

**Attachment to SAR report 10-20-02 per FCC
Correspondence number 24202**

FCC ID: PL5GPC-6210

10/25/02

SAR test facility Bay Area Compliance Lab Corporation

Purpose: This document is an appendix to the GTRAN SAR report for FCC ID: PL5GPC-6210 in response to a request for additional support data in Correspondence number 24202.

Sections:

- I. Validation Verification
- II. Additional Data to determine worst case SAR positioning
- III. Test Configuration Photographs
- IV. Validation SAR results
- V. SAR Measurement Data

I. Validation Verification

In order to justify system validation with body tissue per FCC request in correspondence #24202, the Dasy3 system was first validated with known validation target SAR values with the available test equipment for 900 MHz and 1900 MHz head dielectric tissues. The head tissues was then replaced with body tissue, and the validation procedure was repeated. The validation performed with the body tissue closely tracked the head tissue results, thus indicating that the DASY3 SAR system was providing accurate test results.

At the time of this series of tests, validation targets provided by the manufacture were not available for 835MHz. A Manufacturer provided validation target values for 900 MHz head tissue. While validating at 900 MHz instead of 835 MHz is a deviation from standard testing procedure, it was decided this deviation would be adequate for the purpose of determining accuracy of the SAR system with head versus body tissue.

1900 MHz

Tissue	Freq (MHz)	Parameters	Target SAR (mW/g @ 1W)	Measured SAR (mW/g @ 1W)	% difference
head	1900	Permittivity	39.9	41.6	-4.3%
		Conductivity	1.42	1.38	2.8%
		SAR	39.7	36.73	7.5%
body	1900	Permittivity	53.3	53.4	-0.2%
		Conductivity	1.52	1.49	2.0%
		SAR	39.7	43.03	-8.4%

900 MHz

Tissue	Freq (MHz)	Parameters	Target SAR (mW/g @ 1W)	Measured SAR (mW/g @ 1W)	% difference
head	900	Permittivity	41.5	41.9	-1.0%
		Conductivity	0.97	0.95	2.1%
		SAR	11.48	11.57	-0.8%
body	900	Permittivity	55	54.5	0.9%
		Conductivity	1.05	0.99	5.7%
		SAR	11.48	12.29	-7.1%

II. Additional SAR data for different host and antenna positions

This data is provided in response to the FCC inquiry for additional test positions of host devices and antenna positions in correspondence reference number 24202. It should be noted that SAR values for the additional test positions resulted in lower SAR indicating the worst case SAR positions were captured in the original SAR report. For the cellular band, dielectric parameters for 835 MHz were used per FCC measurement procedure.

Host	Frequency (MHz)	Test Positions	Measured SAR (mW/g averaged over 1 gram)	Limit (mW/g averaged over 1 gram)
HP T18.03 3.C.00	845	Repeat of SAR=0.717 on 10-20-02	0.459	1.6
HP T18.03 3.C.00	845	Bottom of laptop flush with phantom, antenna parallel to laptop side and perpendicular to phantom	0.182	1.6
HP T18.03 3.C.00	845	bystander position with 1.5cm separation distance	0.0513	1.6
HP T18.03 3.C.00	845	keyboard facing with phantom, antenna perpendicular to laptop	.0112	1.6
IPAQ 3650	845	Antenna parallel with IPAC top face	.434	1.6
Dell PP01L	1905	Repeat of SAR=0.515 on 10-20-02	0.552	1.6
Dell PP01L	1905	Bottom of laptop flush with phantom, antenna parallel to laptop side and perpendicular to phantom	0.461	1.6
Dell PP01L	1905	bystander position with 1.5cm separation distance	0.020	1.6
Dell PP01L	1905	keyboard facing with phantom, antenna perpendicular to laptop	1	1.6
IPAQ 3650	1905	Antenna parallel with IPAC top face	1	1.6

III. Photographs



Photo 1: HP T18.033.C.00 Repeat of SAR=0.717 on 10-20-02



Photo 2: HP T18.033.C.00 Bottom of laptop flush with phantom, antenna parallel to laptop side and perpendicular to phantom



Photo 3: HP T18.033.C.00 bystander position with 1.5cm separation distance



Photo 4: HP T18.033.C.00 keyboard facing with phantom, antenna perpendicular to laptop



Photo 5: IPAQ 3650 Antenna parallel with IPAC top face



Photo 6: Dell PP01L Repeat of SAR=0.515 on 10-20-02



Photo 7: Dell PP01L Bottom of laptop flush with phantom, antenna parallel to laptop side and perpendicular to phantom



Photo 8: Dell PP01L bystander position with 1.5cm separation distance



Photo 9: Dell PP01L keyboard facing with phantom, antenna perpendicular to laptop



