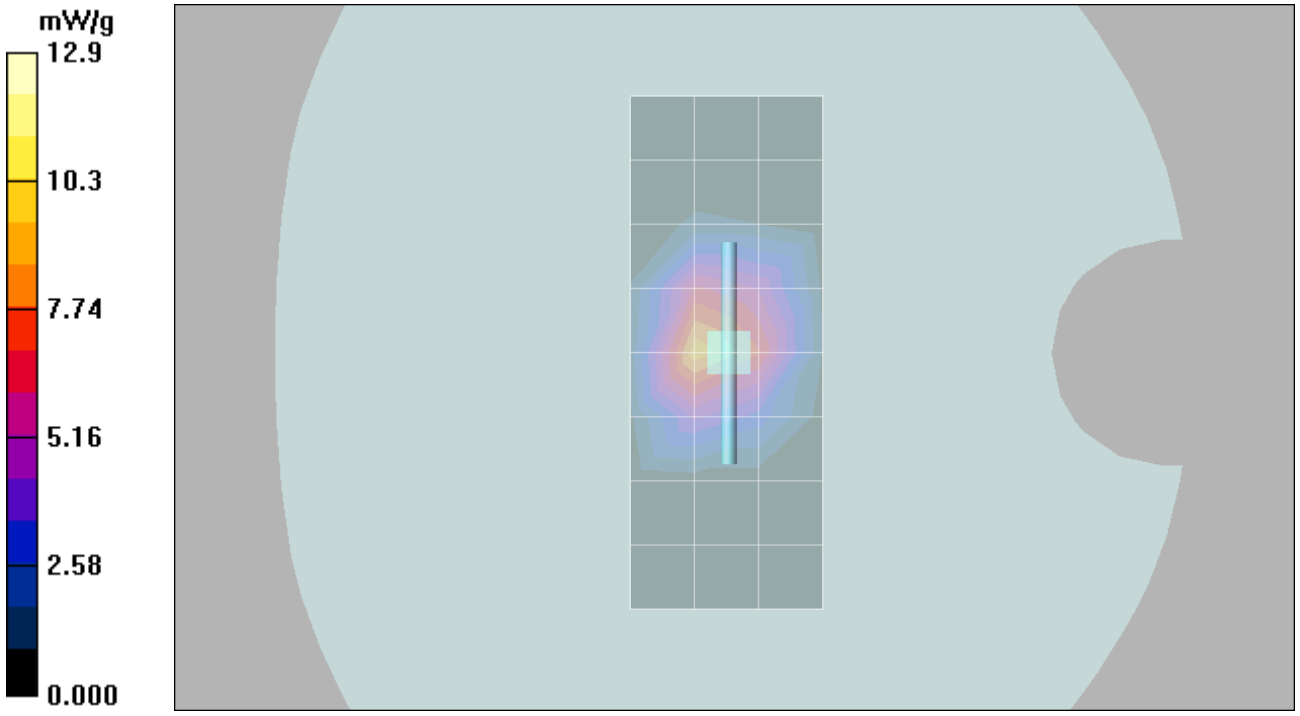
- Probe: ES3DV3 - SN3180; ConvF(4.47, 4.47, 4.47); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

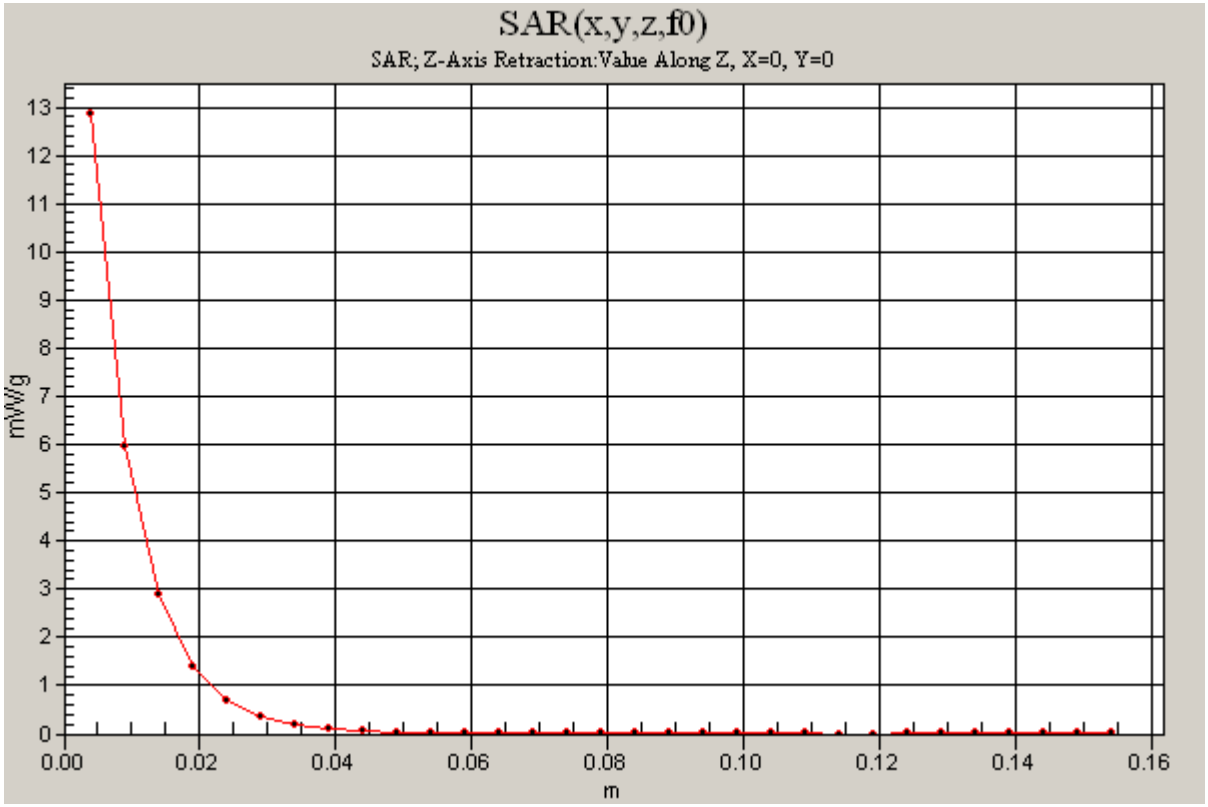
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 9.29 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 81.7 V/m; Power Drift = 0.004 dB
Peak SAR (extrapolated) = 25.3 W/kg
SAR(1 g) = 11.4 mW/g; SAR(10 g) = 5.15 mW/g
Maximum value of SAR (measured) = 12.6 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 81.7 V/m; Power Drift = 0.004 dB
Peak SAR (extrapolated) = 24.8 W/kg
SAR(1 g) = 11.2 mW/g; SAR(10 g) = 5.12 mW/g
Maximum value of SAR (measured) = 12.5 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 12.9 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

Appendix 2

SAR distribution plots for Phantom Head Adjacent Use

Date/Time: 01/15/2009 AM 11:27:55

Test Laboratory: Motorola GSM850 Cheek Slider Down

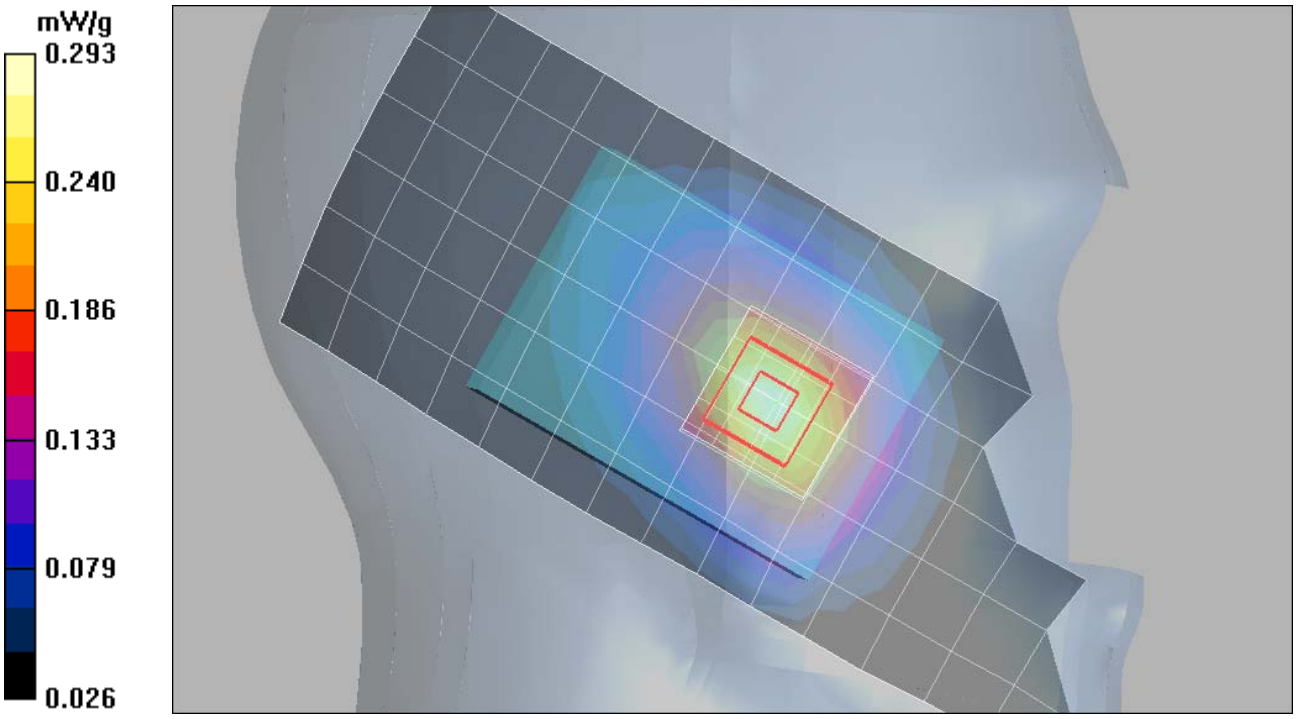
004401029206899;
Procedure Notes: Pwr Step: 05(OTA) Antenna Position: Internal
Battery Model #: SNN5837A DEVICE POSITION (cheek or rotated): Cheek
Communication System: GSM 850; Frequency: 836.6 MHz; Channel Number: 190; Duty Cycle: 1:8
Medium: Low Freq Head; Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Left Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.291 mW/g

Left 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 = 0.040 dB
Peak SAR (extrapolated) = 0.350 W/kg
SAR(1 g) = 0.273 mW/g; SAR(10 g) = 0.195 mW/g
Maximum value of SAR (measured) = 0.293 mW/g



Date/Time: 01/15/2009 PM 01:19:03

Test Laboratory: Motorola GSM850 Cheek Slider Up

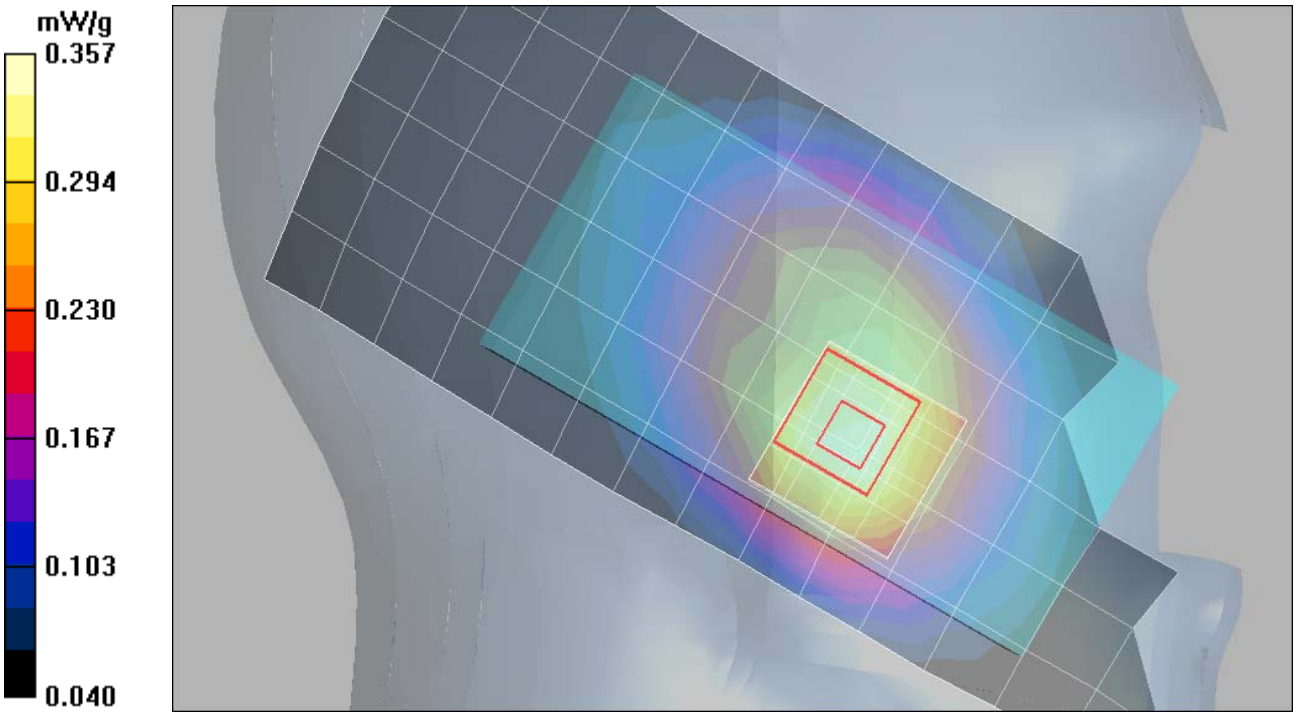
004401029206899;
Procedure Notes: Pwr Step: 05(OTA) Antenna Position: Internal
Battery Model #: SNN5837A DEVICE POSITION (cheek or rotated): Cheek
Communication System: GSM 850; Frequency: 836.6 MHz; Channel Number: 190; Duty Cycle: 1:8
Medium: Low Freq Head; Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Left Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.357 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.3 V/m; Power Drift = -0.056 dB
Peak SAR (extrapolated) = 0.433 W/kg
SAR(1 g) = 0.340 mW/g; SAR(10 g) = 0.255 mW/g



