Testing and Engineering Services Lab

March 26, 2002

Federal Communications Commission
Equipment Approval Services
7435 Oakland Mills Road
Columbia, MD 21046
Attn: Stan Lyles

SUBJECT: **TOPAZ3, L.L.C.**
FCC ID: O7KPL5161
731 Confirmation No.: EA666040
Correspondence Ref. No.: 22265

Dear Stan:

On behalf of Topaz3, L.L.C. is our response to Items 1 and 3-7 of your e-mail dated March 11, 2002 requesting additional information for the subject application.

1. The conducted power measurements were made at two alternate test houses with different equipment. The conducted power measurement accuracy as stated on the EMC report is +/- 3%. A similar measurement uncertainty exists for the SAR report. The EUT was calibrated at its maximum power; therefore it is assumed that both the EMC and SAR reports reflect the same conducted power measurement taking into account the measurement uncertainties.
2. Please see attached Z-Axis SAR scans demonstrating 15cm liquid depth.
3. Included in the SAR report (Appendix C - Dipole Calibration) are historical SAR evaluations for the calibration of the 300MHz dipole. The target value for the 300MHz Validation Dipole was based on repeated SAR measurements using extrapolated E-field probe conversion factors for 300MHz. Since that time, numerically derived conversion factors for another E-field probe have been supplied by the system manufacturer. Preliminary data reveals that with the new conversion factors the validation dipole is within 10% of the target values as prescribed in IEEE P1528. Therefore, it is assumed that by using old extrapolated E-field conversion factors, the actual SAR values for the EUT are approximately 17% higher than reported. A new dipole calibration with the newly acquired E-field probe conversion factors will commence in the near future. Attached is a copy of the system manufacturer's 900MHz dipole validation, and our own 900MHz dipole validation, which was performed a few days before the subject testing. At present all validations performed at both 900MHz and 1800MHz have been within the recommended tolerances as prescribed by the system manufacturer. Any values obtained outside the tolerances would have initiated an investigation.
4. Please see attached revised uncertainty budget.
5. Please see attached SAR test data and photographs for the metal belt-clip taken with the bottom of the radio tilted, and touching the outer surface of the planar phantom, and also with the top of the radio tilted and the tip of the antenna touching the surface of the planar phantom.
6. Please see attached print out of the measured dielectric tissue parameters.

If you have any questions or comments concerning the above, please do not hesitate to contact me.

Sincerely,

Shawn McMillen
General Manager
Celltech Research Inc.
Testing & Engineering Lab

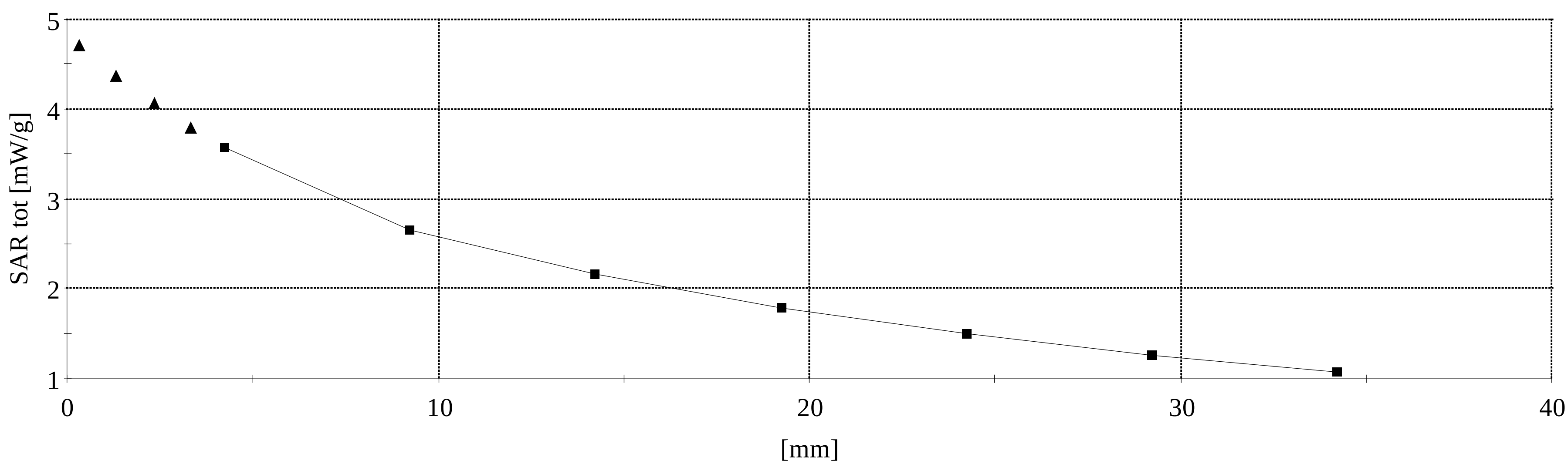
cc: Topaz3 L.L.C.
Rhein Tech Labs

Topaz 3 L.L.C. FCC ID: O7KPL5161

Small Planar Phantom; Planar Section
Probe: ET3DV6 - SN1590; ConvF(7.71,7.71,7.71); Crest factor: 1.0;
150 MHz Brain : $\sigma = 0.76$ mho/m $\varepsilon_r = 52.3$ $\rho = 1.00$ g/cm^3
Cube 4x4x7