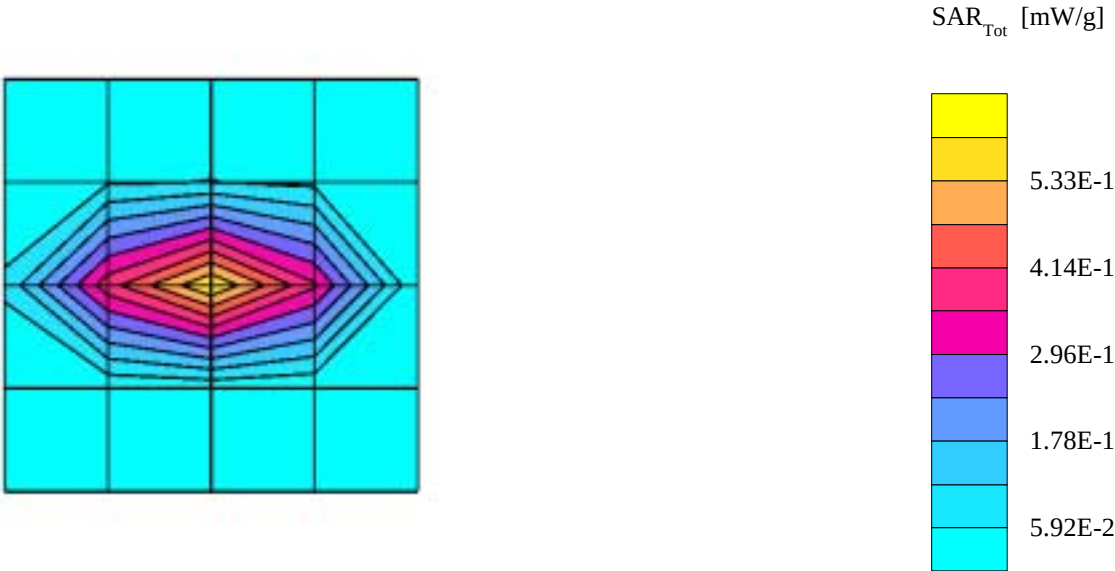
Photo 10: IPAQ 3650 Antenna parallel with IPAC top face

IV. Validation Test Data

Validation 1900 Mhz head, conducted power 11.3 dBm. GTRAN 10-24-02

Dipole 1800 MHz
SAM;

Probe: ET3DV6 - SN1604; ConvF(5.50,5.50,5.50); Crest factor: 1.0; Head 1900 MHz: $\sigma = 1.38 \text{ mho/m}$ $\epsilon_r = 41.6$ $\rho = 1.00 \text{ g/cm}^3$
Cubes (2): Peak: $1.13 \text{ mW/g} \pm 0.10 \text{ dB}$, SAR (1g): $0.507 \text{ mW/g} \pm 0.07 \text{ dB}$, SAR (10g): $0.235 \text{ mW/g} \pm 0.02 \text{ dB}$, (Worst-case extrapolation)
Penetration depth: 6.0 (5.5, 7.6) [mm]
Powerdrift: -0.52 dB



Validation 1900 Mhz body, conducted power 11.3 dBm. GTRAN 10-24-02

Dipole 1800 MHz

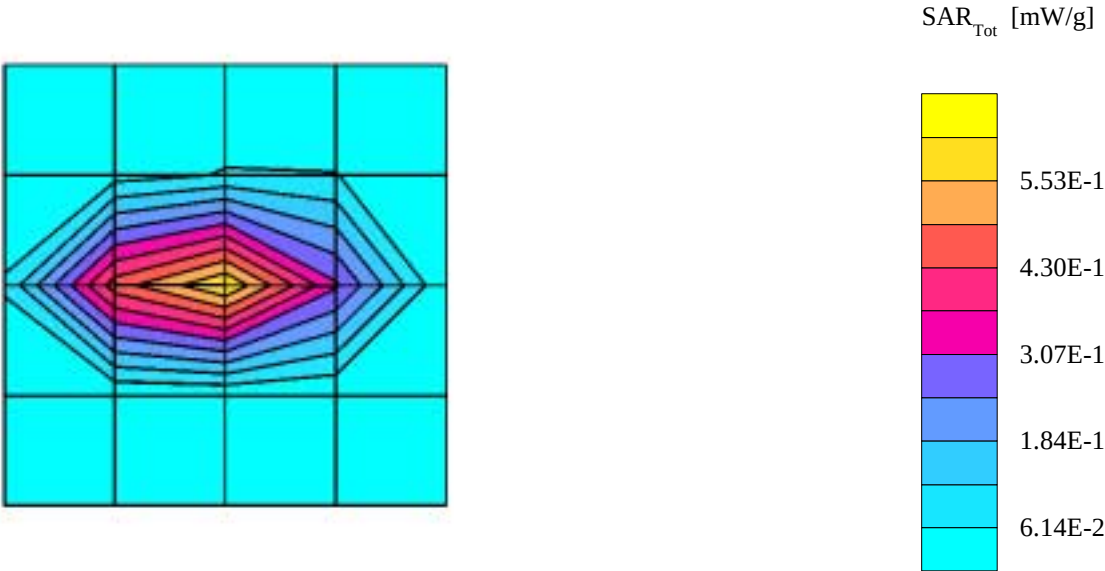
SAM;

Probe: ET3DV6 - SN1604; ConvF(4.90,4.90,4.90); Crest factor: 1.0; Body 1900 MHz: $\sigma = 1.49$ mho/m $\epsilon_r = 53.4$ $\rho = 1.00$ g/cm³

Cubes (2): Peak: 1.24 mW/g $\pm$ 0.33 dB, SAR (1g): 0.594 mW/g $\pm$ 0.16 dB, SAR (10g): 0.275 mW/g $\pm$ 0.04 dB, (Worst-case extrapolation)

Penetration depth: 7.1 (6.3, 9.0) [mm]

