A Test Lab Techno Corp.

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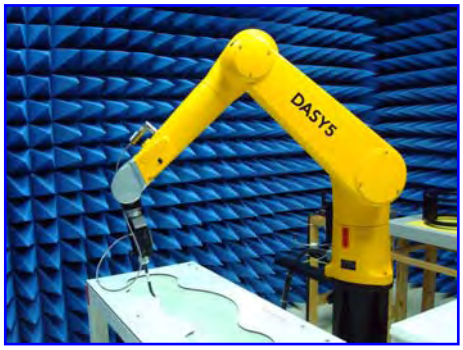
SAR EVALUATION REPORT

Test Report No.	:	**1011FS18**
Applicant	:	**SCT Wireless Inc**
Product Type	:	**USB Broadband Modem**
Trade Name	:	**SCT Wireless**
Model Number	:	**SCT-UM300**
Dates of Test	:	**Nov. 22 ~ Nov. 24, 2010**
Test Environment	:	**Ambient Temperature： 22 ±2˚C**
		Relative Humidity：40 - 70 %
Test Specification	:	**Standard C95.1-2005**
		IEEE Std. 1528-2003
		2.1093;FCC/OET Bulletin 65 Supplement C [July 2001]
		RSS-102 Issue 4 (March 2010)
		FCC KDB 447498 D01 Mobile Portable RF Exposure V04, Published on Nov. 16, 2009
		FCC KDB 616217 D01 SAR for Laptop with screen Ant V01, Published on Nov. 16, 2009
		FCC KDB 941225 D01 SAR test for 3G devices V02
Max. SAR	:	**0.737 W/kg Body SAR**
Test Lab Location	:	**Chang-an Lab**



1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
3. The measurement report has to be written approval of A Test Lab Techno Corp. It may only be reproduced or published in full. This report shall not be reproduced except in full, without the written approval of A Test Lab Techno Corp. The test results in the report only apply to the tested sample.

Sam Chuang **Nov. 26, 2010**
Approve Signer

Alex Wu **Nov. 26, 2010**
Testing Engineer

Contents

1. Description of Equipment under Test (EUT)

Applicant	:	SCT Wireless Inc
Applicant Address	:	1894 US Hwy 50 East Building 4 Suite 281 Carson City NV 89701
Manufacturer	:	Airgoon LTD.
Manufacturer Address	:	2207 Concord Pike, Suite 700, Wilmington, DELAWARE
Product Type	:	USB Broadband Modem
Trade Name	:	SCT Wireless
Model Number	:	SCT-UM300
FCC ID	:	XZZSCT-UM300
Tx Frequency	:	CDMA 2000, 1xRTT revision A, EVDO release 0, EVDO release A 824- 849 MHz Cellular Band 1820 - 1910 MHz PCS Band
RF Conducted Power (Average)	:	0.119 W / 20.77 dBm Cellular Band 0.045 W / 16.57 dBm PCS Band
Max. SAR Measurement	:	0.737 W/kg Body SAR
Antenna Type	:	monopole Antenna
Device Category	:	Mobile Device
RF Exposure Environment	:	General Population / Uncontrolled
Battery Option	:	Standard
Application Type	:	Certification

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment / general population exposure limits specified in Standard C95.1-2005 / RSS-102 Issue 3 (June 2009) and had been tested in accordance with the measurement procedures specified in IEEE Std. 1528-2003.

2. Introduction

The A Test Lab Techno Corp. has performed measurements of the maximum potential exposure to the user of **SCT Wireless Inc Trade Name：SCT Wireless Model(s)：SCT-UM300.** The test procedures, as described in American National Standards, Institute C95.1 - 2005〔1〕, FCC/OET Bulletin 65 Supplement C [July 2001] and RSS-102 Issue 4 (March 2010) were employed and they specify the maximum exposure limit of 1.6mW/g as averaged over any 1 gram of tissue for portable devices being used within 25cm between user and EUT in the uncontrolled environment. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the equipment used are included within this test report.

3. SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative (rate) of the incremental energy (dw) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Figure 2).

SAR Mathematical Equation

$$SAR = \frac{d}{dt}\left(\frac{dw}{dm}\right) = \frac{d}{dt}\left(\frac{dw}{\rho dv}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)

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

Where：

σ = conductivity of the tissue (S/m)

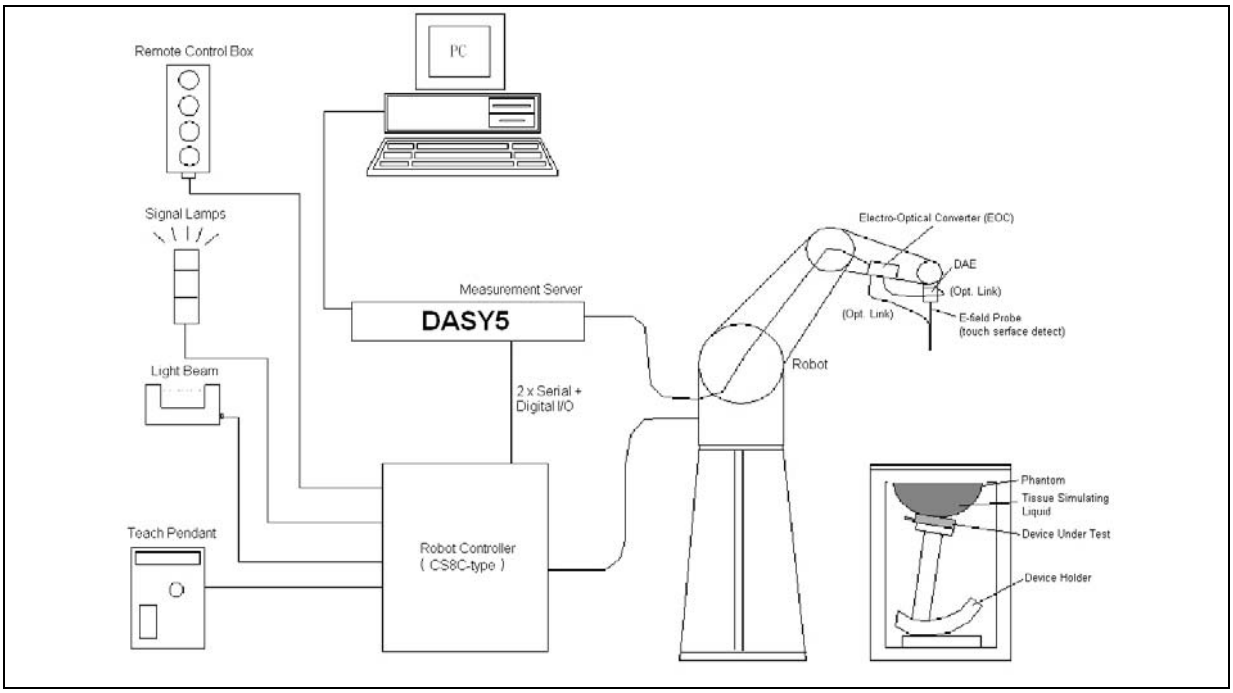
ρ = mass density of the tissue (kg/m^3)

E = RMS electric field strength (V/m)

＊**Note**：

The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane〔2〕

4. SAR Measurement Setup



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

1. A standard high precision 6-axis robot (Stäubli TX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
4. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
5. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
6. A computer operating Windows 2003.
7. DASY5 software.
8. Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
9. The SAM twin phantom enabling testing left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. Validation dipole kits allowing validating the proper functioning of the system.

5. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Last Calibration	Remark
SPEAG	Dosimetric E-Field Probe	EX3DV4	3632	01/26/2010	(1)
SPEAG	835MHz System Validation Kit	D835V2	4d082	07/20/2010	(1)
SPEAG	1900MHz System Validation Kit	D1900V2	5d111	07/16/2010	(1)
SPEAG	Data Acquisition Electronics	DAE4	779	01/21/2010	(1)
SPEAG	Device Holder	N/A	N/A	NCR	-----
SPEAG	Phantom	SAM V4.0	TP-1150	NCR	-----
SPEAG	Robot	Staubli TX90XL	F07/564ZA1/C/01	NCR	-----
SPEAG	Software	DASY5 V5.0 Build 125	N/A	NCR	-----
SPEAG	Software	SEMCAD X V13.4 Build 125	N/A	NCR	-----
SPEAG	Measurement Server	SE UMS 011 AA	1025	NCR	-----
R&S	Wireless Communication Test Set	CMU200	109369	08/10/2010	(1)
Agilent	Wireless Communication Test Set	E5515C	GB47020167	05/25/2010	(1)
Agilent	ENA Series Network Analyzer	E5071B	MY42402996	11/04/2009	(2)
Agilent	Dielectric Probe Kit	85070C	US99360094	NCR	-----
R&S	Power Sensor	NRP-Z22	100179	05/20/2010	(1)
Agilent	Signal Generator	E8257D	MY44320425	03/09/2009	(2)
Agilent	Dual Directional Coupler	778D	50334	NCR	-----
Mini-Circuits	Power Amplifier	ZHL-42W-SMA	D111103#5	NCR	-----
Mini-Circuits	Power Amplifier	ZVE-8G-SMA	D042005 671800514	NCR	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

6. Tissue Simulating Liquids

The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue. The dielectric parameters of the liquids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an E5071B Network Analyzer.

IEEE SCC-34/SC-2 in 1528 recommended Tissue Dielectric Parameters

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in human head. Other head and body tissue parameters that have not been specified in 1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equation and extrapolated according to the head parameter specified in 1528.

Target Frequency	Head		Body	
(MHz)	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 - 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00
(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)				

Table 1. Tissue dielectric parameters for head and body phantoms

6.1 Ingredients

The following ingredients are used:

- Water: deionized water (pure H20), resistivity ≥ 16 M Ω -as basis for the liquid
- Sugar: refied white sugar (typically 99.7 % sucrose, available as crystal sugar in food shops) to reduce relative permittivity
- Salt: pure NaCl -to increase conductivity
- Cellulose: Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2% in water, 20◦ C), CAS # 54290 -to increase viscosity and to keep sugar in solution.
- Preservative: Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 -to prevent the spread of bacteria and molds
- DGBE: Diethylenglycol-monobuthyl ether (DGBE), Fluka Chemie GmbH, CAS # 112-34-5 -to reduce relative permittivity

6.2 Recipes

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands.

Note: The goal dielectric parameters (at 22 ℃) must be achieved within a tolerance of ±5% for ε and σ.

Liquid type	MSL 900-B	
Ingredient	Weight (g)	Weight (%)
Water	633.91	50.75
Sugar	602.12	50.75
Cellulose	-	0.00
Salt	11.76	0.94
Preventol	1.20	0.10
Total amount	1,249.00	100.00
Goal dielectric parameters		
Frequency [MHz]	835	900
Relative Permittivity	55.2	55.0
Conductivity [S/m]	0.97	1.05

Liquid type	MSL 1950-A	
Ingredient	Weight (g)	Weight (%)
Water	697.94	69.79
DGBE	300.03	30.00
Salt	2.03	0.20
Total amount	1,000.00	100.00
Goal dielectric parameters		
Frequency [MHz]	1950	2000
Relative Permittivity	53.3	53.3
Conductivity [S/m]	1.52	1.52

6.3 Liquid Confirmation

6.3.1 Parameters

Liquid Verify (Ambient Temperature： 22 ± 2 °C；Relative Humidity：40 -70%)								
Liquid Type	Frequency	Temp (°C)	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)	Measured Date
835MHz Body	820MHz	22.0	εr	55.2	54.71	-0.88%	± 5	11/22/2010
			σ	0.97	0.96	-0.67%	± 5	
	835MHz	22.0	εr	55.2	54.68	-0.95%	± 5	
			σ	0.97	0.98	1.11%	± 5	
	850MHz	22.0	εr	55.2	54.67	-0.95%	± 5	
			σ	0.97	1.00	3.18%	± 5	
1900MHz Body	1850MHz	22.0	εr	53.3	51.20	-3.94%	± 5	11/23/2010
			σ	1.52	1.46	-3.99%	± 5	
	1900MHz	22.0	εr	53.3	51.12	-4.08%	± 5	
			σ	1.52	1.51	-0.64%	± 5	
	1930MHz	22.0	εr	53.3	51.01	-4.30%	± 5	
			σ	1.52	1.53	0.61%	± 5	
1900MHz Body	1850MHz	22.0	εr	53.3	51.20	-3.94%	± 5	11/24/2010
			σ	1.52	1.46	-3.99%	± 5	
	1900MHz	22.0	εr	53.3	51.12	-4.08%	± 5	
			σ	1.52	1.51	-0.64%	± 5	
	1930MHz	22.0	εr	53.3	51.01	-4.30%	± 5	
			σ	1.52	1.53	0.61%	± 5	

Table 2. Measured Tissue dielectric parameters for head and body phantoms

6.3.2 Liquid Depth

The liquid level was during measurement 15cm ±0.5cm.

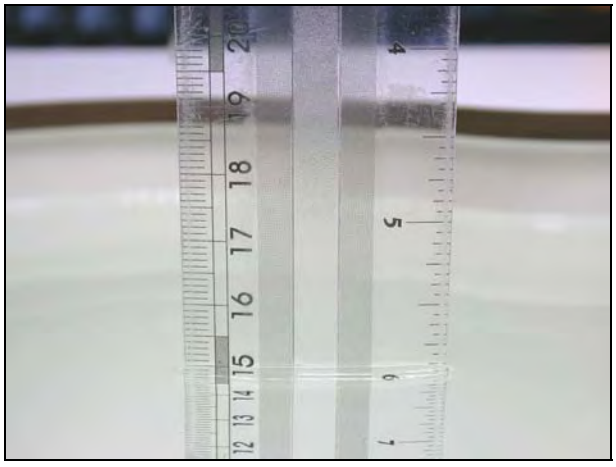


Figure 2. Head-Tissue-Simulating-Liquid

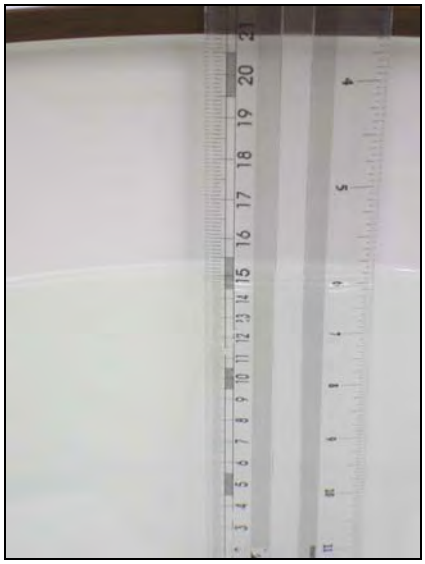


Figure 3. Body-Tissue-Simulating-Liquid

7. Measurement Process

7.1 Device and Test Conditions

The Test Device was provided by **SCT Wireless Inc** for this evaluation. The spatial peak SAR values were assessed for the lowest, middle and highest channels defined by **Cellular Band** (#1013=824.70MHz, #384=836.52MHz, #777=848.31MHz) and **PCS Band** (#25=1851.25MHz, #600=1880.00MHz, #1175=1908.75MHz) systems.