Z-Axis Extrapolation at Peak SAR Location

Face SAR at 2.5cm Separation Distance
Portable VHF PTT Radio Transceiver
Antenna: ACC-115B
Topaz3 Model: PL5161
Continuous Wave Mode
Mid Channel [155.025 MHz]
Conducted Power: 5.0 Watts
Date Tested: November 27, 2001

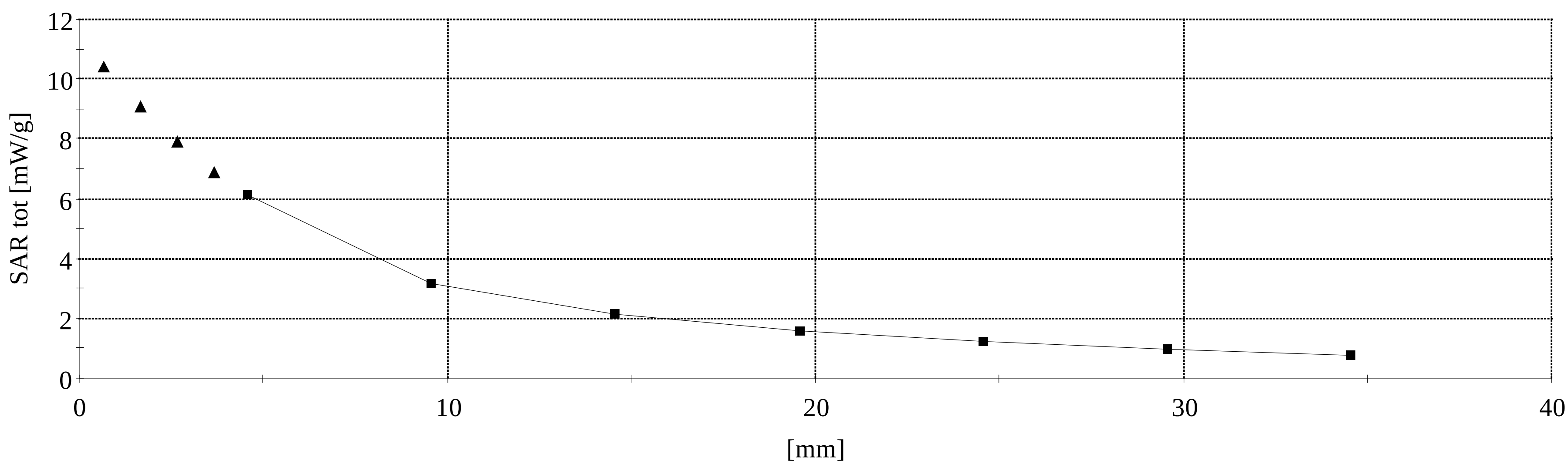


Topaz 3 L.L.C. FCC ID: O7KPL5161

Small Planar Phantom; Planar Section
Probe: ET3DV6 - SN1590; ConvF(7.65,7.65,7.65); Crest factor: 1.0;
150 MHz Muscle: $\sigma = 0.80$ mho/m $\varepsilon_r = 61.9$ $\rho = 1.00$ g/cm^3
Cube 4x4x7

Z-Axis Extrapolation at Peak SAR Location

Body-Worn SAR with 1.2cm Metal Belt Clip
Portable VHF PTT Radio Transceiver
Antenna: ACC-115B
Topaz3 Model: PL5161
Continuous Wave Mode
Low Channel [148.025 MHz]
Conducted Power: 5.0 Watts
Date Tested: November 27, 2001