Date/Time: 01/12/2009 AM 10:52:11

Test Laboratory: Motorola

GSM1900 Cheek Slider Down

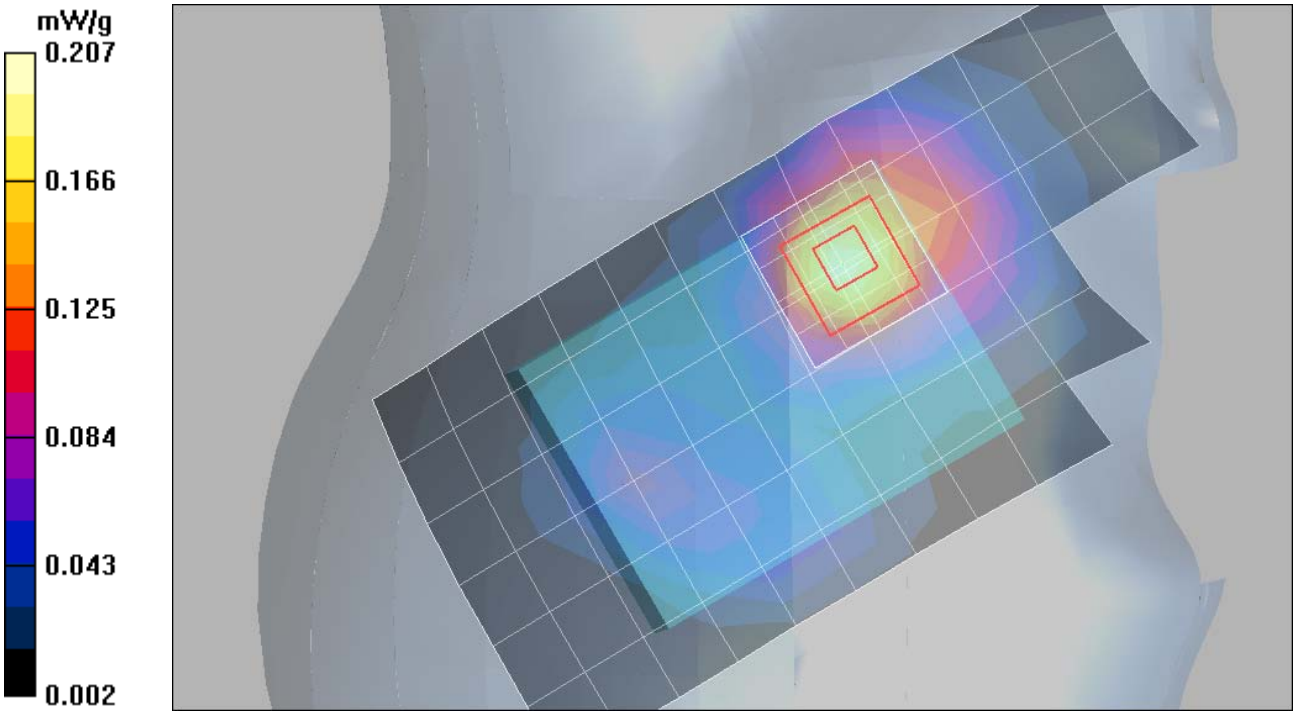
004401029206899;
Procedure Notes: Pwr Step: 00(OTA) Antenna Position: Internal
Battery Model #: SNN5833A DEVICE POSITION (cheek or rotated): Cheek
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Head 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.46 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Right Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.199 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = -0.148 dB
Peak SAR (extrapolated) = 0.291 W/kg
SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.114 mW/g
Maximum value of SAR (measured) = 0.207 mW/g



Date/Time: 01/12/2009 AM 10:31:16

Test Laboratory: Motorola GSM1900 Cheek Slider Up

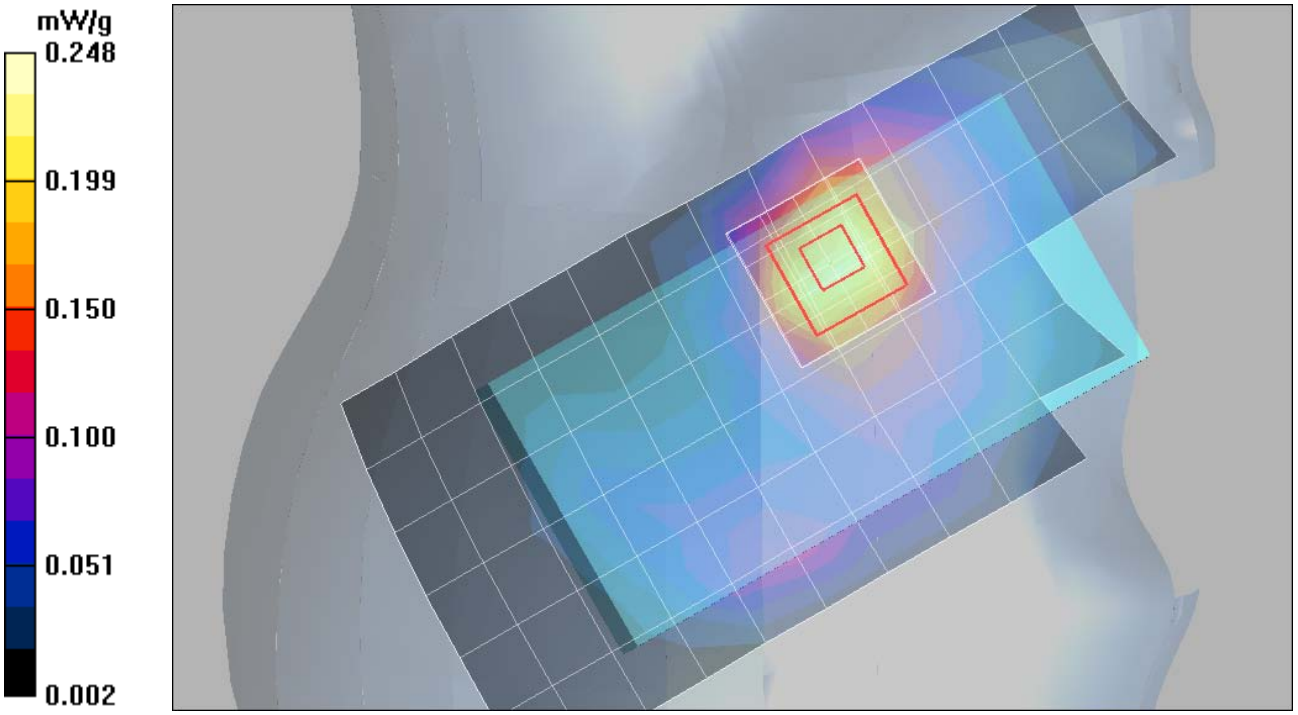
004401029206899;
Procedure Notes: Pwr Step: 00(OTA) Antenna Position: Internal
Battery Model #: SNN5833A DEVICE POSITION (cheek or rotated): Cheek
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Head 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.46 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Right Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.225 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.2 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 0.369 W/kg
SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.138 mW/g
Maximum value of SAR (measured) = 0.248 mW/g



Date/Time: 01/05/2009 PM 01:28:48

Test Laboratory: Motorola

WCDMA850 Cheek Slider Down

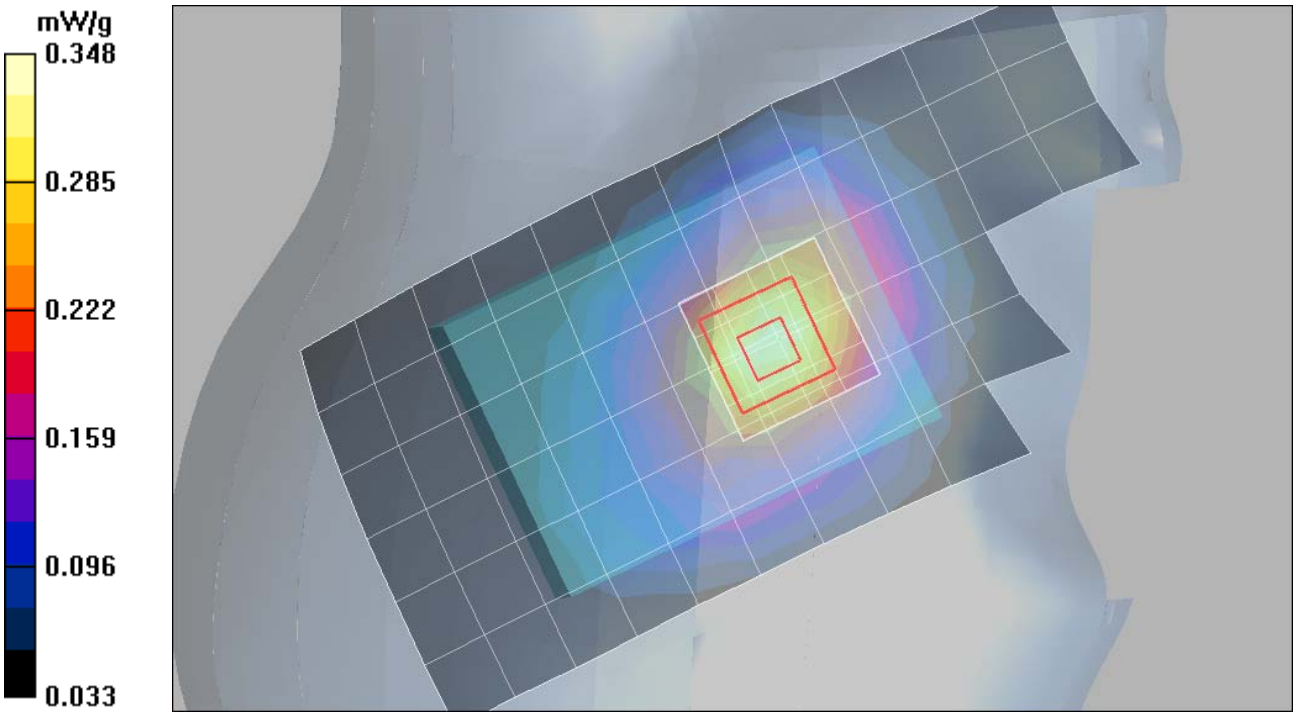
004401029206899;
Procedure Notes: Pwr Step: All up(OTA) Antenna Position: Internal
Battery Model #: SNN5837A DEVICE POSITION (cheek or rotated): Cheek
Communication System: 3G-WCDMA 850; Frequency: 836 MHz; Channel Number: 4180; Duty Cycle: 1:1
Medium: Low Freq Head; Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 41.8; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Right Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.325 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.4 V/m; Power Drift = -0.060 dB
Peak SAR (extrapolated) = 0.418 W/kg
SAR(1 g) = 0.325 mW/g; SAR(10 g) = 0.232 mW/g
Maximum value of SAR (measured) = 0.348 mW/g



Date/Time: 01/06/2009 AM 10:56:47

Test Laboratory: Motorola

WCDMA850 Cheek Slider Up

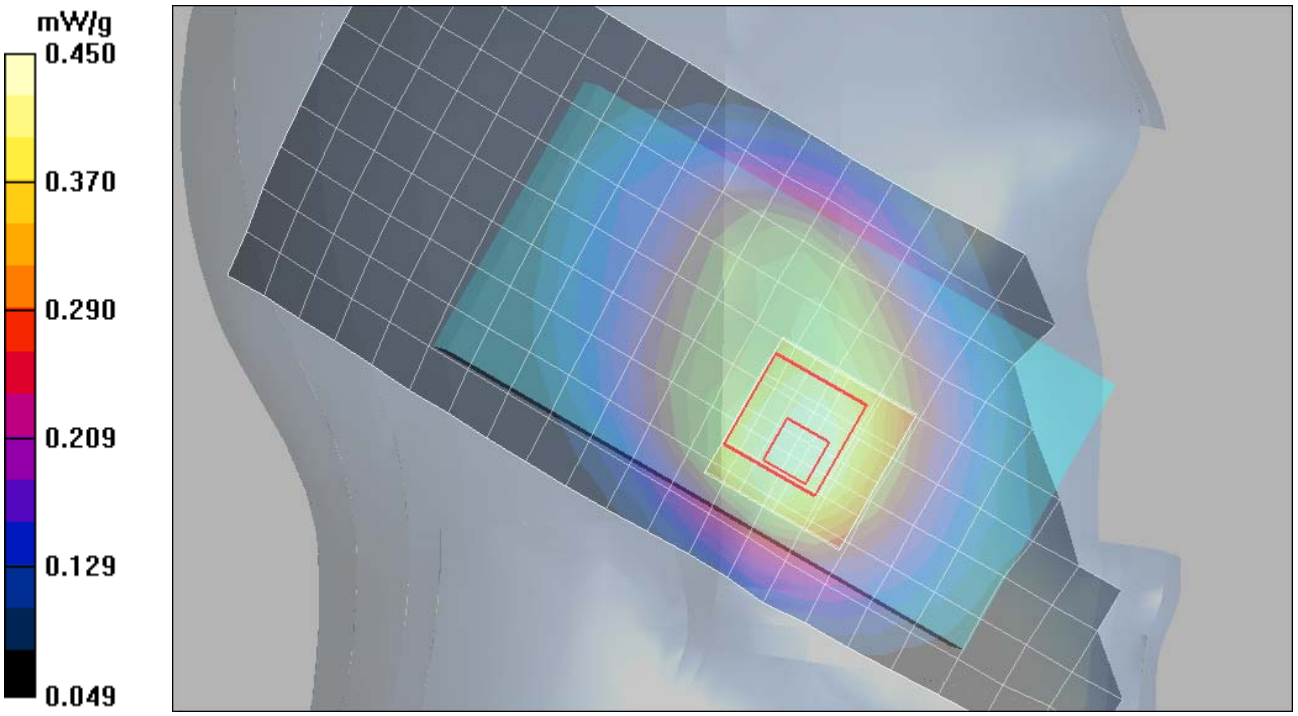
004401029206899;
Procedure Notes: Pwr Step: All up(OTA) Antenna Position: Internal
Battery Model #: SNN5833A DEVICE POSITION (cheek or rotated): Cheek
Communication System: 3G-WCDMA 850; Frequency: 836 MHz; Channel Number: 4180; Duty Cycle: 1:1
Medium: Low Freq Head; Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Left Head Template/Area Scan - Normal (10mm) (10x25x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.448 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.5 V/m; Power Drift = -0.178 dB
Peak SAR (extrapolated) = 0.545 W/kg
SAR(1 g) = 0.430 mW/g; SAR(10 g) = 0.327 mW/g
Maximum value of SAR (measured) = 0.450 mW/g



