APPENDIX E - SYSTEM VALIDATION

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1640 MHz SYSTEM VALIDATION

Type:	**1640 MHz Validation Dipole**
Asset Number:	**00212**
Serial Number:	**0175**
Place of Validation:	**Celltech Labs Inc.**
Date of Validation:	**August 14, 2006**

Celltech Labs Inc. hereby certifies that the 1640 MHz System Validation was performed on the date indicated above.

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

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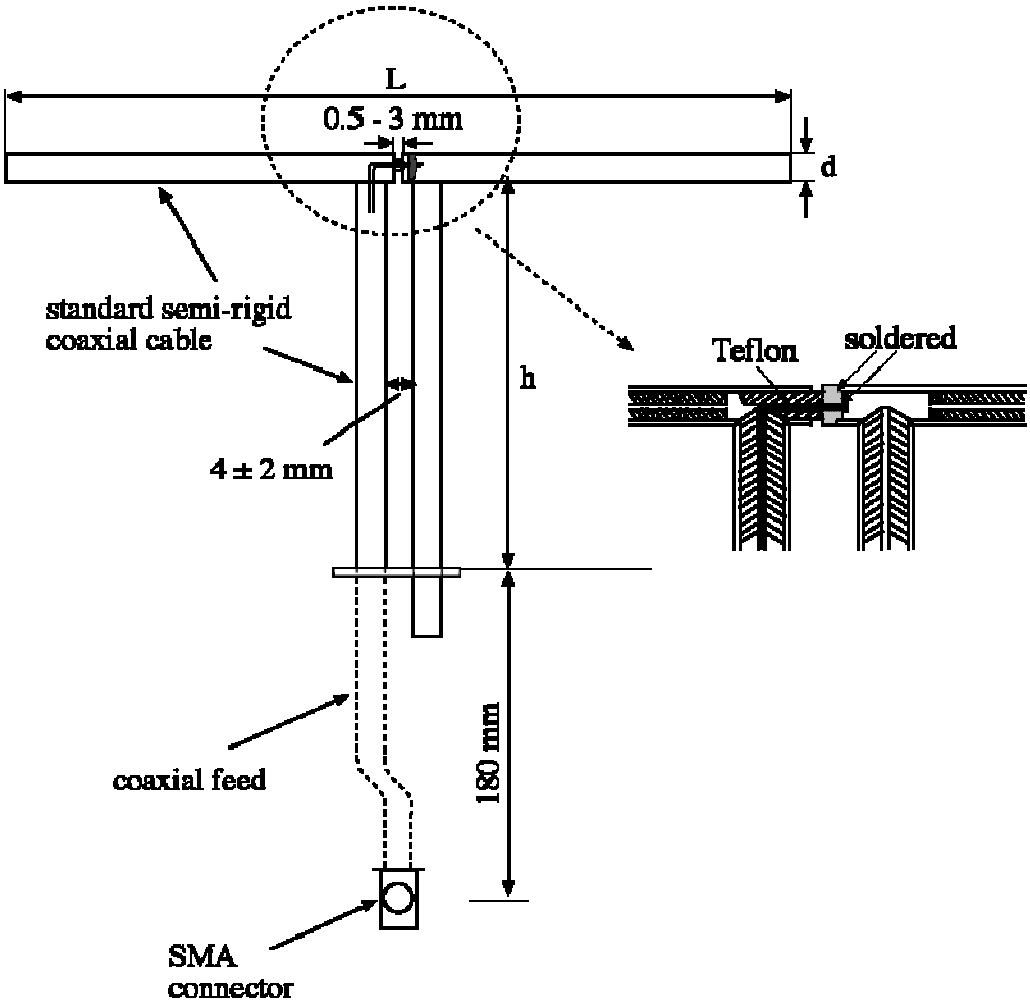
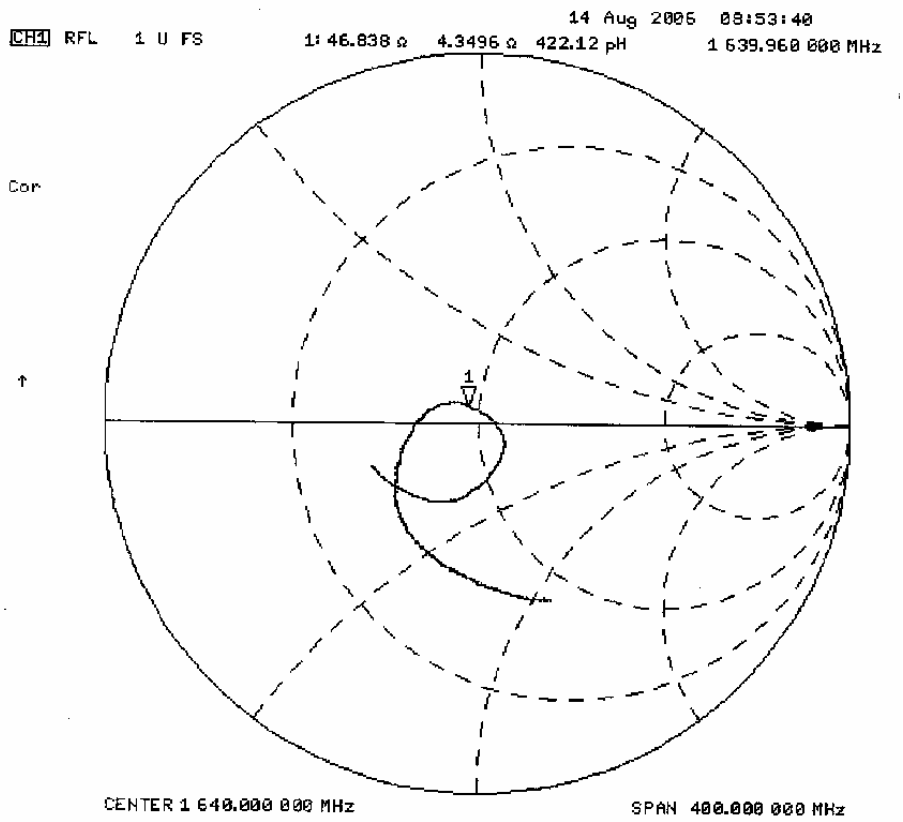
1. Dipole Construction & Electrical Characteristics

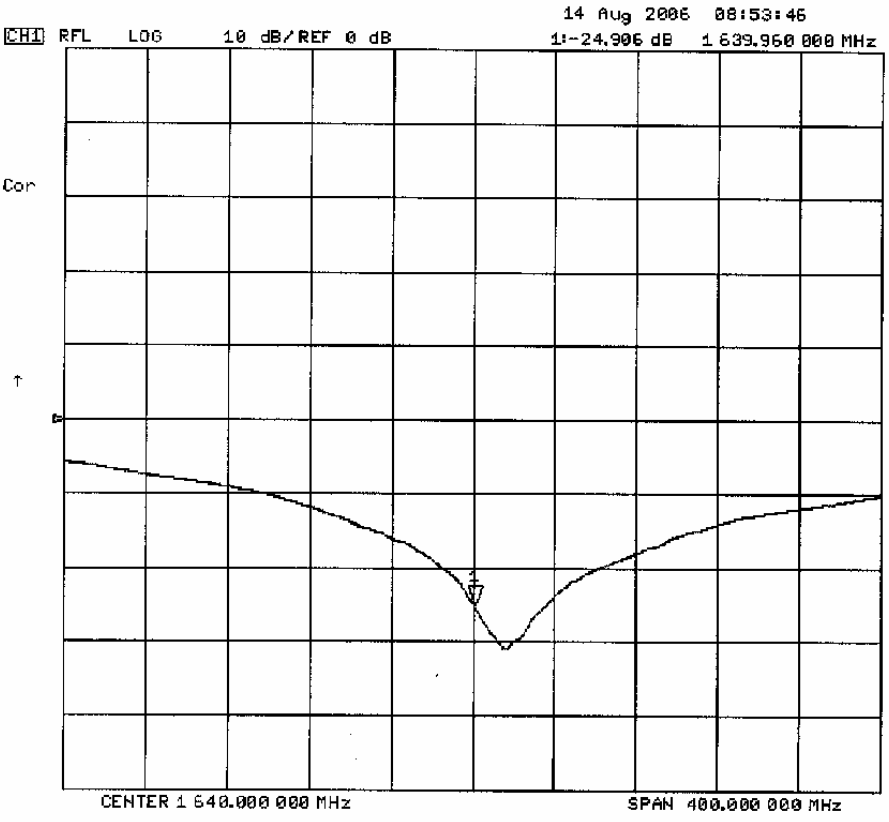
The validation dipole was manufactured by Indexsar and constructed in accordance with the IEEE Standard "Annex G (informative) Reference dipoles for use in system validation". The electrical properties were measured using an HP 8753ET Network Analyzer. The network analyzer was calibrated to the validation 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 1640MHz	Re{Z} = 46.838 Ω
	Im{Z} = 4.3496 Ω
Return Loss at 1640MHz	-24.906 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
1640	81.0	50.0	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

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. 1640 MHz System Validation Dipole Setup

6. Measurement Conditions

The phantom was filled with 1640 MHz Brain tissue simulant.