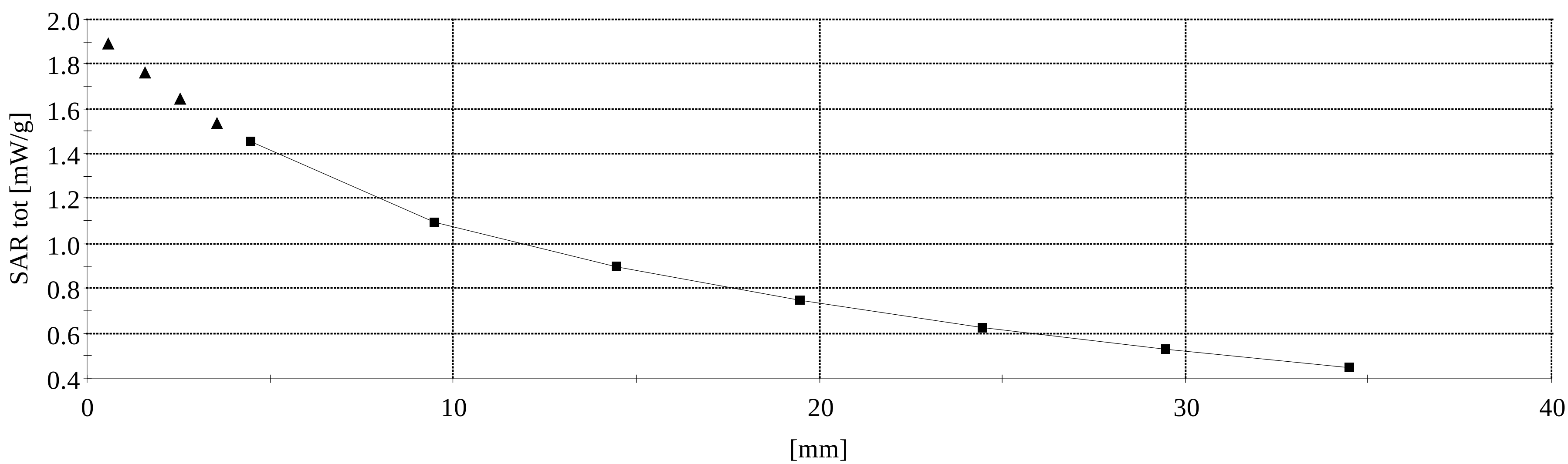


Topaz 3 L.L.C. FCC ID: O7KPL5161

Small Planar Phantom; Planar Section
Probe: ET3DV6 - SN1590; ConvF(7.65,7.65,7.65); Crest factor: 1.0;
150 MHz Muscle: $\sigma = 0.80$ mho/m $\varepsilon_r = 61.9$ $\rho = 1.00$ g/cm^3
Cube 4x4x7

Z-Axis Extrapolation at Peak SAR Location

Body-Worn SAR with 4.5cm Leather Loop and Case
Portable VHF PTT Radio Transceiver
Antenna: ACC-115B
Topaz3 Model: PL5161
Continuous Wave Mode
High Channel [173.980 MHz]
Conducted Power: 5.0 Watts
Date Tested: November 27, 2001



Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate

900 MHz System Validation Dipole

Type:	**D900V2**
Serial Number:	**054**
Place of Calibration:	**Zurich**
Date of Calibration:	**June 20, 2001**
Calibration Interval:	**24 months**

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by: Pokovic Katja

Approved by:

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

DASY

Dipole Validation Kit

Type: D900V2

Serial: 054

Manufactured: August 25, 1999
Calibrated: June 20, 2001

1. Measurement Conditions

The measurements were performed in the flat section of the new generic twin phantom filled with head simulating solution of the following electrical parameters at 900 MHz:

Relative Dielectricity	**42.4**	± 5%
Conductivity	**0.97 mho/m**	± 5%

The DASY3 System (Software version 3.1c) with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.27 at 900 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15mm from dipole center to the solution surface. The included distance holder was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 5x5x7 fine cube was chosen for cube integration. Probe isotropy errors were cancelled by measuring the SAR with normal and 90° turned probe orientations and averaging.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement

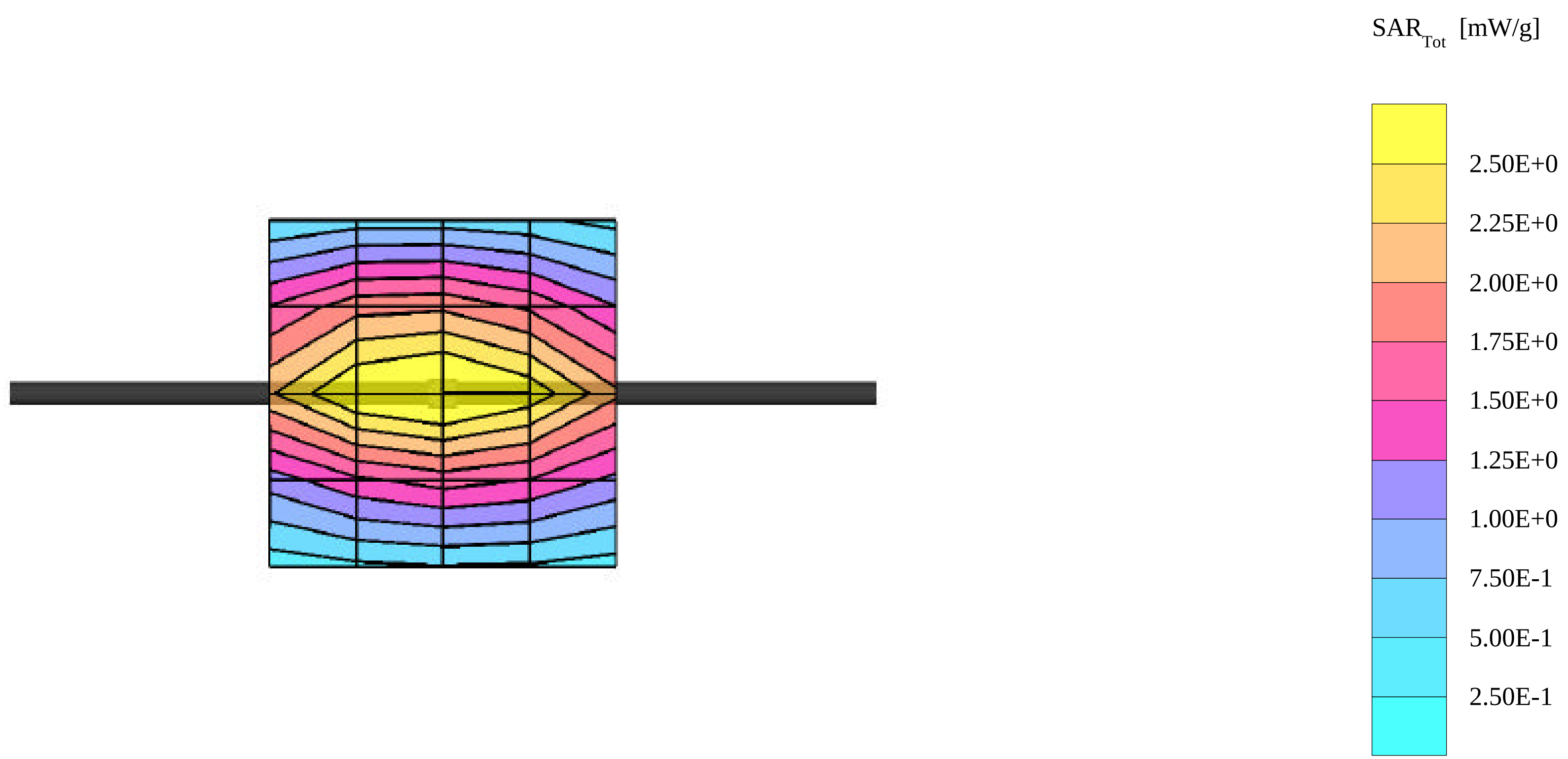
Standard SAR-measurements were performed with the phantom according to the measurement conditions described in section 1. The results have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values are:

averaged over 1 cm^3 (1 g) of tissue:	**11.12 mW/g**
averaged over 10 cm^3 (10 g) of tissue:	**7.04 mW/g**

Note: If the liquid parameters for validation are slightly different from the ones used for initial calibration, the SAR-values will be different as well.