Date/Time: 01/07/2009 AM 08:55:28

Test Laboratory: Motorola

WCDMA1900 Cheek Slider Down

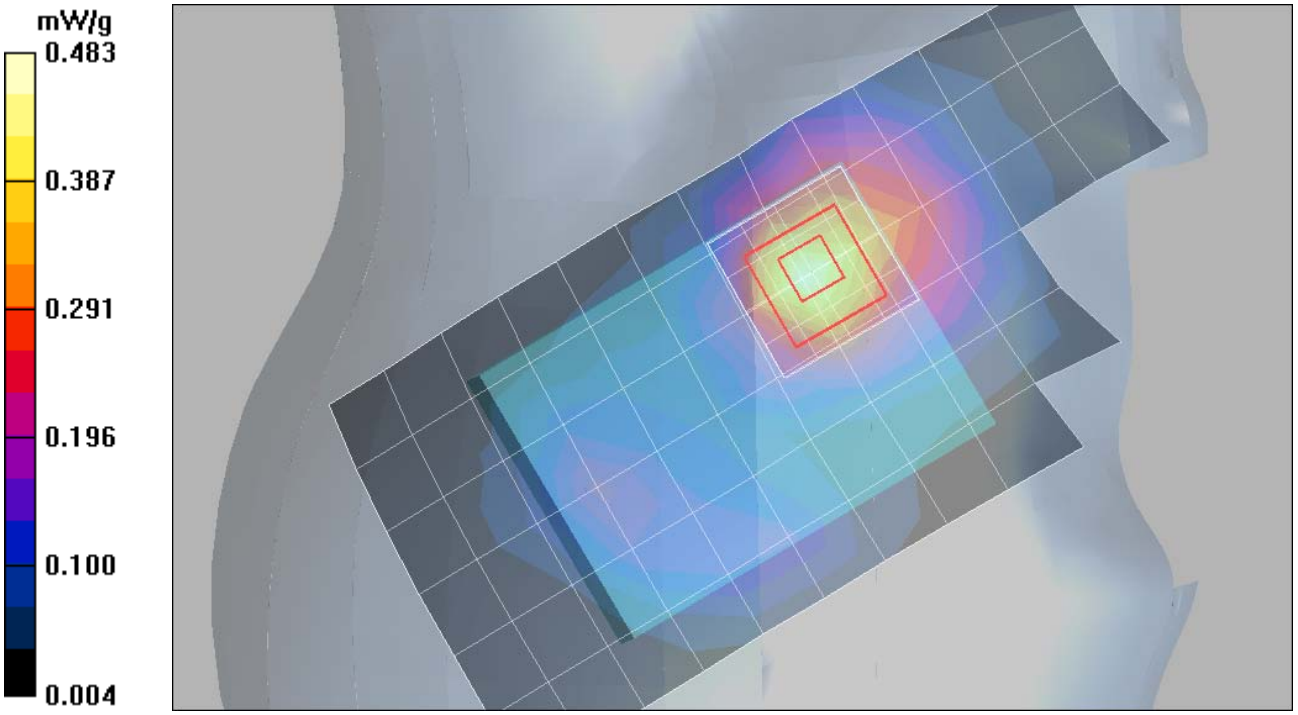
004401029206899;
Procedure Notes: Pwr Step: All up(OTA) Antenna Position: Internal
Battery Model #: SNN5833A DEVICE POSITION (cheek or rotated): Cheek
Communication System: 3G/WCDMA 1900; Frequency: 1880 MHz; Channel Number: 9400; Duty Cycle: 1:1
Medium: Regular Glycol Head 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Right Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.477 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.4 V/m; Power Drift = -0.201 dB
Peak SAR (extrapolated) = 0.668 W/kg
SAR(1 g) = 0.445 mW/g; SAR(10 g) = 0.266 mW/g
Maximum value of SAR (measured) = 0.483 mW/g



Date/Time: 01/06/2009 PM 04:18:49

Test Laboratory: Motorola

WCDMA1900 Cheek Slider Up

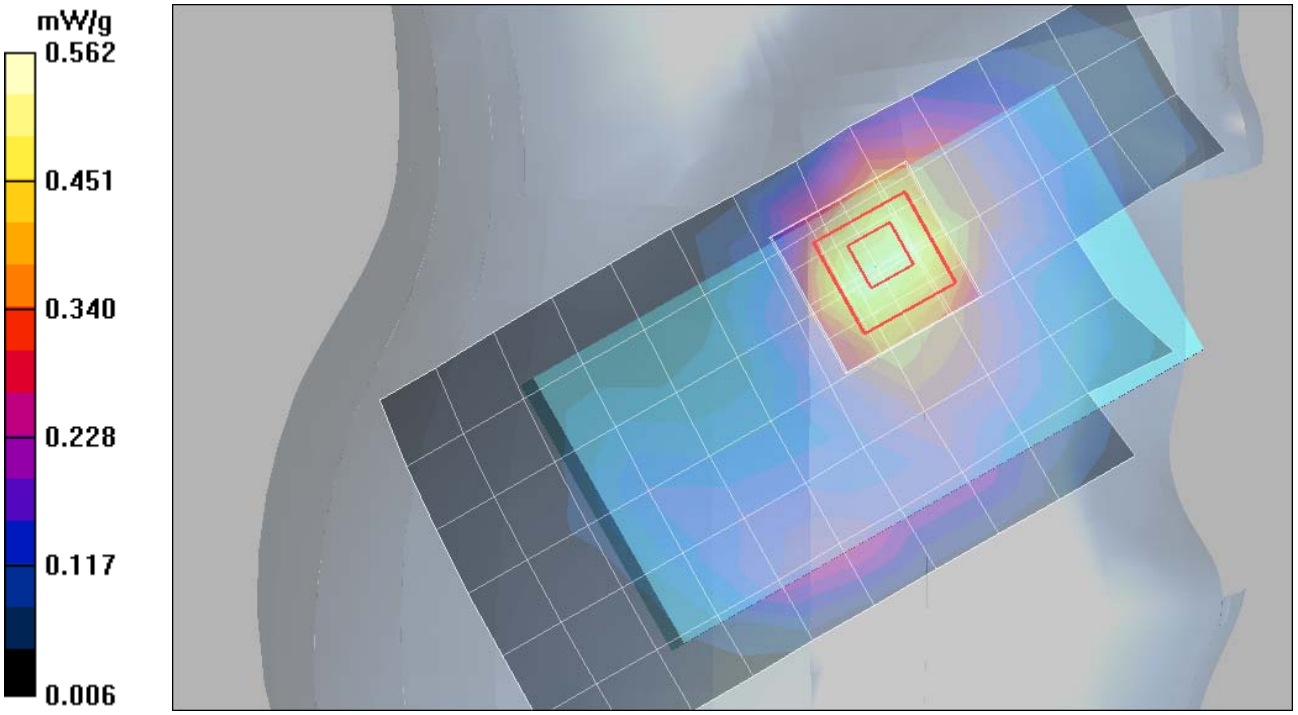
004401029206899;
Procedure Notes: Pwr Step: All up(OTA) Antenna Position: Internal
Battery Model #:SNN5837A DEVICE POSITION (cheek or rotated): Cheek
Communication System: 3G/WCDMA 1900; Frequency: 1880 MHz; Channel Number: 9400; Duty Cycle: 1:1
Medium: Regular Glycol Head 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Right Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.527 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.0 V/m; Power Drift = -0.163 dB
Peak SAR (extrapolated) = 0.833 W/kg
SAR(1 g) = 0.528 mW/g; SAR(10 g) = 0.323 mW/g
Maximum value of SAR (measured) = 0.562 mW/g



Date/Time: 01/15/2009 PM 12:47:47

Test Laboratory: Motorola GSM850 Tilted Slider Down

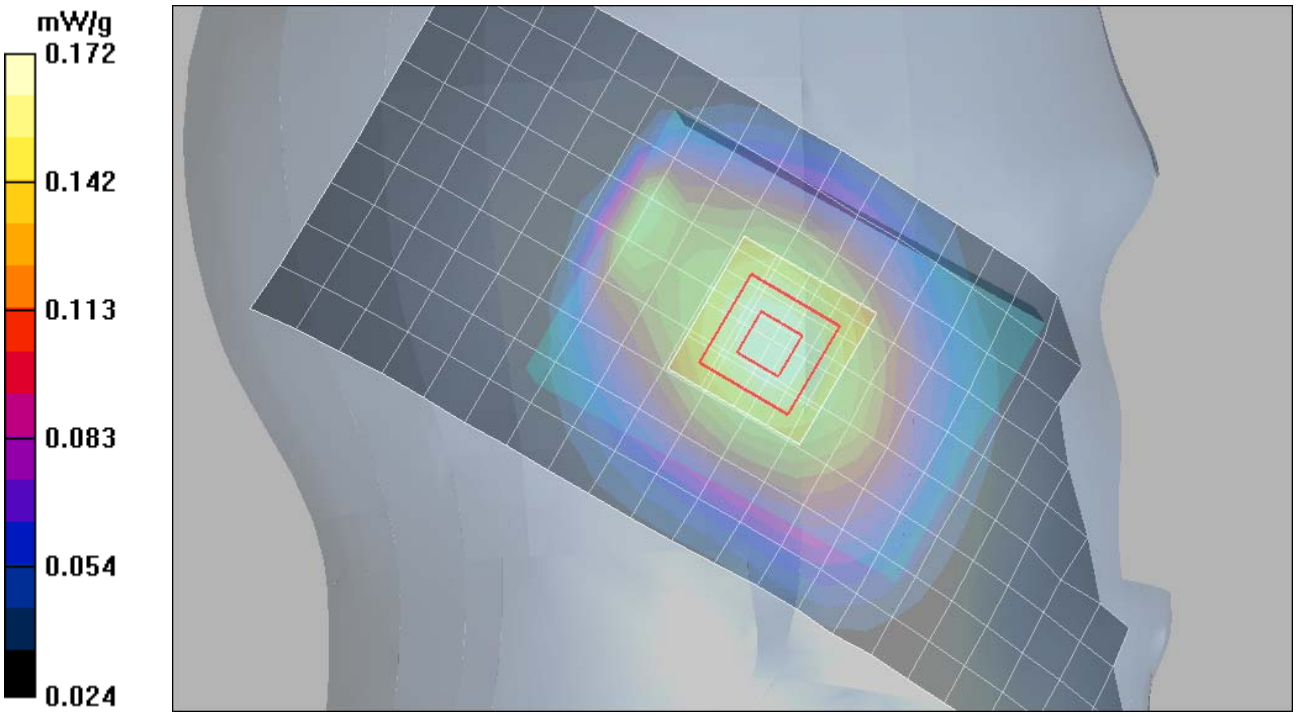
004401029206899;
Procedure Notes: Pwr Step: 05(OTA) Antenna Position: Internal
Battery Model #: SNN5837A DEVICE POSITION (cheek or rotated): Rotated
Communication System: GSM 850; Frequency: 836.6 MHz; Channel Number: 190; Duty Cycle: 1:8
Medium: Low Freq Head; Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Left Head Template/Area Scan - Normal (10mm) (10x25x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.171 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.2 V/m; Power Drift = 0.120 dB
Peak SAR (extrapolated) = 0.197 W/kg
SAR(1 g) = 0.163 mW/g; SAR(10 g) = 0.126 mW/g
Maximum value of SAR (measured) = 0.172 mW/g