7.2 RF Conducted Output Power

Band	RC/TAP (REV)	CH	Frequency (MHz)	EUT Normal Test		EUT with USB cable	
				Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
CDMA 2000 Cellular Band	RC1/SO2	Lowest	824.70	20.70	21.00	20.61	20.97
		Middle	836.52	20.61	20.89	20.54	20.84
		Highest	848.31	20.62	20.94	20.57	20.89
	RC1/SO55	Lowest	824.70	**20.77**	21.03	20.75	21.00
		Middle	836.52	20.48	20.74	20.45	20.73
		Highest	848.31	20.64	20.94	20.63	20.86
	RC2/SO9	Lowest	824.70	20.75	21.06	20.68	21.05
		Middle	836.52	20.60	20.85	20.59	20.83
		Highest	848.31	20.59	20.81	20.55	20.77
	RC3/SO2	Lowest	824.70	20.71	20.88	20.68	20.83
		Middle	836.52	20.55	20.72	20.51	20.65
		Highest	848.31	20.55	20.72	20.47	20.71
	RC3/SO55	Lowest	824.70	20.70	20.97	20.64	20.91
		Middle	836.52	20.58	20.75	20.52	20.68
		Highest	848.31	20.54	20.76	20.44	20.69
CDMA 2000 PCS Band	RC1/SO2	Lowest	1851.25	15.75	16.25	15.74	16.17
		Middle	1880.00	**16.57**	16.90	16.55	16.88
		Highest	1908.75	15.44	15.84	15.43	15.82
	RC1/SO55	Lowest	1851.25	15.80	16.33	15.72	16.29
		Middle	1880.00	16.56	16.99	16.53	16.97
		Highest	1908.75	15.37	15.62	15.27	15.59
	RC2/SO9	Lowest	1851.25	15.60	16.14	15.54	16.07
		Middle	1880.00	16.56	16.87	16.53	16.83
		Highest	1908.75	15.48	15.82	15.42	15.73
	RC3/SO2	Lowest	1851.25	15.80	16.21	15.79	16.17
		Middle	1880.00	16.56	17.02	16.48	16.94
		Highest	1908.75	15.45	15.65	15.44	15.55
	RC3/SO55	Lowest	1851.25	15.57	15.94	15.48	15.86
		Middle	1880.00	16.53	17.09	16.45	17.02
		Highest	1908.75	15.37	15.63	15.36	15.55

Band	RC/TAP (REV)	CH	Frequency (MHz)	EUT Normal Test		EUT with USB cable	
				Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
1xRTT revision A Cellular Band	RC3/SO32	Lowest	824.70	**20.75**	21.04	20.72	21.02
		Middle	836.52	20.53	20.76	20.45	20.72
		Highest	848.31	20.66	20.92	20.58	20.85
1xRTT revision A PCS Band	RC3/SO32	Lowest	1851.25	15.85	16.53	15.76	16.53
		Middle	1880.00	**16.55**	16.76	16.47	16.71
		Highest	1908.75	15.38	15.55	15.32	15.53

Band	RTAP (kbps)	CH	Frequency (MHz)	EUT Normal Test		EUT with USB cable	
				Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
EVDO release 0 Cellular Band	9.6	Lowest	824.70	**20.47**	26.86	20.46	26.85
		Middle	836.52	20.37	26.86	20.37	26.84
		Highest	848.31	20.18	26.65	20.18	26.64
	19.2	Lowest	824.70	20.36	26.65	20.36	26.64
		Middle	836.52	20.28	26.68	20.27	26.67
		Highest	848.31	20.20	26.68	20.18	26.68
	38.4	Lowest	824.70	20.34	26.65	20.33	26.64
		Middle	836.52	20.24	26.55	20.23	26.55
		Highest	848.31	20.18	26.36	20.16	26.35
	76.8	Lowest	824.70	20.43	26.45	20.41	26.44
		Middle	836.52	20.23	26.30	20.22	26.29
		Highest	848.31	20.24	26.42	20.24	26.40
	153.6	Lowest	824.70	20.40	26.47	20.39	26.45
		Middle	836.52	20.35	26.09	20.34	26.08
		Highest	848.31	20.38	26.03	20.38	26.03
EVDO release 0 PCS Band	9.6	Lowest	1851.25	15.41	22.43	15.40	22.41
		Middle	1880.00	16.01	22.69	16.00	22.68
		Highest	1908.75	14.88	21.64	14.88	21.64
	19.2	Lowest	1851.25	15.28	21.89	15.28	21.88
		Middle	1880.00	16.02	22.48	16.01	22.46
		Highest	1908.75	14.80	21.64	14.79	21.63
	38.4	Lowest	1851.25	15.14	21.93	15.14	21.92
		Middle	1880.00	**16.08**	22.31	16.07	22.29
		Highest	1908.75	14.96	21.20	14.94	21.19
	76.8	Lowest	1851.25	15.21	21.28	15.19	21.27
		Middle	1880.00	15.95	21.86	15.95	21.84
		Highest	1908.75	14.84	21.21	14.84	21.20
	153.6	Lowest	1851.25	15.26	21.28	15.25	21.27
		Middle	1880.00	16.05	21.57	16.04	21.56
		Highest	1908.75	14.90	20.70	14.89	20.69

Band	RTAP (kbps)	CH	Frequency (MHz)	EUT Normal Test		EUT with USB cable	
				Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
EVDO release A Cellular Band	128	Lowest	824.70	19.66	27.09	19.65	27.08
		Middle	836.52	19.86	27.06	19.85	27.05
		Highest	848.31	19.36	27.33	19.35	27.33
	256	Lowest	824.70	20.36	27.15	20.35	27.13
		Middle	836.52	19.99	26.83	19.99	26.81
		Highest	848.31	20.04	26.83	20.02	26.81
	512	Lowest	824.70	20.25	27.01	20.24	27.00
		Middle	836.52	20.40	26.98	20.38	26.97
		Highest	848.31	20.46	26.99	20.45	26.98
	768	Lowest	824.70	20.45	27.09	20.44	27.09
		Middle	836.52	20.45	26.91	20.43	26.90
		Highest	848.31	20.51	26.97	20.50	26.96
	1024	Lowest	824.70	20.37	26.77	20.37	26.77
		Middle	836.52	20.31	26.76	20.29	26.74
		Highest	848.31	20.38	26.93	20.37	26.91
	1536	Lowest	824.70	20.50	27.48	20.49	27.47
		Middle	836.52	20.35	27.26	20.35	27.25
		Highest	848.31	20.32	27.22	20.31	27.22
	2048	Lowest	824.70	20.49	27.27	20.48	27.26
		Middle	836.52	20.41	27.27	20.41	27.26
		Highest	848.31	20.37	27.19	20.36	27.18
	3072	Lowest	824.70	20.47	28.39	20.45	28.38
		Middle	836.52	20.38	28.44	20.37	28.42
		Highest	848.31	20.12	27.97	20.11	27.96
	4096	Lowest	824.70	20.57	28.25	20.55	28.24
		Middle	836.52	20.49	28.29	20.48	28.29
		Highest	848.31	20.39	28.12	20.38	28.10
	6144	Lowest	824.70	**20.59**	28.72	20.58	28.71
		Middle	836.52	20.43	28.75	20.42	28.75
		Highest	848.31	20.43	28.40	20.41	28.38
	8192	Lowest	824.70	20.49	28.31	20.48	28.30
		Middle	836.52	20.53	28.32	20.51	28.30
		Highest	848.31	20.42	28.42	20.41	28.41
	12288	Lowest	824.70	20.44	28.57	20.43	28.56
		Middle	836.52	20.44	28.37	20.44	28.37
		Highest	848.31	20.37	28.39	20.37	28.38

Band	RTAP (kbps)	CH	Frequency (MHz)	EUT Normal Test		EUT with USB cable	
				Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
EVDO release A PCS Band	128	Lowest	1851.25	14.45	22.52	14.43	22.51
		Middle	1880.00	15.72	23.03	15.70	23.03
		Highest	1908.75	14.41	21.69	14.40	21.67
	256	Lowest	1851.25	15.21	22.11	15.19	22.11
		Middle	1880.00	16.15	22.93	16.14	22.92
		Highest	1908.75	14.46	21.61	14.45	21.61
	512	Lowest	1851.25	15.26	21.98	15.24	21.97
		Middle	1880.00	**16.16**	22.76	16.16	22.75
		Highest	1908.75	14.87	21.66	14.85	21.66
	768	Lowest	1851.25	15.13	22.15	15.11	22.15
		Middle	1880.00	16.14	22.42	16.13	22.41
		Highest	1908.75	14.90	21.70	14.88	21.69
	1024	Lowest	1851.25	15.17	21.91	15.17	21.91
		Middle	1880.00	15.94	22.56	15.93	22.55
		Highest	1908.75	14.62	21.45	14.62	21.44
	1536	Lowest	1851.25	15.25	22.41	15.24	22.39
		Middle	1880.00	16.02	22.42	16.01	22.42
		Highest	1908.75	14.82	21.73	14.80	21.73
	2048	Lowest	1851.25	15.26	21.60	15.24	21.59
		Middle	1880.00	15.97	22.66	15.96	22.66
		Highest	1908.75	15.02	21.96	15.01	21.95
	3072	Lowest	1851.25	15.16	23.08	15.16	23.07
		Middle	1880.00	15.99	23.28	15.98	23.28
		Highest	1908.75	14.87	22.61	14.86	22.60
	4096	Lowest	1851.25	15.24	23.25	15.23	23.23
		Middle	1880.00	16.02	23.57	16.01	23.56
		Highest	1908.75	15.01	22.52	15.00	22.51
	6144	Lowest	1851.25	15.39	23.36	15.38	23.35
		Middle	1880.00	16.13	23.79	16.11	23.78
		Highest	1908.75	14.83	23.00	14.81	22.99
	8192	Lowest	1851.25	15.39	23.57	15.37	23.57
		Middle	1880.00	16.07	23.90	16.06	23.88
		Highest	1908.75	14.88	22.80	14.87	22.80
	12288	Lowest	1851.25	15.41	23.38	15.39	23.37
		Middle	1880.00	16.11	**23.92**	16.10	23.91
		Highest	1908.75	14.87	23.04	14.85	23.04

7.3 Test Mode Description

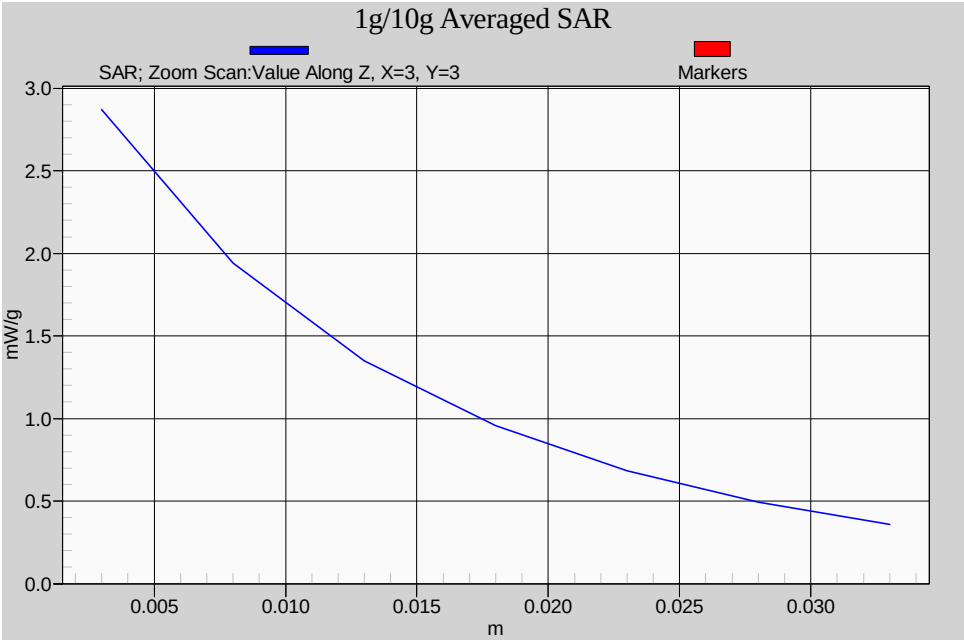
Body						
Band	CH	Phantom Position				Note
		Horizontal Up	Horizontal Down	Vertical Front	Vertical Back	
CDMA 2000 Cellular Band (RC/TAP RC1/SO55)	Low	■	■	■	■	
	Middle					
	High					
CDMA 2000 PCS Band (RC/TAP RC1/SO2)	Low					
	Middle	■	■	■	■	
	High					
1xRTT revision A Cellular Band (RC/TAP RC3/SO32)	Low					
	Middle					
	High					
1xRTT revision A PCS Band (RC/TAP RC3/SO32)	Low					
	Middle					
	High					
EVDO release 0 Cellular Band (RTAP 9.6 kbps)	Low					
	Middle					
	High					
EVDO release 0 PCS Band (RTAP 38.4 kbps)	Low					
	Middle					
	High					
EVDO release A Cellular Band (RTAP 6614 kbps)	Low	■	■	■	■	RTAP 6614 kbps
	Middle					
	High					
EVDO release A PCS Band (RTAP 512 kbps)	Low					
	Middle	■	■	■	■	RTAP 512 kbps
	High					

7.4 System Performance Check

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ± 7%. The validation was performed at 835MHz and 1900MHz.

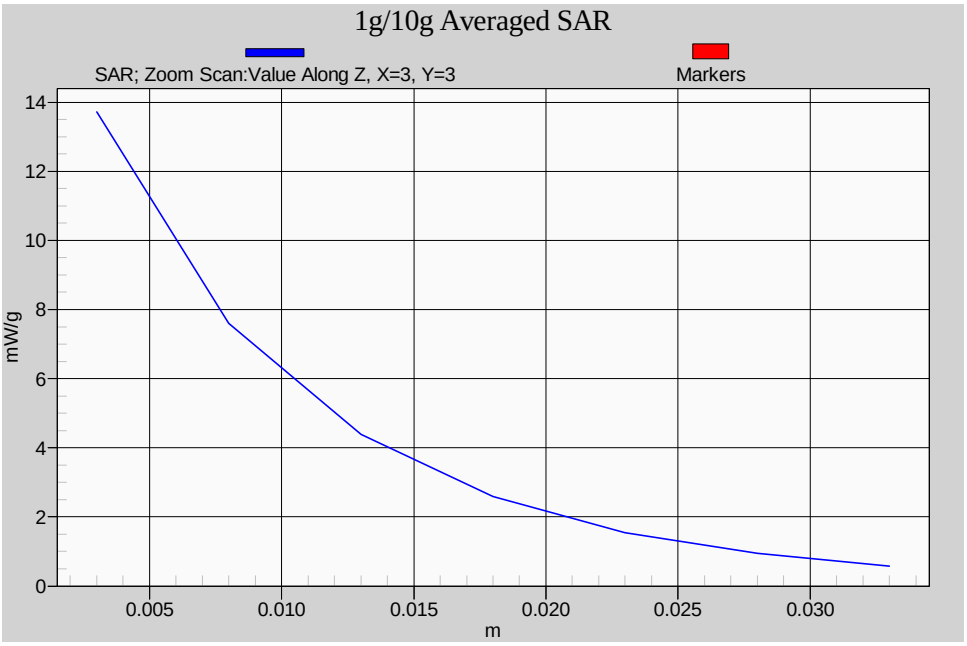
Validation kit		Mixture Type	SAR_{1g} [mW/g]		SAR_{10g} [mW/g]		Date of Calibration
D835V2-SN4d082		Body	10.32		6.76		07/20/2011
D1900V2-SN5d111		Body	42.4		22.64		07/16/2011
Frequency (MHz)	Power (dBm)	SAR_{1g} (mW/g)	SAR_{10g} (mW/g)	Drift (dB)	Difference Percentage		Date of Test
					1g	10g	
835 (Body)	250mW	2.46	1.62	0.0170	-4.7 %	-4.1 %	11/22/2010
	Normalize to 1 Watt	9.84	6.48				
1900 (Body)	250mW	10.7	5.53	-0.0200	0.9 %	-2.3 %	11/23/2010
	Normalize to 1 Watt	42.8	22.12				
1900 (Body)	250mW	10.6	5.51	-0.122	0.0 %	-2.7 %	11/24/2010
	Normalize to 1 Watt	42.4	22.04				

Z-axis Plot of System Performance Check

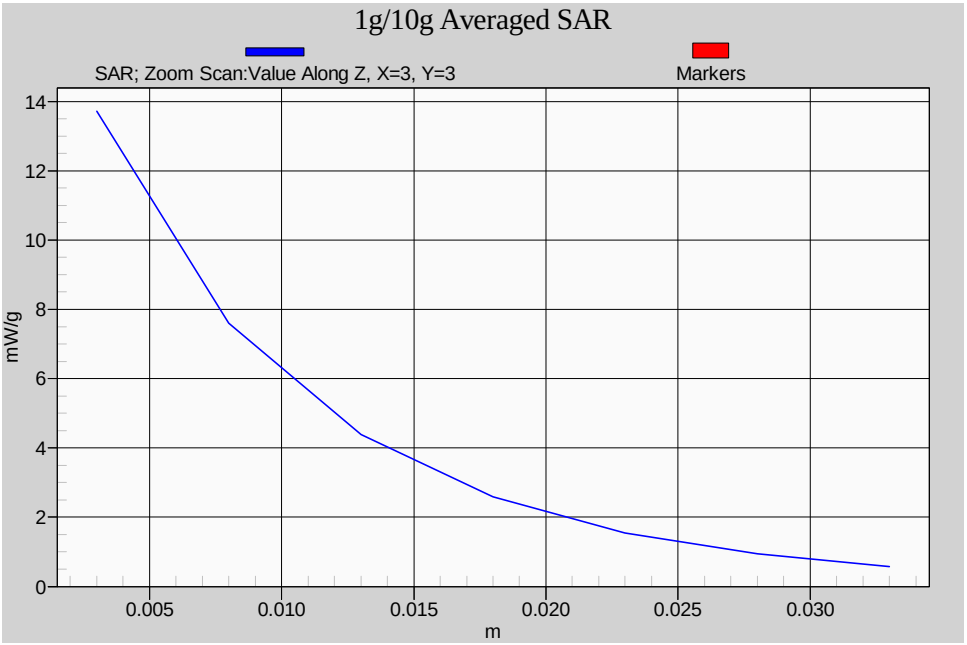


Body-Tissue-Simulating-Liquid 835MHz

Z-axis Plot of System Performance Check



Body-Tissue-Simulating-Liquid 1900MHz _ 11/23/2010



Body-Tissue-Simulating-Liquid 1900MHz _ 11/24/2010

7.5 Measurement Procedures

The evaluation was performed with the following procedures：

Surface Check： A surface checks job gathers data used with optical surface detection. It determines the distance from the phantom surface where the reflection from the optical detector has its peak. Any following measurement jobs using optical surface detection will then rely on this value. The surface check performs its search a specified number of times, so that the repeatability can be verified. The probe tip distance is 1.3mm to phantom inner surface during scans.

Reference： The reference job measures the field at a specified reference position, at 4 mm from the selected section's grid reference point.

