5800 MHz SYSTEM VALIDATION

Type:	**5800 MHz Validation Dipole**
Asset Number:	**00126**
Serial Number:	**1031**
Place of Validation:	**Celltech Labs Inc.**
Date of Validation:	**March 15, 2006**

Celltech Labs Inc. certifies that the 5800 MHz System Validation was performed on the date indicated above.

Performed by:	**Sean Johnston**
Approved by:	**Spencer Watson**

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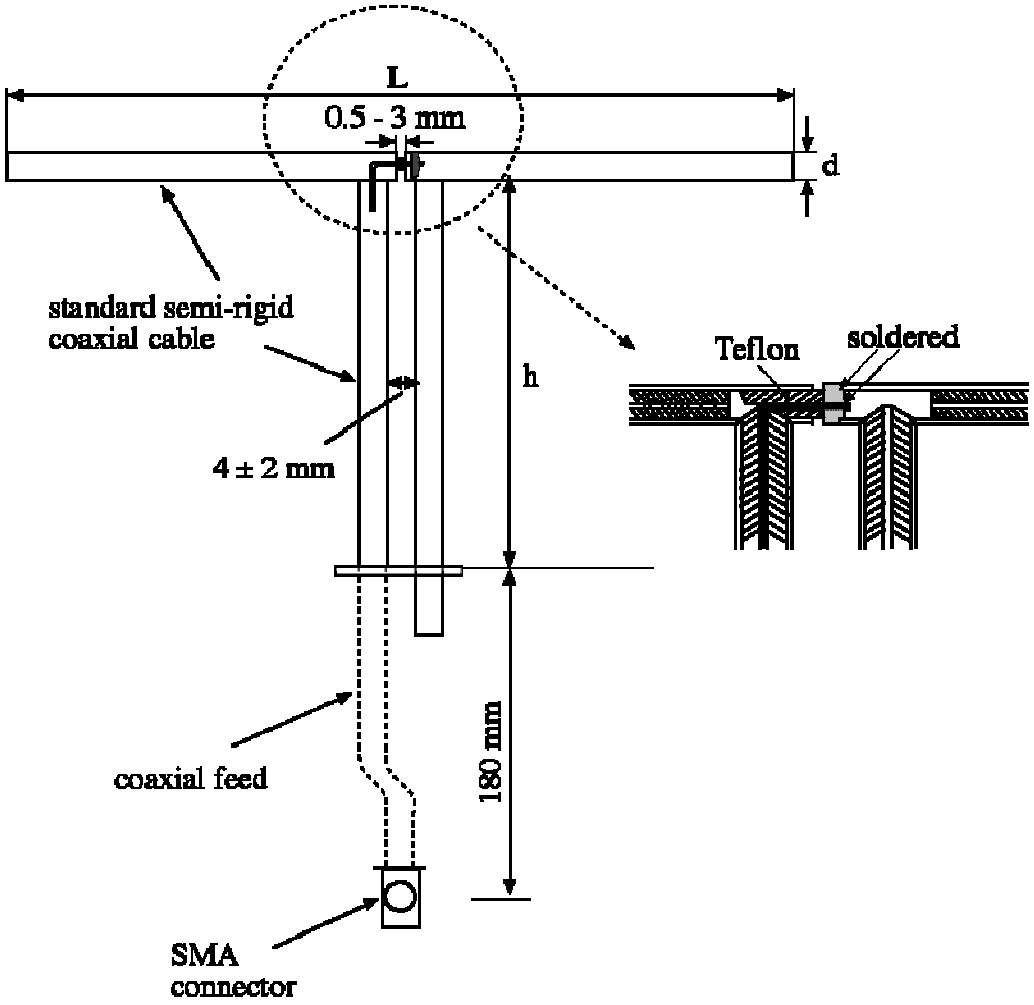
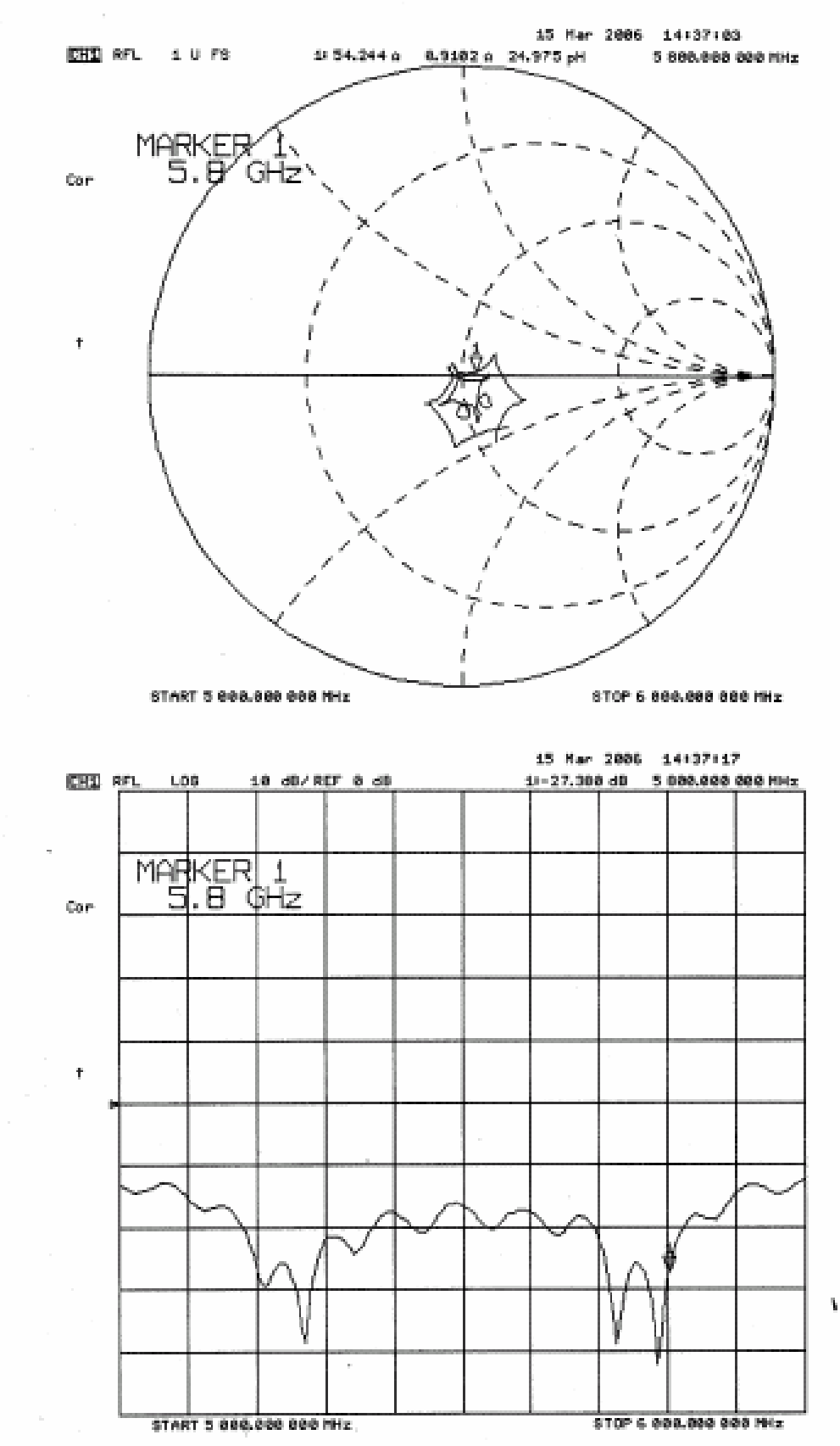
1. Dipole Construction & Electrical Characteristics