Date/Time: 01/15/2009 PM 01:39:20

Test Laboratory: Motorola GSM850 Tilted Slider Up

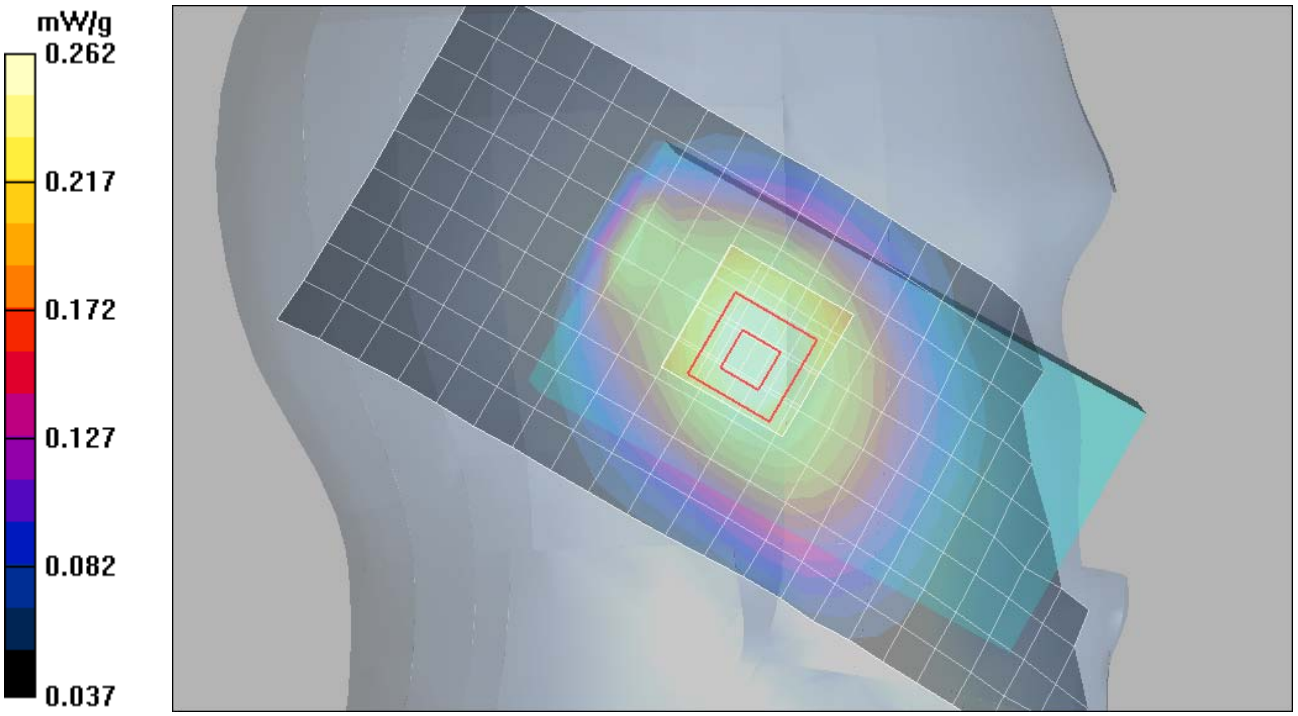
004401029206899;
Procedure Notes: Pwr Step: 05(OTA) Antenna Position: Internal
Battery Model #: SNN5837A DEVICE POSITION (cheek or rotated): Rotated
Communication System: GSM 850; Frequency: 836.6 MHz; Channel Number: 190; Duty Cycle: 1:8
Medium: Low Freq Head; Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Left Head Template/Area Scan - Normal (10mm) (10x25x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.267 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.7 V/m; Power Drift = 0.088 dB
Peak SAR (extrapolated) = 0.303 W/kg
SAR(1 g) = 0.251 mW/g; SAR(10 g) = 0.195 mW/g
Maximum value of SAR (measured) = 0.262 mW/g



Date/Time: 01/12/2009 PM 12:24:40

Test Laboratory: Motorola GSM1900 Tilted Slider Down

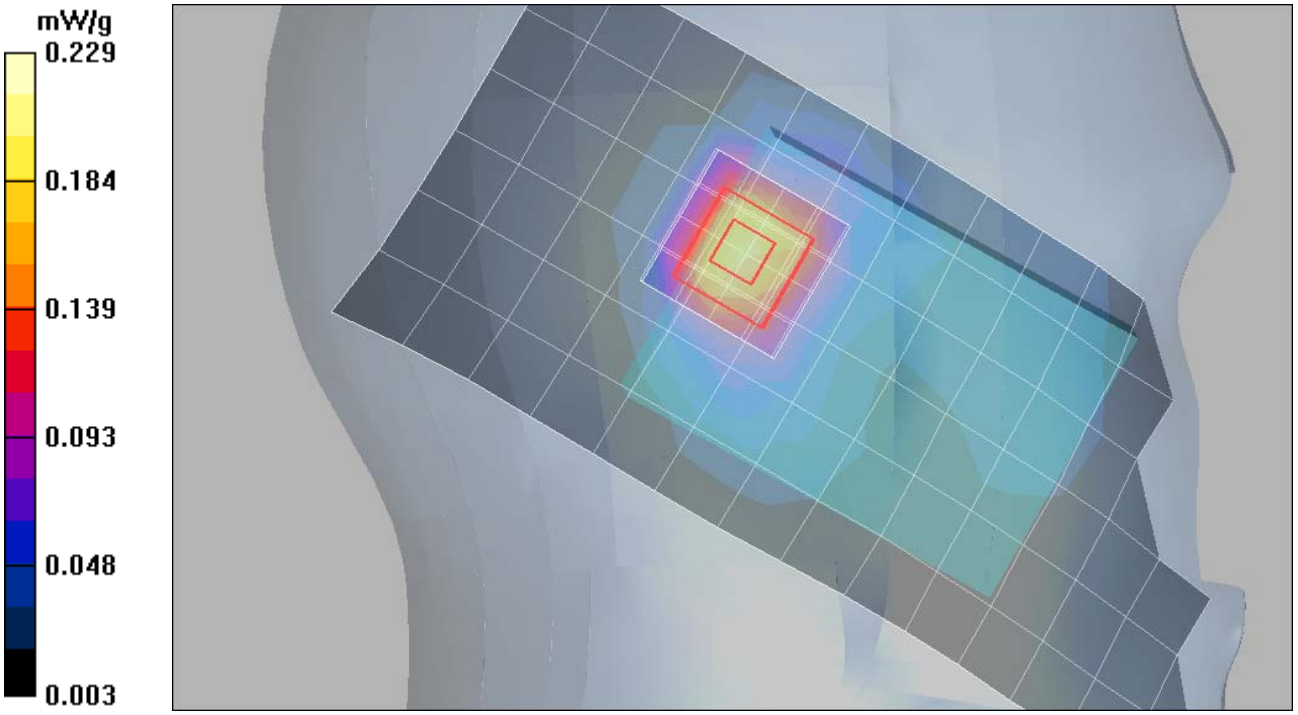
004401029206899;
Procedure Notes: Pwr Step: 00(OTA) Antenna Position: Internal
Battery Model #: SNN5833A DEVICE POSITION (cheek or rotated): Rotated
Communication System: GSM 1900; Frequency: 1880MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Head 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.46 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Left Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.173 mW/g

Left 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 = -0.042 dB
Peak SAR (extrapolated) = 0.345 W/kg
SAR(1 g) = 0.204 mW/g; SAR(10 g) = 0.111 mW/g
Maximum value of SAR (measured) = 0.229 mW/g



Date/Time: 01/09/2009 PM 05:16:48

Test Laboratory: Motorola GSM1900 Tilted Slider Up

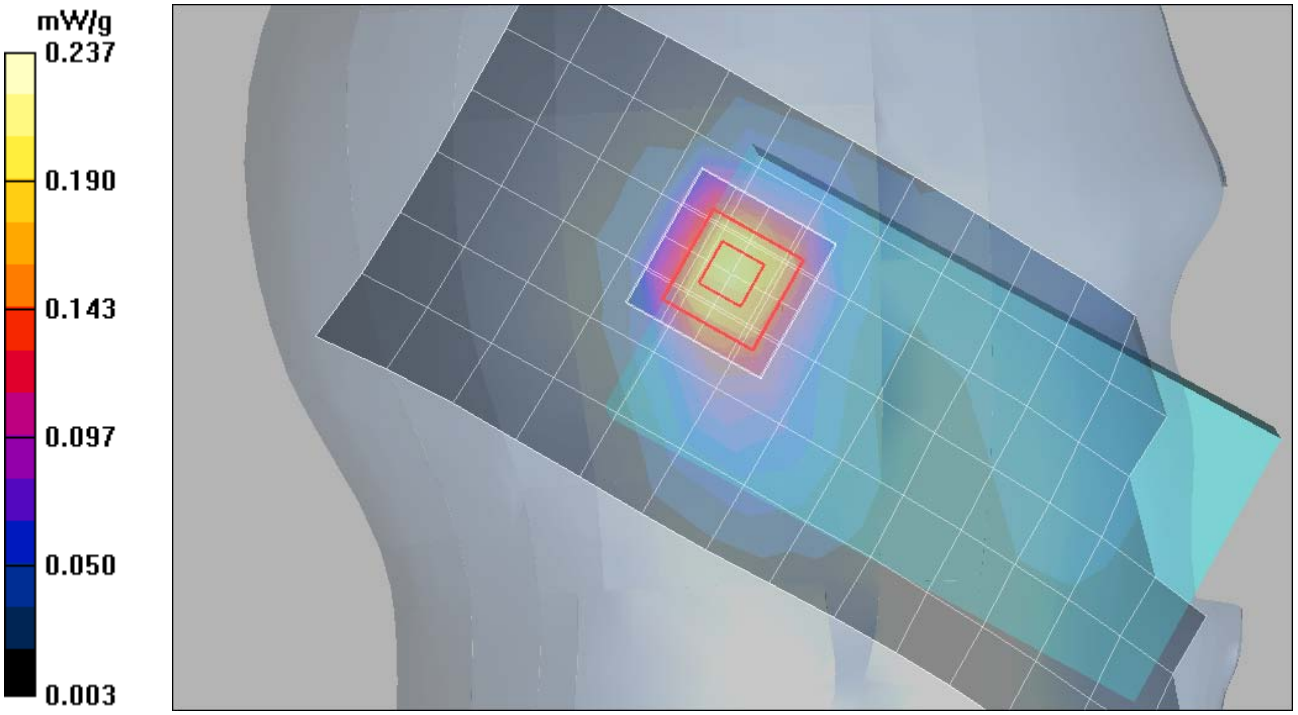
004401029206899;
Procedure Notes: Pwr Step: 00(OTA) Antenna Position: Internal
Battery Model #: SNN5837A DEVICE POSITION (cheek or rotated): Rotated
Communication System: GSM 1900; Frequency: 1880MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Head 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.46 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Left Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.171 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.9 V/m; Power Drift = -0.032 dB
Peak SAR (extrapolated) = 0.366 W/kg
SAR(1 g) = 0.209 mW/g; SAR(10 g) = 0.112 mW/g
Maximum value of SAR (measured) = 0.237 mW/g



Date/Time: 01/06/2009 AM 10:11:23

Test Laboratory: Motorola WCDMA850 Tilted Slider Down

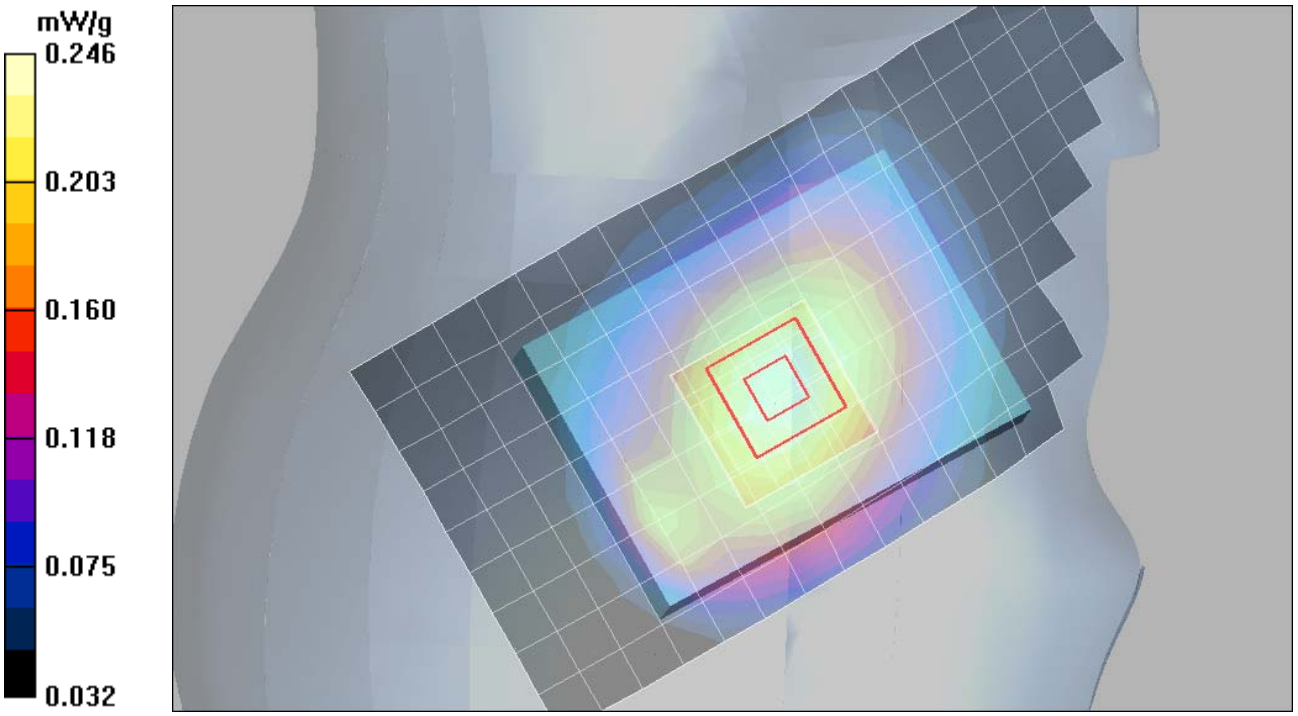
004401029206899;
Procedure Notes: Pwr Step: All up(OTA) Antenna Position: Internal
Battery Model #: SNN5833A DEVICE POSITION (cheek or rotated): Rotated
Communication System: 3G-WCDMA 850; Frequency: 836 MHz; Channel Number: 4180; Duty Cycle: 1:1
Medium: Low Freq Head; Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Right Head Template/Area Scan - Normal (10mm) (10x25x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.250 mW/g