Area Scan： The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot. The sophisticated interpolation routines can find the maximum locations even in relatively coarse grids. When an area scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. Any following zoom scan within the same procedure will then perform fine scans around these maxima. The area covered the entire dimension of the EUT and the horizontal grid spacing was 15 mm × 15 mm.

Zoom Scan： Zoom scans are used to assess the highest averaged SAR for cubic averaging volumes with 1 g and 10 g of simulated tissue. The zoom scan measures 7 x 7 x 9 points in a 30 x 30 x 24 mm cube whose base faces are centered around the maxima returned from a preceding area scan within the same procedure.

Drift： The drift job measures the field at the same location as the most recent reference job within the same procedure, with the same settings. The drift measurement gives the field difference in dB from the last reference measurement. Several drift measurements are possible for each reference measurement. This allows monitoring of the power drift of the device in the batch process. If the value changed by more than 5%, the evaluation was repeated.

7.6 Spatial Peak SAR Evaluation

The DASY5 software includes all numerical procedures necessary to evaluate the spatial peak SAR values. Based on the Draft: SCC-34, SC-2, WG-2 - Computational Dosimetry, IEEE P1529/D0.0 (Draft Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) Associated with the Use of Wireless Handsets - Computational Techniques), a new algorithm has been implemented. The spatial-peak SAR can be computed over any required mass.

The base for the evaluation is a ”cube” measurement in a volume of (32x32x30)mm^3 (5x5x7 points). The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan. If the 10g cube or both cubes are not entirely inside the measured volumes, the system issues a warning regarding the evaluated spatial peak values within the Postprocessing engine (SEMCAD). This means that if the measured volume is shifted, higher values might be possible. To get the correct values you can use a finer measurement grid for the area scan. In complicated field distributions, a large grid spacing for the area scan might miss some details and give an incorrectly interpolated peak location.
The entire evaluation of the spatial peak values is performed within the Postprocessing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into three stages:

Interpolation and Extrapolation

The probe is calibrated at the center of the dipole sensors which is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated.

In DASY5, the choice of the coordinate system defining the location of the measurement points has no influence on the uncertainty of the interpolation, Maxima Search and SAR extrapolation routines. The interpolation, Maxima Search and extrapolation routines are all based on the modified Quadratic Shepard’s method [7].

8. Measurement Uncertainty

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, we estimate the measurement uncertainties in SAR to be less than ±21.4 %〔8〕.

According to Std. C95.3〔9〕, the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy's of ±1 to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least ±2dB can be expected.

According to CENELEC〔10〕, typical worst-case uncertainty of field measurements is ±5 dB. For well-defined modulation characteristics the uncertainty can be reduced to ±3 dB.

Error Description	Uncertainty value	Prob. Dist.	Div.	(*ci*) 1g	(*ci*) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(*vi*) *veff*
Measurement System								
Probe Calibration	± 5.5 %	N	1	1	1	± 5.5 %	± 5.5 %	
Axial Isotropy	± 4.7 %	R		0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical Isotropy	± 9.6 %	R	$\sqrt{3}$	0.7	0.7	± 3.9 %	± 3.9 %	∞
Boundary Effects	± 1.0 %	R	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∞
Linearity	± 4.7 %	R	$\sqrt{3}$	1	1	± 2.7 %	± 2.7 %	∞
System Detection Limits	± 1.0 %	R	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∞
Readout Electronics	± 0.3 %	N	1	1	1	± 0.3 %	± 0.3 %	∞
Response Time	± 0.8 %	R	$\sqrt{3}$	1	1	± 0.5 %	± 0.5 %	∞
Integration Time	± 2.6 %	R	$\sqrt{3}$	1	1	± 1.5 %	± 1.5 %	∞
RF Ambient Noise	± 3.0 %	R	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
RF Ambient Reflections	± 3.0 %	R	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
Probe Positioner	± 0.4 %	R	$\sqrt{3}$	1	1	± 0.2 %	± 0.2 %	∞
Probe Positioning	± 2.9 %	R	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
Max. SAR Eval.	± 1.0 %	R	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∞
Test Sample Related								
Device Positioning	± 2.9 %	N	1	1	1	± 2.9 %	± 2.9 %	145
Device Holder	± 3.6 %	N	1	1	1	± 3.6 %	± 3.6 %	5
Power Drift	± 5.0 %	R	$\sqrt{3}$	1	1	± 2.9 %	± 2.9 %	∞
Phantom and Setup								
Phantom Uncertainty	± 4.0 %	R	$\sqrt{3}$	1	1	± 2.3 %	2.3 %	∞
Liquid Conductivity (target)	± 5.0 %	R	$\sqrt{3}$	0.64	0.43	± 1.8 %	1.2 %	∞
Liquid Conductivity (meas.)	± 2.5 %	N	1	0.64	0.43	± 1.6 %	1.1 %	∞
Liquid Permittivity (target)	± 5.0 %	R	$\sqrt{3}$	0.6	0.49	± 1.7 %	1.4 %	∞
Liquid Permittivity (meas.)	± 2.5 %	N	1	0.6	0.49	± 1.5 %	1.2 %	∞
Combined Std. Uncertainty						± **10.7 %**	± **10.5 %**	387
Expanded STD Uncertainty						± **21.4 %**	± **21.0 %**	

Table 3. Uncertainty Budget of DASY

9. SAR Test Results Summary

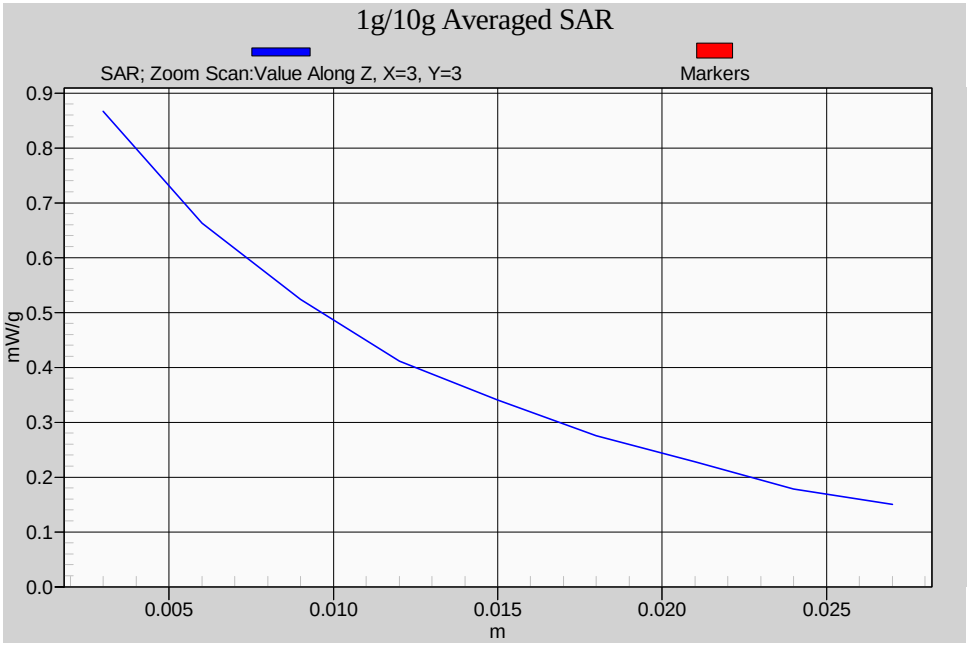
Detail results see Appendix B.

CDMA 2000 Cellular Band - Body SAR							
Ambient：							
Temperature (℃)：	22 ± 2			Relative HUMIDITY (%)：	40-70		
Liquid：							
Mixture Type：	MSL850			Liquid Temperature (℃) ：	22.0		
				Depth of liquid (cm)：	15		
Measurement：							
Duty Cycle：	1:1			Probe S/N：	3632		

Frequency		RC/TAP (REV)	Phantom Position	Accessory	SAR_{1g} [mW/g]	Power Drift (dB)	Remark
MHz	CH						
824.70	1013	RC1/SO55	Flat	N/A	0.365	-0.026	Horizontal Up, LCD Open 90° EUT to Phantom 5mm
824.70	1013	RC1/SO55	Flat	with USB Cable	0.543	0.025	Horizontal Down, LCD Open 90° EUT to Phantom 5mm
824.70	1013	RC1/SO55	Flat	N/A	0.284	0.072	Vertical Front, LCD Open 90° EUT to Phantom 5mm
824.70	1013	RC1/SO55	Flat	with USB Cable	**0.737**	0.073	Vertical Back, LCD Open 90° EUT to Phantom 5mm
824.70	1013	RC1/SO55	Flat	with USB Cable	0.462	-0.015	Vertical Back, LCD Open 90° EUT to Phantom 10mm
824.70	1013	RC1/SO55	Flat	with USB Cable	0.258	0.001	Vertical Back, LCD Open 90° EUT to Phantom 15mm
Std. C95.1-2005 - Safety Limit Spatial Peak Uncontrolled Exposure/General Population					1.6 W/kg (mW/g) Averaged over 1 gram		

Note: EUT to phantom position description see SAR test setup photo.

Z-axis Plot of Flat



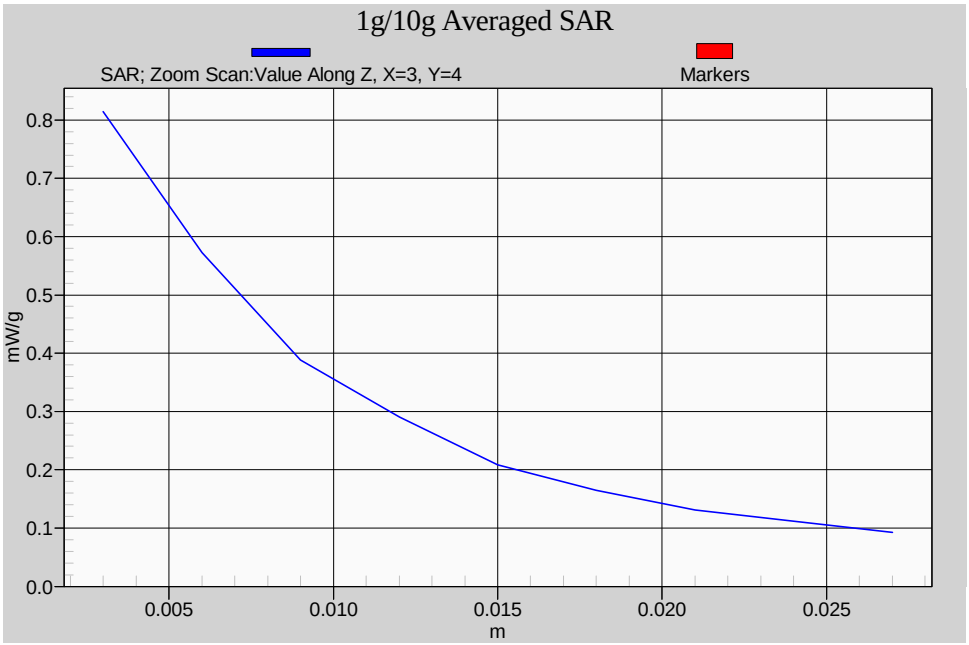
CH 1013 _ Vertical Back, LCD Open 90° EUT to Phantom 5mm

CDMA 2000 PCS Band - Body SAR			
Ambient：			
Temperature (℃)：	22 ± 2	Relative HUMIDITY (%)：	40-70
Liquid：			
Mixture Type：	MSL1900	Liquid Temperature (℃) ：	22.0
		Depth of liquid (cm)：	15
Measurement：			
Duty Cycle：	1:1	Probe S/N：	3632

Frequency		RC/TAP (REV)	Phantom Position	Accessory	SAR_{1g} [mW/g]	Power Drift (dB)	Remark
MHz	CH						
1880.00	600	RC1/SO2	Flat	N/A	0.496	0.146	Horizontal Up, LCD Open 90° EUT to Phantom 5mm
1880.00	600	RC1/SO2	Flat	with USB Cable	**0.637**	0.121	Horizontal Down, LCD Open 90° EUT to Phantom 5mm
1880.00	600	RC1/SO2	Flat	with USB Cable	0.351	0.043	Horizontal Down, LCD Open 90° EUT to Phantom 10mm
1880.00	600	RC1/SO2	Flat	with USB Cable	0.217	-0.021	Horizontal Down, LCD Open 90° EUT to Phantom 15mm
1880.00	600	RC1/SO2	Flat	N/A	0.403	-0.129	Vertical Front, LCD Open 90° EUT to Phantom 5mm
1880.00	600	RC1/SO2	Flat	with USB Cable	0.404	0.096	Vertical Back, LCD Open 90° EUT to Phantom 5mm
Std. C95.1-2005 - Safety Limit Spatial Peak Uncontrolled Exposure/General Population					1.6 W/kg (mW/g) Averaged over 1 gram		

Note: EUT to phantom position description see SAR test setup photo.

Z-axis Plot of Flat



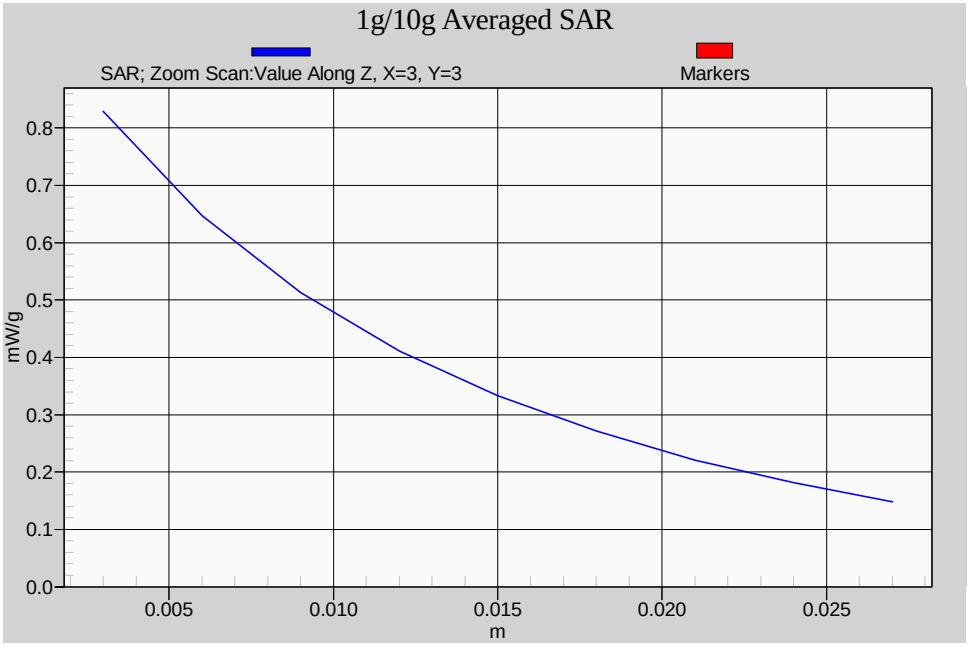
CH 600 _ Horizontal Down, LCD Open 90° EUT to Phantom 5mm

EVDO release A Cellular Band - Body SAR			
Ambient：			
Temperature (℃)：	22 ± 2	Relative HUMIDITY (%)：	40-70
Liquid：			
Mixture Type：	MSL850	Liquid Temperature (℃) ：	22.0
		Depth of liquid (cm)：	15
Measurement：			
Duty Cycle：	1:1	Probe S/N：	3632

Frequency		RTAP (kbps)	Phantom Position	Accessory	SAR_{1g} [mW/g]	Power Drift (dB)	Remark
MHz	CH						
824.70	1013	6614	Flat	N/A	0.407	0.059	Horizontal Up, LCD Open 90° EUT to Phantom 5mm
824.70	1013	6614	Flat	with USB Cable	0.641	0.117	Horizontal Down, LCD Open 90° EUT to Phantom 5mm
824.70	1013	6614	Flat	N/A	0.267	-0.042	Vertical Front, LCD Open 90° EUT to Phantom 5mm
824.70	1013	6614	Flat	with USB Cable	**0.706**	0.006	Vertical Back, LCD Open 90° EUT to Phantom 5mm
824.70	1013	6614	Flat	with USB Cable	0.418	-0.019	Vertical Back, LCD Open 90° EUT to Phantom 10mm
824.70	1013	6614	Flat	with USB Cable	0.295	0.015	Vertical Back, LCD Open 90° EUT to Phantom 15mm
Std. C95.1-2005 - Safety Limit Spatial Peak Uncontrolled Exposure/General Population					1.6 W/kg (mW/g) Averaged over 1 gram		

Note: EUT to phantom position description see SAR test setup photo.