Relative Permittivity: 40.9 (+1.5% deviation from target)
Conductivity: 1.34 mho/m (+2.3% deviation from target)
Fluid Temperature: 23.5 °C
Fluid Depth: ≥ 15.0 cm

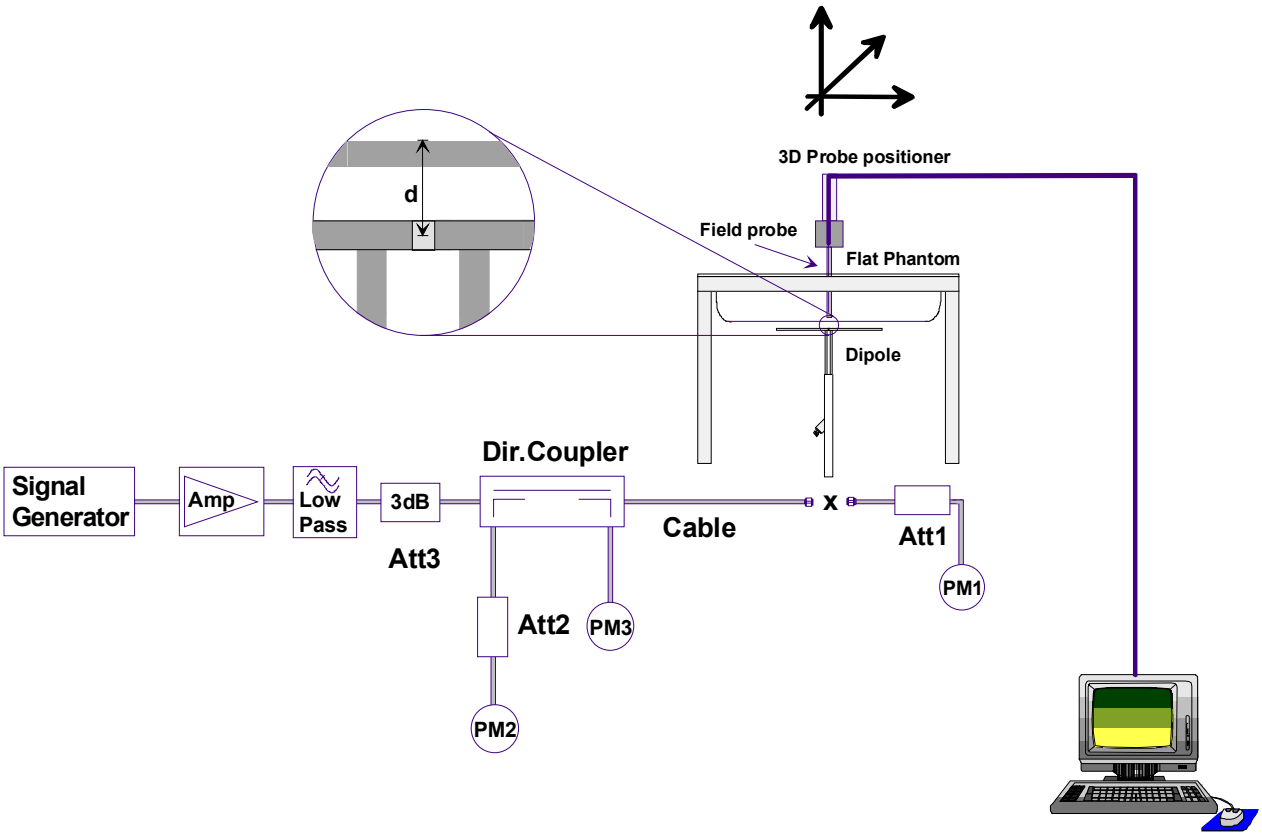
Environmental Conditions:
Ambient Temperature: 24.6 °C
Barometric Pressure: 101.2 kPa
Humidity: 35 %

The 1640 MHz Brain tissue simulant consisted of the following ingredients:

Ingredient	Percentage by weight
Water	55.5%
Glycol	44.0%
Salt	0.5%
Target Dielectric Parameters at 25 °C	ε_r = 40.3 (+/-5%) σ = 1.31 S/m (+/-5%)

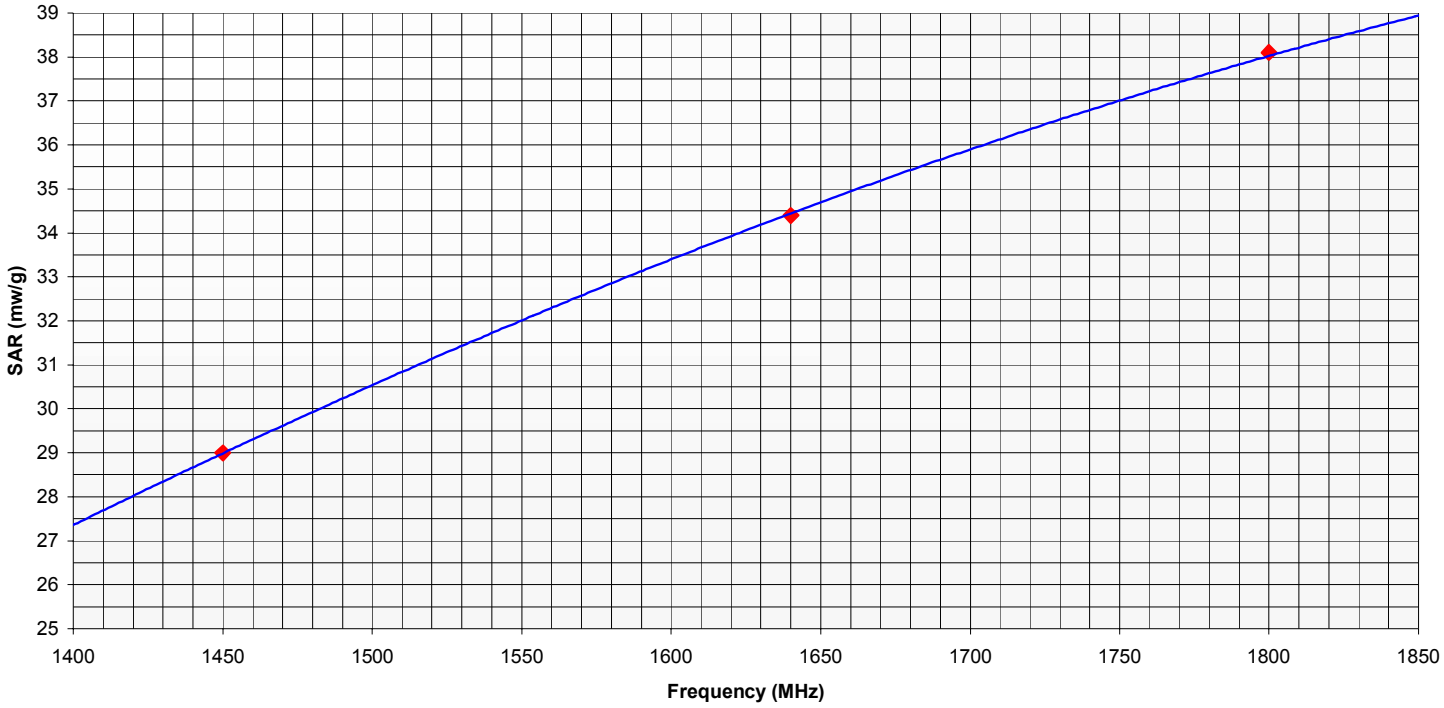
7. SAR Measurement

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 50dB below the forward power.

8. 1640 MHz Interpolated SAR Target



Normalized to 1 Watt

IEEE Target (1g)
1450 MHz = 29.0 W/Kg
1800 MHz = 28.1 W/kg

Interpolated Target (1g)
1640 MHz = 34.4 W/kg

9. 1640 MHz Validation Dipole SAR Test Results

SAR @ 0.25W Input averaged over 1g				SAR @ 1W Input averaged over 1g			
Interpolated Target		**Measured**	**Deviation**	**Interpolated Target**		**Measured**	**Deviation**
8.60	**+/- 10%**	**8.61**	+0.1%	**34.4**	**+/- 10%**	**34.44**	+0.1%
SAR @ 0.25W Input averaged over 10g				**SAR @ 1W Input averaged over 10g**			
Interpolated Target		**Measured**	**Deviation**	**Interpolated Target**		**Measured**	**Deviation**
4.60	**+/- 10%**	4.48	-2.6%	**18.4**	**+/- 10%**	17.92	-2.6%
The results have been normalized to 1W (forward power) into the dipole.							

System Validation (Brain) - 1640 MHz Dipole - August 14, 2006

DUT: Dipole 1640 MHz; Model: IXD-164; Serial: 0175; Asset: 00212; Manufacturer: Indexsar