Validation Dipole D900V2 SN:054, d = 15 mm

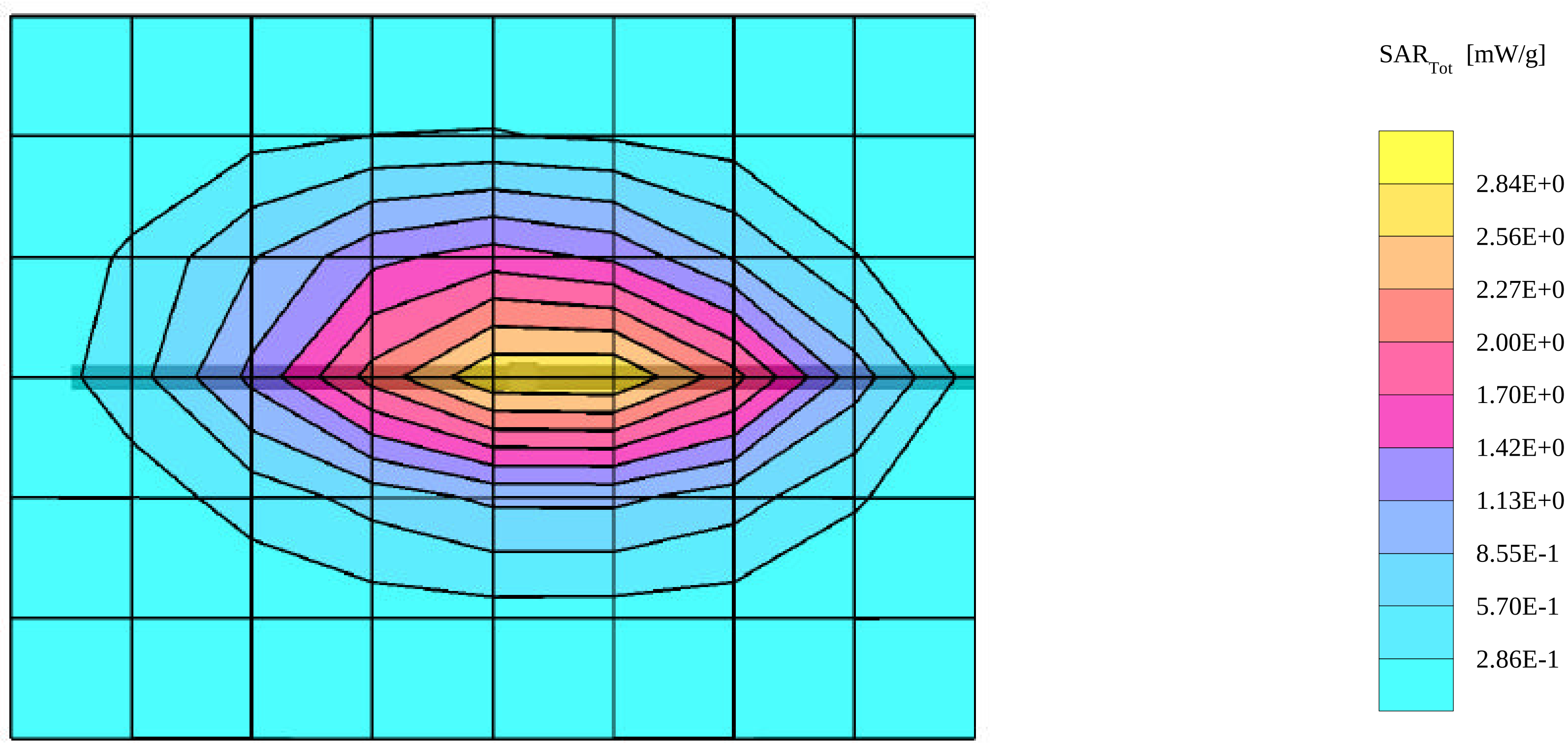
Frequency: 900 MHz; Antenna Input Power: 250 [mW]
Generic Twin Phantom; Flat Section; Grid Spacing:Dx = 15.0, Dy = 15.0, Dz = 10.0
Probe: ET3DV6 - SN1507; ConvF(6.27,6.27,6.27); Crest factor: 1.0; IEEE1528 900 MHz: $\sigma = 0.97$ mho/m $\varepsilon_r = 42.4$ $\rho = 1.00$ g/cm^3
Cubes (2): Peak: 4.47 mW/g ± 0.05 dB, SAR (1g): 2.78 mW/g ± 0.04 dB, SAR (10g): 1.76 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 11.5 (10.3, 13.2) [mm]
Powerdrift: -0.00 dB