Powerdrift: 0.12 dB



Validation Body 900 MHz 10-25-02

Dipole 900 MHz

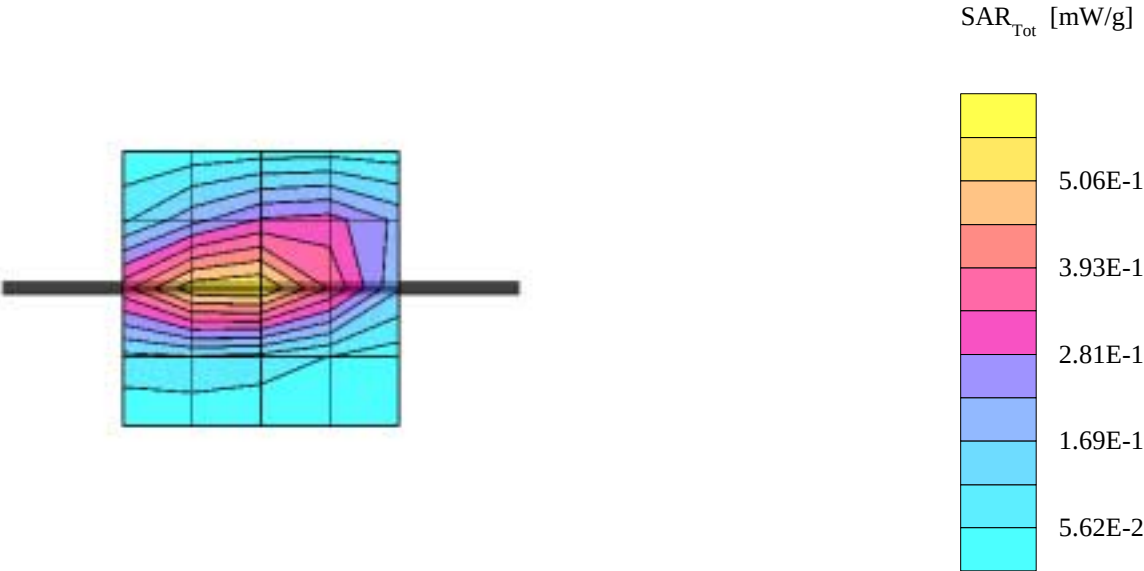
SAM; Flat

Probe: ET3DV6 - SN1604; ConvF(6.40,6.40,6.40); Crest factor: 1.0; Body 900 MHz: $\sigma = 0.98 \text{ mho/m}$ $\epsilon_r = 54.5$ $\rho = 1.00 \text{ g/cm}^3$

Cubes (2): Peak: $1.00 \text{ mW/g} \pm 0.04 \text{ dB}$, SAR (1g): $0.578 \text{ mW/g} \pm 0.02 \text{ dB}$, SAR (10g): $0.340 \text{ mW/g} \pm 0.01 \text{ dB}$, (Worst-case extrapolation)

Penetration depth: 10.1 (9.0, 11.9) [mm]

Powerdrift: 0.04 dB



900 head validation 10-25-02

Dipole 900 MHz

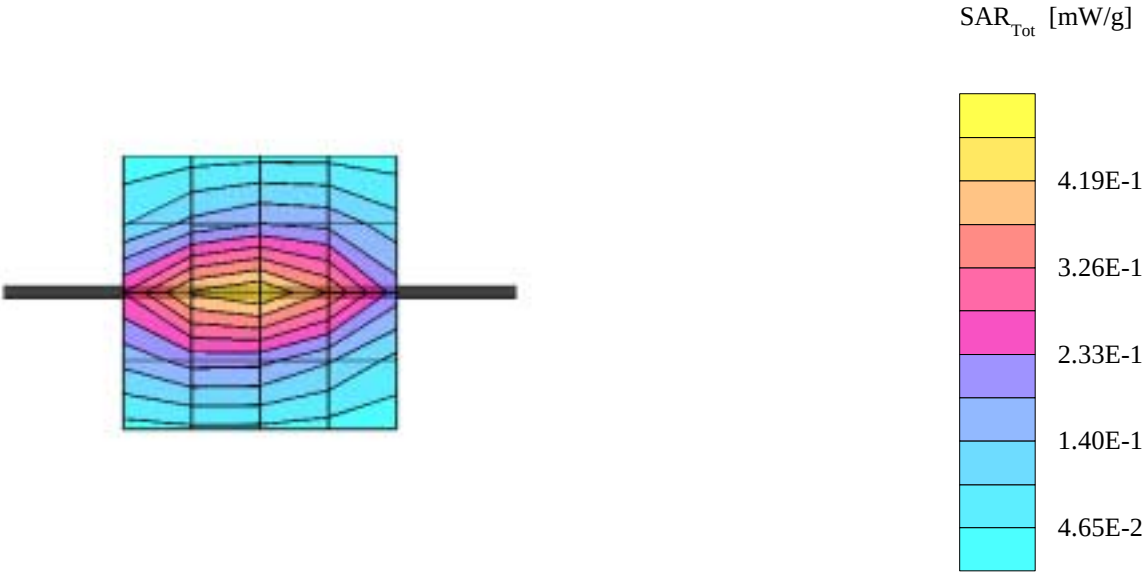
SAM; Flat

Probe: ET3DV6 - SN1604; ConvF(6.50,6.50,6.50); Crest factor: 1.0; Head 900 MHz: $\sigma = 0.95 \text{ mho/m}$ $\epsilon_r = 41.9$ $\rho = 1.00 \text{ g/cm}^3$

Cubes (2): Peak: $0.697 \text{ mW/g} \pm 0.01 \text{ dB}$, SAR (1g): $0.432 \text{ mW/g} \pm 0.00 \text{ dB}$, SAR (10g): $0.273 \text{ mW/g} \pm 0.01 \text{ dB}$, (Worst-case extrapolation)