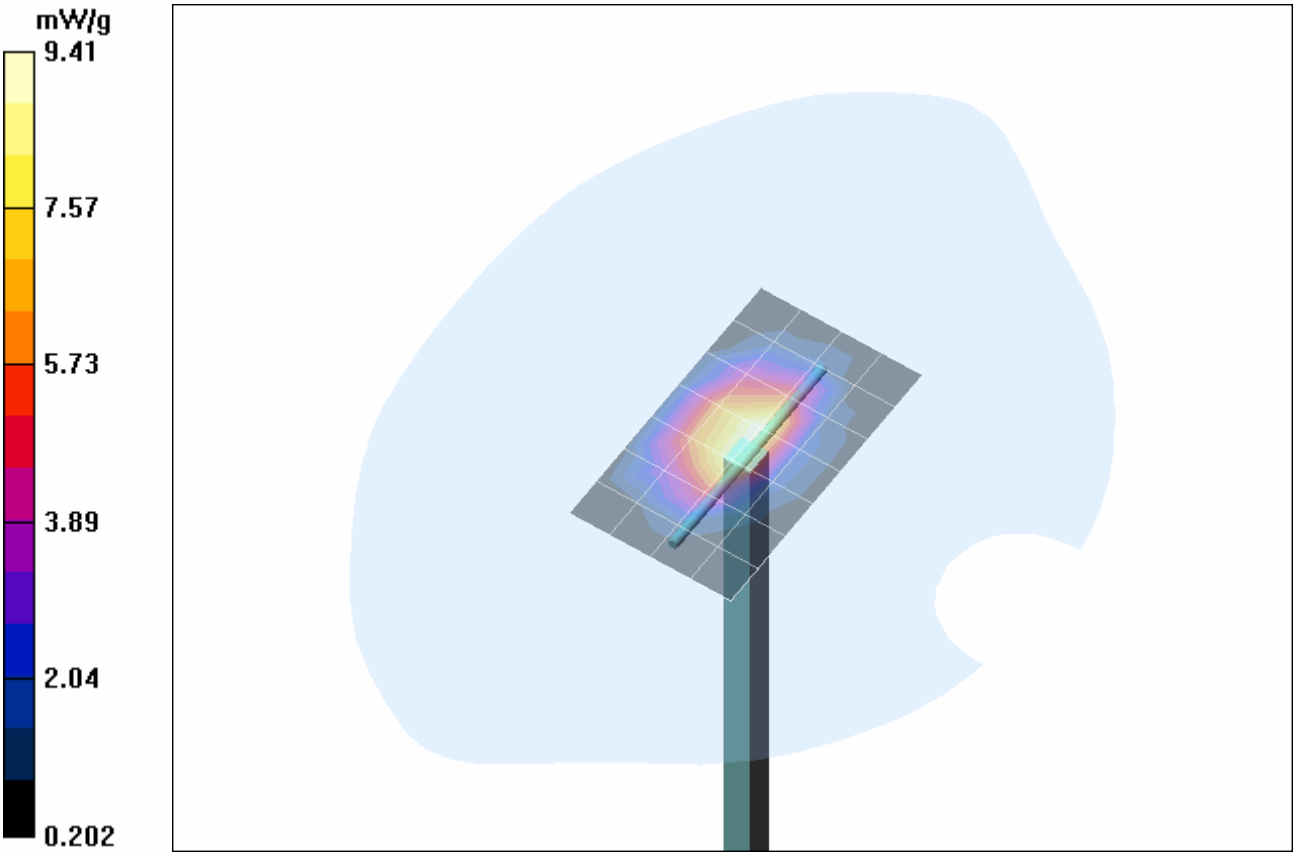
Ambient Temp: 24.6 °C; Fluid Temp: 23.5 °C; Barometric Pressure: 101.2 kPa; Humidity: 35%

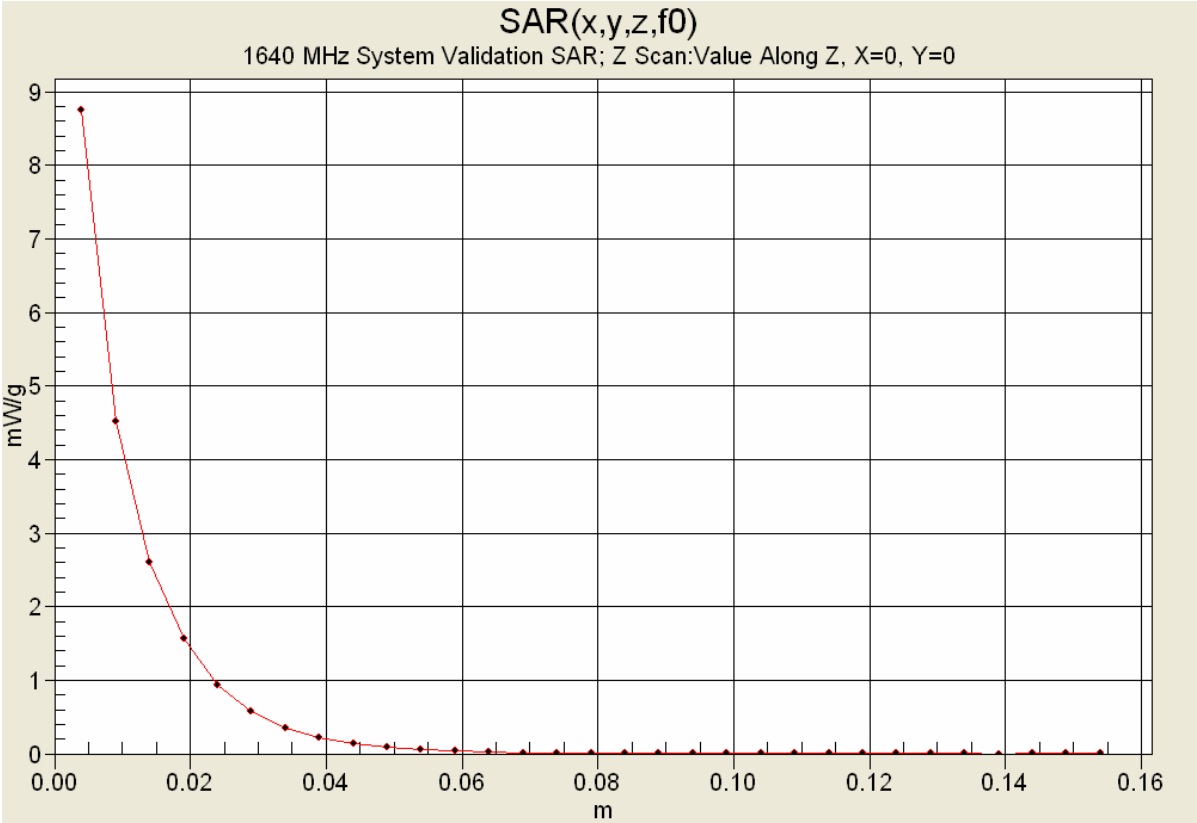
Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 1640 MHz; Duty Cycle: 1:1
Medium: HSL1640 Medium parameters used: f = 1640 MHz; σ = 1.34 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3

- Probe: ET3DV6 - SN1387; ConvF(5.4, 5.4, 5.4); Calibrated: 16/03/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 21/06/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

1640 MHz Dipole - System Validation/Area Scan (5x8x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 7.92 mW/g

1640 MHz Dipole - System Validation/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 78.5 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 18.3 W/kg
SAR(1 g) = 8.61 mW/g; SAR(10 g) = 4.48 mW/g
Maximum value of SAR (measured) = 9.41 mW/g





10. Measured Fluid Dielectric Parameters

1640 MHz System Validation (Brain)

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Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
Mon 14/Aug/2006
Freq 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

****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
1.5000	40.44	1.23	41.85	1.24
1.5100	40.42	1.23	41.66	1.25
1.5200	40.41	1.24	41.63	1.26
1.5300	40.40	1.25	41.58	1.27
1.5400	40.39	1.25	41.48	1.27
1.5500	40.38	1.26	41.46	1.27
1.5600	40.36	1.26	41.44	1.29
1.5700	40.35	1.27	41.30	1.29
1.5800	40.34	1.27	41.18	1.30
1.5900	40.33	1.28	41.20	1.31
1.6000	40.31	1.28	41.03	1.31
1.6100	40.30	1.29	41.05	1.32
1.6200	40.28	1.30	40.93	1.33
1.6300	40.27	1.30	40.84	1.34
1.6400	40.25	1.31	40.90	1.34
1.6500	40.24	1.31	40.76	1.36
1.6600	40.22	1.32	40.76	1.35
1.6700	40.21	1.32	40.78	1.36
1.6800	40.19	1.33	40.82	1.37
1.6900	40.17	1.34	40.72	1.38
1.7000	40.16	1.34	40.75	1.39

1900 MHz SYSTEM VALIDATION

Type:	**1900 MHz Validation Dipole**
Asset Number:	**00032**
Serial Number:	**151**
Place of Validation:	**Celltech Labs Inc.**
Date of Validation:	**June 09, 2006**

Celltech Labs Inc. hereby certifies that the 1900 MHz System Validation was performed on the date indicated above.