Z-axis Plot of Flat



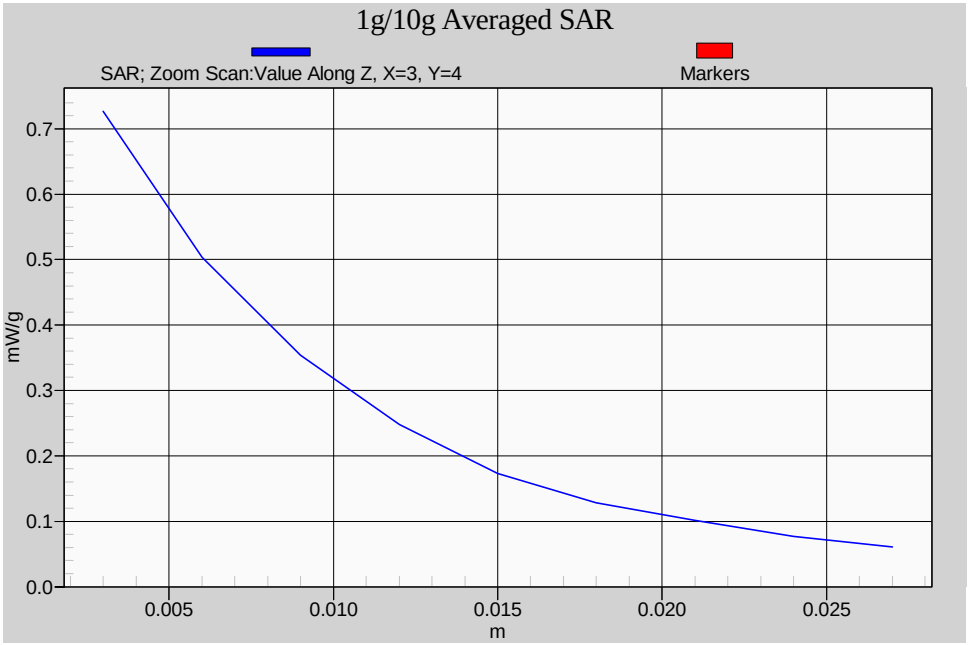
CH 1013 _ Vertical Back, LCD Open 90° EUT to Phantom 5mm

EVDO release A PCS Band - Body SAR			
Ambient：			
Temperature (℃)：	22 ± 2	Relative HUMIDITY (%)：	40-70
Liquid：			
Mixture Type：	MSL1900	Liquid Temperature (℃) ：	22.0
		Depth of liquid (cm)：	15
Measurement：			
Duty Cycle：	1:1	Probe S/N：	3632

Frequency		RTAP (kbps)	Phantom Position	Accessory	SAR_{1g} [mW/g]	Power Drift (dB)	Remark
MHz	CH						
1880.00	600	512	Flat	N/A	0.482	-0.017	Horizontal Up, LCD Open 90° EUT to Phantom 5mm
1880.00	600	512	Flat	with USB Cable	**0.568**	-0.061	Horizontal Down, LCD Open 90° EUT to Phantom 5mm
1880.00	600	512	Flat	with USB Cable	0.349	0.148	Horizontal Down, LCD Open 90° EUT to Phantom 10mm
1880.00	600	512	Flat	with USB Cable	0.229	0.111	Horizontal Down, LCD Open 90° EUT to Phantom 15mm
1880.00	600	512	Flat	N/A	0.360	-0.129	Vertical Front, LCD Open 90° EUT to Phantom 5mm
1880.00	600	512	Flat	with USB Cable	0.291	-0.050	Vertical Back, LCD Open 90° EUT to Phantom 5mm
Std. C95.1-2005 - Safety Limit Spatial Peak Uncontrolled Exposure/General Population					1.6 W/kg (mW/g) Averaged over 1 gram		

Note: EUT to phantom position description see SAR test setup photo.

Z-axis Plot of Flat



CH 600 _ Horizontal Down, LCD Open 90° EUT to Phantom 5mm

9.1 Std. C95.1-2005 RF Exposure Limit

Human Exposure	Population Uncontrolled	Occupational Controlled
	Exposure	Exposure
	(W/kg) or (mW/g)	(W/kg) or (mW/g)
Spatial Peak SAR*	1.60	8.00
(head)		
Spatial Peak SAR**	0.08	0.40
(Whole Body)		
Spatial Peak SAR***	1.60	8.00
(Partial-Body)		
Spatial Peak SAR******	4.00	20.00
(Hands / Feet / Ankle / Wrist)		

Table 4. Safety Limits for Partial Body Exposure

Notes：

***** The Spatial Peak value of the SAR averaged over any 1 gram of tissue.
(defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

****** The Spatial Average value of the SAR averaged over the whole – body.

******* The Spatial Average value of the SAR averaged over the partial – body.

******** The Spatial Peak value of the SAR averaged over any 10 grams of tissue.
(defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Population / Uncontrolled Environments： are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Occupational / Controlled Environments： are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

10. Conclusion

The SAR test values found for the portable mobile phone **SCT Wireless Inc Trade Name：SCT Wireless Model(s)：SCT-UM300** is below the maximum recommended level of 1.6 W/kg (mW/g).

11. References

[1] Std. C95.1-2005, "*American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300KHz to 100GHz",* New York.

[2] NCRP, National Council on Radiation Protection and Measurements, "*Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields"*, NCRP report NO. 86, 1986.

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[5] K. Pokovi ć, T. Schmid, and N. Kuster, "*E-field probe with improved isotropy in brain simulating liquids*", in Proceedings of the ELMAR, Zadar, Croatia, 23-25 June, 1996, pp.172-175.

[6] N. Kuster, and Q. Balzano, "*Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz"*, IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.

[7] Robert J. Renka, "*Multivariate Interpolation Of Large Sets Of Scattered Data*", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988 , pp. 139-148.

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[9] Std. C95.3-1991, "*IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave,* New York: IEEE, Aug. 1992.

[10] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), *Human Exposure to Electromagnetic Fields High-frequency*: 10KHz-300GHz, Jan. 1995.

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 9:47:11 AM

System Performance Check at 835MHz_20101122_Body

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

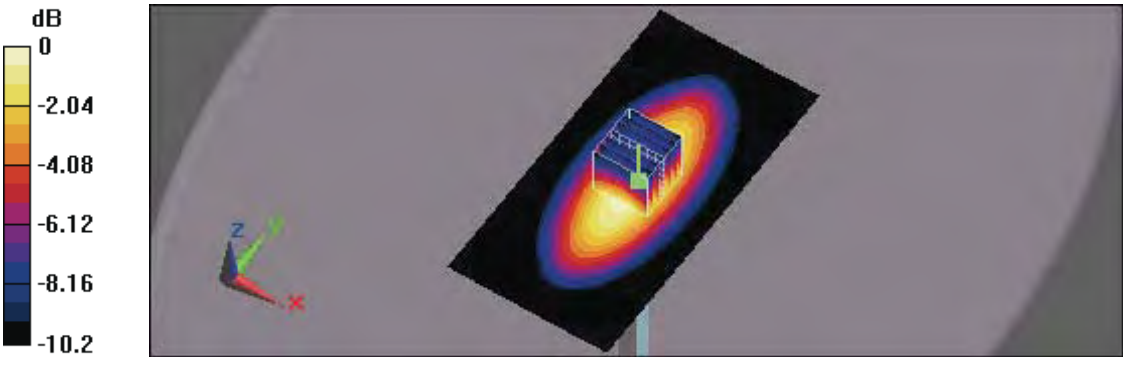
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.981 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 835MHz/Area Scan (61x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.85 mW/g

System Performance Check at 835MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 3.67 W/kg
SAR(1 g) = 2.46 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.87 mW/g



0 dB = 2.87mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/23/2010 1:09:48 PM

System Performance Check at 1900MHz_20101123_Body

DUT: Dipole D1900V2_SN5d111; Type: D1900V2; Serial: D1900V2 - SN:5d111

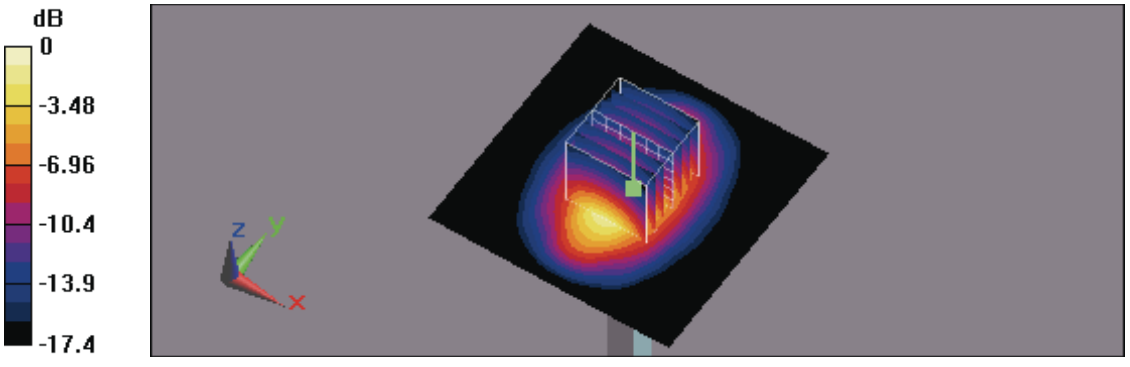
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.51 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 1900MHz/Area Scan (61x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.4 mW/g

System Performance Check at 1900MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.1 V/m; Power Drift = -0.020 dB
Peak SAR (extrapolated) = 20 W/kg
SAR(1 g) = 10.7 mW/g; SAR(10 g) = 5.53 mW/g
Maximum value of SAR (measured) = 13.7 mW/g



0 dB = 13.7mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/24/2010 1:19:52 AM

System Performance Check at 1900MHz_20101124_Body

DUT: Dipole D1900V2_SN5d111; Type: D1900V2; Serial: D1900V2 - SN:5d111

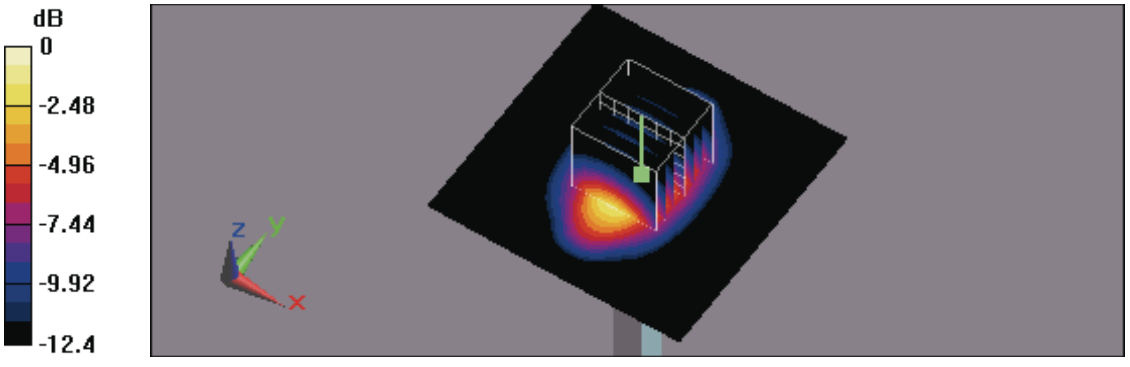
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.51 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

System Performance Check at 1900MHz/Area Scan (61x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.2 mW/g

System Performance Check at 1900MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.5 V/m; Power Drift = -0.122 dB
Peak SAR (extrapolated) = 20 W/kg
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.51 mW/g
Maximum value of SAR (measured) = 13.7 mW/g



0 dB = 13.7mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 11:13:43 AM

Flat_CDMA Cellular CH1013_Horizontal Up_5mm_LCD Open90 degree

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

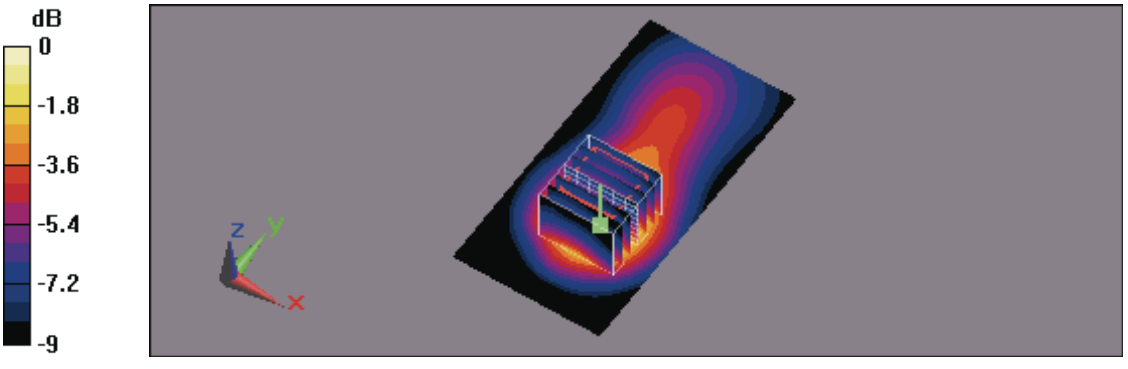
Communication System: CDMA Cellular ; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.470 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 17.1 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 0.580 W/kg
SAR(1 g) = 0.365 mW/g; SAR(10 g) = 0.225 mW/g
Maximum value of SAR (measured) = 0.431 mW/g



0 dB = 0.431mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 11:50:17 AM

Flat_CDMA Cellular CH1013_Horizontal Down_5mm_LCD Open90 degree

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

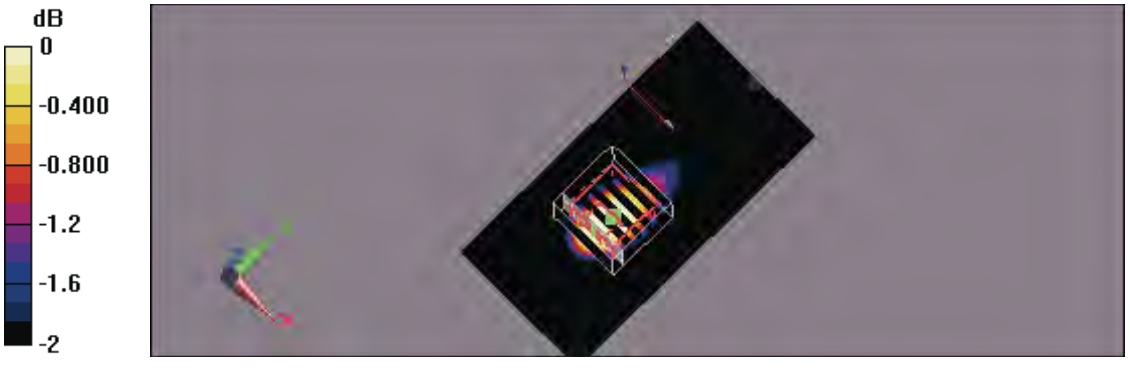
Communication System: CDMA Cellular ; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.704 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 24.5 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 0.874 W/kg
SAR(1 g) = 0.543 mW/g; SAR(10 g) = 0.344 mW/g
Maximum value of SAR (measured) = 0.647 mW/g



0 dB = 0.647mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 1:05:30 PM

Flat_CDMA Cellular CH1013_Vertical Front_5mm_LCD Open90 degree

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

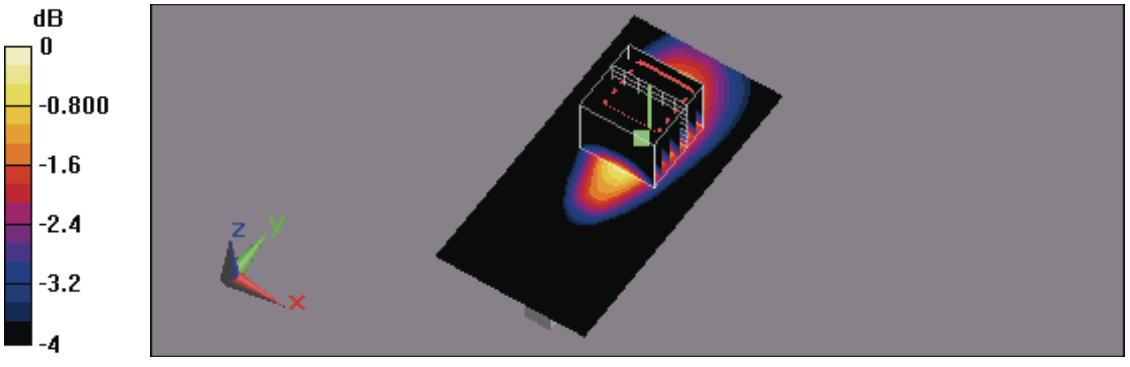
Communication System: CDMA Cellular ; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.355 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 16.9 V/m; Power Drift = 0.072 dB
Peak SAR (extrapolated) = 0.428 W/kg
SAR(1 g) = 0.284 mW/g; SAR(10 g) = 0.186 mW/g
Maximum value of SAR (measured) = 0.329 mW/g



0 dB = 0.329mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 1:41:16 PM

Flat_CDMA Cellular CH1013_Vertical Back_5mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