Right Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.2 V/m; Power Drift = -0.349 dB
Peak SAR (extrapolated) = 0.279 W/kg
SAR(1 g) = 0.235 mW/g; SAR(10 g) = 0.180 mW/g
Maximum value of SAR (measured) = 0.246 mW/g



Date/Time: 01/05/2009 PM 01:00:38

Test Laboratory: Motorola

WCDMA850 Tilted Slider Up

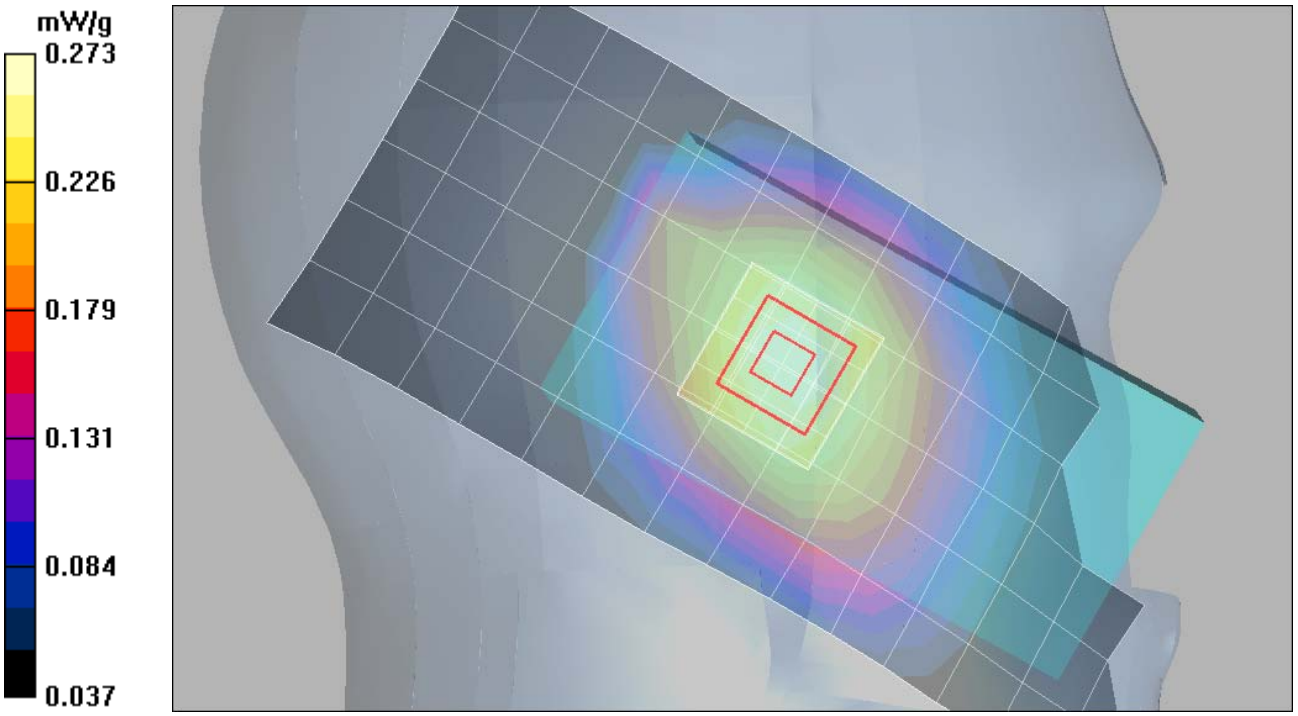
004401029206899;
Procedure Notes: Pwr Step: All up(OTA) Antenna Position: Internal
Battery Model #: SNN5837A DEVICE POSITION (cheek or rotated): Rotated
Communication System: 3G-WCDMA 850; Frequency: 836 MHz; Channel Number: 4180; Duty Cycle: 1:1
Medium: Low Freq Head; Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 41.8; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.91, 5.91, 5.91); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1155;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Left Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.266 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.4 V/m; Power Drift = 0.103 dB
Peak SAR (extrapolated) = 0.311 W/kg
SAR(1 g) = 0.261 mW/g; SAR(10 g) = 0.204 mW/g
Maximum value of SAR (measured) = 0.273 mW/g



Date/Time: 01/07/2009 AM 10:05:25

Test Laboratory: Motorola WCDMA1900 Tilted Slider Down

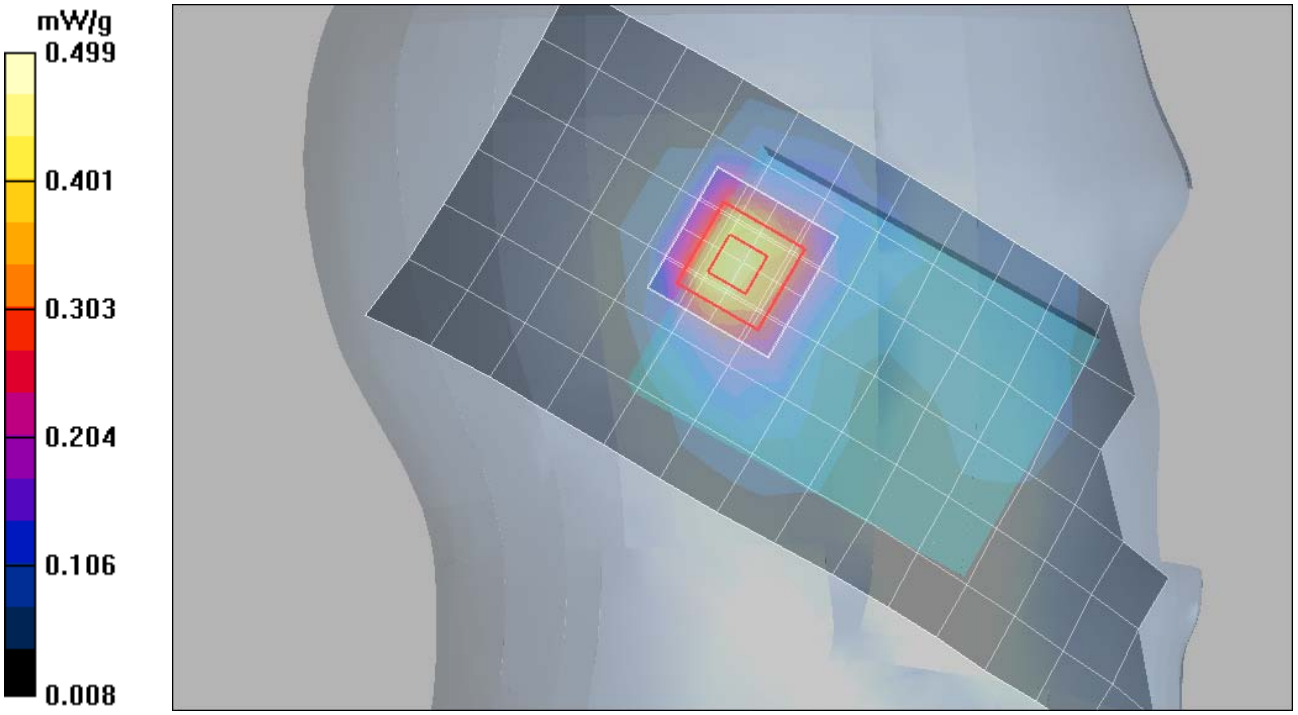
004401029206899;
Procedure Notes: Pwr Step: All up(OTA) Antenna Position: Internal
Battery Model #: SNN5833A DEVICE POSITION (cheek or rotated): Rotated
Communication System: 3G/WCDMA 1900; Frequency: 1880 MHz; Channel Number: 9400; Duty Cycle: 1:1
Medium: Regular Glycol Head 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Left Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.375 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.9 V/m; Power Drift = -0.122 dB
Peak SAR (extrapolated) = 0.752 W/kg
SAR(1 g) = 0.447 mW/g; SAR(10 g) = 0.244 mW/g
Maximum value of SAR (measured) = 0.499 mW/g



Date/Time: 01/06/2009 PM 03:51:52

Test Laboratory: Motorola WCDMA1900 Tilted Slider Up

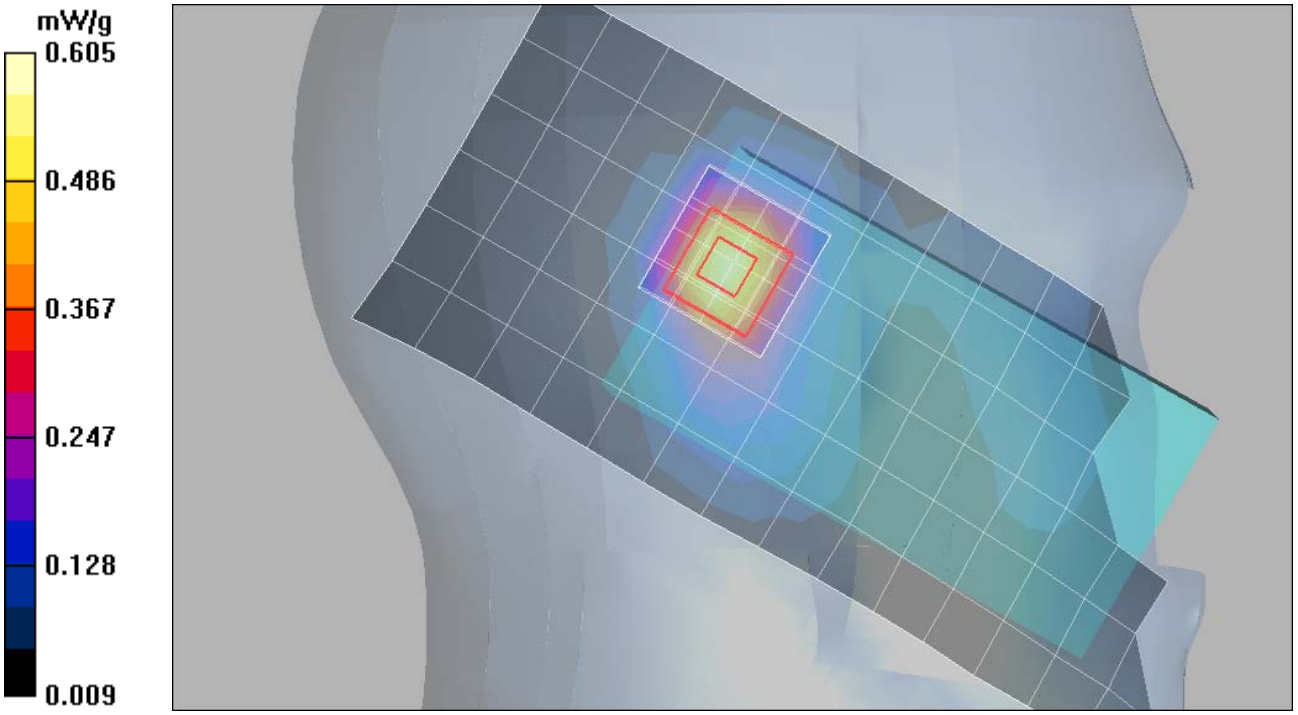
004401029206899;
Procedure Notes: Pwr Step: All up(OTA) Antenna Position: Internal
Battery Model #: SNN5837A DEVICE POSITION (cheek or rotated):Rotated
Communication System: 3G/WCDMA 1900; Frequency: 1880 MHz; Channel Number: 9400; Duty Cycle: 1:1
Medium: Regular Glycol Head 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.15, 5.15, 5.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1086;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Left Head Template/Area Scan - Normal (15mm) (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.431 mW/g

Left Head Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.8 V/m; Power Drift = 0.038 dB
Peak SAR (extrapolated) = 0.927 W/kg
SAR(1 g) = 0.545 mW/g; SAR(10 g) = 0.296 mW/g
Maximum value of SAR (measured) = 0.605 mW/g