The validation dipole was constructed in accordance with the IEEE Std "Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques". The electrical properties were measured using an HP 8753E Network Analyzer. The network analyzer was calibrated to the validation dipole N-type connector feed point using an HP85032E Type N calibration kit. The dipole was placed parallel to a planar phantom at a separation distance of 10.0mm from the simulating fluid using a loss-less dielectric spacer. The measured input impedance is:

Feed point impedance at 5800 MHz	Re{Z} = 54.244Ω Im{Z} = 0.9102Ω
Return Loss at 5800 MHz	-27.380 dB



2. Validation Dipole VSWR Data



3. Validation Dipole Dimensions

Frequency (MHz)	L (mm)	H (mm)	D (mm)
300	420.0	250.0	6.2
450	288.0	167.0	6.2
835	161.0	89.8	3.6
900	149.0	83.3	3.6
1450	89.1	51.7	3.6
1800	72.0	41.7	3.6
1900	68.0	39.5	3.6
2000	64.5	37.5	3.6
2450	51.8	30.6	3.6
3000	41.5	25.0	3.6
5200 - 5800	20.6	40.65	3.6

4. Validation Phantom

The validation phantom is the SAM (Specific Anthropomorphic Mannequin) phantom manufactured by Schmid & Partner Engineering AG. The SAM phantom is a Fiberglass shell integrated in a wooden table. The shape of the shell corresponds to the phantom defined by SCC34-SC2. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

Shell Thickness: 2.0 ± 0.1 mm
Filling Volume: Approx. 25 liters
Dimensions: 50 cm (W) x 100 cm (L)

5. 5800 MHz System Validation Setup

6. 5800 MHz Dipole Setup

7. Measurement Conditions

The SAM phantom was filled with 5800 MHz Brain tissue simulant.

Relative Permittivity:	34.4 (-2.5% deviation from target)
Conductivity:	5.27 mho/m (0% deviation from target)
Fluid Temperature:	23 °C
Fluid Depth:	≥ 15.0 cm

Environmental Conditions:

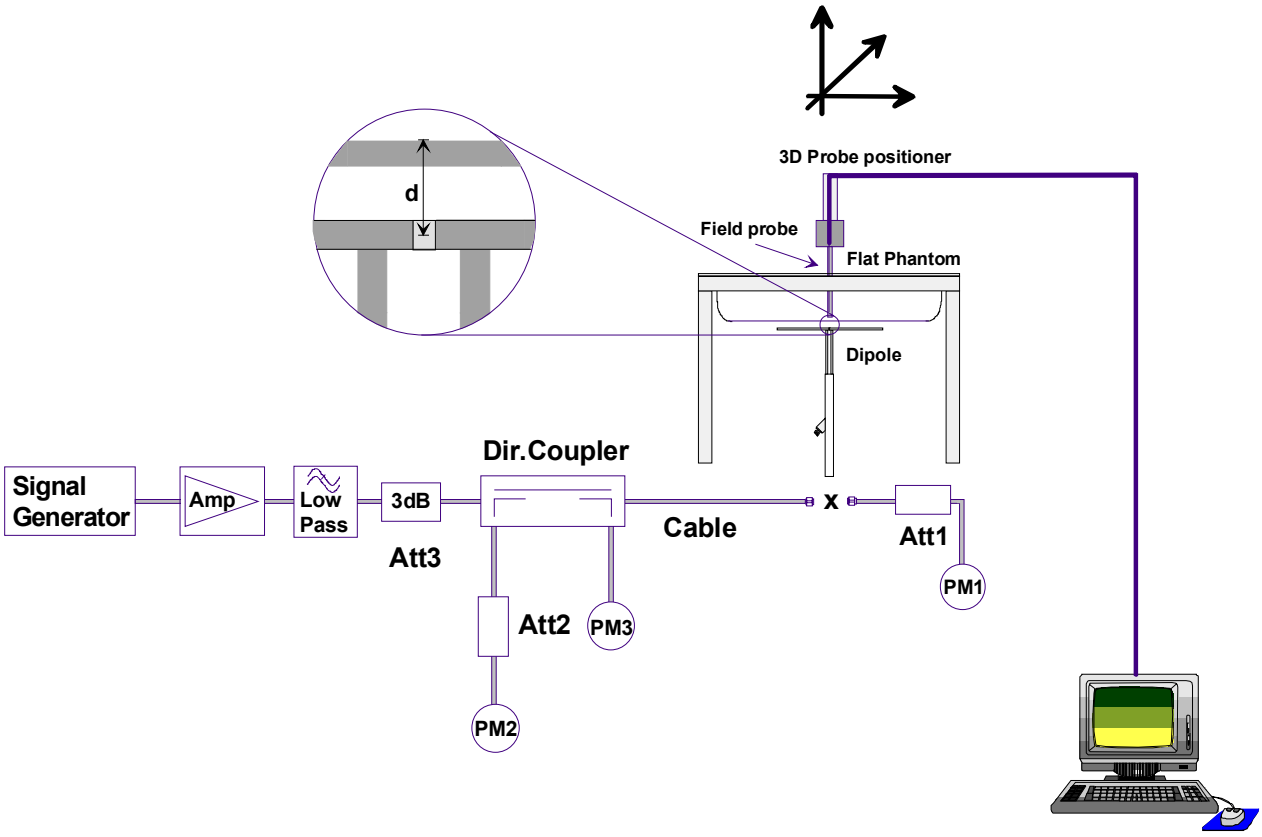
Ambient Temperature:	24.8°C
Humidity:	30%
Barometric Pressure:	101.1kPa

