



Date: October 10, 2002

Subject: Supplement to SAR Test Report for Motorola portable cellular phone (FCC ID IHDT56CB1)

Reference:

Correspondence Reference Number:	221009.IHD
Confirmation Number:	TC1347
Date of Original Email:	10/09/2002
Log-in Date:	10/07/2002

Prepared by:

Steven Hauswirth
Motorola Personal Communications Sector Product Safety Laboratory
Harvard, Illinois

Andrew Bachler, Principal Staff Engineer
Motorola Personal Communications Sector
Libertyville, Illinois

Note:
This is a corrected response to these questions.

Summary of FCC request for additional information

There was a request for additional information regarding Motorola’s SAR Test Report for Motorola portable cellular phone (FCC ID IHDT56CB1). The requested information is addressed below in the same numbering sequence received.

SAR:

1) Please address the discrepancies in power drift stated on pages 6-8 of Exhibit 11 and the corresponding SAR plots submitted.

Response: After further review, the table had one typo and the values on the plots were incorrect. The corrected tables are shown below. The corrected plots are attached in Appendix 1.

f (MHz)	Description	Conducted Output Power (dBm)	Cheek / Touch Position									
			Left Head					Right Head				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
Digital 800MHz	Channel 128	29.37										
	Channel 189	29.43	0.607	-0.07	0.62	22.8	22.3	0.695	-0.07	0.71	22.8	22.2
	Channel 251	29.32										
Digital 1900MHz	Channel 512	29.36										
	Channel 661	29.42	0.672	-0.06	0.68	22	21.50	0.809	-0.06	0.82	22	21.50
	Channel 810	29.38										

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT56CB1 at highest possible output power. Measured against the left head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	15° Tilt Position									
			Left Head					Right Head				
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Amb. Temp (°C)	Simulate Temp (°C)
Digital 800MHz	Channel 128	29.37										
	Channel 189	29.43	0.14	-0.03	0.14	22.80	22.30	0.143	0.00	0.14	22.80	22.30
	Channel 251	29.32										
Digital 1900MHz	Channel 512	29.36										
	Channel 661	29.42	0.101	-0.05	0.10	22.00	21.50	0.111	0.29	0.11	22.00	21.50
	Channel 810	29.38										

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT56CB1 at highest possible output power. Measured against the left head in the 15° Tilt Position.

2) Please provide justification for testing only two belt-clips during Body SAR measurements.

Response: The previous filings for IHDT56CB1 were reviewed to find the body worn accessories that resulted in the highest SAR measurement values, by band. These accessories were used for these additional measurements to determine if there was an SAR impact.

4) Statement explaining the large SAR drift noted at 1900 MHz tilt position.

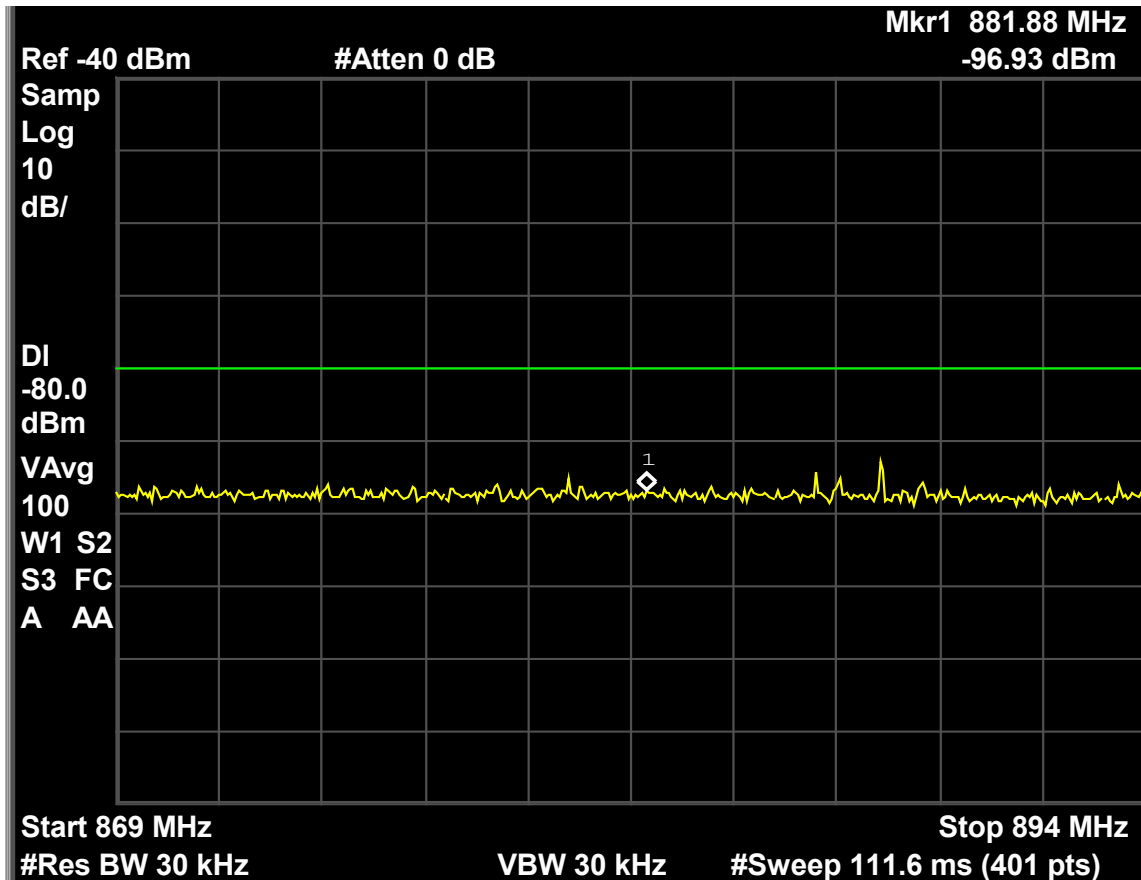
Response: As shown in table 2 above, the 1900MHz tilt position had a drift of +0.29dB. A Time Sweep of SAR was performed in this side of the head. The plot of the Time Sweep is attached as appendix 2. We believe this is inherent to the design of the phone, the placement of the antenna and the coupling of the phone & antenna to the right side of the head in the 15° Tilt Position.