Appendix 3

SAR distribution plots for Body Worn Configuration

Date/Time: 01/15/2009 AM 08:42:16

Test Laboratory: Motorola GSM850 BodyWorn

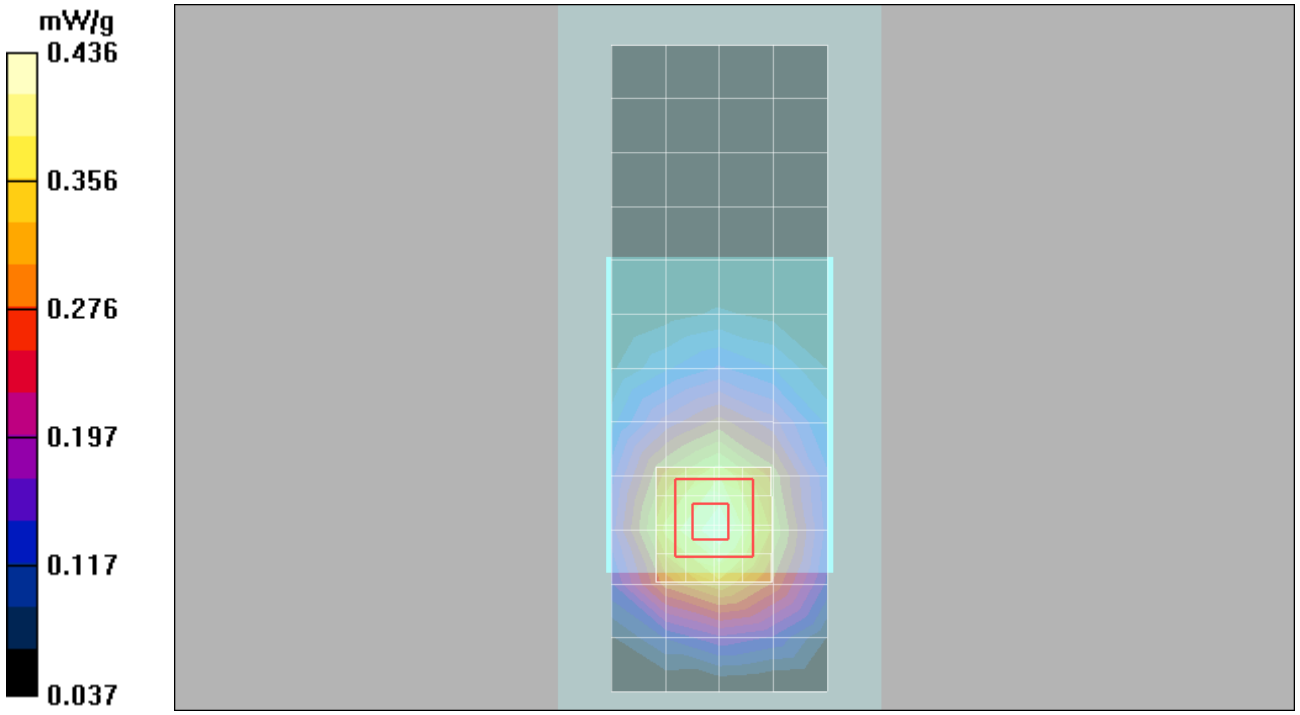
004401029206899;
Procedure Notes: Pwr Step: 05(OTA) Antenna Position: Internal
Battery Model #: SNN5837A Device Position: Back of phone 15mm from Phantom
Communication System: GSM 850; Frequency: 836.6MHz; Channel Number: 190; Duty Cycle: 1:8
Medium: Low Freq Body; Medium parameters used: f = 835 MHz; σ = 1.01 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.93, 5.93, 5.93); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Section 1, Amy Twin, Rev2 (23-June-04); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.432 mW/g

Amy Twin Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.8 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 0.541 W/kg
SAR(1 g) = 0.410 mW/g; SAR(10 g) = 0.292 mW/g
Maximum value of SAR (measured) = 0.436 mW/g



Date/Time: 01/12/2009 PM 04:38:27

Test Laboratory: Motorola GSM1900 BodyWorn

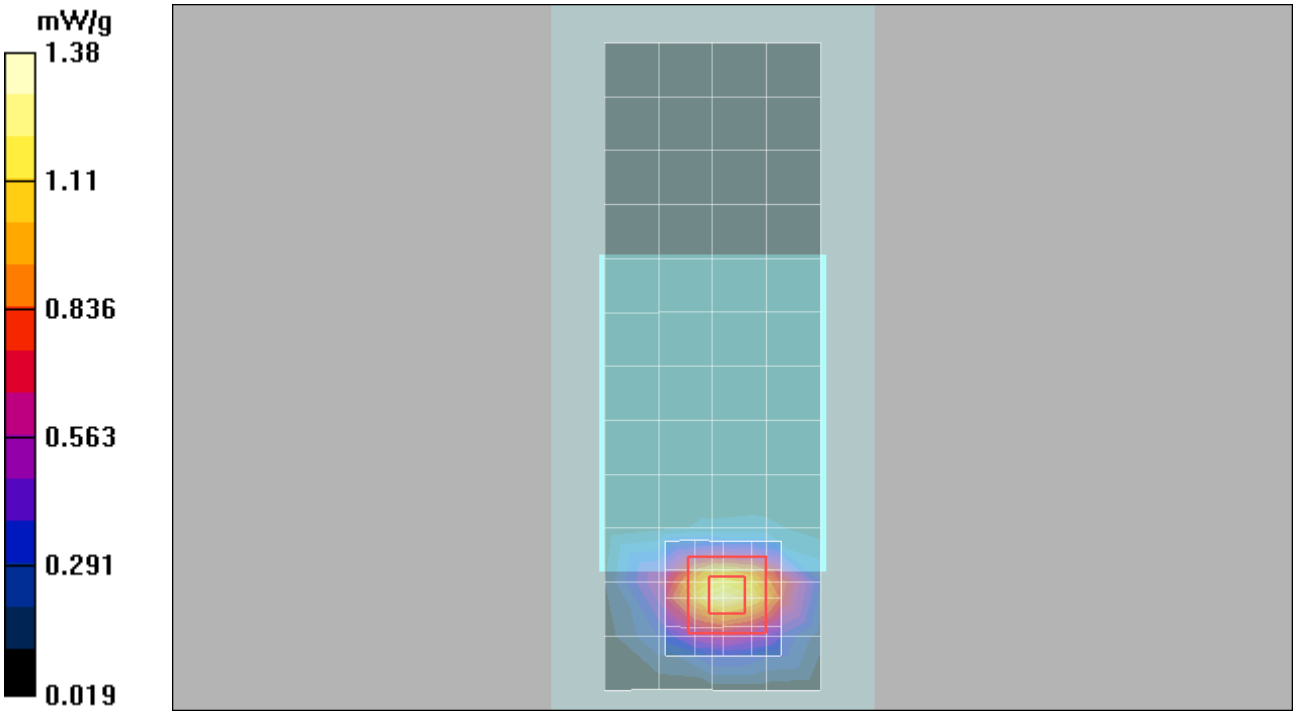
004401029206899;
Procedure Notes: Pwr Step: 00(OTA) Antenna Position: Internal
Battery Model #: SNN5833A Device Position: Back of phone 15mm from Phantom
Communication System: GSM 1900; Frequency: 1850.2 MHz; Channel Number: 512; Duty Cycle: 1:8
Medium: Regular Glycol Body 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.59 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(4.76, 4.76, 4.76); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Section 2, Amy Twin, Rev2 (23-June-04); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.24 mW/g

Amy Twin Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.8 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 2.18 W/kg
SAR(1 g) = 1.25 mW/g; SAR(10 g) = 0.647 mW/g
Maximum value of SAR (measured) = 1.38 mW/g



Date/Time: 01/06/2009 PM 01:33:32

Test Laboratory: Motorola WCDMA850 BodyWorn

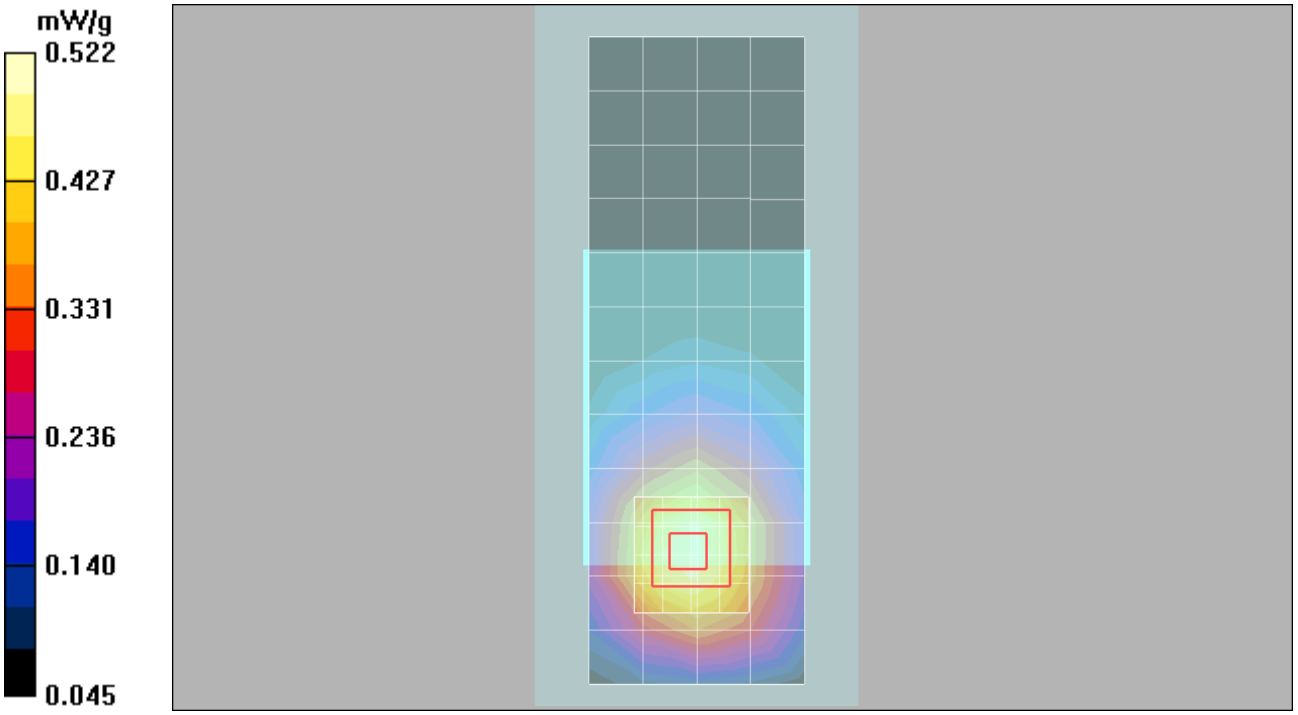
004401029206899;
Procedure Notes: Pwr Step: All up(OTA) Antenna Position: Internal
Battery Model #: SNN5833A Device Position: Back of phone 15mm from Phantom
Communication System: 3G-WCDMA 850; Frequency: 836 MHz; Channel Number: 4180; Duty Cycle: 1:1
Medium: Low Freq Body; Medium parameters used: f = 835 MHz; σ = 1.01 mho/m; ε_r = 55.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(5.93, 5.93, 5.93); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Section 1, Amy Twin, Rev2 (23-June-04); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.505 mW/g

Amy Twin Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.1 V/m; Power Drift = -0.079 dB
Peak SAR (extrapolated) = 0.644 W/kg
SAR(1 g) = 0.489 mW/g; SAR(10 g) = 0.349 mW/g
Maximum value of SAR (measured) = 0.522 mW/g



Date/Time: 01/13/2009 AM 09:45:18

Test Laboratory: Motorola WDMA1900 BodyWorn

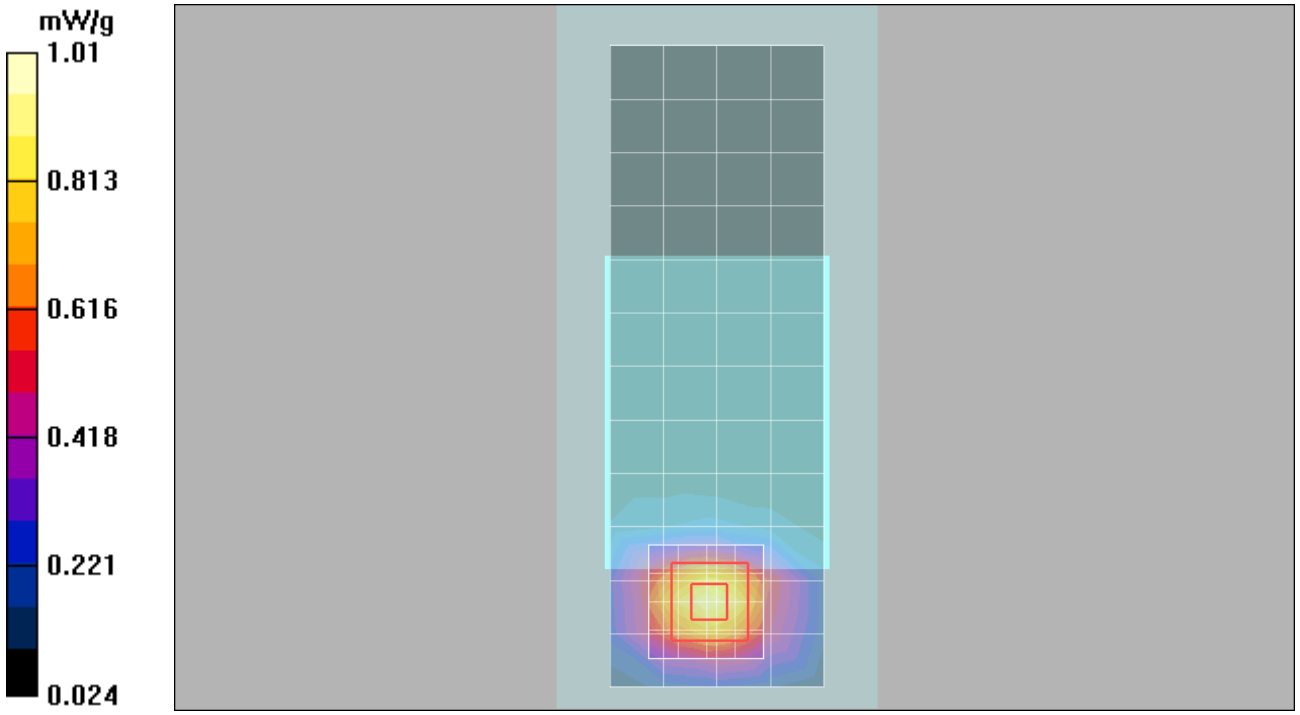
004401029206899;
Procedure Notes: Pwr Step: All up(OTA) Antenna Position: Internal
Battery Model #: SNN5837A Device Position: Back of phone 25mm from Phantom
Communication System: 3G/WCDMA 1900;Frequency: 1852.5 MHz; Channel Number: 9262; Duty Cycle: 1:1
Medium: Regular Glycol Body 1750/1880; Medium parameters used: f = 1880 MHz; σ = 1.59 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(4.76, 4.76, 4.76); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Section 2, Amy Twin, Rev2 (23-June-04); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.867 mW/g