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

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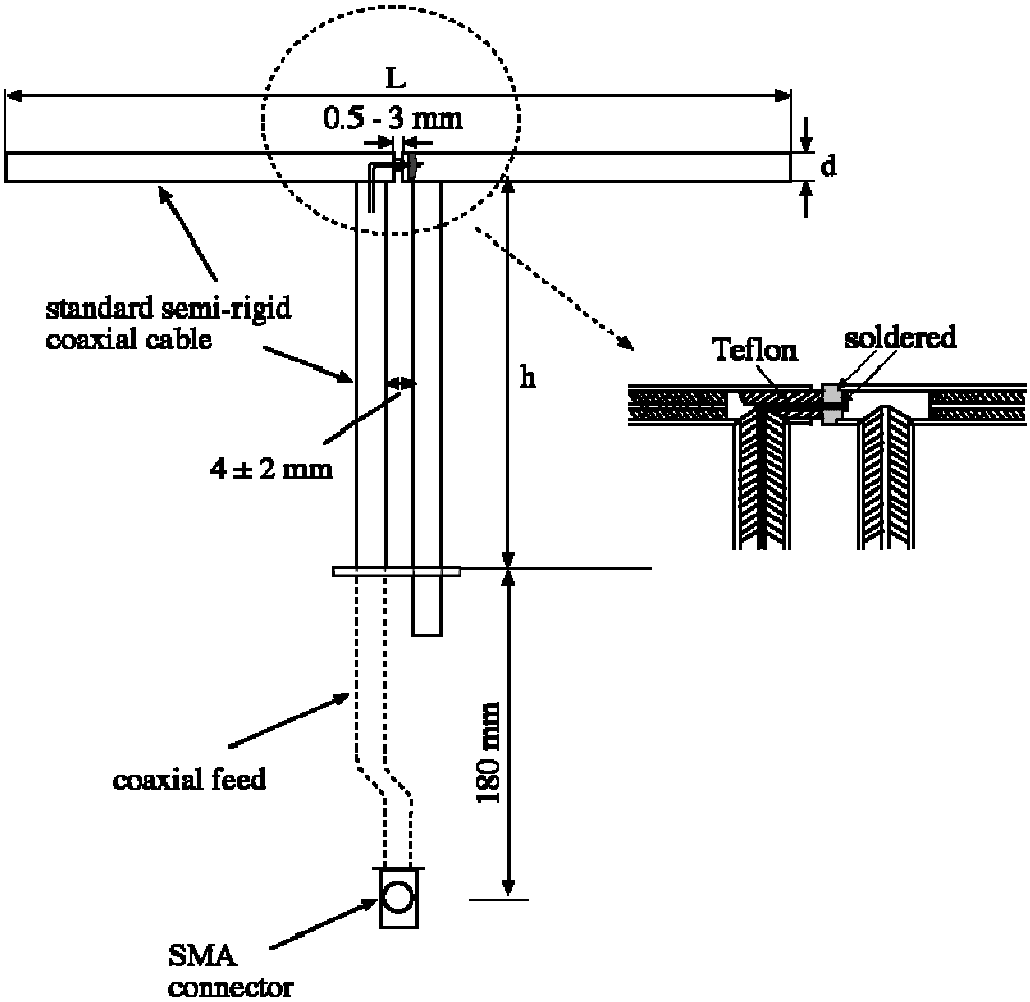
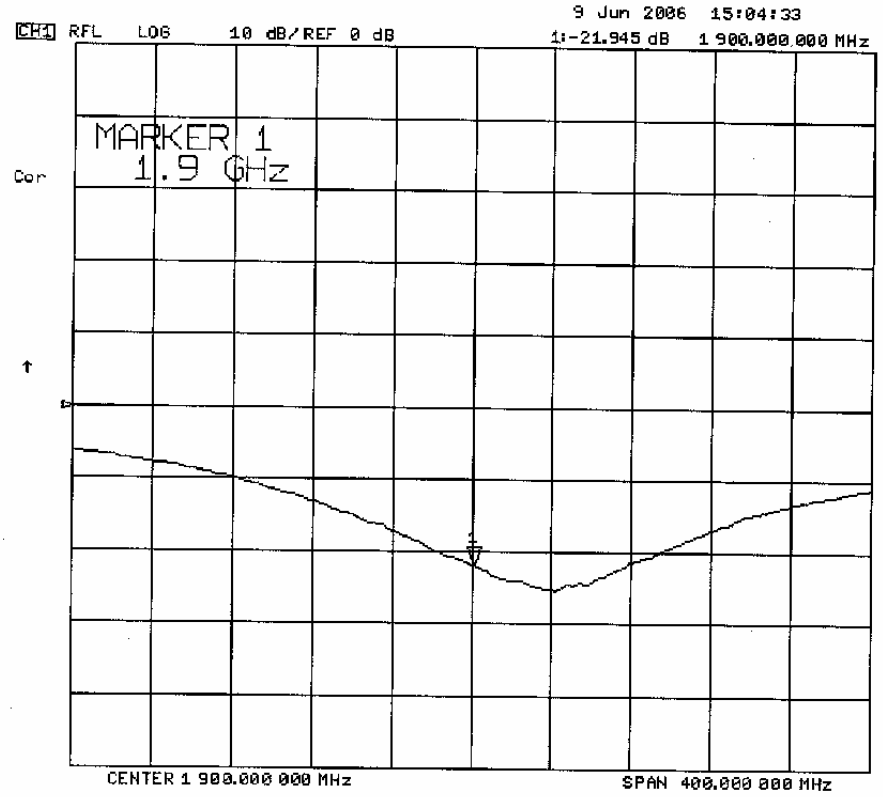
1. Dipole Construction & Electrical Characteristics

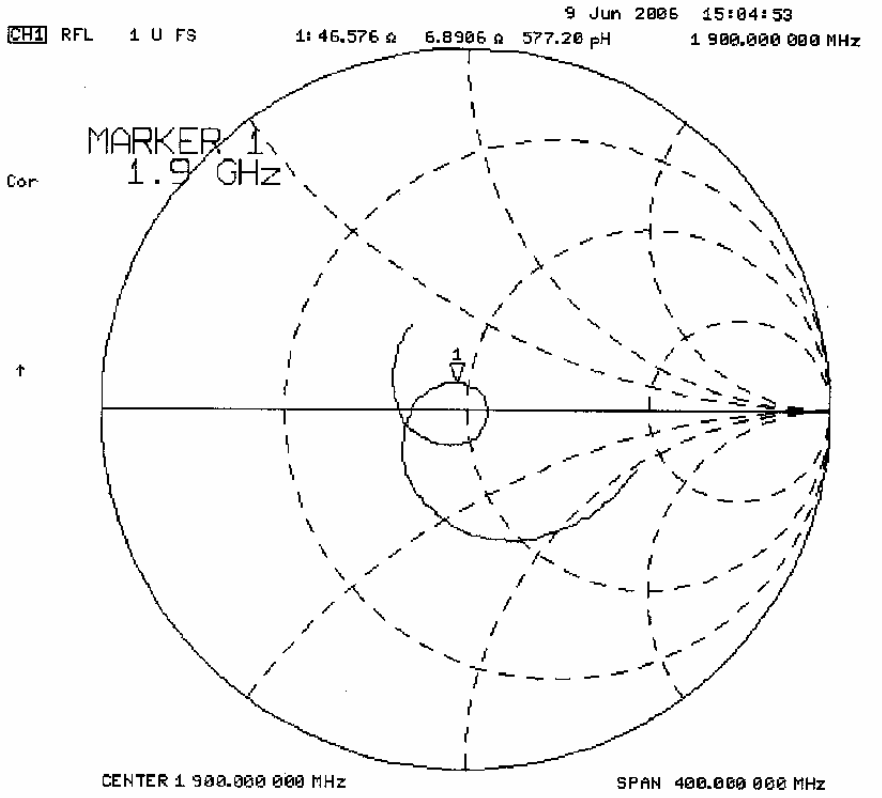
The validation dipole was constructed in accordance with the IEEE Standard "Annex G (informative) Reference dipoles for use in system validation". The electrical properties were measured using an HP 8753ET Network Analyzer. The network analyzer was calibrated to the validation dipole N-type connector 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 1900MHz	Re{Z} = 46.576Ω
	Im{Z} = 6.8906Ω
Return Loss at 1900MHz	-21.945 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

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)

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5. 1900 MHz System Validation Setup

6. 1900 MHz System Validation Dipole

7. Measurement Conditions

The phantom was filled with 1900 MHz Brain tissue simulant.

Relative Permittivity:	39.7 (-0.7% deviation from target)
Conductivity:	1.42 mho/m (+1.5% deviation from target)
Fluid Temperature:	23.5 °C
Fluid Depth:	≥ 15.0 cm

Environmental Conditions:

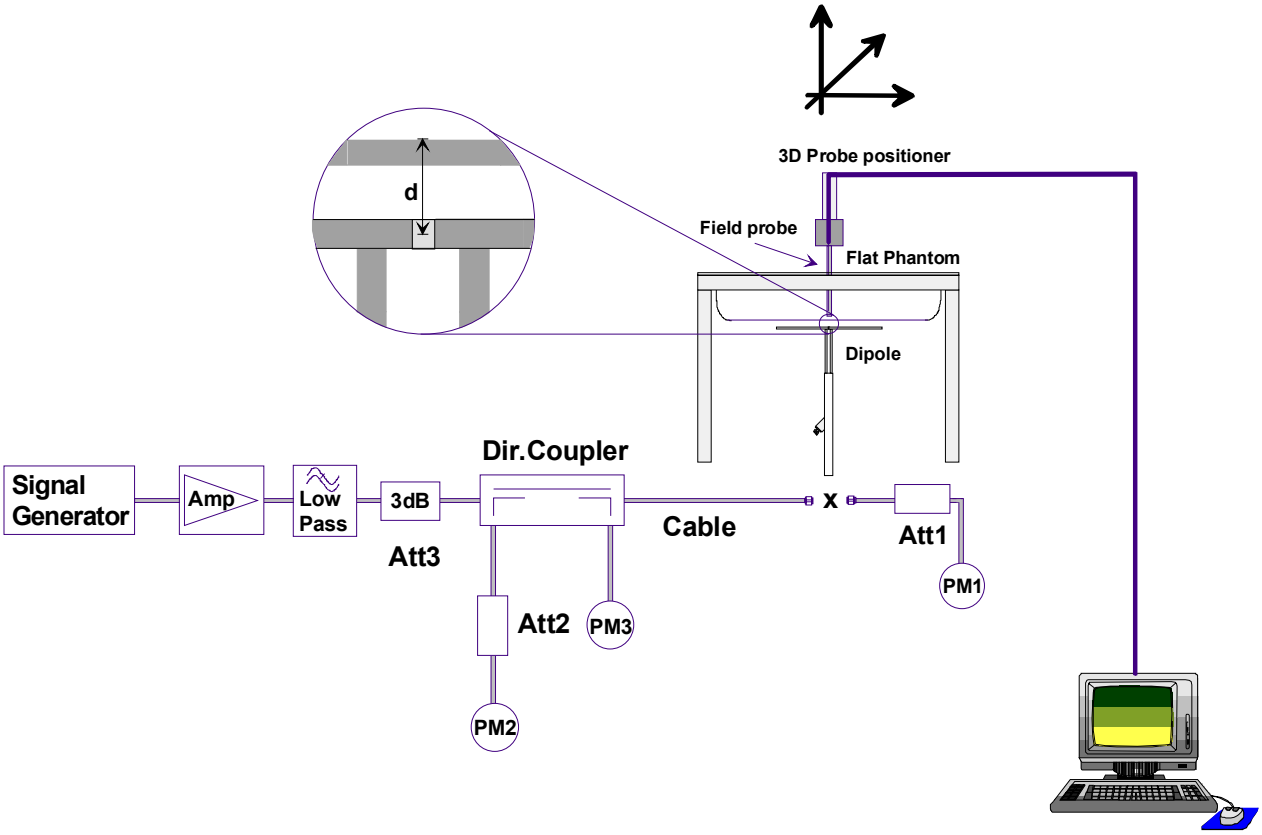
Ambient Temperature:	24.6 °C
Barometric Pressure:	101.2 kPa
Humidity:	35 %

The 1900 MHz Brain tissue simulant consisted of the following ingredients:

Ingredient	Percentage by weight
Water	55.85%
Glycol	44.00%
Salt	0.15%
Target Dielectric Parameters at 25 °C	ε_r = 40.0 (+/- 5%) σ = 1.40 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 50dB below the forward power.