Penetration depth: 11.5 (10.3, 13.1) [mm]

Powerdrift: 0.03 dB



V. SAR Test Data

Repeat of Dell 1905 MHz (SAR=0.515mW/g 10-20-0)

GTran Wireless (Dell PPo1L, 24 Deg, 10/24/02)

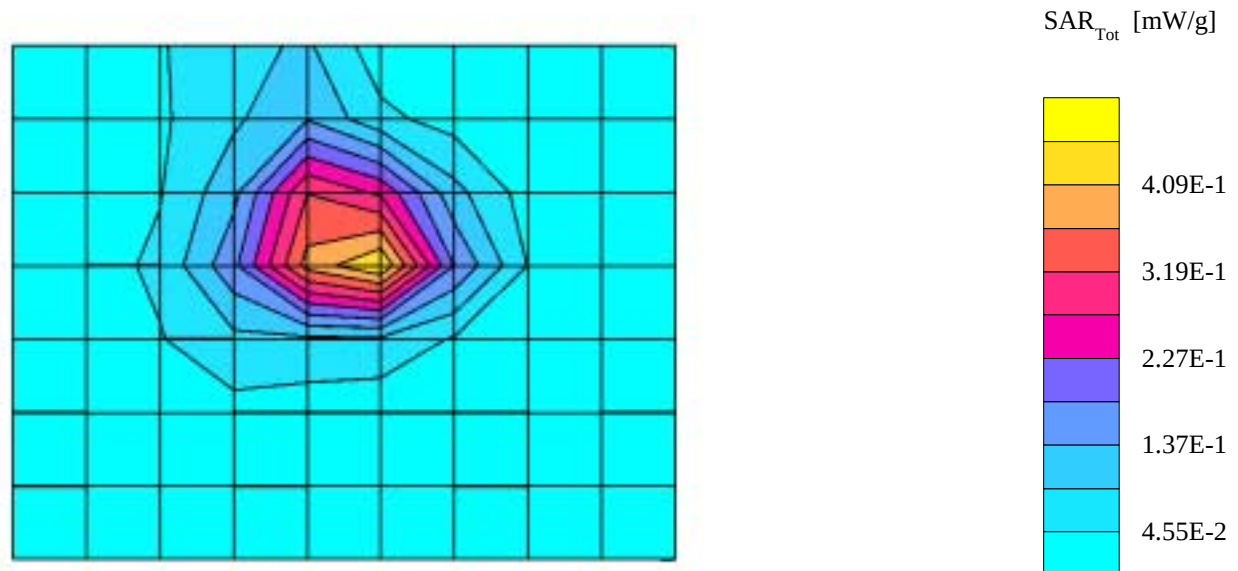
SAM;

Probe: ET3DV6 - SN1604; ConvF(4.90,4.90,4.90); Crest factor: 1.0; Body 1900 MHz: $\sigma = 1.49$ mho/m $\epsilon_r = 53.4$ $\rho = 1.00$ g/cm³

Cube 5x5x7: Peak: 0.836 mW/g, SAR (1g): 0.459 mW/g, SAR (10g): 0.254 mW/g, (Worst-case extrapolation)

Penetration depth: 9.3 (8.2, 11.1) [mm]

Powerdrift: -0.10 dB



1905 MHz, antenna parallel with laptop side

GTran Wireless (Dell PPo1L, 24 Deg, 10/24/02)

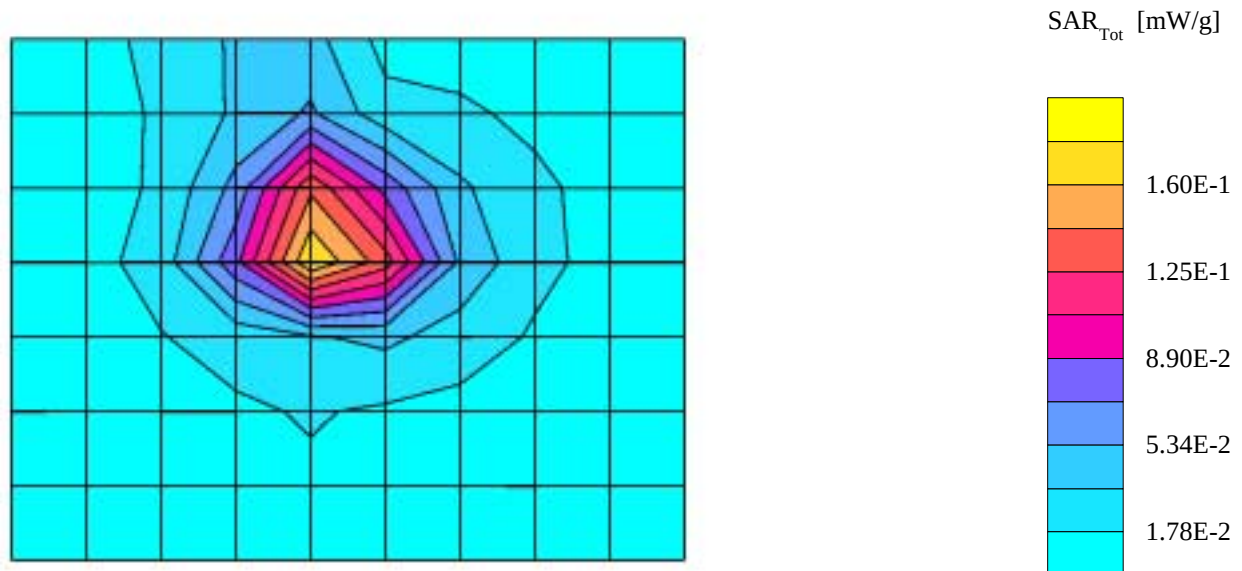
SAM;