The 5800 MHz Brain tissue simulant consisted of the following ingredients:

Ingredient	Percentage by weight
Water	64 - 78%
Mineral Oil	11 - 18%
Emulsifiers	9 - 15%
Additives and Salt	2 - 3%
Target Dielectric Parameters at 22°C	ε_r = 35.3 (+/-5%) σ = 5.27 S/m (+/-5%)

8. SAR Measurement

The SAR measurement was performed with the E-field probe in mechanical detection mode only. The setup and determination of the forward power into the dipole was performed using the following procedures.



First the power meter PM1 (including attenuator Att1) is connected to the cable to measure the forward power at the location of the dipole connector (X). The signal generator is adjusted for the desired forward power at the dipole connector (taking into account the attenuation of Att1) as read by power meter PM2. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2. If the signal generator does not allow adjustment in 0.01dB steps, the remaining difference at PM2 must be taken into consideration. PM3 records the reflected power from the dipole to ensure that the value is not changed from the previous value. The reflected power should be 20dB below the forward power.

9. Validation Dipole SAR Test Results

Ten SAR measurements were performed in order to achieve repeatability and to establish an average target value (W/kg).

Validation Measurement	SAR @ 0.25W Input averaged over 1g	SAR @ 1W Input averaged over 1g	SAR @ 0.25W Input averaged over 10g	SAR @ 1W Input averaged over 10g	Max SAR @ 0.25W Input
Test 1	20.40	81.60	5.72	22.88	40.00
Test 2	20.40	81.60	5.70	22.80	40.00
Test 3	20.50	82.00	5.72	22.88	39.90
Test 4	20.30	81.20	5.68	22.72	40.20
Test 5	20.80	83.20	5.81	23.24	40.40
Test 6	20.50	82.00	5.75	23.00	39.70
Test 7	20.50	82.00	5.74	22.96	39.40
Test 8	20.50	82.00	5.73	22.92	39.60
Test 9	20.50	82.00	5.73	22.92	39.60
Test10	20.40	81.60	5.71	22.84	39.40
Average SAR	**20.48**	**81.92**	**5.73**	**22.92**	**39.82**

The results have been normalized to 1W (forward power) into the dipole.