Dipole 900 MHz

SAM Phantom; Flat Section
Probe: ET3DV6 - SN1590; ConvF(6.83,6.83,6.83); Crest factor: 1.0; 900 MHz Brain: σ = 0.97 mho/m ϵ_r = 42.1 ρ = 1.00 g/cm^3
Cube 5x5x7: Peak: 4.42 mW/g, SAR (1g): 2.75 mW/g, SAR (10g): 1.73 mW/g, (Worst-case extrapolation)
Penetration depth: 11.3 (10.2, 12.7) [mm]
Powerdrift: 0.03 dB

900MHz Dipole Validation
Conducted Power: 250.0 mW
Date Tested: November 23, 2001



MEASUREMENT UNCERTAINTIES

Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	c_i 1g	Standard Uncertainty ±% (1g)	v_i or v_{eff}
Measurement System						
Probe calibration	± 4.4	Normal	1	1	± 4.4	∞
Axial isotropy of the probe	± 4.7	Rectangular	√3	$(1-c_p)$	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	√3	(c_p)	± 3.9	∞
Spatial resolution	± 0.0	Rectangular	√3	1	± 0.0	∞
Boundary effects	± 5.5	Rectangular	√3	1	± 3.2	∞
Probe linearity	± 4.7	Rectangular	√3	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	√3	1	± 0.6	∞
Readout electronics	± 1.0	Normal	1	1	± 1.0	∞
Response time	± 0.8	Rectangular	√3	1	± 0.5	∞
Integration time	± 1.4	Rectangular	√3	1	± 0.8	∞
RF ambient conditions	± 3.0	Rectangular	√3	1	± 1.7	∞
Mech. constraints of robot	± 0.4	Rectangular	√3	1	± 0.2	∞
Probe positioning	± 2.9	Rectangular	√3	1	± 1.7	∞
Extrap. & integration	± 3.9	Rectangular	√3	1	± 2.3	∞
Test Sample Related						
Device positioning	± 6.0	Normal	0.89	1	± 6.7	12
Device holder uncertainty	± 5.0	Normal	0.84	1	± 5.9	8
Power drift	± 5.0	Rectangular	√3		± 2.9	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid conductivity (measured)	± 10.0	Rectangular	√3	0.6	± 3.5	∞
Liquid permittivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (measured)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Combined Standard Uncertainty					**± 13.6**	
Expanded Uncertainty (k=2)					**± 27.1**	

The divisor for device positioning uncertainty and holder uncertainty is based on the procedure defined in IEEE Std 1528 (draft), or based on the degrees of freedom for each error source.