Probe: ET3DV6 - SN1604; ConvF(4.90,4.90,4.90); Crest factor: 1.0; Body 1900 MHz: $\sigma = 1.49$ mho/m $\epsilon_r = 53.4$ $\rho = 1.00$ g/cm³

Cube 5x5x7: Peak: 0.338 mW/g, SAR (1g): 0.182 mW/g, SAR (10g): 0.0991 mW/g, (Worst-case extrapolation)

Penetration depth: 9.1 (7.9, 11.0) [mm]

Powerdrift: 0.01 dB



1905 MHz, bystander position, antenna 1.5cm from phantom

GTran Wireless (Dell PPo1L, 24 Deg, 10/24/02)

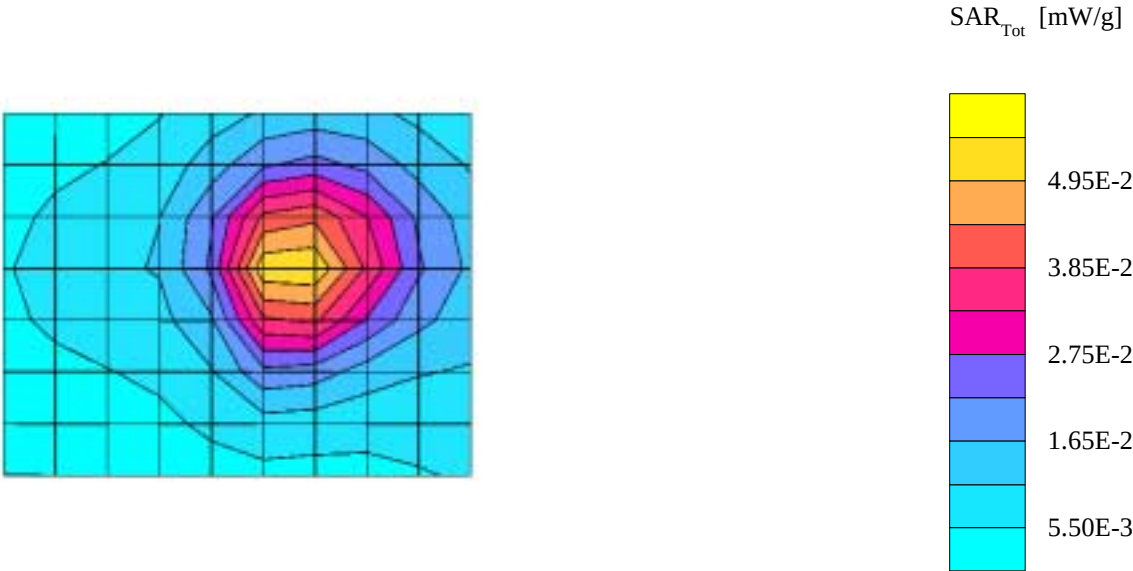
SAM;

Probe: ET3DV6 - SN1604; ConvF(4.90,4.90,4.90); Crest factor: 1.0; Body 1900 MHz: $\sigma = 1.49 \text{ mho/m}$ $\epsilon_r = 53.4$ $\rho = 1.00 \text{ g/cm}^3$

Cube 5x5x7: Peak: 0.0869 mW/g, SAR (1g): 0.0513 mW/g, SAR (10g): 0.0322 mW/g, (Worst-case extrapolation)

Penetration depth: 10.9 (9.1, 13.3) [mm]

Powerdrift: -0.98 dB



1905 MHz, keyboard facing phantom, antenna perpendicular to laptop side

GTran Wireless (Dell PPo1L, 24 Deg, 10/24/02)

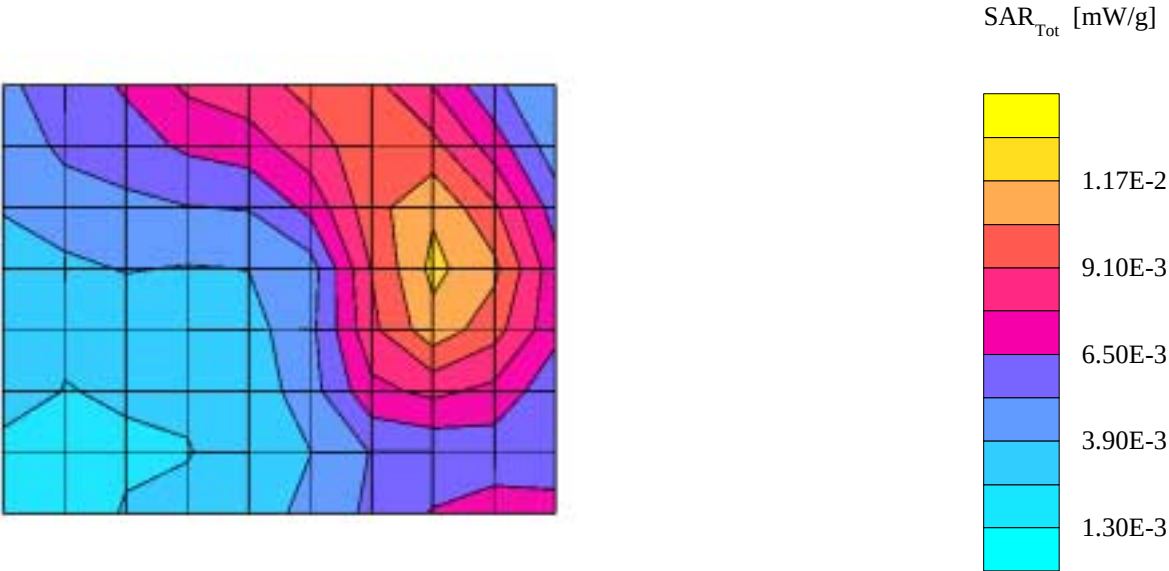
SAM;