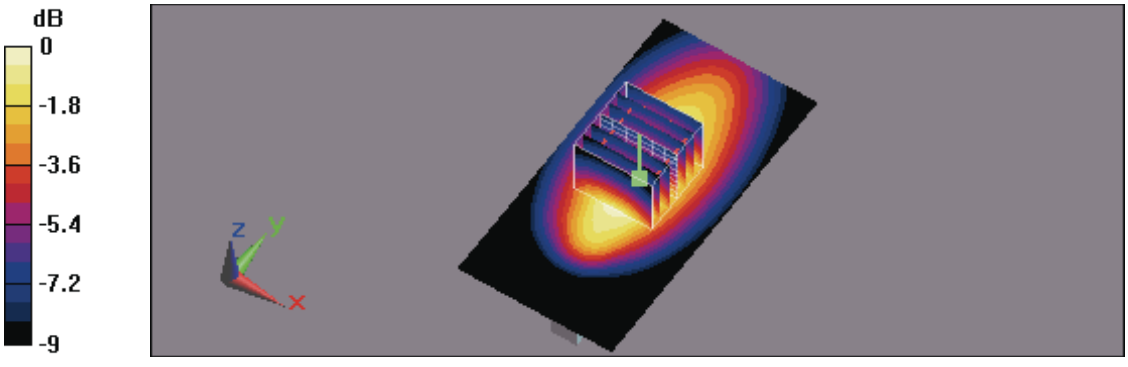
Communication System: CDMA Cellular ; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.926 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 31 V/m; Power Drift = 0.073 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.737 mW/g; SAR(10 g) = 0.475 mW/g
Maximum value of SAR (measured) = 0.867 mW/g



0 dB = 0.867mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 2:05:21 PM

Flat_CDMA Cellular CH1013_Vertical Back_10mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

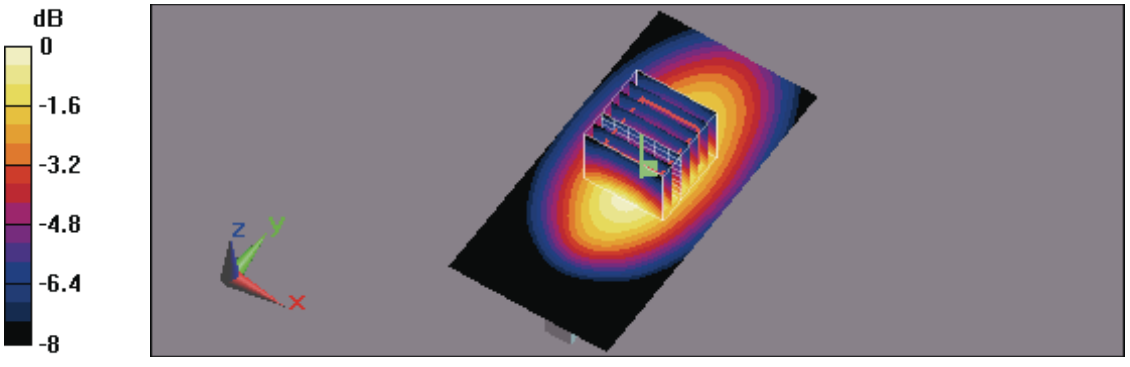
Communication System: CDMA Cellular ; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.532 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 23.3 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 0.688 W/kg
SAR(1 g) = 0.462 mW/g; SAR(10 g) = 0.315 mW/g
Maximum value of SAR (measured) = 0.532 mW/g



0 dB = 0.532mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 5:59:27 PM

Flat_CDMA Cellular CH1013_Vertical Back_15mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

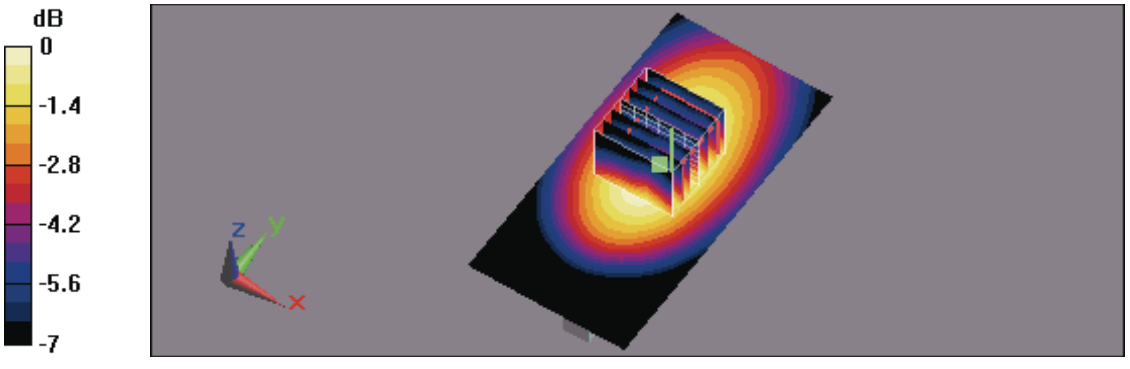
Communication System: CDMA Cellular ; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.330 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 18.1 V/m; Power Drift = 0.000533 dB
Peak SAR (extrapolated) = 0.365 W/kg
SAR(1 g) = 0.258 mW/g; SAR(10 g) = 0.180 mW/g
Maximum value of SAR (measured) = 0.311 mW/g



0 dB = 0.311mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/23/2010 1:52:54 PM

Flat_CDMA PCS CH600_Horizontal Up_5mm_LCD Open90 degree

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

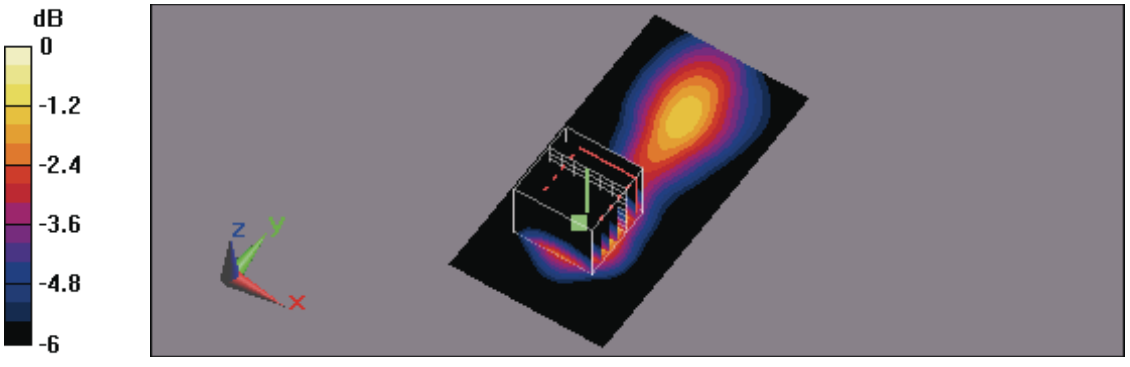
Communication System: CDMA PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.709 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 14.7 V/m; Power Drift = 0.146 dB
Peak SAR (extrapolated) = 0.945 W/kg
SAR(1 g) = 0.496 mW/g; SAR(10 g) = 0.291 mW/g
Maximum value of SAR (measured) = 0.616 mW/g



0 dB = 0.616mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/23/2010 2:24:30 PM

Flat_CDMA PCS CH600_Horizontal Down_5mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

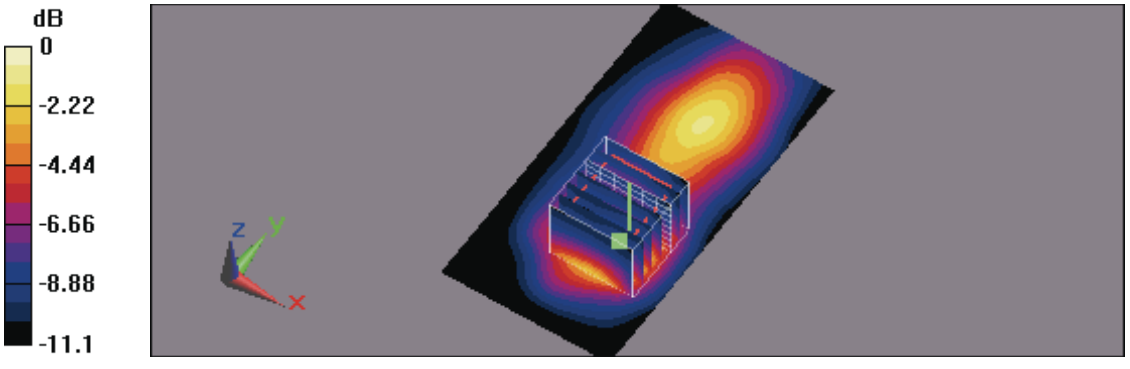
Communication System: CDMA PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.983 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 15.3 V/m; Power Drift = 0.121 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.637 mW/g; SAR(10 g) = 0.337 mW/g
Maximum value of SAR (measured) = 0.814 mW/g



0 dB = 0.814mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/23/2010 4:12:20 PM

Flat_CDMA PCS CH600_Horizontal Down_10mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

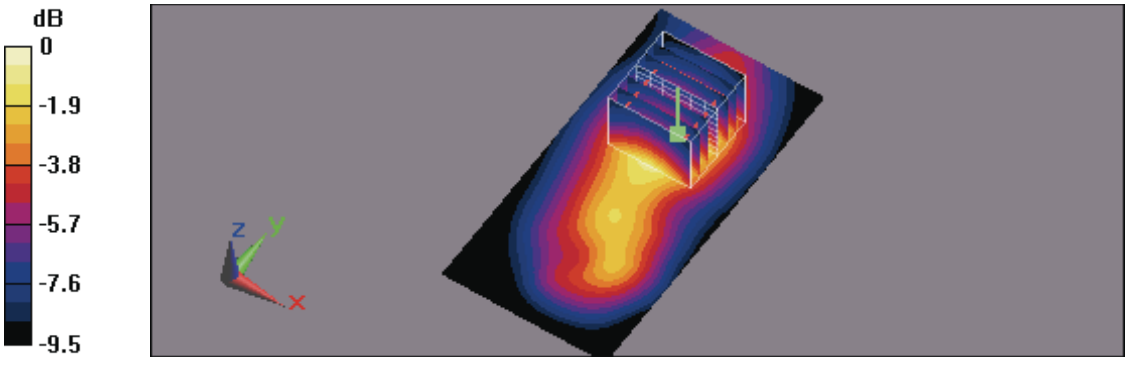
Communication System: CDMA PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.420 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 13.1 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 0.557 W/kg
SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.215 mW/g
Maximum value of SAR (measured) = 0.415 mW/g



0 dB = 0.415mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/23/2010 4:34:52 PM

Flat_CDMA PCS CH600_Horizontal Down_15mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

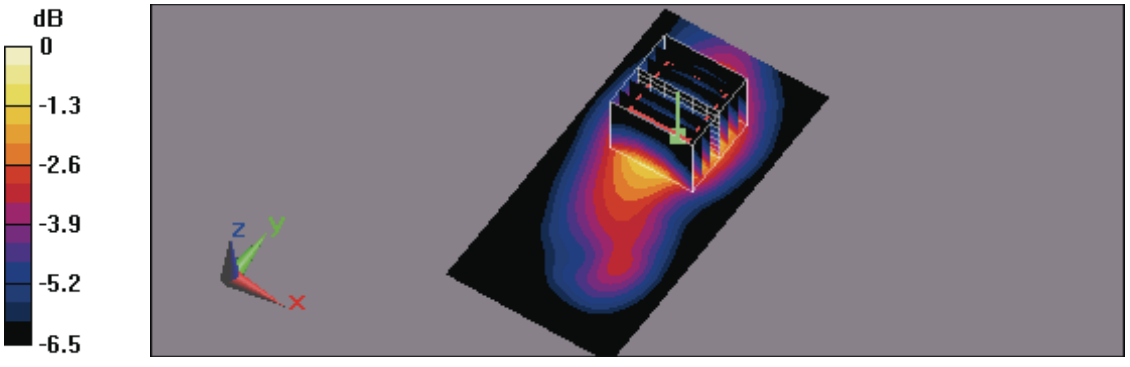
Communication System: CDMA PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.257 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.5 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 0.325 W/kg
SAR(1 g) = 0.217 mW/g; SAR(10 g) = 0.139 mW/g
Maximum value of SAR (measured) = 0.256 mW/g



0 dB = 0.256mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/23/2010 3:01:58 PM

Flat_CDMA PCS CH600_Vertical Front_5mm_LCD Open90 degree

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

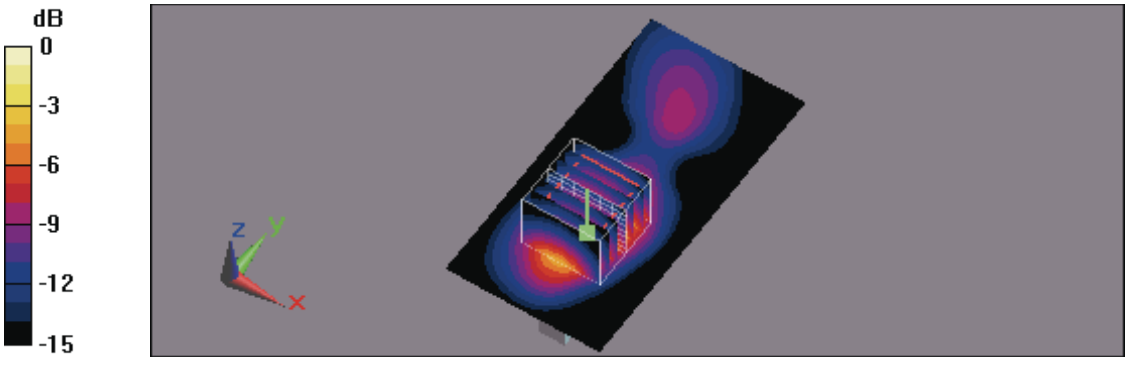
Communication System: CDMA PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.505 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 10.5 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 0.791 W/kg
SAR(1 g) = 0.403 mW/g; SAR(10 g) = 0.193 mW/g
Maximum value of SAR (measured) = 0.540 mW/g



0 dB = 0.540mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/23/2010 3:40:43 PM

Flat_CDMA PCS CH600_Vertical Back_5mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

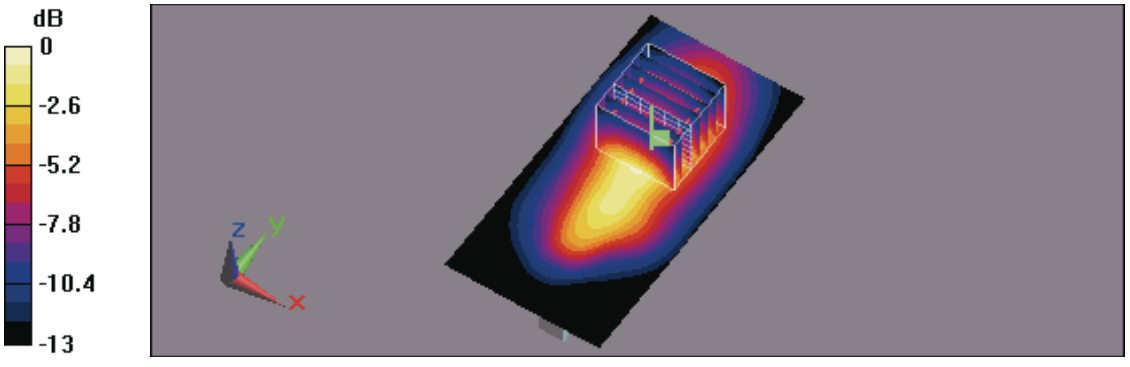
Communication System: CDMA PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.497 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 15.6 V/m; Power Drift = 0.096 dB
Peak SAR (extrapolated) = 0.682 W/kg
SAR(1 g) = 0.404 mW/g; SAR(10 g) = 0.226 mW/g
Maximum value of SAR (measured) = 0.502 mW/g



0 dB = 0.502mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 3:32:44 PM

Flat_1XEVDO Cellular CH1013_Horizontal Up_5mm_LCD Open90 degree

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

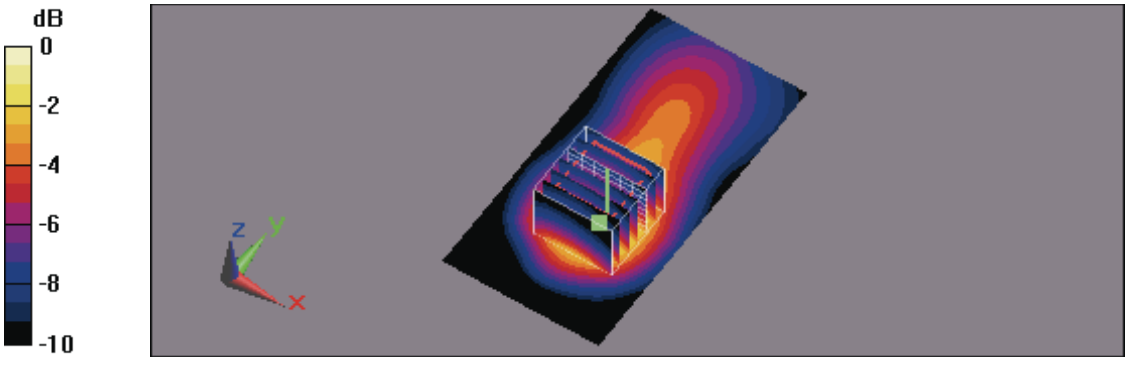
Communication System: 1xEVDO Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.517 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 17.8 V/m; Power Drift = 0.059 dB
Peak SAR (extrapolated) = 0.654 W/kg
SAR(1 g) = 0.407 mW/g; SAR(10 g) = 0.244 mW/g
Maximum value of SAR (measured) = 0.487 mW/g