Amy Twin Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.3 V/m; Power Drift = -0.009 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.914 mW/g; SAR(10 g) = 0.534 mW/g
Maximum value of SAR (measured) = 1.01 mW/g



Date/Time: 01/16/2009 PM 01:05:57

Test Laboratory: Motorola **Bluetooth 2450 BodyWorn**

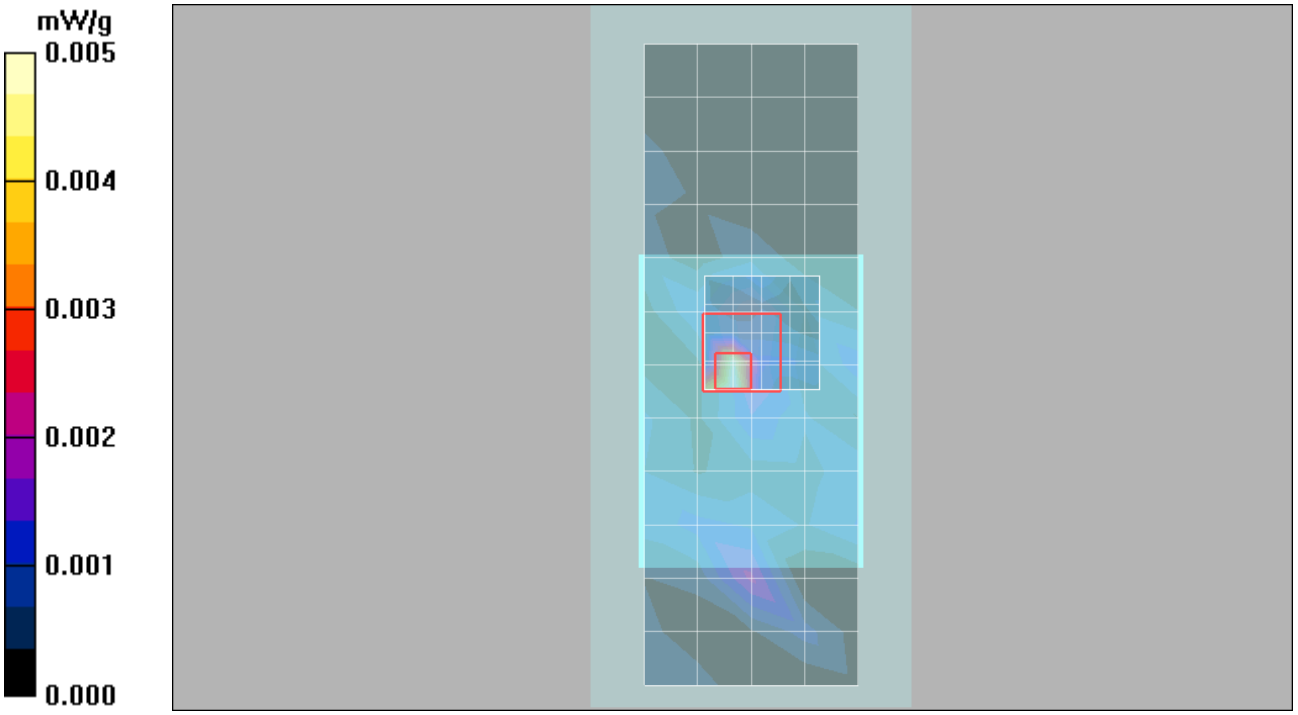
004401029206899;
Procedure Notes: Pwr Step: TestMode(OTA) Antenna Position: Internal
Battery Model #: SNN5837A Device Position: Back of phone 15mm Phantom
Communication System: Bluetooth; Frequency: 2441 MHz; Channel Number: 39; Duty Cycle: 1:1
Medium: 2450 Glycol Body; Medium parameters used: f = 2450 MHz; σ = 2.04 mho/m; ε_r = 48.2; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3180; ConvF(4.15, 4.15, 4.15); Calibrated: 07/14/2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn386; Calibrated: 04/22/2008
- Phantom: PCS-10_ Section 2, Amy Twin, Rev2 (23-June-04); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.002 mW/g

Amy Twin Phone Template/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.24 V/m; Power Drift = -3.34 dB
Peak SAR (extrapolated) = 0.013 W/kg
SAR(1 g) = 0.00372 mW/g; SAR(10 g) = 0.000854 mW/g
Maximum value of SAR (measured) = 0.005 mW/g



Appendix 4

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

Client Motorola Korea **Certificate No:** ES3-3180_Jul08

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3180
Calibration procedure(s)	QA CAL-01.v6 and QA CAL-23.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	July 14, 2008
Condition of the calibrated item	In Tolerance

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

All calibrations have been conducted 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-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	1-Jul-08 (No. 217-00865)	Jul-09
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	1-Jul-08 (No. 217-00866)	Jul-09
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 660	3-Sep-07 (No. DAE4-660_Sep07)	Sep-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

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

Issued: July 14, 2008

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
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

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 $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF.*
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *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:3180

Manufactured: March 25, 2008
Calibrated: July 14, 2008

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ES3DV3 SN:3180

Sensitivity in Free Space[A] Diode Compression[B]

NormX	**1.18** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**95** mV
NormY	**1.03** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**93** mV
NormZ	**1.01** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**94** mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	9.4	5.8
SAR_{be} [%]	With Correction Algorithm	0.6	0.3

TSL **1810 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	9.1	5.3
SAR_{be} [%]	With Correction Algorithm	0.5	0.3

Sensor Offset

Probe Tip to Sensor Center	**2.0** mm

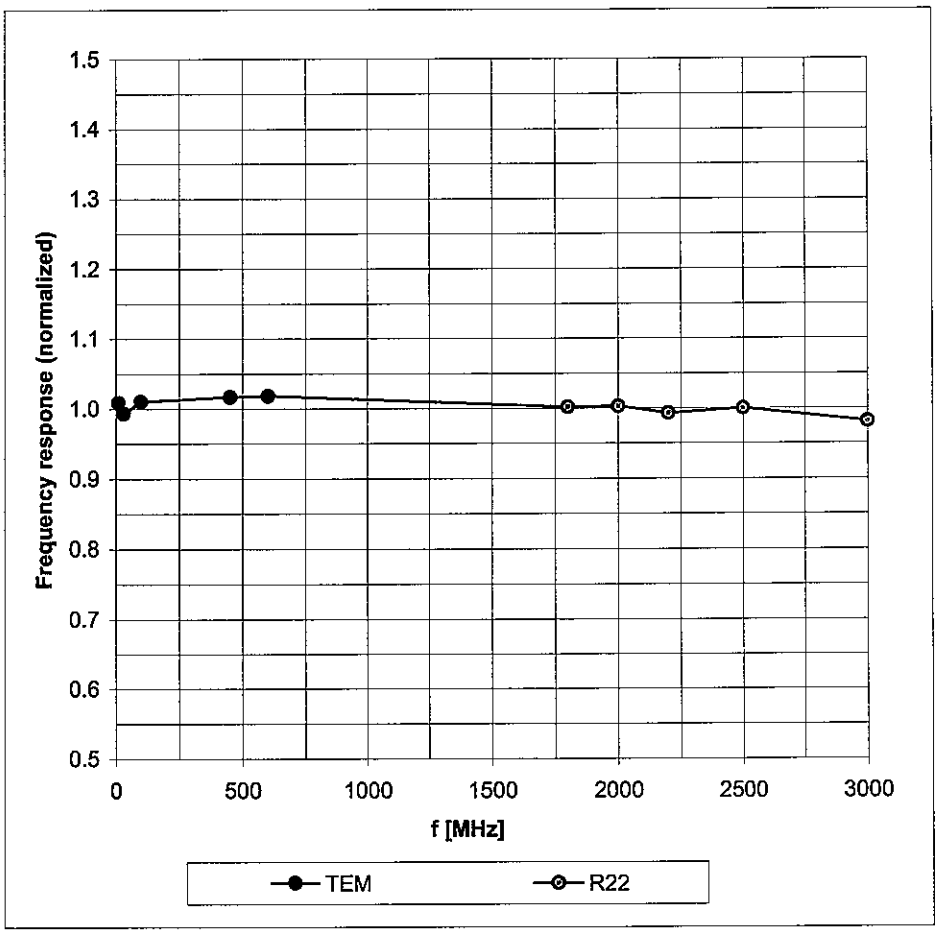
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

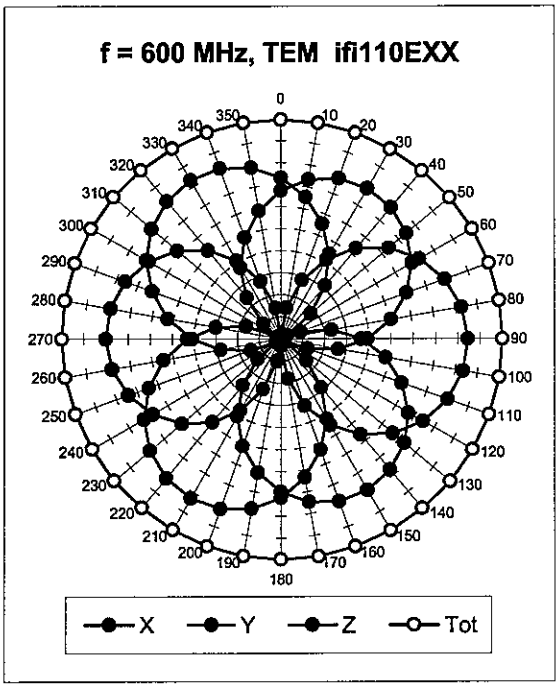
Frequency Response of E-Field

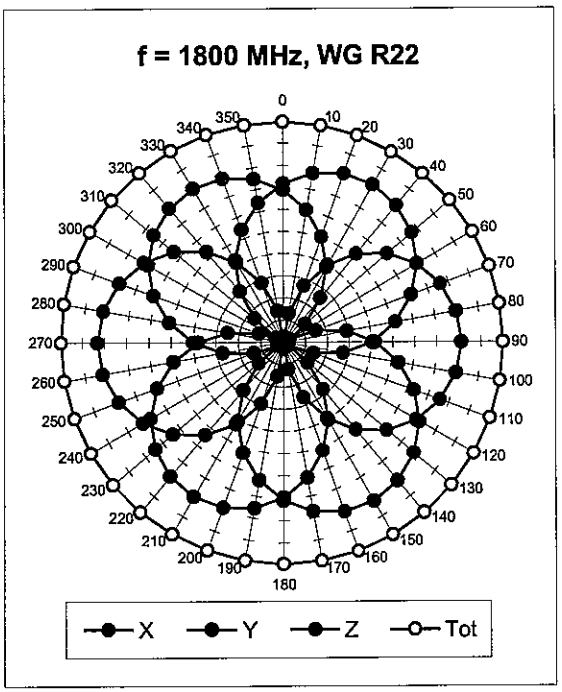
(TEM-Cell:ifi110 EXX, Waveguide: R22)