Probe: ET3DV6 - SN1604; ConvF(4.90,4.90,4.90); Crest factor: 1.0; Body 1900 MHz: $\sigma = 1.49 \text{ mho/m}$ $\epsilon_r = 53.4$ $\rho = 1.00 \text{ g/cm}^3$

Cube 5x5x7: Peak: 0.0186 mW/g, SAR (1g): 0.0112 mW/g, SAR (10g): 0.0075 mW/g, (Worst-case extrapolation)

Penetration depth: 12.4 (10.8, 14.5) [mm]

Powerdrift: 0.07 dB



1905 Mhz, antenna parallel to top of IPAC

GTran Wireless (IPAC 3650, 24 Deg, 10/24/02)

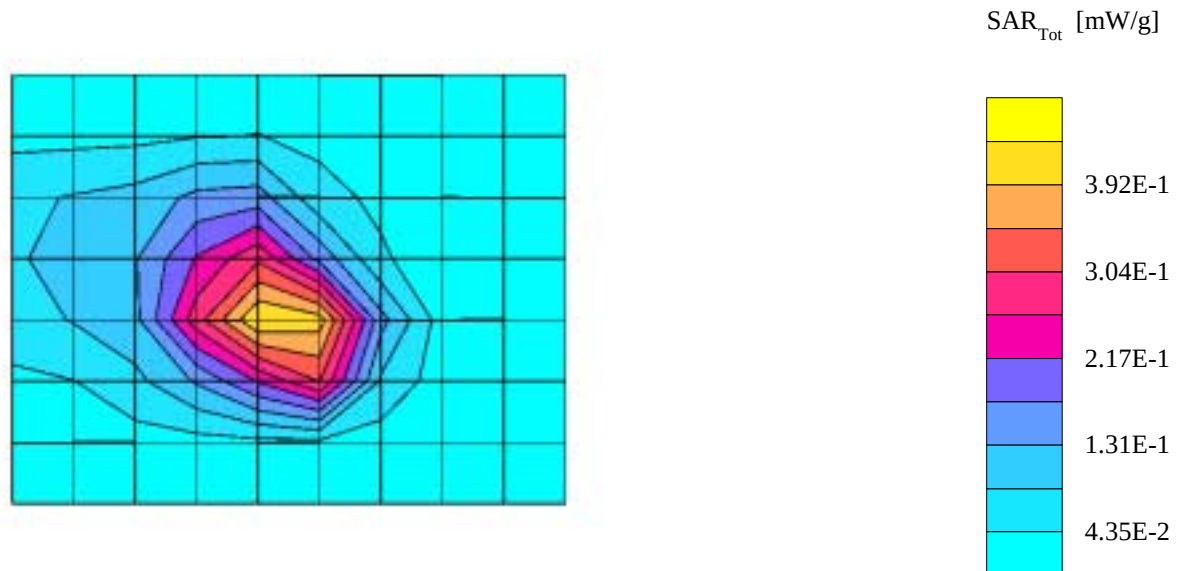
SAM;

Probe: ET3DV6 - SN1604; ConvF(4.90,4.90,4.90); Crest factor: 1.0; Body 1900 MHz: $\sigma = 1.49$ mho/m $\epsilon_r = 53.4$ $\rho = 1.00$ g/cm³

Cube 5x5x7: Peak: 0.834 mW/g, SAR (1g): 0.434 mW/g, SAR (10g): 0.245 mW/g, (Worst-case extrapolation)

Penetration depth: 10.0 (8.7, 12.0) [mm]

Powerdrift: -0.50 dB



845 MHz, Repeat of HP from 10-20-02

GTran Wireless (HP T18.033.C.00, 24 Deg, 10/24/02)