0 dB = 0.487mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 4:09:30 PM

Flat_1XEVDO Cellular CH1013_Horizontal Down_5mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

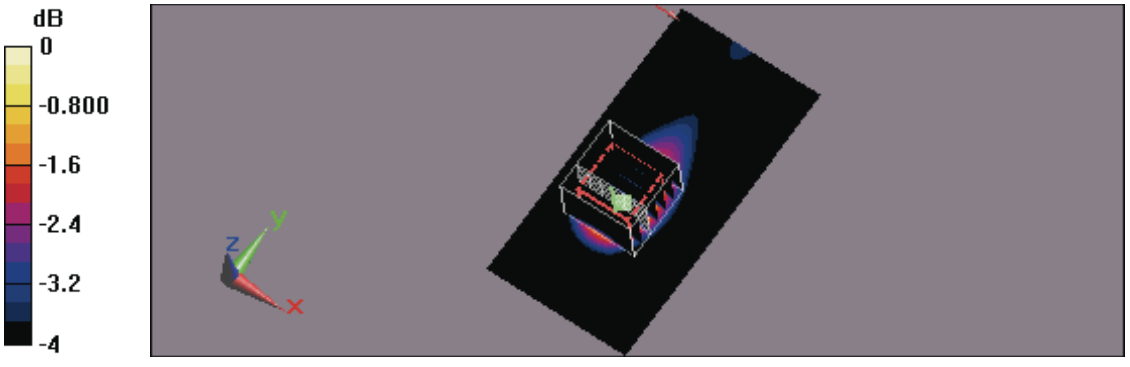
Communication System: 1xEVDO Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.795 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 24.9 V/m; Power Drift = 0.117 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.641 mW/g; SAR(10 g) = 0.387 mW/g
Maximum value of SAR (measured) = 0.772 mW/g



0 dB = 0.772mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 4:36:32 PM

Flat_1XEVDO Cellular CH1013_Vertical Front_5mm_LCD Open90 degree

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

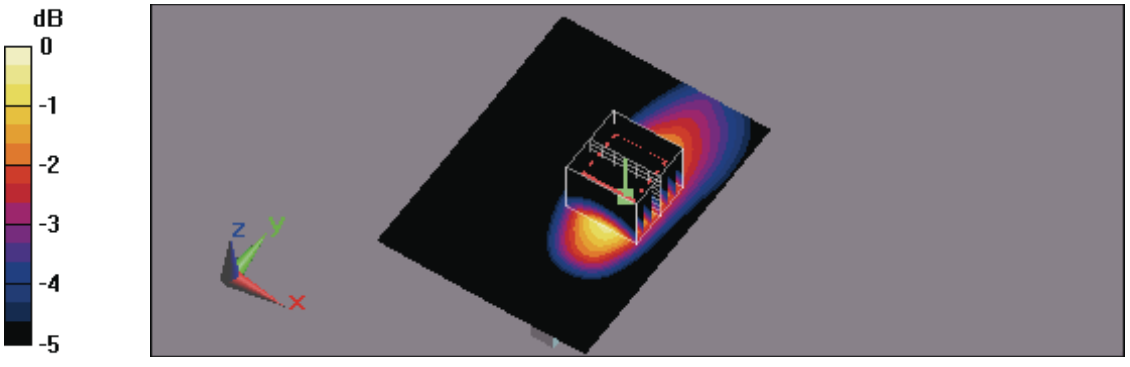
Communication System: 1xEVDO Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.307 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 17.9 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 0.414 W/kg
SAR(1 g) = 0.267 mW/g; SAR(10 g) = 0.171 mW/g
Maximum value of SAR (measured) = 0.314 mW/g



0 dB = 0.314mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 2:39:48 PM

Flat_1XEVDO Cellular CH1013_Vertical Back_5mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

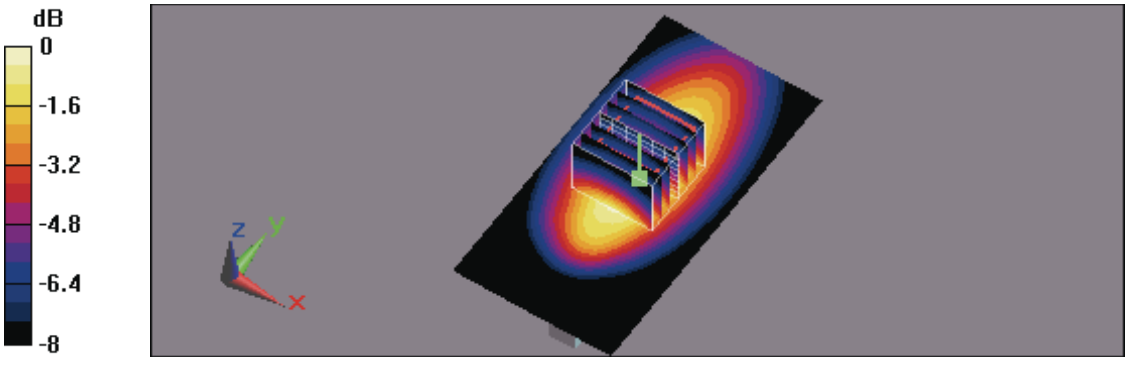
Communication System: 1xEVDO Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.830 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 29.4 V/m; Power Drift = 0.00623 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.706 mW/g; SAR(10 g) = 0.462 mW/g
Maximum value of SAR (measured) = 0.829 mW/g



0 dB = 0.829mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 5:07:30 PM

Flat_1XEVDO Cellular CH1013_Vertical Back_10mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

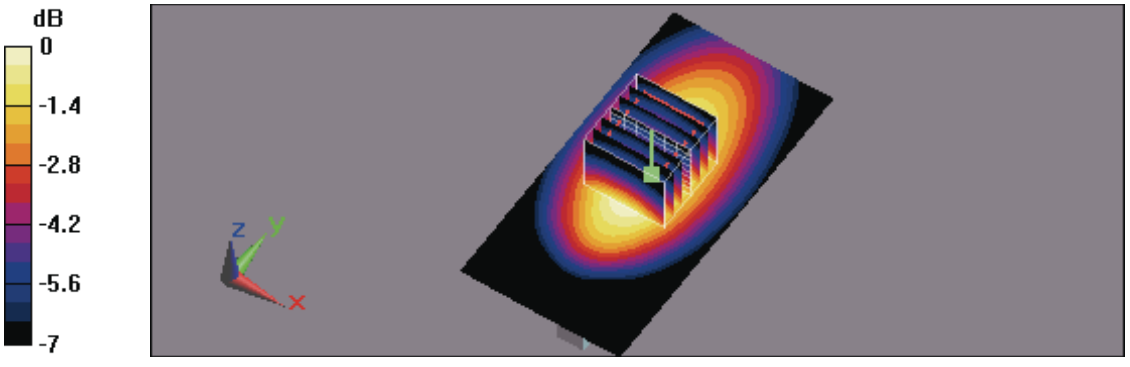
Communication System: 1xEVDO Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.511 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 23.6 V/m; Power Drift = -0.019 dB
Peak SAR (extrapolated) = 0.598 W/kg
SAR(1 g) = 0.418 mW/g; SAR(10 g) = 0.287 mW/g
Maximum value of SAR (measured) = 0.481 mW/g



0 dB = 0.481mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/22/2010 5:35:48 PM

Flat_1XEVDO Cellular CH1013_Vertical Back_15mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

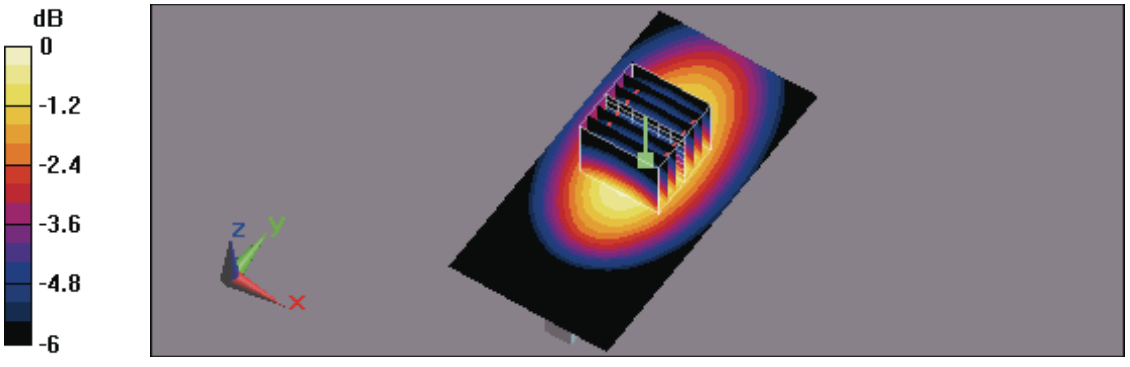
Communication System: 1xEVDO Cellular; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.969 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(9.17, 9.17, 9.17); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.339 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 18.5 V/m; Power Drift = 0.015 dB
Peak SAR (extrapolated) = 0.410 W/kg
SAR(1 g) = 0.295 mW/g; SAR(10 g) = 0.208 mW/g
Maximum value of SAR (measured) = 0.336 mW/g



0 dB = 0.336mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/24/2010 11:05:35 AM

Flat_1XEVDO PCS CH600_Horizontal Up_5mm_LCD Open90 degree

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

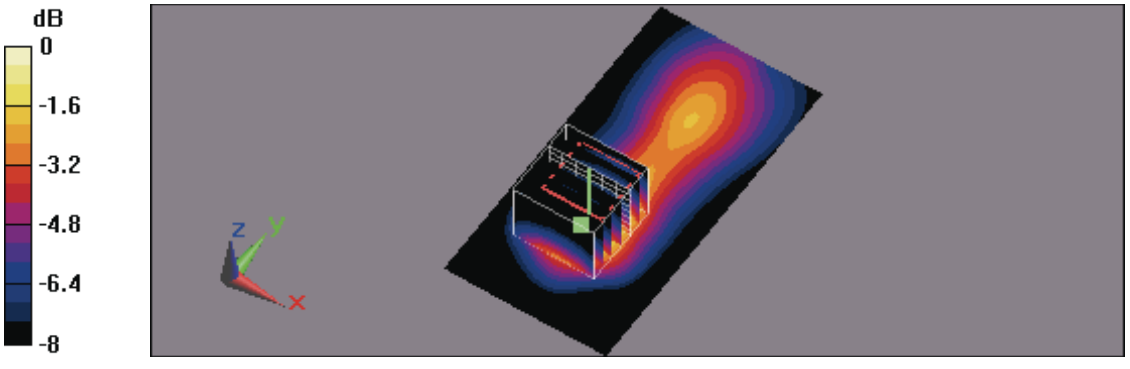
Communication System: 1xEVDO PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.678 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 15.4 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 0.867 W/kg
SAR(1 g) = 0.482 mW/g; SAR(10 g) = 0.274 mW/g
Maximum value of SAR (measured) = 0.594 mW/g



0 dB = 0.594mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/24/2010 11:39:16 AM

Flat_1XEVDO PCS CH600_Horizontal Down_5mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

Communication System: 1xEVDO PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

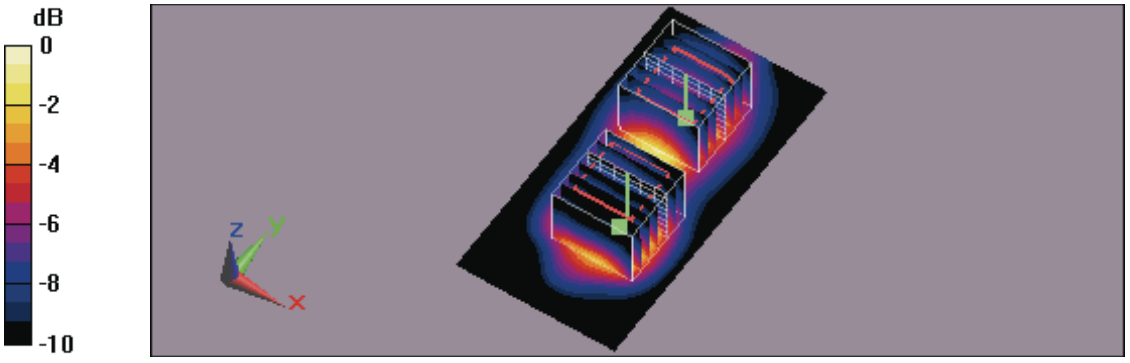
DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.817 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 16.2 V/m; Power Drift = -0.061 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.568 mW/g; SAR(10 g) = 0.303 mW/g
Maximum value of SAR (measured) = 0.727 mW/g

Flat/Zoom Scan (7x7x9)/Cube 1:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 16.2 V/m; Power Drift = -0.061 dB
Peak SAR (extrapolated) = 0.901 W/kg
SAR(1 g) = 0.556 mW/g; SAR(10 g) = 0.323 mW/g
Maximum value of SAR (measured) = 0.677 mW/g



0 dB = 0.677mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/24/2010 1:56:16 PM

Flat_1XEVDO PCS CH600_Horizontal Down_10mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

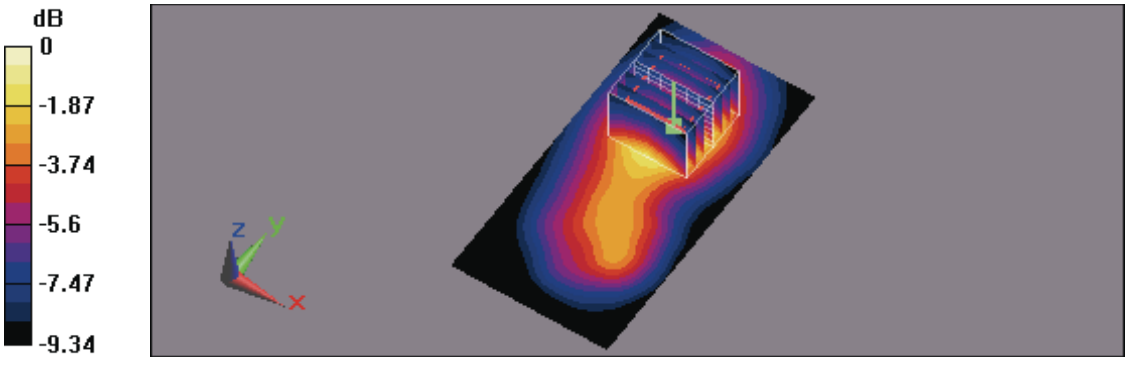
Communication System: 1xEVDO PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.430 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 12.3 V/m; Power Drift = 0.148 dB
Peak SAR (extrapolated) = 0.538 W/kg
SAR(1 g) = 0.349 mW/g; SAR(10 g) = 0.217 mW/g
Maximum value of SAR (measured) = 0.415 mW/g



0 dB = 0.415mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/24/2010 2:19:58 PM

Flat_1XEVDO PCS CH600_Horizontal Down_15mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

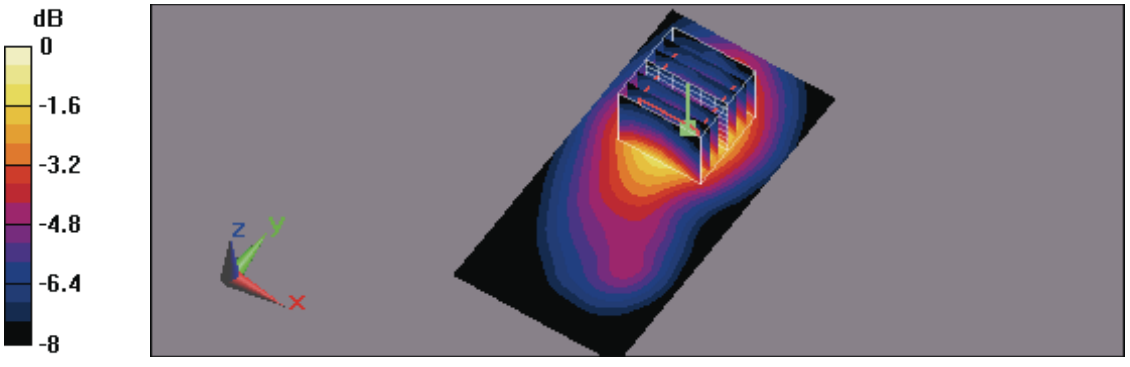
Communication System: 1xEVDO PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.271 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.74 V/m; Power Drift = 0.111 dB
Peak SAR (extrapolated) = 0.381 W/kg
SAR(1 g) = 0.229 mW/g; SAR(10 g) = 0.147 mW/g
Maximum value of SAR (measured) = 0.273 mW/g



0 dB = 0.273mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/24/2010 9:32:41 AM