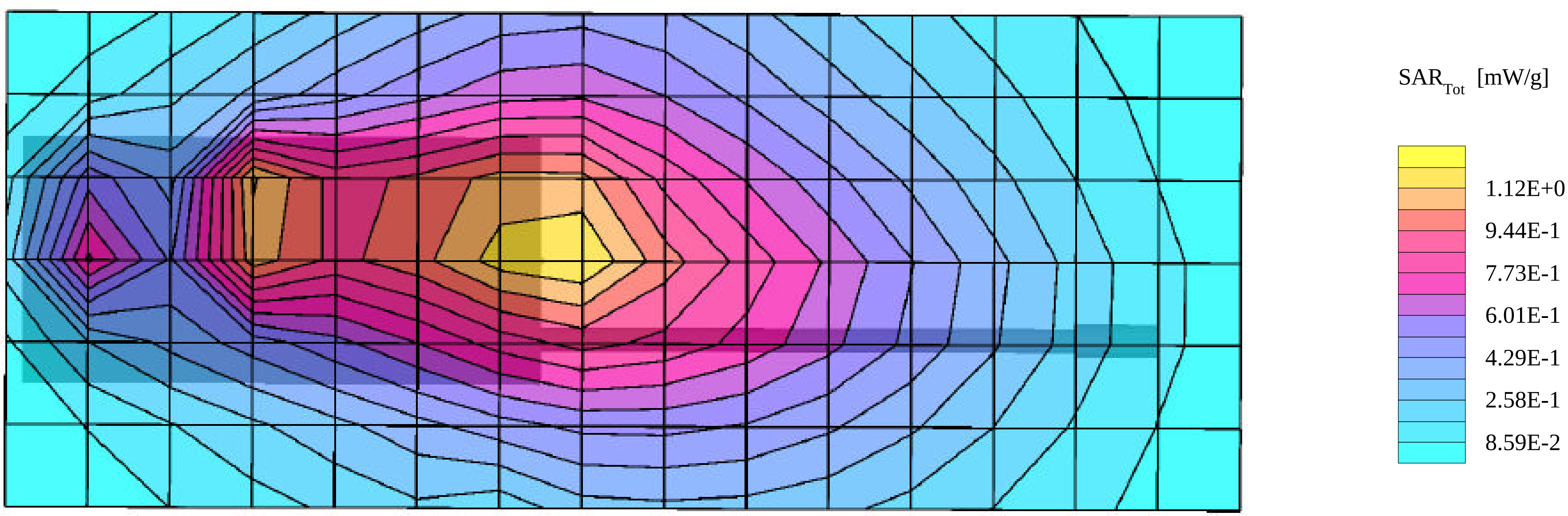
For estimation of Device Positioning Uncertainty (divisor=0.89) 12 different devices were used (see last column - i.e. degrees of freedom). The corresponding k_p factor for v_{eff}=12 is 2.23, therefore the divisor is 2/2.23=0.89.

For estimation of Device Holder Uncertainty (divisor=0.84) 8 different devices were used (see last column - i.e. degrees of freedom). The corresponding k_p factor for v_{eff}=8 is 2.37, therefore the divisor is 2/2.37=0.84.

Topaz 3 L.L.C. FCC ID: O7KPL5161

Small Planar Phantom; Planar Section; Position: (270°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.65,7.65,7.65); Crest factor: 1.0
150 MHz Muscle: σ = 0.80 mho/m ε_r = 61.5 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: 0.02 dB
SAR (1g): 1.46 mW/g, SAR (10g): 0.738 mW/g

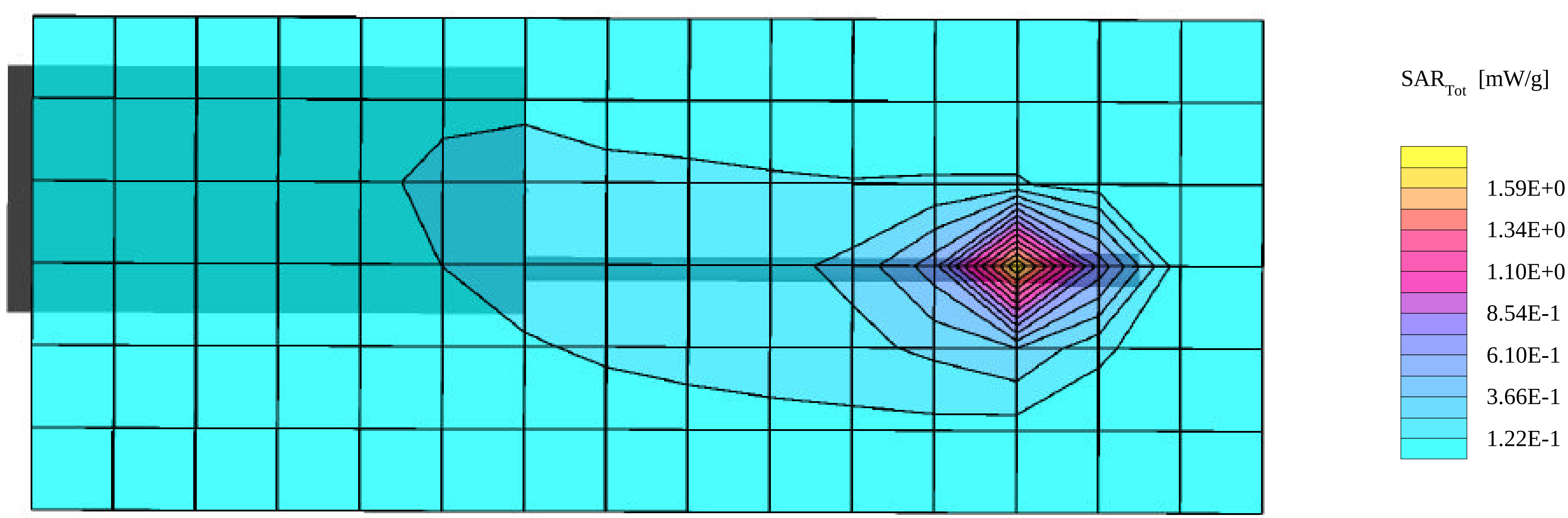
Body-Worn SAR with 1.2cm Metal Belt Clip
Tilted with bottom of unit touching phantom surface
Portable VHF PTT Radio Transceiver
Antenna: ACC-115B
Topaz3 Model: PL5161
Continuous Wave Mode
Low Channel [148.025 MHz]
Conducted Power: 5.2 Watts
Date Tested: March 22, 2002