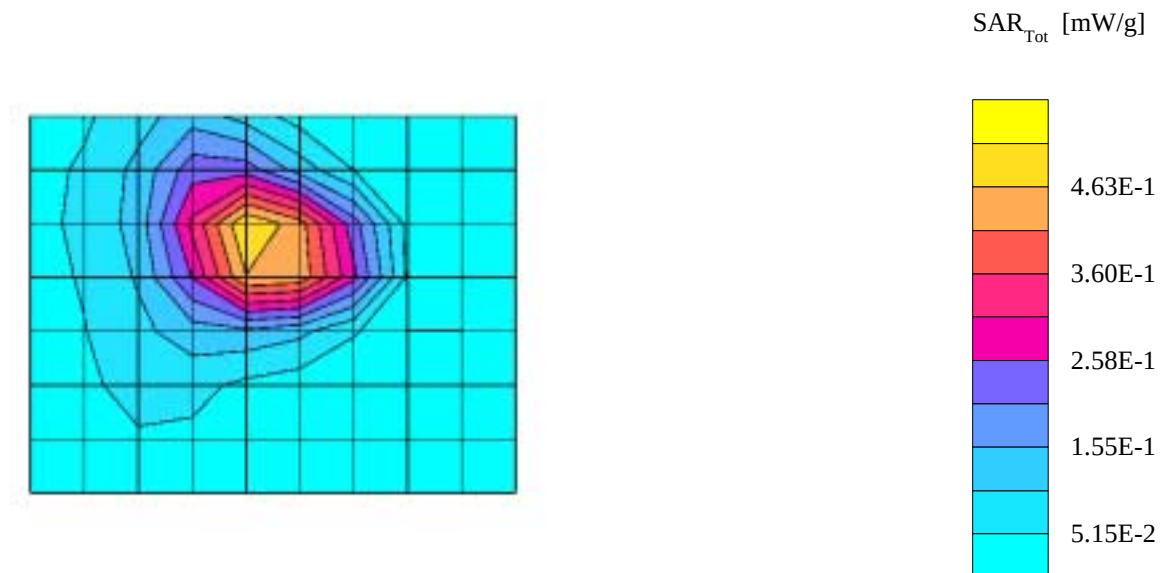
SAM;

Probe: ET3DV6 - SN1604; ConvF(6.40,6.40,6.40); Crest factor: 1.0; Body 900 MHz: $\sigma = 0.98$ mho/m $\epsilon_r = 54.5$ $\rho = 1.00$ g/cm³

Cube 5x5x7: Peak: 0.928 mW/g, SAR (1g): 0.552 mW/g, SAR (10g): 0.334 mW/g, (Worst-case extrapolation)

Penetration depth: 10.9 (9.6, 12.7) [mm]

Powerdrift: -0.26 dB



845 MHz, Antenna perpendicular to phatom with bottom of laptop flush to phatom

GTran Wireless (HP T18.033.C.00, 24 Deg, 10/24/02)

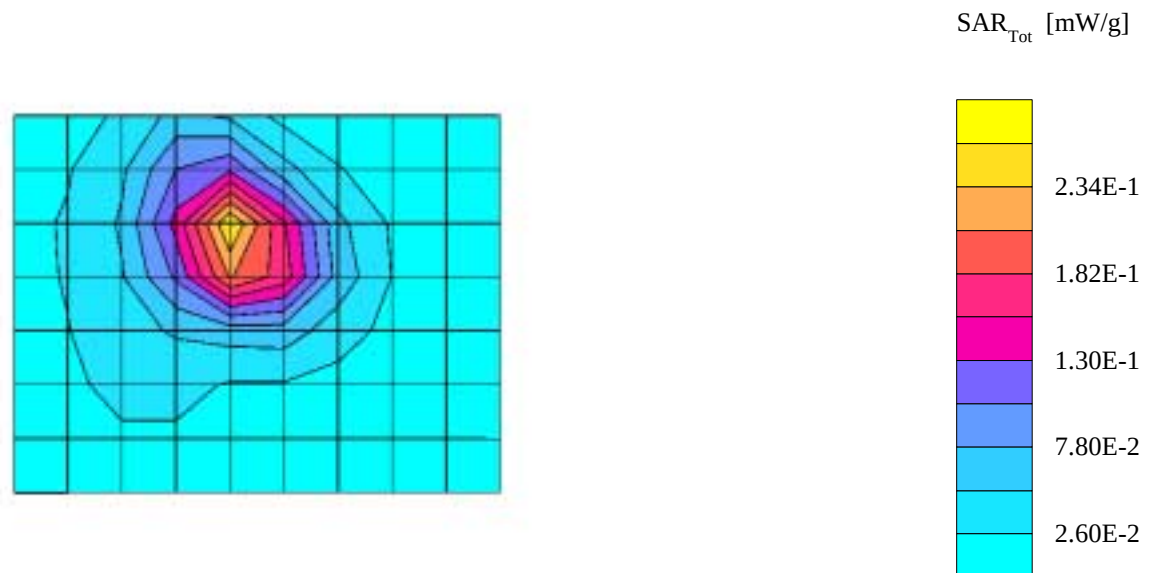
SAM;

Probe: ET3DV6 - SN1604; ConvF(6.40,6.40,6.40); Crest factor: 1.0; Body 900 MHz: $\sigma = 0.97$ mho/m $\epsilon_r = 54.2$ $\rho = 1.00$ g/cm³

Cube 5x5x7: Peak: 0.461 mW/g, SAR (1g): 0.262 mW/g, SAR (10g): 0.151 mW/g, (Worst-case extrapolation)

Penetration depth: 9.9 (8.8, 11.7) [mm]

Powerdrift: -0.07 dB



845 MHz,bystander position, antenna 1.5cm from phantom

GTran Wireless (HP T18.033.C.00, 24 Deg, 10/24/02)