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9. Validation Dipole SAR Test Results

Ten SAR measurements were performed in order to achieve repeatability and to establish an average target value.

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	Peak SAR @ 0.25W Input
Test 1	10.70	42.80	5.51	22.04	12.10
Test 2	10.40	41.60	5.37	21.48	11.80
Test 3	10.30	41.20	5.33	21.32	11.60
Test 4	10.30	41.20	5.31	21.24	11.60
Test 5	10.40	41.60	5.39	21.56	11.80
Test 6	10.60	42.40	5.40	21.60	11.80
Test 7	10.60	42.40	5.40	21.60	11.80
Test 8	10.40	41.60	5.32	21.28	11.60
Test 9	10.40	41.60	5.32	21.28	11.60
Test 10	10.40	41.60	5.31	21.24	11.60
Average	**10.45**	**41.80**	**5.37**	**21.46**	**11.73**

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
39.7	+/- 10%	**41.8**	W/kg	+5.3%	20.5	+/- 10%	**21.46**	W/kg	+4.7%

System Validation (Brain) - 1900 MHz Dipole - June 9, 2006

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 151; Asset: 00032
Ambient Temp: 24.6 °C; Fluid Temp: 23.5 °C; Barometric Pressure: 101.2 kPa; Humidity: 35%
Communication System: CW
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL1900 (σ = 1.42 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3)
- Probe: EX3DV4 - SN3547; ConvF(8.2, 8.2, 8.2); Calibrated: 14/02/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 08/02/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

1900 MHz System Validation/Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm

1900 MHz System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.7 V/m; Power Drift = 0.037 dB
SAR(1 g) = 10.7 mW/g; SAR(10 g) = 5.51 mW/g
Maximum value of SAR (measured) = 12.1 mW/g

1900 MHz System Validation/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.8 V/m; Power Drift = 0.003 dB
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.37 mW/g
Maximum value of SAR (measured) = 11.8 mW/g

1900 MHz System Validation/Zoom Scan 3 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.7 V/m; Power Drift = 0.020 dB
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.33 mW/g
Maximum value of SAR (measured) = 11.6 mW/g

1900 MHz System Validation/Zoom Scan 4 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.2 V/m; Power Drift = 0.041 dB
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.31 mW/g
Maximum value of SAR (measured) = 11.6 mW/g

1900 MHz System Validation/Zoom Scan 5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.1 V/m; Power Drift = 0.036 dB
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.39 mW/g
Maximum value of SAR (measured) = 11.8 mW/g

1900 MHz System Validation/Zoom Scan 7 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.2 V/m; Power Drift = 0.009 dB
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.4 mW/g
Maximum value of SAR (measured) = 11.8 mW/g

1900 MHz System Validation/Zoom Scan 8 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.4 V/m; Power Drift = -0.015 dB
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.4 mW/g
Maximum value of SAR (measured) = 11.8 mW/g

1900 MHz System Validation/Zoom Scan 9 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.6 V/m; Power Drift = -0.009 dB
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.32 mW/g
Maximum value of SAR (measured) = 11.6 mW/g

1900 MHz System Validation/Zoom Scan 10 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.5 V/m; Power Drift = 0.002 dB
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.32 mW/g
Maximum value of SAR (measured) = 11.6 mW/g

1900 MHz System Validation/Zoom Scan 11 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.4 V/m; Power Drift = 0.005 dB
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.31 mW/g
Maximum value of SAR (measured) = 11.6 mW/g

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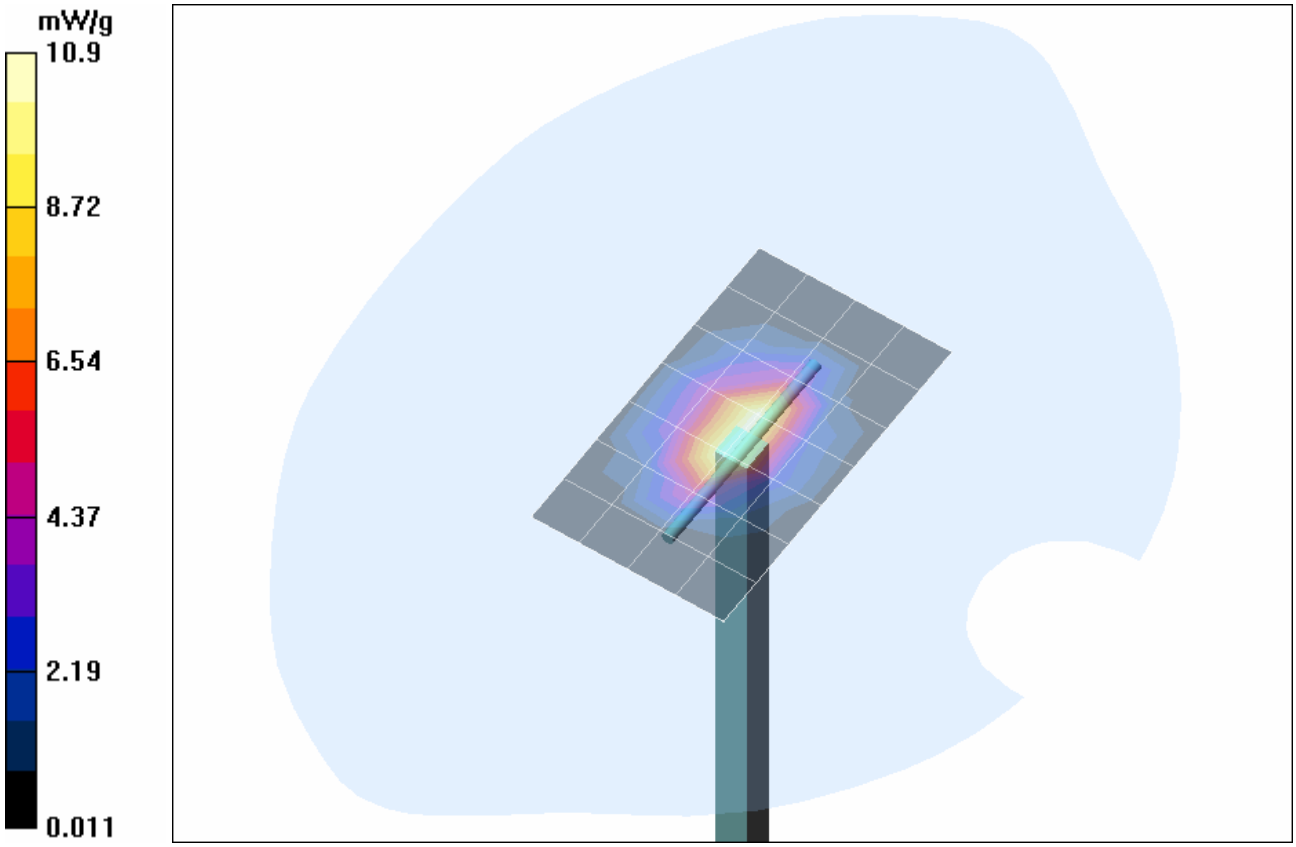
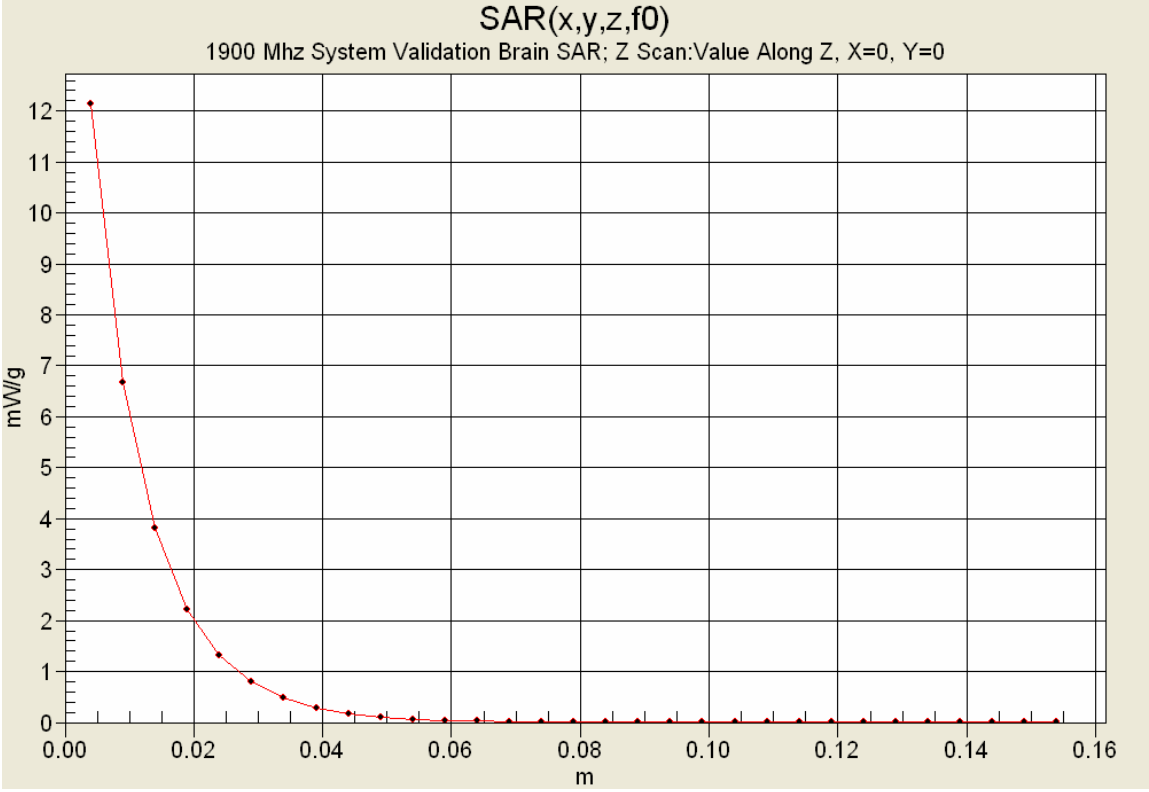