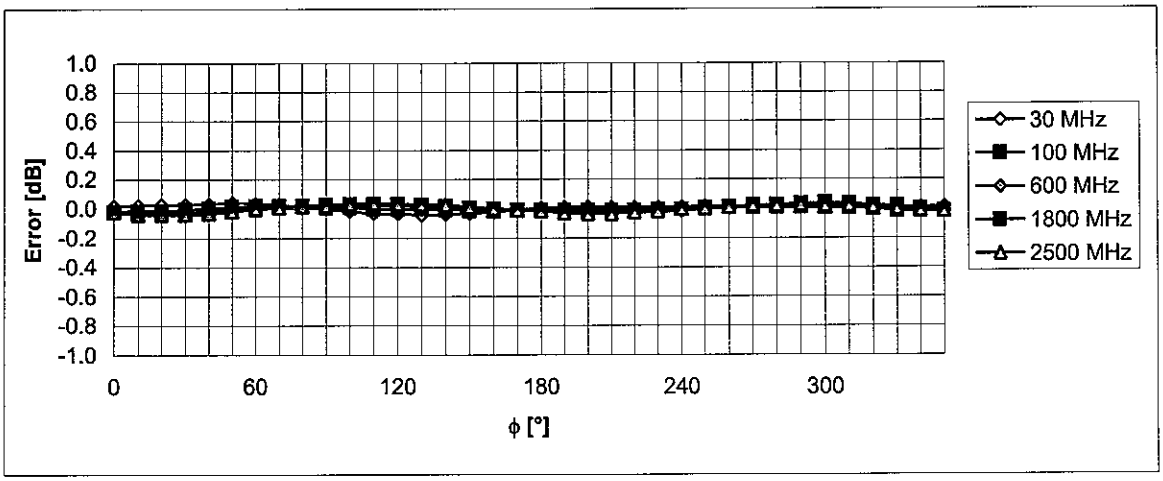


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



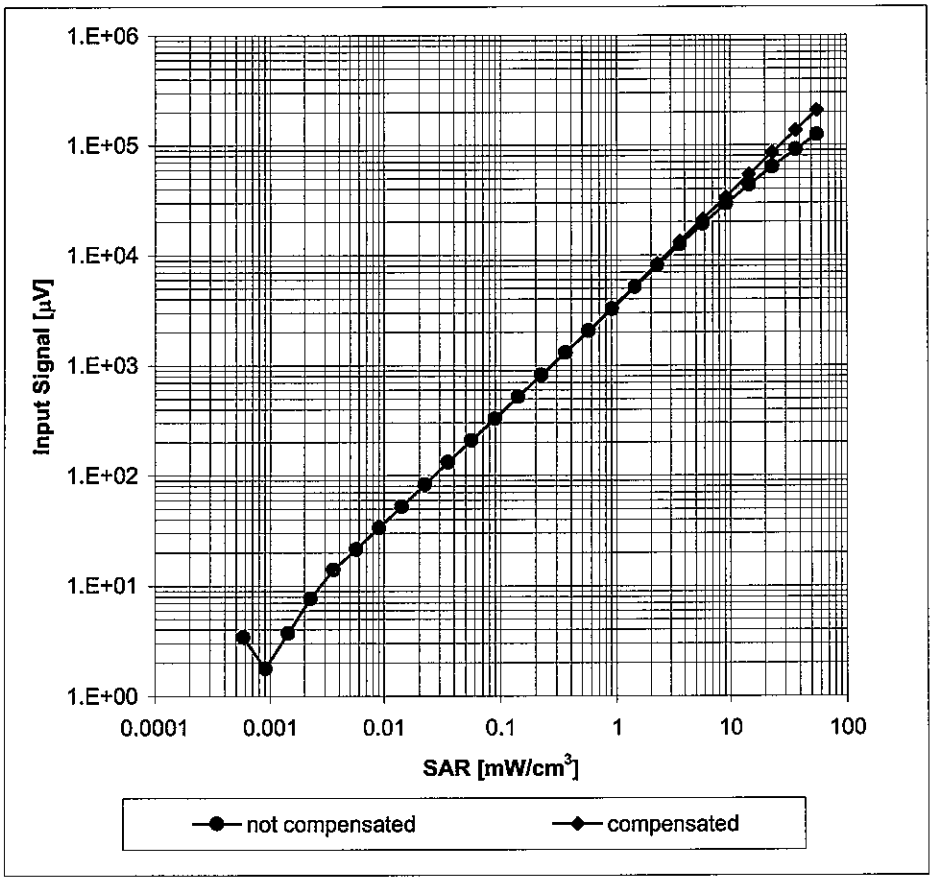


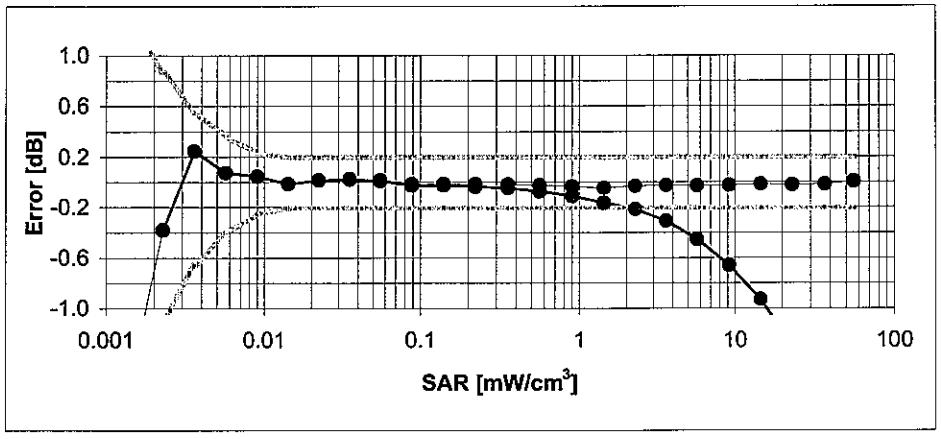


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

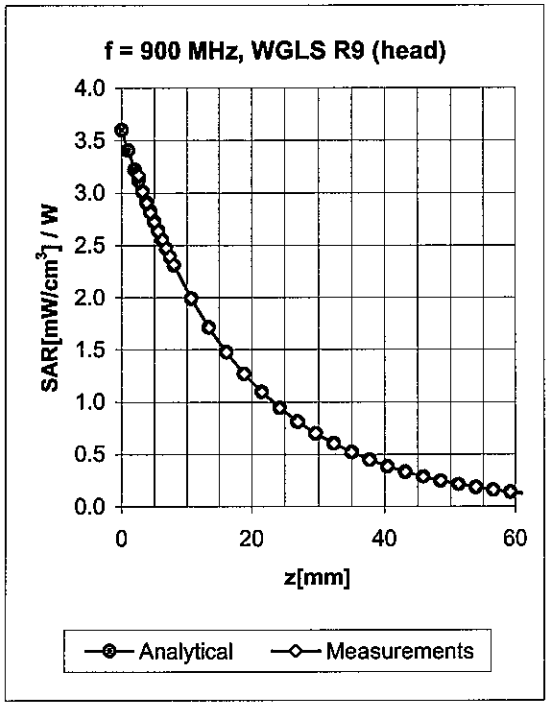
(Waveguide R22, f = 1800 MHz)

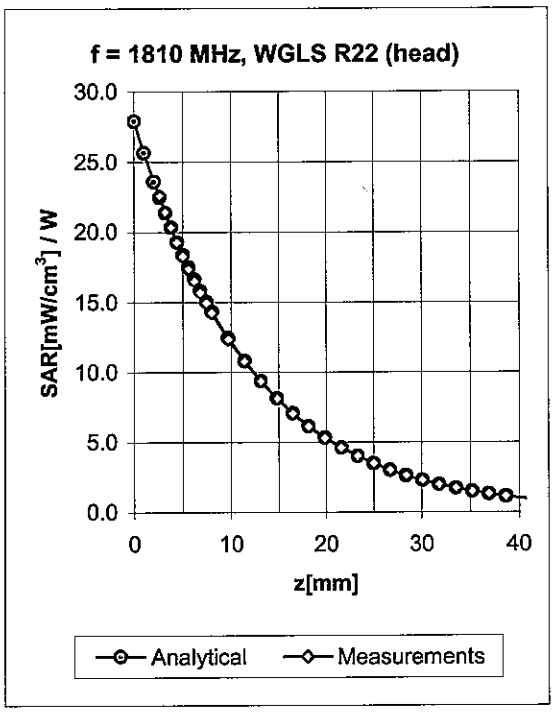




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



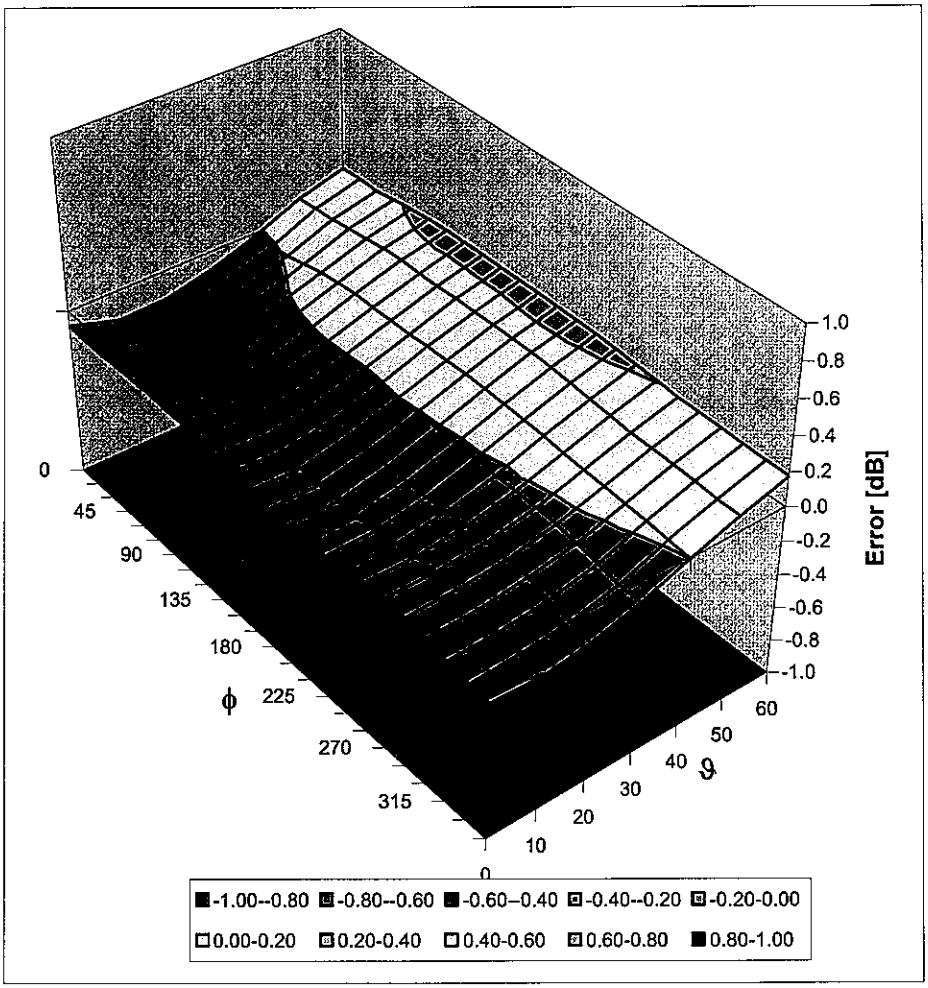


f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.21	2.35	5.91 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.40	1.64	5.15 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.78	1.17	4.89 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.70	1.25	4.47 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.37	1.69	5.93 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.35	1.92	4.76 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.63	1.37	4.67 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.75	1.25	4.15 ± 11.0% (k=2)

[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.

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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

Appendix 5

Measurement Uncertainty Budget

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**IEEE 1528 section**	**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	E.2.1	5.9	N	1.00	1	1	5.9	5.9	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	1.1	R	1.73	1	1	0.6	0.6	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mech. Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.2	N	1.00	1	1	3.2	3.2	29
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0	8
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	N	1.00	0.64	0.43	2.1	1.4	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	N	1.00	0.6	0.49	1.1	0.9	∞
Combined Standard Uncertainty			RSS				11.1	10.8	411
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				22.2	21.6	

Appendix 6

Dipole Characterization Certificate

Certification of System Performance Check Targets

Based on WI-0396

-Historical Data-

	900MHz	
Reference Target:	10.9	**(W/kg)**
Measurement Uncertainty (k=1):	9.0%	
Measurement Period:	*18-April-07 to 14-April-08*	
# of tests performed:	1,125	
Grand Average:	11.29	**(W/kg)**
% Delta (Average - Reference Target)	3.6%	
Is % Delta <= Expanded Measurement Uncertainty (k=2)?	**Yes**	
Accept/Reject Average as new system performance check target?	**ACCEPT**	
	Applies to Dipole SN's: 55, 69, 77, 78, 79, 80, 91, 92, 93, 94, 95, 96, 97, 1d034, 1d035	

-New System Performance Check Targets- per WI-0396

(based on analysis of historical data)

Frequency	SAR Target (W/kg)	Permittivity	Conductivity (S/m)
900MHz	**11.29**	41.5 ± 5%	0.97 ± 5%

-Approvals-

Submitted by: Marge Kaunas Date: 16-Apr-08

Signed: Marge Kaunas

Comments: Spreadsheet detailing referenced historical measurements is available upon request.

Approved by: Mark Douglas **Date:** 22-Apr-08

Signed: Mark Douglas

Comments:

Certification of System Performance Check Targets

Based on WI-0396

-Historical Data-

	1800MHz	
Reference Target:	38.4	**(W/kg)**
Measurement Uncertainty (k=1):	9.0%	
Measurement Period:	*18-April-07 to 14-April-08*	
# of tests performed:	1,028	
Grand Average:	37.7	**(W/kg)**
% Delta (Average - Reference Target)	-1.7%	
Is % Delta <= Expanded Measurement Uncertainty (k=2)?	**Yes**	
Accept/Reject Average as new system performance check target?	**ACCEPT**	
	Applies to Dipole SN's: **246tr, 250tr, 251tr, 259tr, 263tr, 271tr, 272tr, 276tr, 277tr, 279tr, 280tr, 281tr, 283tr, 284tr, 2d128, 2d129**	

-New System Performance Check Targets- per WI-0396

(based on analysis of historical data)

Frequency	SAR Target (W/kg)	Permittivity	Conductivity (S/m)
1800MHz	**37.7**	40.0 ± 5%	1.40 ± 5%

-Approvals-

Submitted by: Marge Kaunas Date: 16-Apr-08

Signed: Marge Kaunas

Comments: Spreadsheet detailing referenced historical measurements is available upon request.

Approved by: Mark Douglas **Date:** 22-Apr-08

Signed: Mark Douglas

Comments:

Certification of System Performance Check Targets

Based on WI-0396

-Historical Data-

	2450MHz	
Reference Target:	52.4	**(W/kg)**
Measurement Uncertainty (k=1):	9.0%	
Measurement Period:	*18-April-07 to 14-April-08*	
# of tests performed:	77	
Grand Average:	56.5	**(W/kg)**
% Delta (Average - IEEE1528 Target)	7.8%	
Is % Delta <= Expanded Measurement Uncertainty (k=2)?	**Yes**	
Accept/Reject Average as new system performance check target?	**ACCEPT**	
	Applies to Dipole SN's: 740, 766, 767, 788, 789	

-New System Performance Check Targets- per WI-0396

(based on analysis of historical data)

Frequency	SAR Target (W/kg)	Permittivity	Conductivity (S/m)
2450MHz	**56.5**	39.2 ± 5%	1.80 ± 5%

-Approvals-

Submitted by: Marge Kaunas Date: 16-Apr-08

Signed: Marge Kaunas

Comments: Spreadsheet detailing referenced historical measurements is available upon request.

Approved by: Mark Douglas **Date:** 22-Apr-08

Signed: Mark Douglas

Comments:

END OF REPORT