Target SAR @ 1 Watt Input averaged over 1 gram (W/kg)		Measured SAR @ 1 Watt Input averaged over 1 gram		Deviation from Target	Target SAR @ 1 Watt Input averaged over 10 grams (W/kg)		Measured SAR @ 1 Watt Input averaged over 10 grams		Deviation from Target
78.0	+/- 10%	**81.92**	W/kg	+5.03%	21.9	+/- 10%	**22.92**	W/kg	+4.66%

5800 MHz System Validation (Brain) - 5200-5800 MHz Dipole - March 15, 2006

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1031; Asset: 00126
Ambient Temp: 24.8 °C; Fluid Temp: 23.0 °C; Barometric Pressure: 101.1 kPa; Humidity: 30%
Communication System: CW
Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: HSL5800 (σ = 5.27 mho/m; ε_r = 34.4; ρ = 1000 kg/m^3)
- Probe: EX3DV4 - SN3547; ConvF(4.79, 4.79, 4.79); Calibrated: 14/02/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 15/06/2005
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

5800 MHz System Performance Check /Area Scan (9x13x1): Measurement grid: dx=5mm, dy=5mm
Maximum value of SAR (measured) = 43.0 mW/g

5800 MHz System Validation/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 93.4 V/m; Power Drift = 0.038 dB
SAR(1 g) = 20.4 mW/g; SAR(10 g) = 5.72 mW/g
Maximum value of SAR (measured) = 40.0 mW/g

5800 MHz System Validation/Zoom Scan 2 (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 93.0 V/m; Power Drift = 0.077 dB
SAR(1 g) = 20.4 mW/g; SAR(10 g) = 5.7 mW/g
Maximum value of SAR (measured) = 40.0 mW/g

5800 MHz System Validation/Zoom Scan 3 (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 92.9 V/m; Power Drift = 0.047 dB
SAR(1 g) = 20.5 mW/g; SAR(10 g) = 5.72 mW/g
Maximum value of SAR (measured) = 39.9 mW/g

5800 MHz System Validation/Zoom Scan 4 (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 93.0 V/m; Power Drift = 0.003 dB
SAR(1 g) = 20.3 mW/g; SAR(10 g) = 5.68 mW/g
Maximum value of SAR (measured) = 40.2 mW/g

5800 MHz System Validation/Zoom Scan 5 (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 93.3 V/m; Power Drift = 0.016 dB
SAR(1 g) = 20.8 mW/g; SAR(10 g) = 5.81 mW/g
Maximum value of SAR (measured) = 40.4 mW/g