1 g average of 10 measurements: 10.45 mW/g
10 g average of 10 measurements: 5.37 mW/g



10. Measured Fluid Dielectric Parameters

1900 MHz System Validation (Brain)

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Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
Fri 09/Jun/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

****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
1.8000	40.00	1.40	40.27	1.31
1.8100	40.00	1.40	40.15	1.32
1.8200	40.00	1.40	40.10	1.33
1.8300	40.00	1.40	40.01	1.33
1.8400	40.00	1.40	39.93	1.35
1.8500	40.00	1.40	39.90	1.36
1.8600	40.00	1.40	39.84	1.37
1.8700	40.00	1.40	39.77	1.39
1.8800	40.00	1.40	39.81	1.39
1.8900	40.00	1.40	39.73	1.41
1.9000	40.00	1.40	39.65	1.42
1.9100	40.00	1.40	39.71	1.42
1.9200	40.00	1.40	39.61	1.43
1.9300	40.00	1.40	39.67	1.43
1.9400	40.00	1.40	39.52	1.44
1.9500	40.00	1.40	39.61	1.45
1.9600	40.00	1.40	39.44	1.46
1.9700	40.00	1.40	39.46	1.46
1.9800	40.00	1.40	39.41	1.48
1.9900	40.00	1.40	39.32	1.50
2.0000	40.00	1.40	39.31	1.51

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1900 MHz SYSTEM VALIDATION

Type:	**1900 MHz Validation Dipole**
Asset Number:	**00032**
Serial Number:	**151**
Place of Validation:	**Celltech Labs Inc.**
Date of Validation:	**June 12, 2006**

Celltech Labs Inc. certifies that the 1900 MHz System Validation (Body) was performed on the date indicated above.

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

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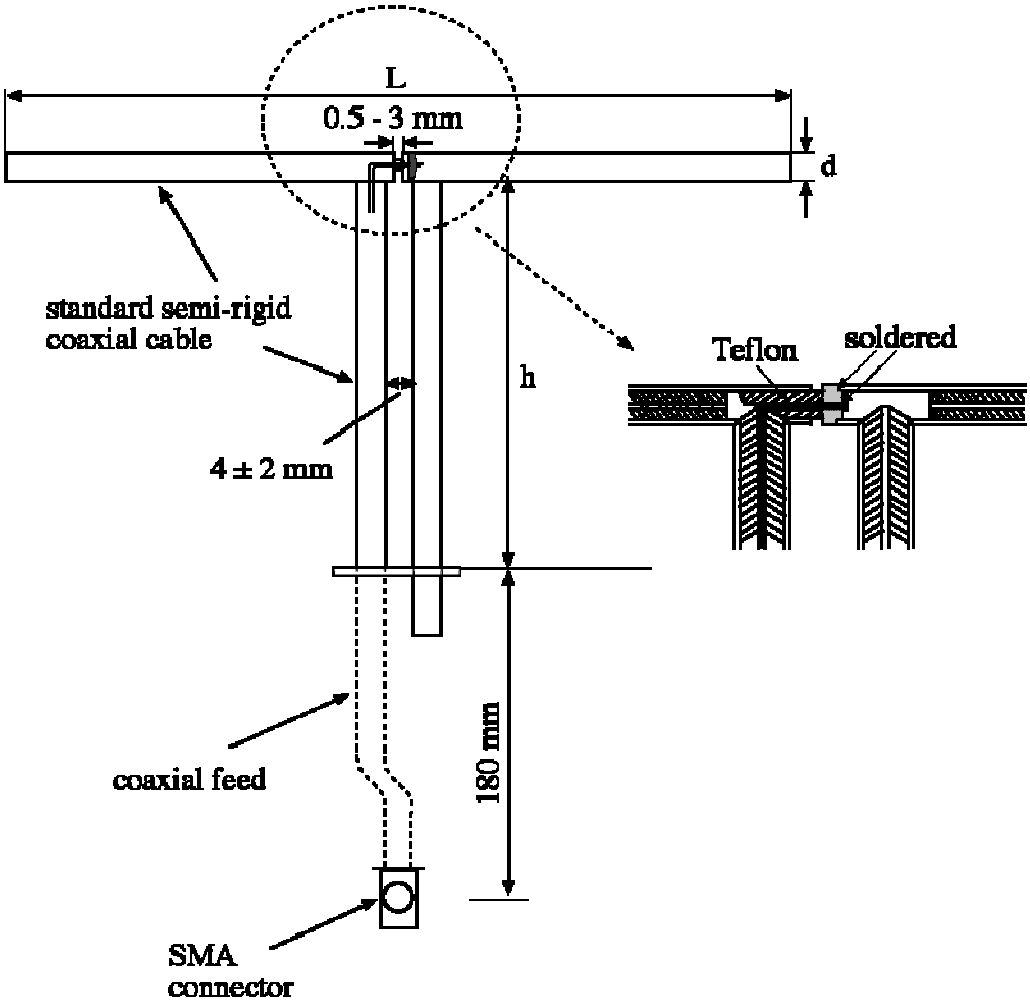
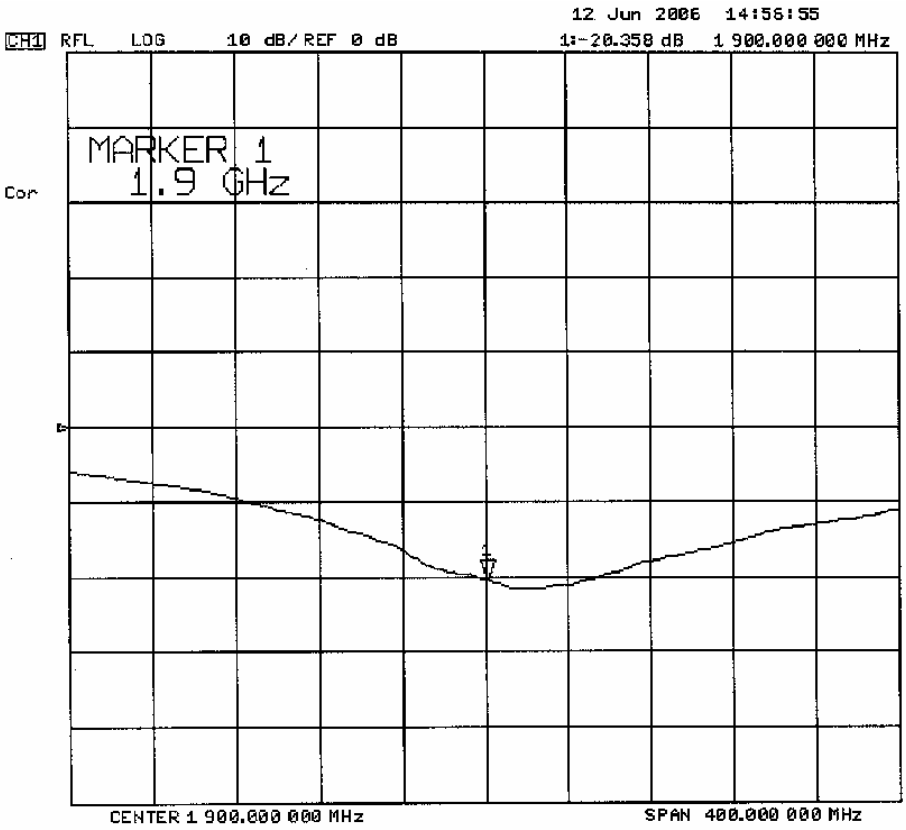
1. Dipole Construction & Electrical Characteristics