Flat_1XEVDO PCS CH600_Vertical Front_5mm_LCD Open90 degree

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

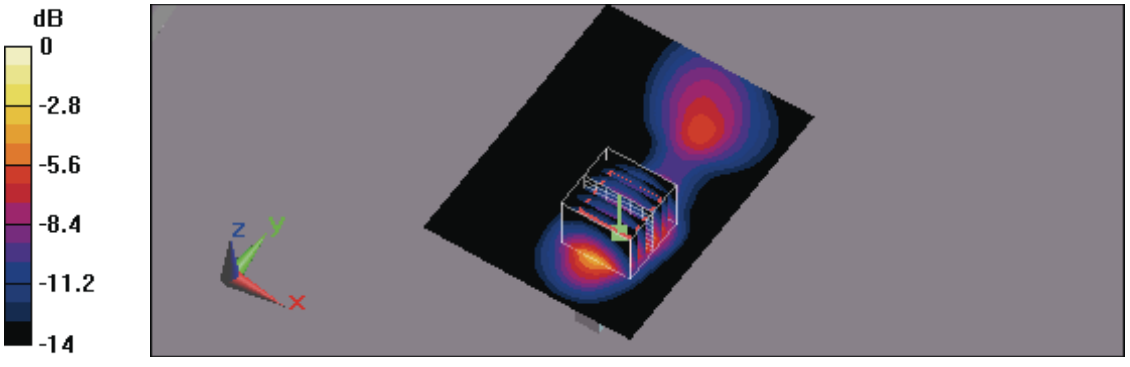
Communication System: 1xEVDO PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (61x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.494 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 8.06 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 0.749 W/kg
SAR(1 g) = 0.360 mW/g; SAR(10 g) = 0.163 mW/g
Maximum value of SAR (measured) = 0.488 mW/g



0 dB = 0.488mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 11/24/2010 10:10:11 AM

Flat_1XEVDO PCS CH600_Vertical Back_5mm_LCD Open90 degree_USB Cable

DUT: SCT-UM300; Type: USB Broadband Modem; FCC ID: XZZSCT-UM300

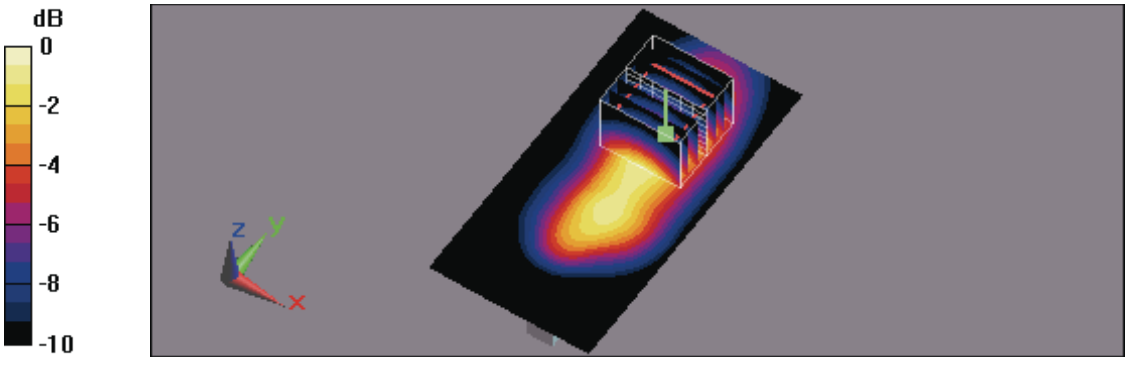
Communication System: 1xEVDO PCS ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.5 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: EX3DV4 - SN3632; ConvF(7.57, 7.57, 7.57); Calibrated: 1/26/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 1/21/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 125;SEMCAD X Version 13.4 Build 125

Flat/Area Scan (41x81x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.361 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 13.3 V/m; Power Drift = -0.050 dB
Peak SAR (extrapolated) = 0.484 W/kg
SAR(1 g) = 0.291 mW/g; SAR(10 g) = 0.165 mW/g
Maximum value of SAR (measured) = 0.359 mW/g



0 dB = 0.359mW/g

Appendix C - Calibration

All of the instruments Calibration information are listed below.

- Dipole _ D835V2 SN:4d082 Calibration No.D835V2-4d082 _Jul10
- Dipole _ D1900V2 SN:5d111 Calibration No.D1900V2-5d111_Jul10
- Probe _ EX3DV4 SN:3632 Calibration No.EX3-3632_Jan10
- DAE _ DAE4 SN:779 Calibration No.DAE4-779_ Jan10

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Accreditation No.: SCS 108

Client **ATL (Auden)** Certificate No: **D835V2-4d082_Jul10**

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d082
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	July 20, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 20, 2010

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Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.0 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature during test	(23.1 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.40 mW / g
SAR normalized	normalized to 1W	9.60 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.65 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.56 mW / g
SAR normalized	normalized to 1W	6.24 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.26 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.0 ± 6 %	1.01 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.58 mW / g
SAR normalized	normalized to 1W	10.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**10.0 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.69 mW / g
SAR normalized	normalized to 1W	6.76 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.60 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.7 Ω - 3.2 jΩ
Return Loss	- 29.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω - 4.6 jΩ
Return Loss	- 26.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.389ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 17, 2008

DASY5 Validation Report for Head TSL

Date/Time: 20.07.2010 15:48:57

Test Laboratory: SPEAG, Zurich, Switzerland

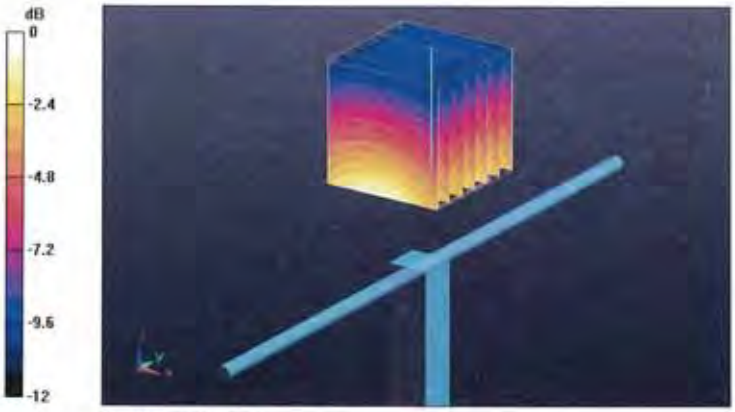
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL900
Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 42.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

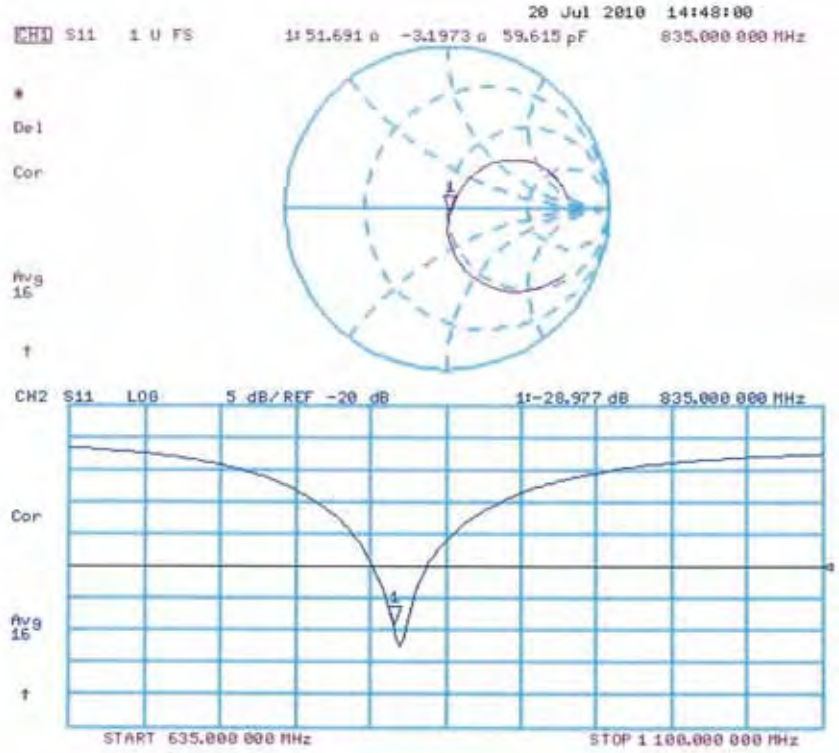
- Probe: ES3DV3 - SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.1 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 3.63 W/kg
SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.56 mW/g
Maximum value of SAR (measured) = 2.8 mW/g



0 dB = 2.8mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 20.07.2010 12:03:13

Test Laboratory: SPEAG, Zurich, Switzerland

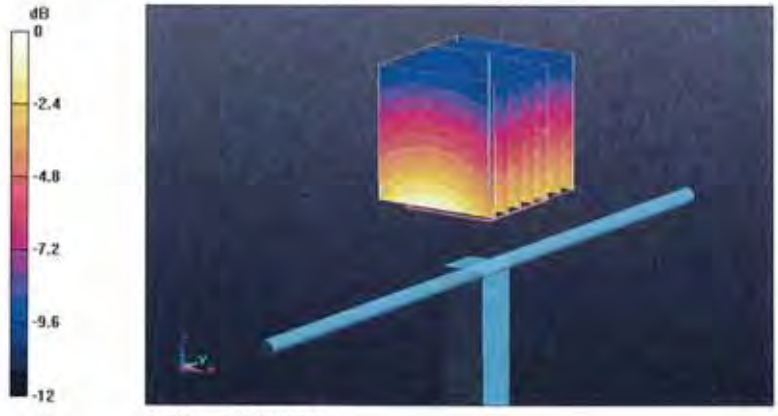
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: MSL900
Medium parameters used: f = 835 MHz; σ = 1.01 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

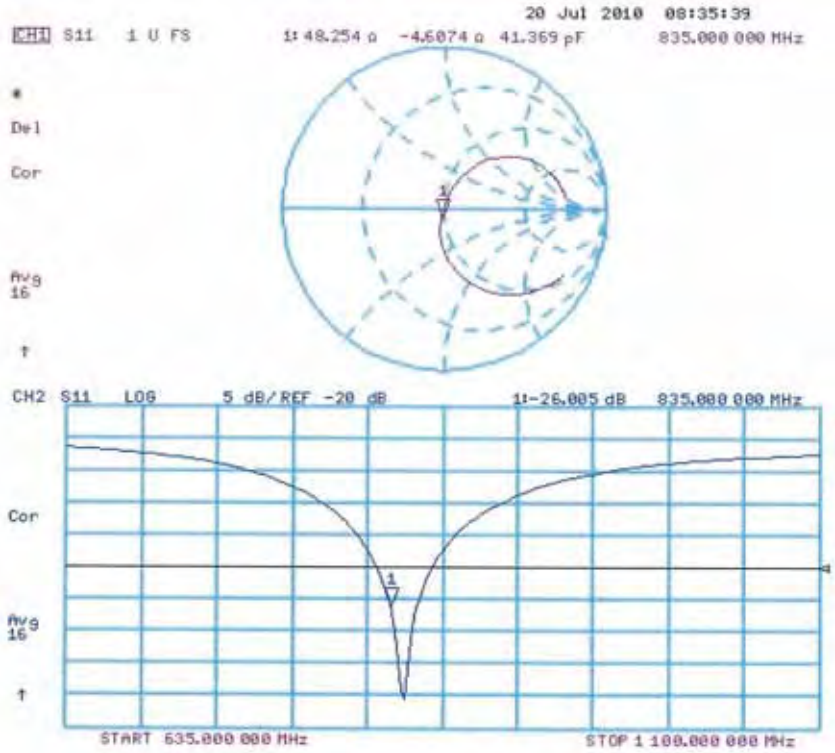
- Probe: ES3DV3 - SN3205; ConvF(5.86, 5.86, 5.86); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.1 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 3.81 W/kg
SAR(1 g) = 2.58 mW/g; SAR(10 g) = 1.69 mW/g
Maximum value of SAR (measured) = 2.98 mW/g



0 dB = 2.98mW/g

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client **ATL (Auden)** **Certificate No: D1900V2-5d111_Jul10**

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d111
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	July 16, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 19, 2010

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.3 ± 6 %	1.43 mho/m ± 6 %
Head TSL temperature during test	(22.4 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.1 mW / g
SAR normalized	normalized to 1W	40.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**39.9 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.28 mW / g
SAR normalized	normalized to 1W	21.1 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**21.0 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.3 ± 6 %	1.55 mho/m ± 6 %
Body TSL temperature during test	(22.4 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.6 mW / g
SAR normalized	normalized to 1W	42.4 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**41.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.66 mW / g
SAR normalized	normalized to 1W	22.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**22.5 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.7 Ω + 6.6 jΩ
Return Loss	- 23.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.7 Ω + 6.5 jΩ
Return Loss	- 22.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.202 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 28, 2008

DASY5 Validation Report for Head TSL

Date/Time: 16.07.2010 13:15:00

Test Laboratory: SPEAG, Zurich, Switzerland

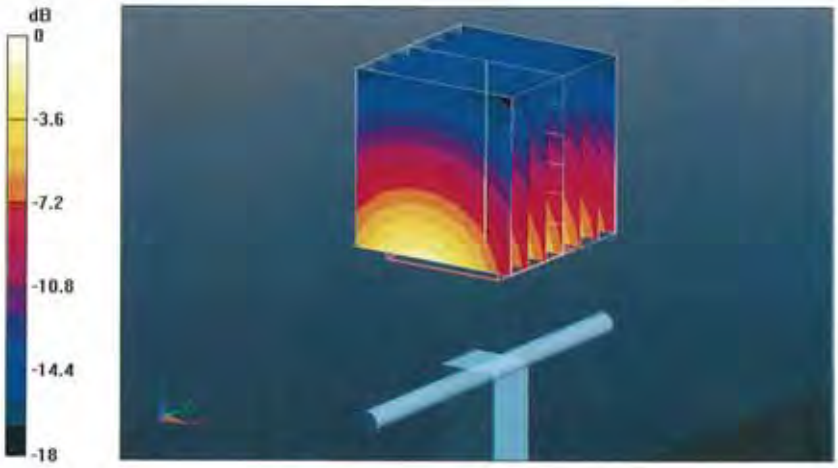
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d111

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL U12 BB
Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

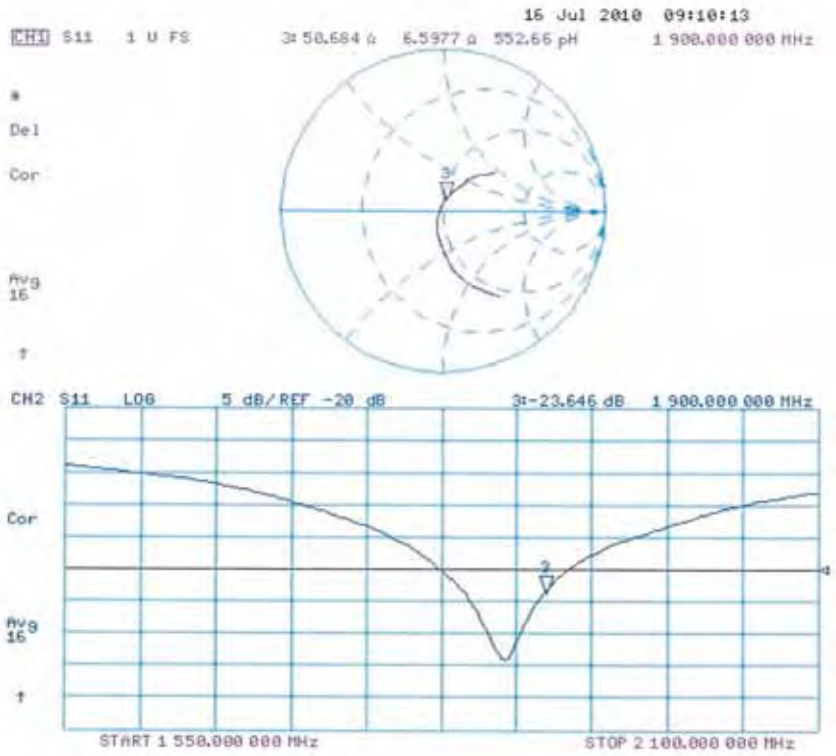
- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.6 V/m; Power Drift = 0.029 dB
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.28 mW/g
Maximum value of SAR (measured) = 12.4 mW/g



0 dB = 12.4mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 13.07.2010 12:57:16

Test Laboratory: SPEAG, Zurich, Switzerland

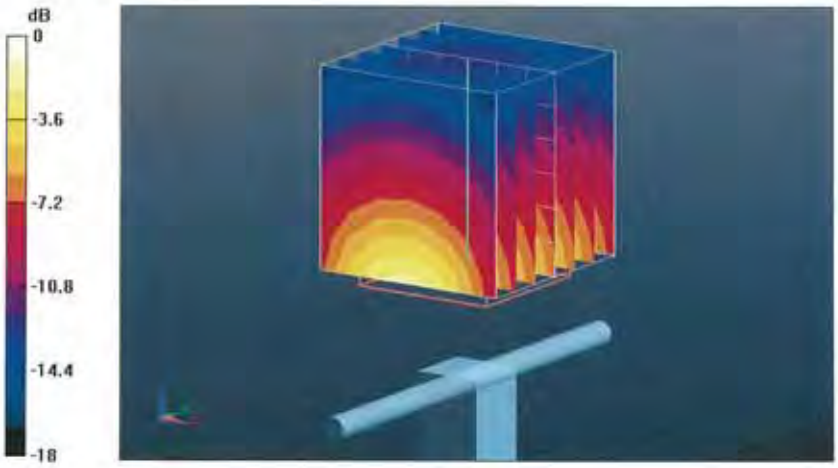
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d111