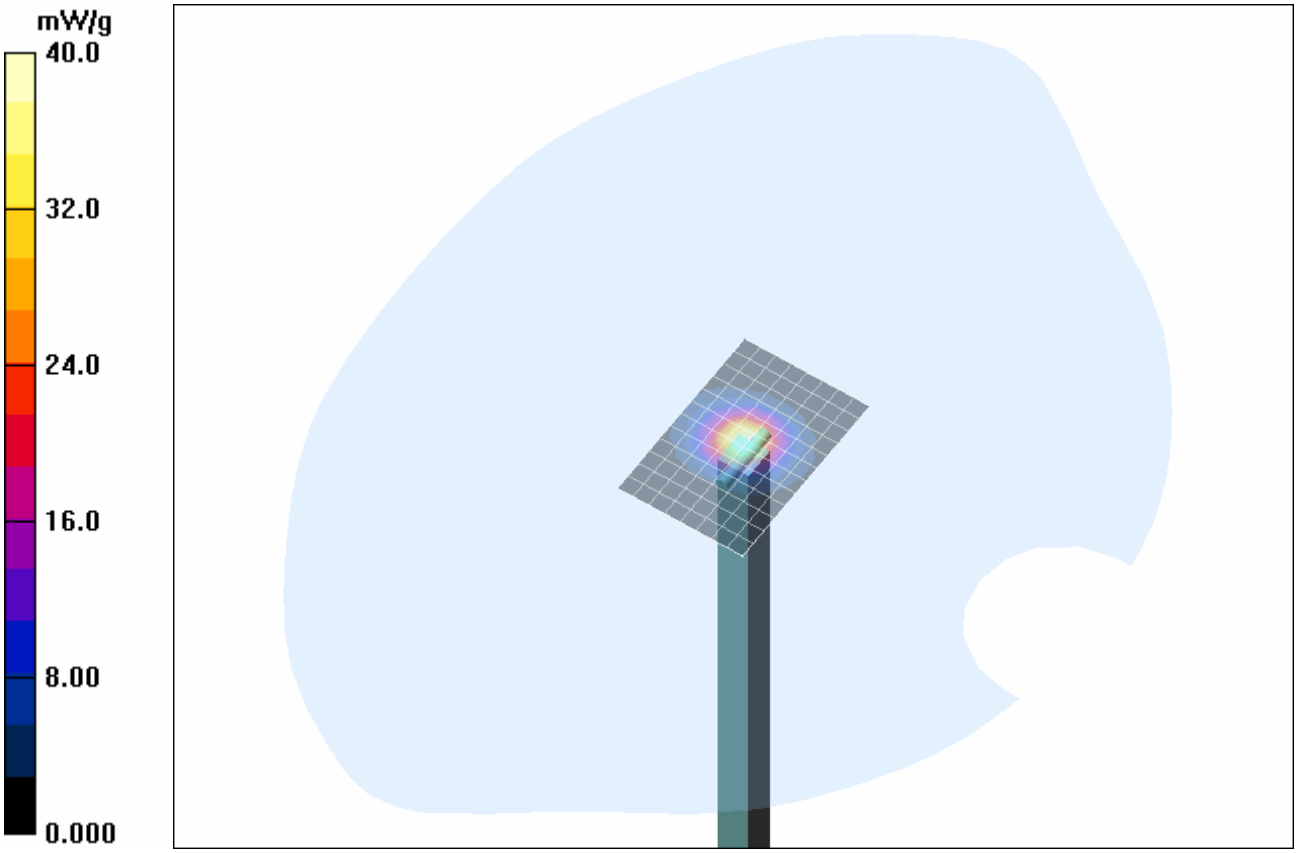
5800 MHz System Validation/Zoom Scan 6 (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 93.5 V/m; Power Drift = 0.016 dB
SAR(1 g) = 20.5 mW/g; SAR(10 g) = 5.75 mW/g
Maximum value of SAR (measured) = 39.7 mW/g

5800 MHz System Validation/Zoom Scan 7 (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 94.2 V/m; Power Drift = 0.042 dB
SAR(1 g) = 20.5 mW/g; SAR(10 g) = 5.74 mW/g
Maximum value of SAR (measured) = 39.4 mW/g