Topaz 3 L.L.C. FCC ID: O7KPL5161

Small Planar Phantom; Planar Section; Position: (270°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.65,7.65,7.65); Crest factor: 1.0
150 MHz Muscle: $\sigma = 0.80$ mho/m $\varepsilon_r = 61.5$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.06 dB
SAR (1g): 1.96 mW/g, SAR (10g): 0.716 mW/g

Body-Worn SAR with 1.2cm Metal Belt Clip
Tilted with antenna tip touching planar phantom
Portable VHF PTT Radio Transceiver
Antenna: ACC-115B
Topaz3 Model: PL5161
Continuous Wave Mode
Low Channel [148.025 MHz]
Conducted Power: 5.2 Watts
Date Tested: March 22, 2002



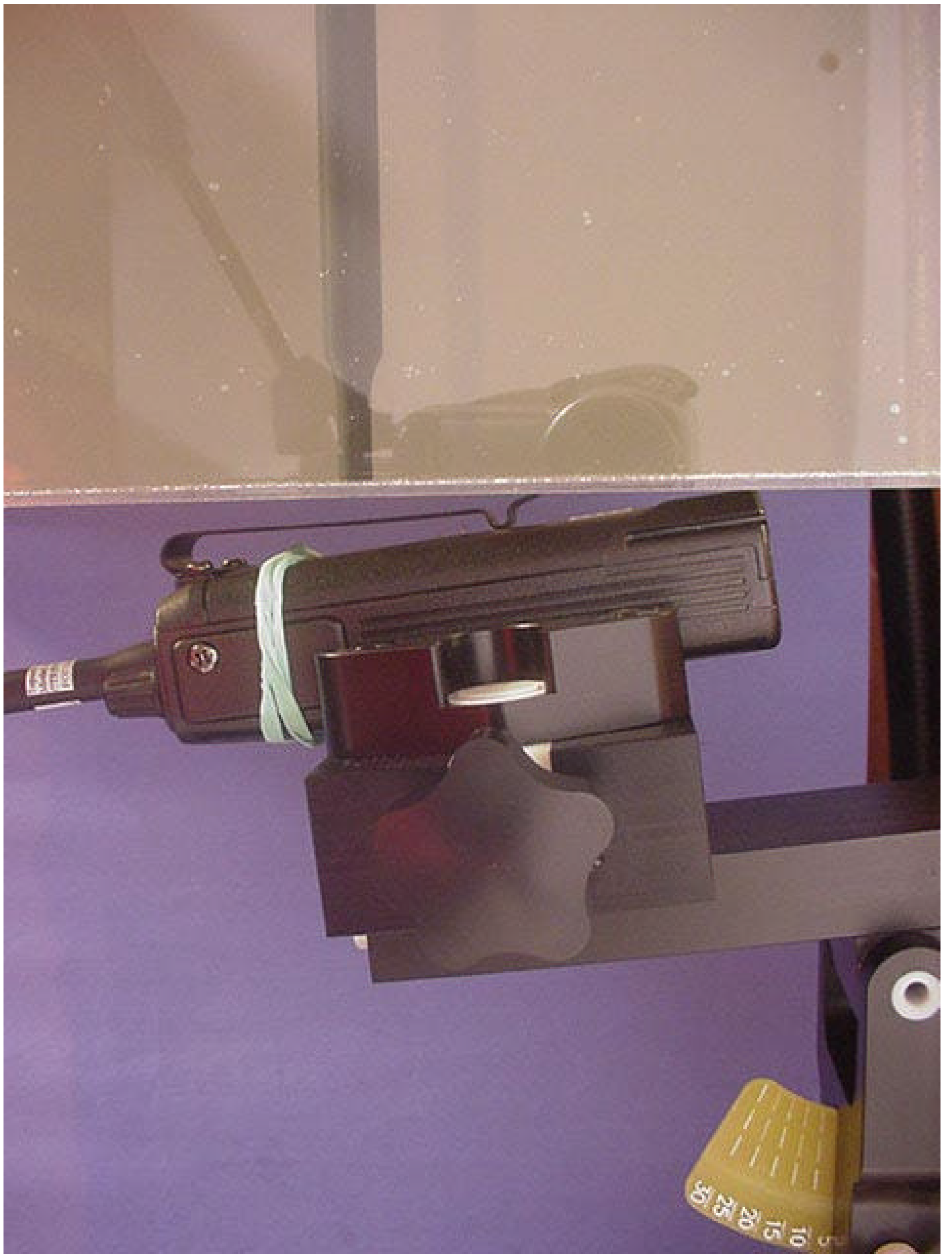
150MHz EUT Evaluation

Measured Liquid Dielectric Parameters (Body)

March 22, 2002

Frequency	e'	e''
100.000000 MHz	63.7323	120.4888
105.000000 MHz	63.6177	120.1430
110.000000 MHz	63.4542	119.5010
115.000000 MHz	62.9894	118.2399
120.000000 MHz	62.8696	110.3970
125.000000 MHz	62.6661	109.6278
130.000000 MHz	62.5197	105.8746
135.000000 MHz	61.9459	100.3151
140.000000 MHz	61.5806	99.5087
145.000000 MHz	61.6588	98.7307
150.000000 MHz	61.5105	95.8278
155.000000 MHz	60.8197	95.7746
160.000000 MHz	60.0283	95.3525
165.000000 MHz	59.8976	94.7159
170.000000 MHz	59.6738	94.5391
175.000000 MHz	59.6129	93.9768
180.000000 MHz	59.4046	92.1174
185.000000 MHz	59.3879	90.3843
190.000000 MHz	59.1399	88.7814
195.000000 MHz	59.1634	87.3186
200.000000 MHz	58.7953	85.9008

BODY-WORN SAR TEST SETUP PHOTOGRAPHS
Bottom Tip of EUT & Belt-Clip Touching Phantom Surface



BODY-WORN SAR TEST SETUP PHOTOGRAPHS
Tip of Antenna & Belt-Clip Touching Phantom Surface

150MHz EUT Evaluation

Measured Liquid Dielectric Parameters (Brain)

November 27, 2001

Frequency	e'	e''
100.000000 MHz	55.9011	130.6403
102.000000 MHz	56.1181	128.8191
104.000000 MHz	55.8112	126.0708
106.000000 MHz	55.9538	124.5600
108.000000 MHz	55.6830	122.4436
110.000000 MHz	55.6038	120.3206
112.000000 MHz	55.2856	118.5399
114.000000 MHz	55.1845	116.6320
116.000000 MHz	54.9943	115.0406
118.000000 MHz	54.7207	113.0915
120.000000 MHz	54.6098	111.5398
122.000000 MHz	54.4783	109.5704
124.000000 MHz	54.4067	108.0898
126.000000 MHz	54.4909	106.4850
128.000000 MHz	53.9828	105.2497
130.000000 MHz	54.0297	103.5502
132.000000 MHz	54.0517	102.5852
134.000000 MHz	54.0514	101.2523
136.000000 MHz	53.8747	100.0286
138.000000 MHz	53.5746	98.6694
140.000000 MHz	53.5235	97.4516
142.000000 MHz	53.3949	96.3880
144.000000 MHz	53.3097	95.0662
146.000000 MHz	53.2727	94.0145
148.000000 MHz	52.6306	92.8961
150.000000 MHz	52.5494	91.7407
152.000000 MHz	52.2993	90.7936
154.000000 MHz	52.2524	89.9223
156.000000 MHz	52.2398	88.8910
158.000000 MHz	52.1705	88.0409
160.000000 MHz	52.1214	87.1742
162.000000 MHz	51.9974	86.1550
164.000000 MHz	51.8890	85.3236
166.000000 MHz	51.7153	84.7358
168.000000 MHz	51.8560	83.6749

150MHz EUT Evaluation

Measured Liquid Dielectric Parameters (Body)

November 27, 2001

Frequency	e'	e''
100.000000 MHz	64.9331	102.8650
105.000000 MHz	64.0851	101.8940
110.000000 MHz	64.0214	100.9824
115.000000 MHz	64.1660	100.1368
120.000000 MHz	63.9403	99.9220
125.000000 MHz	63.7522	99.6360
130.000000 MHz	63.5185	98.8007
135.000000 MHz	63.4486	98.5876
140.000000 MHz	63.2978	97.8446
145.000000 MHz	63.1098	97.0230
150.000000 MHz	62.3124	96.0529
155.000000 MHz	61.9956	95.1040
160.000000 MHz	61.7893	93.4630
165.000000 MHz	60.9479	91.8511
170.000000 MHz	60.4851	90.1989
175.000000 MHz	59.6004	88.4978
180.000000 MHz	58.8164	88.2901
185.000000 MHz	57.8573	87.7953
190.000000 MHz	56.4963	87.5044
200.000000 MHz	55.3124	86.0602