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: MSL U11 BB
Medium parameters used: f = 1900 MHz; σ = 1.55 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

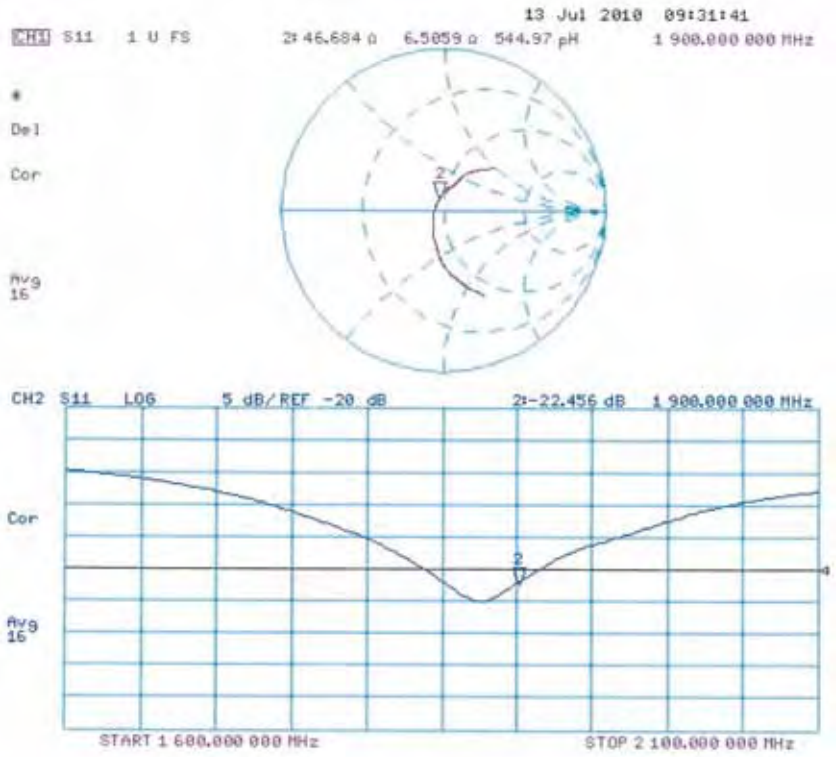
- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.7 V/m; Power Drift = 0.00345 dB
Peak SAR (extrapolated) = 17.7 W/kg
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.66 mW/g
Maximum value of SAR (measured) = 13.3 mW/g



0 dB = 13.3mW/g

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client ATL (Auden)

Certificate No: EX3-3632_Jan10

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3632

Calibration procedure(s): QA CAL-01.v6, QA CAL-12.v6, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes

Calibration date: January 26, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10
Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	29-Sep-09 (No. DAE4-660_Sep09)	Sep-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Fin Bomholt	R&D Director	

Issued: January 26, 2010

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

Probe EX3DV4

SN:3632

Manufactured:	November 1, 2007
Last calibrated:	January 13, 2009
Recalibrated:	January 26, 2010

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: EX3DV4 SN:3632

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.46	0.44	0.39	± 10.1%
DCP (mV)[B]	88.1	83.7	91.9	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300	± 1.5%
			Y	0.00	0.00	1.00	300	
			Z	0.00	0.00	1.00	300	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

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

DASY - Parameters of Probe: EX3DV4 SN:3632

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
450	± 50 / ± 100	43.5 ± 5%	0.87 ± 5%	9.64	9.64	9.64	0.24	1.00	± 13.3%
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	9.11	9.11	9.11	0.63	0.67	± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.80	7.80	7.80	0.64	0.66	± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.81	7.81	7.81	0.76	0.59	± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	7.16	7.16	7.16	0.41	0.82	± 11.0%

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

DASY - Parameters of Probe: EX3DV4 SN:3632

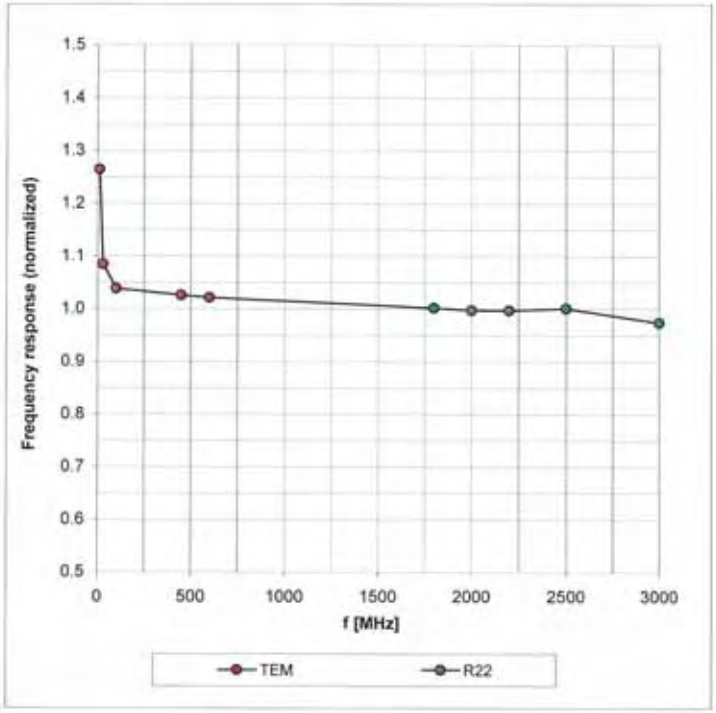
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
450	± 50 / ± 100	56.7 ± 5%	0.94 ± 5%	10.57	10.57	10.57	0.32	0.47	± 13.3%
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	9.17	9.17	9.17	0.59	0.73	± 11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.84	7.84	7.84	0.68	0.68	± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.57	7.57	7.57	0.82	0.60	± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	7.40	7.40	7.40	0.45	0.80	± 11.0%

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

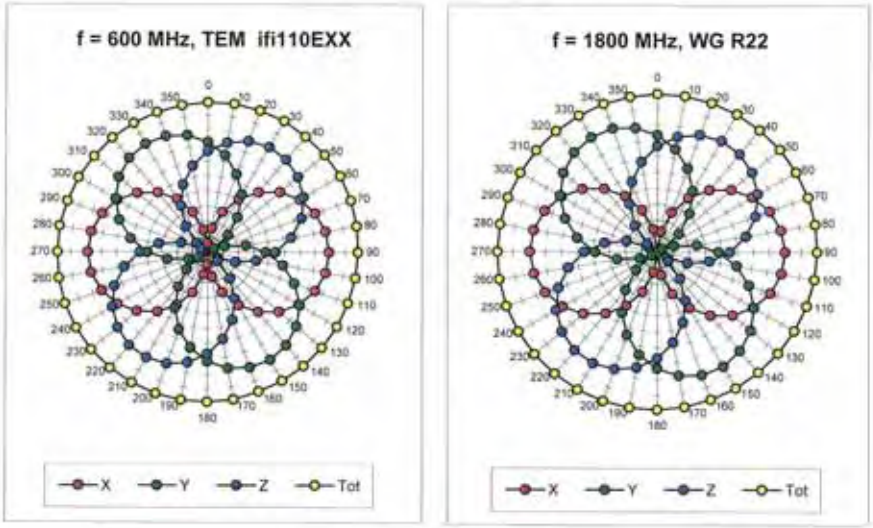
Frequency Response of E-Field

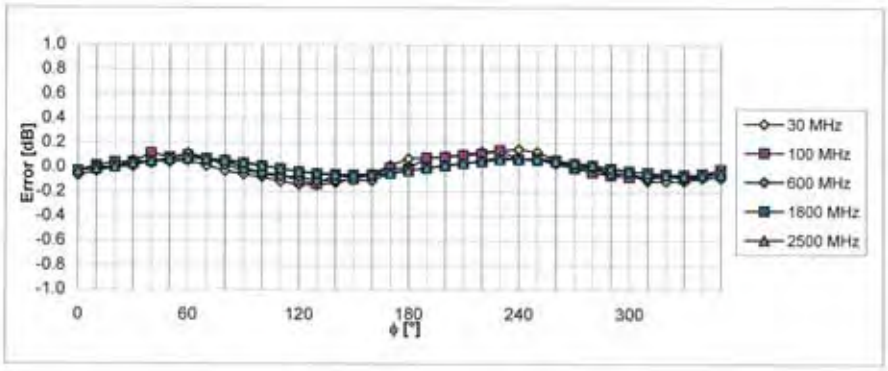
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

Receiving Pattern (ϕ), ϑ = 0°

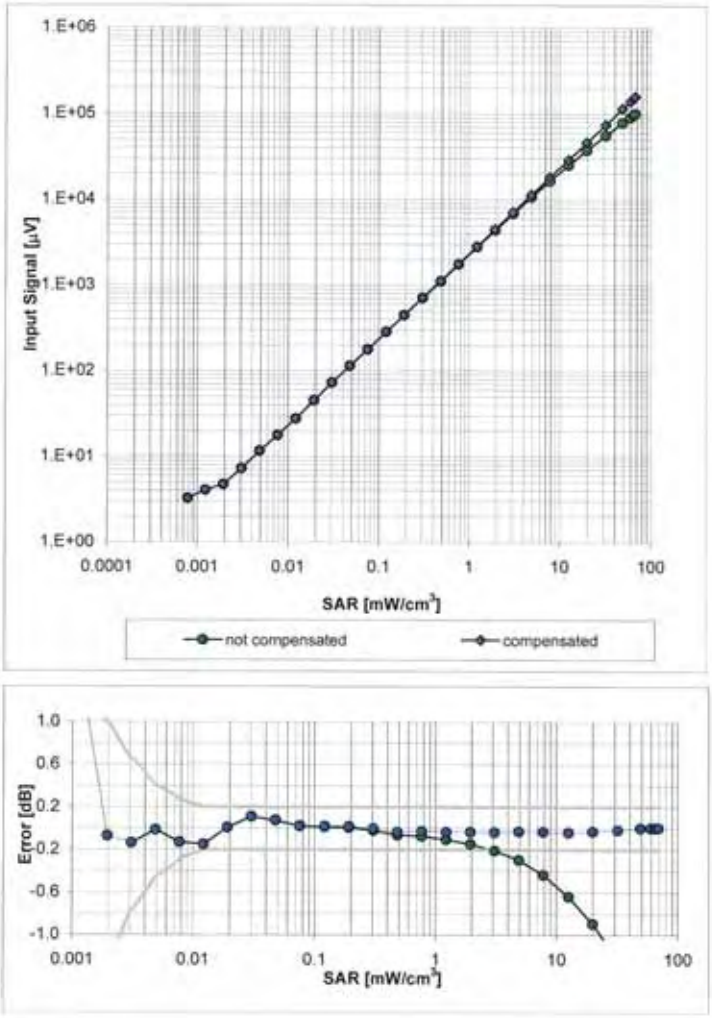




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

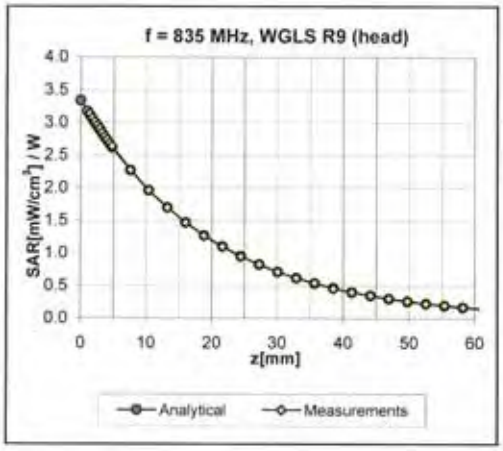
Dynamic Range f(SAR_{head})

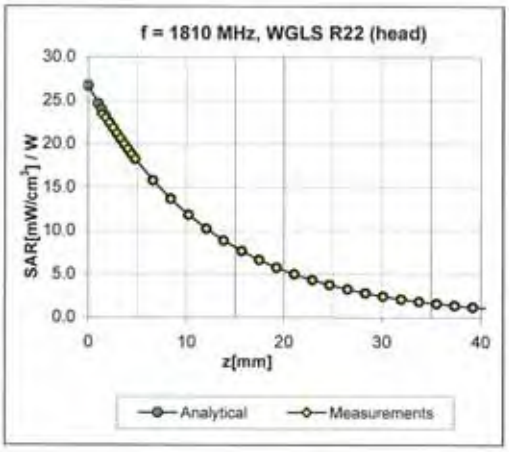
(Waveguide R22, f = 1800 MHz)



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

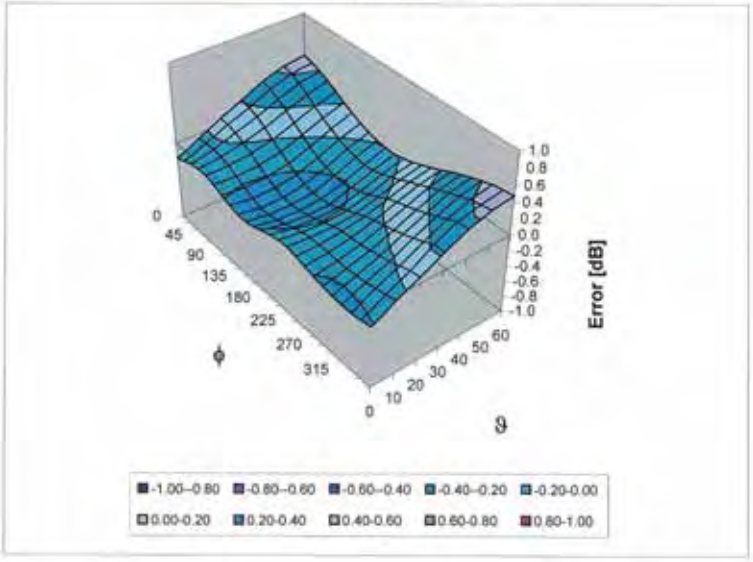
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

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

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

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

Accreditation No.: SCS 108

Client ATL (Auden)

Certificate No: DAE4-779_Jan10

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BJ - SN: 779
Calibration procedure(s)	QA CAL-06.v12 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	January 21, 2010

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	1-Oct-09 (No: 9055)	Oct-10
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	05-Jun-09 (in house check)	In house check: Jun-10

	Name	Function	Signature
Calibrated by:	Andrea Guntli	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: January 21, 2010

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

Glossary

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

Methods Applied and Interpretation of Parameters

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

DC Voltage Measurement

A/D - Converter Resolution nominal

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

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

Calibration Factors	X	Y	Z
High Range	404.487 ± 0.1% (k=2)	403.723 ± 0.1% (k=2)	403.948 ± 0.1% (k=2)
Low Range	3.97046 ± 0.7% (k=2)	3.98719 ± 0.7% (k=2)	4.00014 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	84.5 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	200010.5	1.14	0.00
Channel X	+ Input	20003.28	3.68	0.02
Channel X	- Input	-19997.24	3.06	-0.02
Channel Y	+ Input	200009.6	0.87	0.00
Channel Y	+ Input	19999.83	0.43	0.00
Channel Y	- Input	-19998.10	2.10	-0.01
Channel Z	+ Input	199998.4	0.15	0.00
Channel Z	+ Input	20000.44	1.04	0.01
Channel Z	- Input	-19997.62	-0.01	-0.01

Low Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	1999.6	-0.33	-0.02
Channel X	+ Input	199.84	-0.16	-0.08
Channel X	- Input	-200.02	-0.22	0.11
Channel Y	+ Input	2000.1	0.05	0.00
Channel Y	+ Input	198.87	-1.13	-0.56
Channel Y	- Input	-201.72	-1.62	0.81
Channel Z	+ Input	2000.2	0.14	0.01
Channel Z	+ Input	199.12	-1.18	-0.59
Channel Z	- Input	-200.60	-0.60	0.30

2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	-3.75	-5.42
	- 200	6.52	4.96
Channel Y	200	14.47	13.94
	- 200	-14.47	-14.52
Channel Z	200	3.70	3.28
	- 200	-3.73	-3.84

3. Channel separation

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

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200	-	2.60	0.09
Channel Y	200	1.31	-	3.04
Channel Z	200	2.43	-2.04	-

4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	15621	15863
Channel Y	15831	16095
Channel Z	16132	15816

5. Input Offset Measurement

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

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	-0.14	-1.27	1.10	0.43
Channel Y	-0.91	-2.36	0.81	0.61
Channel Z	-1.02	-1.92	0.28	0.44

6. Input Offset Current

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

7. Input Resistance

	Zeroing (MOhm)	Measuring (MOhm)
Channel X	0.1999	202.7
Channel Y	0.1999	202.5
Channel Z	0.2000	202.7

8. Low Battery Alarm Voltage (verified during pre test)

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

9. Power Consumption (verified during pre test)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.0	+6	+14
Supply (- Vcc)	-0.01	-8	-9