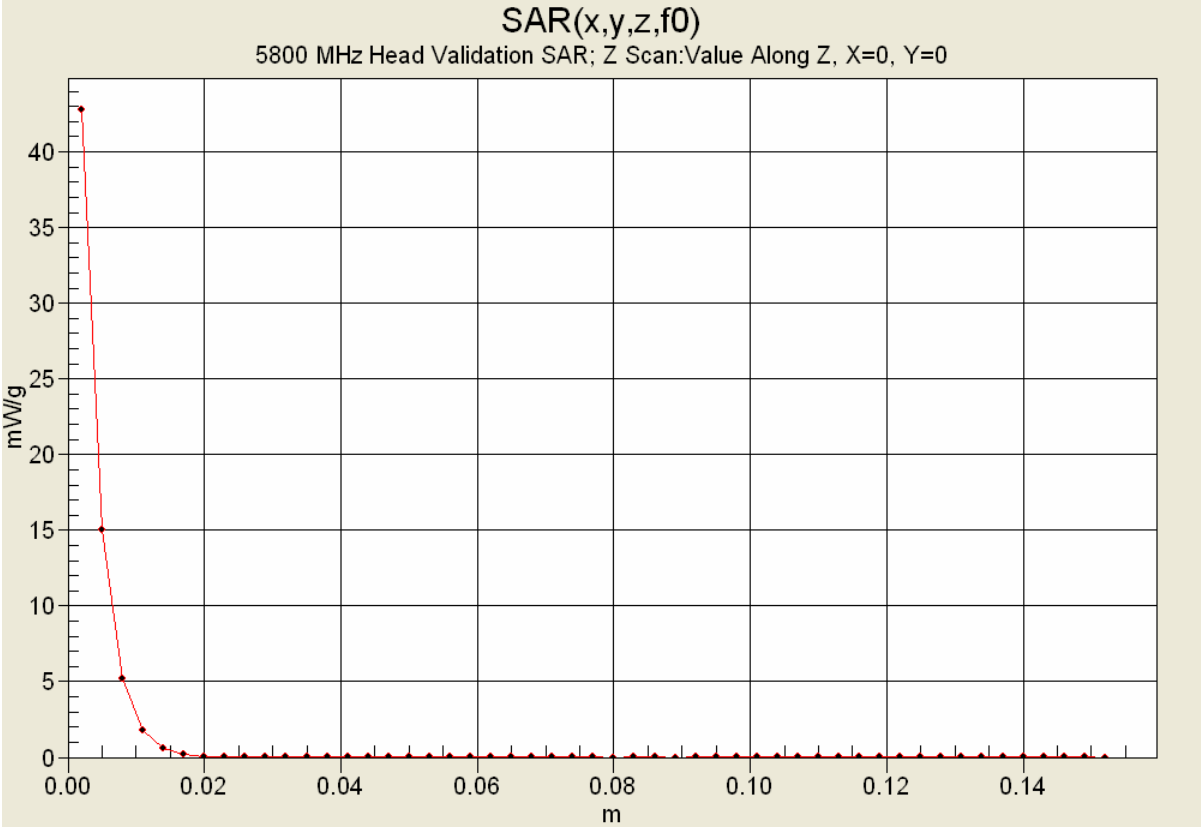
5800 MHz System Validation/Zoom Scan 8 (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 92.8 V/m; Power Drift = 0.049 dB
SAR(1 g) = 20.5 mW/g; SAR(10 g) = 5.73 mW/g
Maximum value of SAR (measured) = 39.6 mW/g

5800 MHz System Validation/Zoom Scan 9 (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 92.2 V/m; Power Drift = 0.018 dB
SAR(1 g) = 20.5 mW/g; SAR(10 g) = 5.73 mW/g
Maximum value of SAR (measured) = 39.6 mW/g

5800 MHz System Validation/Zoom Scan 10 (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 92.3 V/m; Power Drift = 0.051 dB
SAR(1 g) = 20.4 mW/g; SAR(10 g) = 5.71 mW/g
Maximum value of SAR (measured) = 39.4 mW/g



1 g average of 10 measurements: 20.48 mW/g
10 g average of 10 measurements: 5.73 mW/g



10. Measured Fluid Dielectric Parameters

System Validation (Brain) - 5800 MHz Dipole

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Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
Wed 15/Mar/2006
Frequency (GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

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Freq	FCC_eH	FCC_sH	Test_e	Test_s
5.7000	35.41	5.17	34.38	5.21
5.7100	35.40	5.18	34.67	5.17
5.7200	35.39	5.19	34.55	5.22
5.7300	35.38	5.20	34.55	5.19
5.7400	35.37	5.21	34.27	5.21
5.7500	35.36	5.22	34.38	5.26
5.7600	35.35	5.23	34.47	5.28
5.7700	35.33	5.24	34.20	5.25
5.7800	35.32	5.25	34.38	5.24
5.7900	35.31	5.26	34.14	5.24
5.8000	35.30	5.27	34.36	5.27
5.8100	35.29	5.28	34.40	5.36
5.8200	35.28	5.29	34.38	5.27
5.8300	35.27	5.30	34.34	5.29
5.8400	35.25	5.31	34.27	5.30
5.8500	35.24	5.32	34.22	5.35
5.8600	35.23	5.33	34.40	5.33
5.8700	35.22	5.34	34.12	5.30
5.8800	35.21	5.35	34.18	5.34
5.8900	35.20	5.36	34.25	5.37
5.9000	35.19	5.37	34.18	5.35