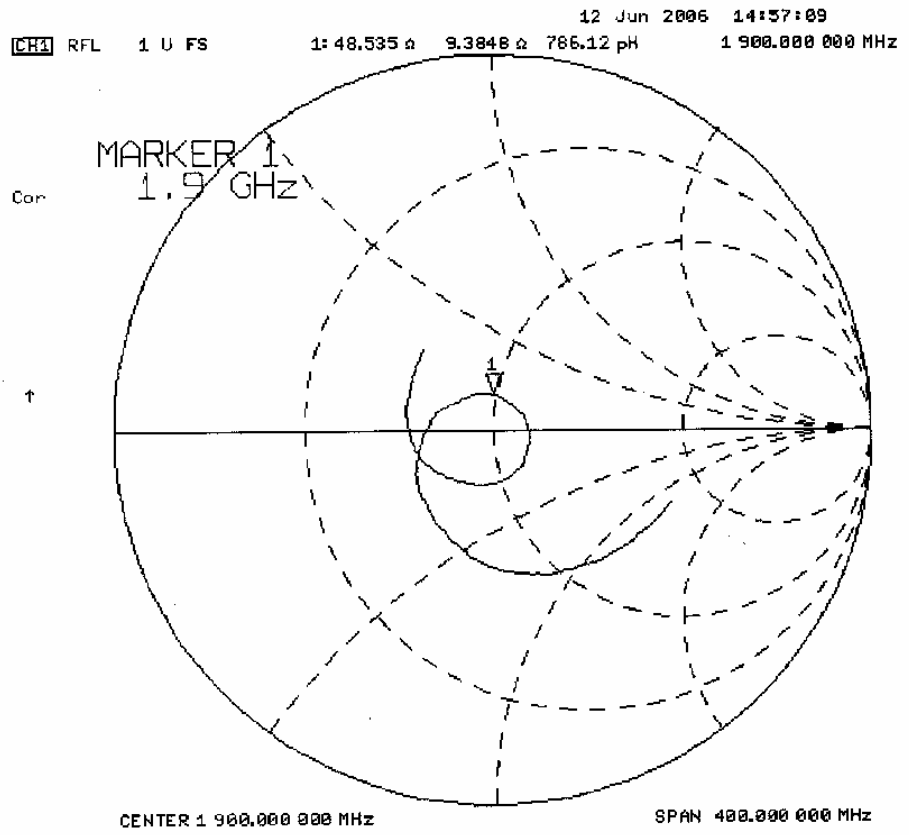
The validation dipole was constructed in accordance with the IEEE Standard "Annex G (informative) Reference dipoles for use in system validation". The electrical properties were measured using an HP 8753ET Network Analyzer. The network analyzer was calibrated to the validation dipole N-type connector 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 1900MHz	Re{Z} = 48.535Ω
	Im{Z} = 9.3848Ω
Return Loss at 1900MHz	-20.358dB



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

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)

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5. 1900 MHz System Validation Setup

6. 1900 MHz Dipole Setup

7. Measurement Conditions

The phantom was filled with 1900 MHz Body tissue simulant.

Relative Permittivity: 51.4 (-3.5% deviation from target)
Conductivity: 1.51 mho/m (-0.5% deviation from target)
Fluid Temperature: 23.5 °C
Fluid Depth: ≥ 15.0 cm

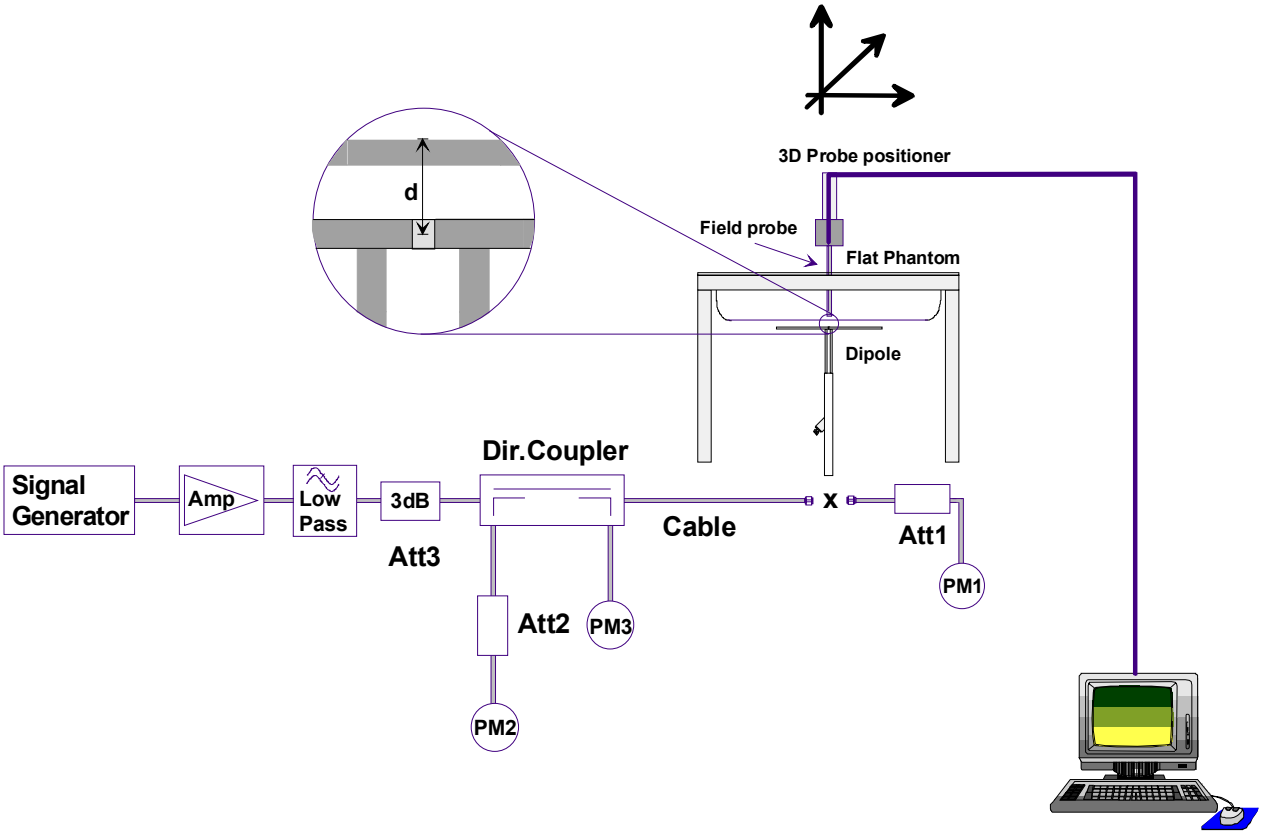
Environmental Conditions:
Ambient Temperature: 23.2 °C
Barometric Pressure: 101.2 kPa
Humidity: 44%

The 1900 MHz Body tissue simulant consisted of the following ingredients:

Ingredient	Percentage by weight
Water	69.85%
Glycol	29.89%
Salt	0.26%
Target Dielectric Parameters at 25 °C	ε_r = 53.3 (+/-5%) σ = 1.52 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 50dB 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.

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	Peak SAR @ 0.25W Input
Test 1	10.50	42.00	5.40	21.60	11.90
Test 2	10.40	41.60	5.37	21.48	11.80
Test 3	10.40	41.60	5.37	21.48	11.80
Test 4	10.60	42.40	5.47	21.88	12.00
Test 5	10.30	41.20	5.30	21.20	11.60
Test 6	10.20	40.80	5.28	21.12	11.60
Test 7	10.20	40.80	5.27	21.08	11.60
Test 8	10.30	41.20	5.34	21.36	11.70
Test 9	10.30	41.20	5.31	21.24	11.60
Test 10	10.30	41.20	5.32	21.28	11.70
Average	**10.35**	**41.40**	**5.34**	**21.37**	**11.73**

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 (W/kg)	Deviation from Target (%)	Target SAR @ 1 Watt Input averaged over 10 grams (W/kg)		Measured SAR @ 1 Watt Input averaged over 10 grams (W/kg)	Deviation from Target (%)
39.8	+/- 10%	41.40	+4.02	20.8	+/- 10%	21.37	+2.74

Dipole Type	Distance [mm]	Frequency [MHz]	SAR (1g) [W/kg]	SAR (10g) [W/kg]	SAR (peak) [W/kg]
D300V2	15	300	3.02	2.06	4.36
D450V2	15	450	5.01	3.36	7.22
D835V2	15	835	9.71	6.38	14.1
D900V2	15	900	11.1	7.17	16.3
D1450V2	10	1450	29.6	16.6	49.8
D1500V2	10	1500	30.8	17.1	52.1
D1640V2	10	1640	34.4	18.7	59.4
D1800V2	10	1800	38.5	20.3	67.5
D1900V2	10	1900	39.8	20.8	69.6
D2000V2	10	2000	40.9	21.2	71.5
D2450V2	10	2450	51.2	23.7	97.6
D3000V2	10	3000	61.9	24.8	136.7

Table 32.1: Numerical reference SAR values for SPEAG dipoles and flat phantom filled with body-tissue simulating liquid. Note: All SAR values normalized to 1 W forward power.