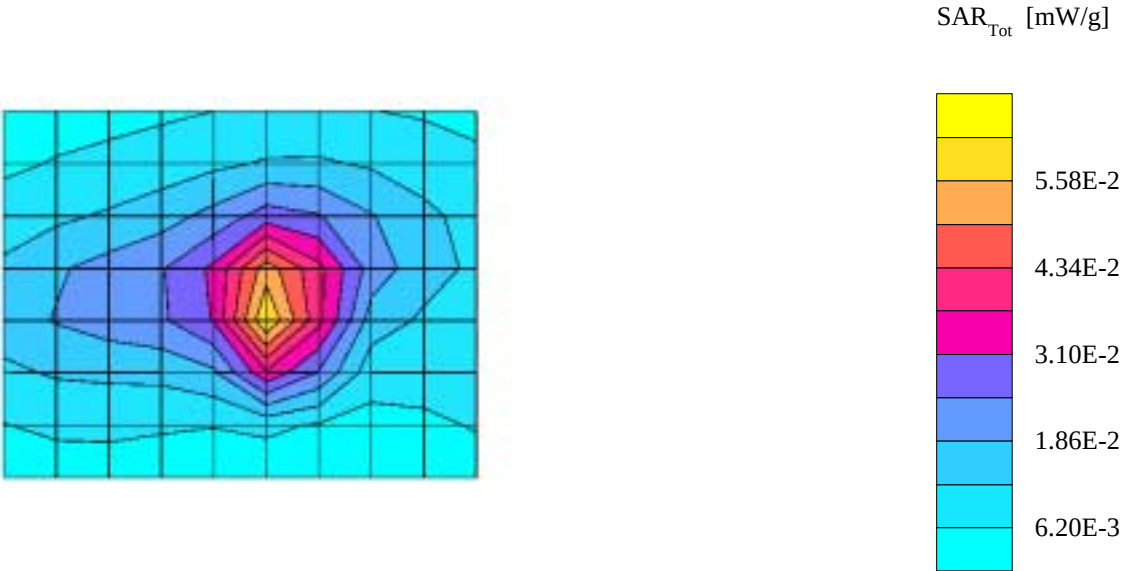
SAM;

Probe: ET3DV6 - SN1604; ConvF(6.40,6.40,6.40); Crest factor: 1.0; Body 900 MHz: $\sigma = 0.97$ mho/m $\epsilon_r = 54.2$ $\rho = 1.00$ g/cm³

Cube 5x5x7: Peak: 0.0990 mW/g, SAR (1g): 0.0586 mW/g, SAR (10g): 0.0361 mW/g, (Worst-case extrapolation)

Penetration depth: 11.0 (9.5, 13.0) [mm]

Powerdrift: 0.03 dB



845 MHz, keyboard facing phantom, antenna perpendicular to laptop

GTran Wireless (HP T18.033.C.00, 24 Deg, 10/24/02)

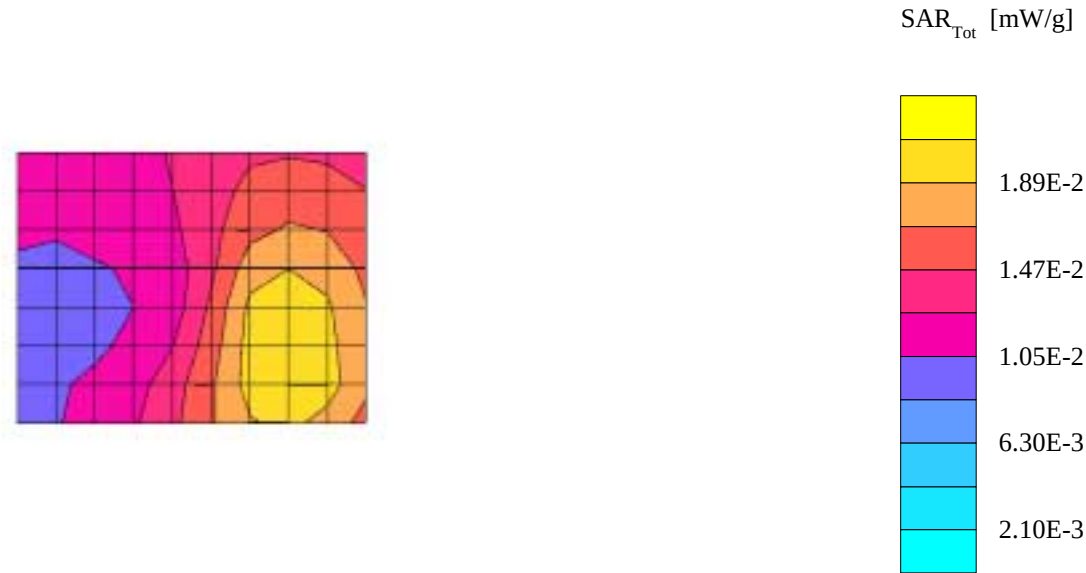
SAM;

Probe: ET3DV6 - SN1604; ConvF(6.40,6.40,6.40); Crest factor: 1.0; Body 900 MHz: $\sigma = 0.97$ mho/m $\epsilon_r = 54.2$ $\rho = 1.00$ g/cm³

Cube 5x5x7: Peak: 0.0250 mW/g, SAR (1g): 0.0200 mW/g, SAR (10g): 0.0172 mW/g * Max outside, (Worst-case extrapolation)

Penetration depth: 37.6 (25.0, 54.7) [mm]

Powerdrift: -0.17 dB



845 MHz, Ipac 3650 with antenna parallel to top

GTran Wireless (IPAC 3650 24 Deg, 10/24/02)

SAM;

Probe: ET3DV6 - SN1604; ConvF(6.40,6.40,6.40); Crest factor: 1.0; Body 900 MHz: $\sigma = 0.97$ mho/m $\epsilon_r = 54.2$ $\rho = 1.00$ g/cm³

Cube 5x5x7: Peak: 0.572 mW/g, SAR (1g): 0.319 mW/g, SAR (10g): 0.203 mW/g, (Worst-case extrapolation)

Penetration depth: 11.3 (9.0, 15.0) [mm]

Powerdrift: -0.16 dB