System Validation (Body) - 1900 MHz Dipole - June 12, 2006

Dipole: 1900 MHz; Serial: 151
Ambient Temp: 23.2 °C; Fluid Temp: 23.5°C; Barometric Pressure: 101.2 kPa; Humidity: 44%
Communication System: CW
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: M1900 (σ = 1.51 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3)
- Probe: EX3DV4 - SN3547; ConvF(7.84, 7.84, 7.84); Calibrated: 14/02/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 08/02/2006
- Phantom: SAM 4.0; Type: Fiberglas; Serial: 1033
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

1900 MHz System Validation/Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm

1900 MHz System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.7 V/m; Power Drift = -0.024 dB
SAR(1 g) = 10.5 mW/g; SAR(10 g) = 5.4 mW/g
Maximum value of SAR (measured) = 11.9 mW/g

1900 MHz System Validation/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.7 V/m; Power Drift = -0.033 dB
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.37 mW/g
Maximum value of SAR (measured) = 11.8 mW/g

1900 MHz System Validation/Zoom Scan 3 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.5 V/m; Power Drift = -0.011 dB
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.37 mW/g
Maximum value of SAR (measured) = 11.8 mW/g

1900 MHz System Validation/Zoom Scan 4 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.3 V/m; Power Drift = 0.003 dB
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.47 mW/g
Maximum value of SAR (measured) = 12.0 mW/g

1900 MHz System Validation/Zoom Scan 5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.9 V/m; Power Drift = -0.004 dB
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.3 mW/g
Maximum value of SAR (measured) = 11.6 mW/g

1900 MHz System Validation/Zoom Scan 6 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.9 V/m; Power Drift = -0.007 dB
SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.28 mW/g
Maximum value of SAR (measured) = 11.6 mW/g

1900 MHz System Validation/Zoom Scan 7 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.6 V/m; Power Drift = -0.008 dB
SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.27 mW/g
Maximum value of SAR (measured) = 11.6 mW/g

1900 MHz System Validation/Zoom Scan 8 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.3 V/m; Power Drift = -0.006 dB
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.34 mW/g
Maximum value of SAR (measured) = 11.7 mW/g

1900 MHz System Validation/Zoom Scan 9 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.9 V/m; Power Drift = -0.019 dB
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.31 mW/g
Maximum value of SAR (measured) = 11.6 mW/g

1900 MHz System Validation/Zoom Scan 10 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.2 V/m; Power Drift = -0.013 dB
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.32 mW/g
Maximum value of SAR (measured) = 11.7 mW/g

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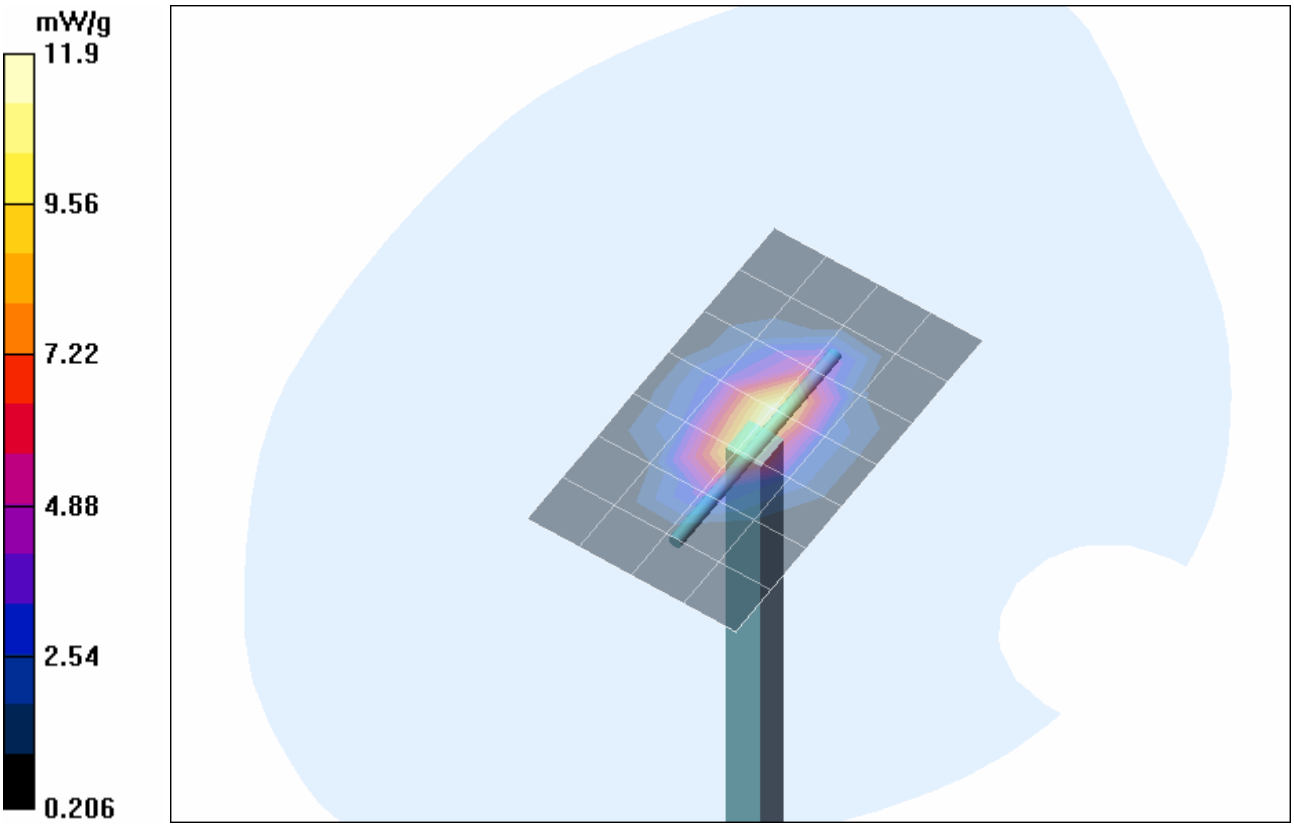
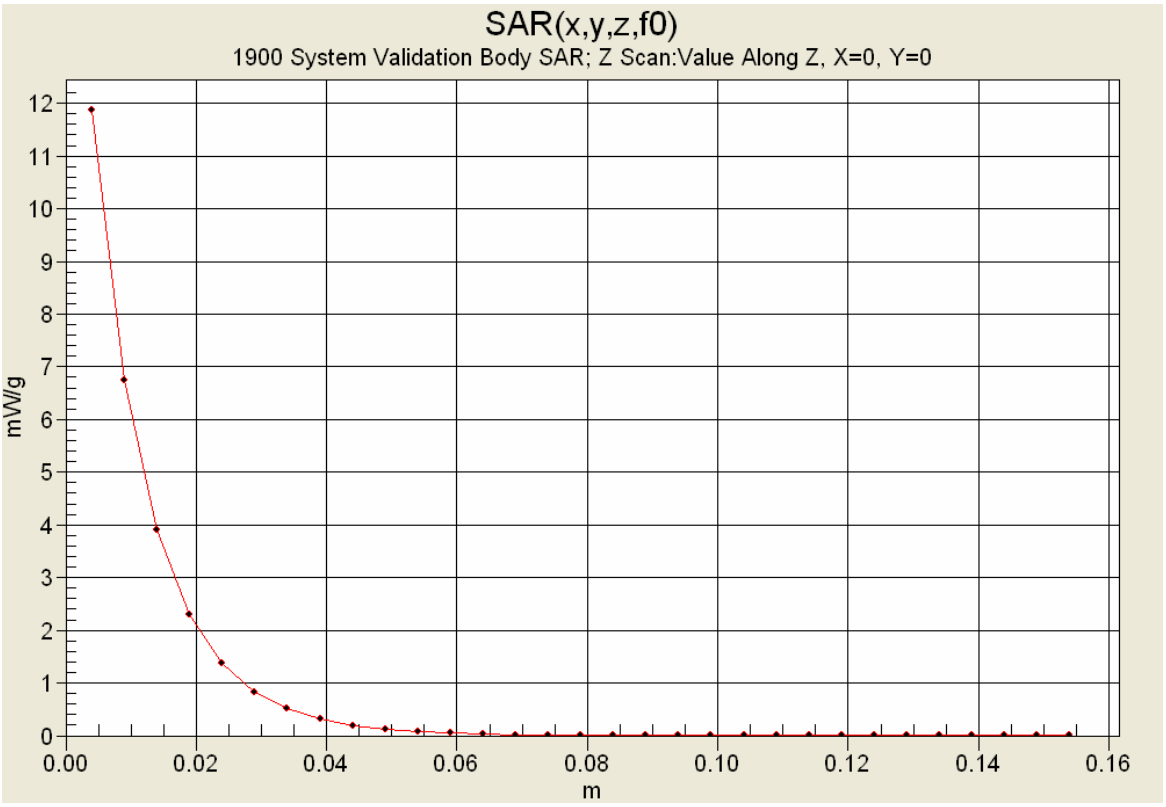


1 g average of 10 measurements: 10.35 mW/g
10 g average of 10 measurements: 5.34 mW/g



10. Measured Fluid Dielectric Parameters

1900 MHz Dipole System Validation (Body)

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Celltech Labs Inc.
Test Result for UIM Dielectric Parameter
Mon 12/Jun/2006
Frequency(GHz)
FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB FCC Limits for Body Epsilon
FCC_sB FCC Limits for Body Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM

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Freq	FCC_eB	FCC_sB	Test_e	Test_s
1.8000	53.30	1.52	51.68	1.43
1.8100	53.30	1.52	51.72	1.44
1.8200	53.30	1.52	51.59	1.44
1.8300	53.30	1.52	51.60	1.45
1.8400	53.30	1.52	51.57	1.46
1.8500	53.30	1.52	51.47	1.46
1.8600	53.30	1.52	51.50	1.48
1.8700	53.30	1.52	51.46	1.49
1.8800	53.30	1.52	51.51	1.49
1.8900	53.30	1.52	51.37	1.52
1.9000	53.30	1.52	51.36	1.51
1.9100	53.30	1.52	51.28	1.54
1.9200	53.30	1.52	51.23	1.54
1.9300	53.30	1.52	51.23	1.55
1.9400	53.30	1.52	51.25	1.56
1.9500	53.30	1.52	51.31	1.57
1.9600	53.30	1.52	51.16	1.59
1.9700	53.30	1.52	51.21	1.59
1.9800	53.30	1.52	51.19	1.61
1.9900	53.30	1.52	51.12	1.62
2.0000	53.30	1.52	51.13	1.63