EMC:

3) Please resubmit the cellular base station freq. plot showing frequencies and power levels.

Response: Please refer to the following:

GSM 850 – Cellular Base Station Frequency Range – 836.6 MHz - 28.96 dBm



* The cellular base station frequency range is evaluated for low, middle, and high channels of the transceiver. The worst case is reported.

Grant Info:

GSM 850 0.58 W
GSM 1900 1.5 W

Class II Permissive Change

Output power listed is ERP for Part 22 and EIRP for Part 24.

SAR

compliance for body-worn operating configurations are limited to the specific belt-clips/holsters tested for this filing. End-users must be informed of the body-worn operating requirements for satisfying RF exposure compliance.

The highest reported SAR values are:

Part 22

Head: 0.71 W/kg
Body-worn: 0.25 W/kg

Part 24

Head: 0.82 W/kg
Body-worn: 0.62 W/kg

Appendix 1

Corrected SAR Plots

SN# T7Z0021

Ch# 189 / Pwr Step: 7 / Antenna Position: FIXED / Type of Modulation: 850 GSM / Battery Model #: SNN5582B / DEVICE POSITION (cheek or rotated): CHEEK

R3: SUGAR TP-1155 (rev 3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 836 MHz

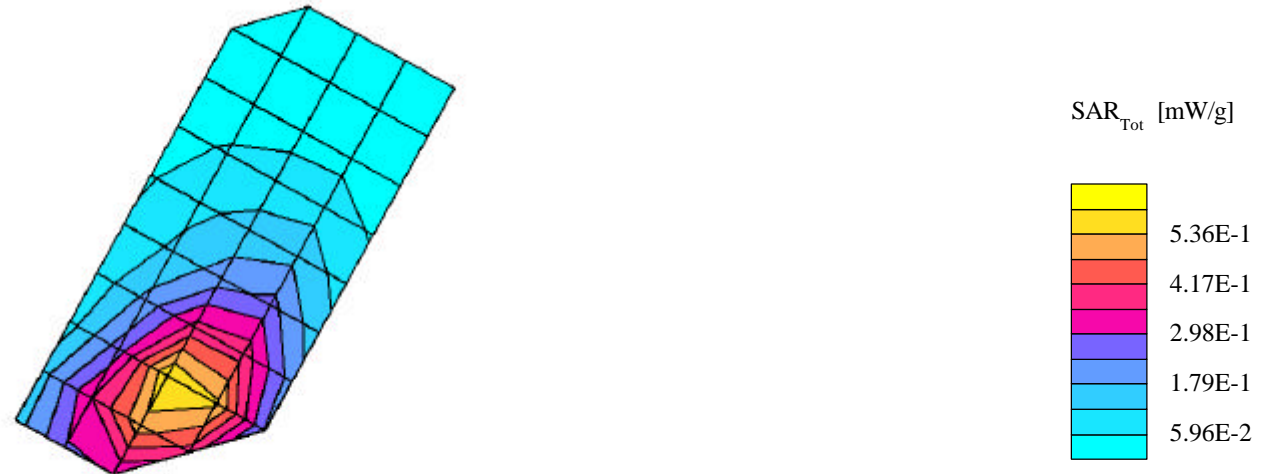
Probe: ET3DV6R - SN1522 - IEEE Head; ConvF(4.60,4.60,4.60); Crest factor: 8.0; 835 MHz Head & Body: $\sigma = 0.93$ mho/m $\epsilon_r = 42.6$ $\rho = 1.00$ g/cm³

Cube 7x7x7: SAR (1g): 0.607 mW/g, SAR (10g): 0.400 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0

Penetration depth: 14.4 (12.1, 17.4) [mm]

Powerdrift: -0.07 dB



SN# T7Z0021

Ch# 189 / Pwr Step: 7 / Antenna Position: FIXED / Battery Model #: SNN5582B / DEVICE POSITION (cheek or rotated): TILTED

R3: SUGAR TP-1155 (rev 3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 836 MHz

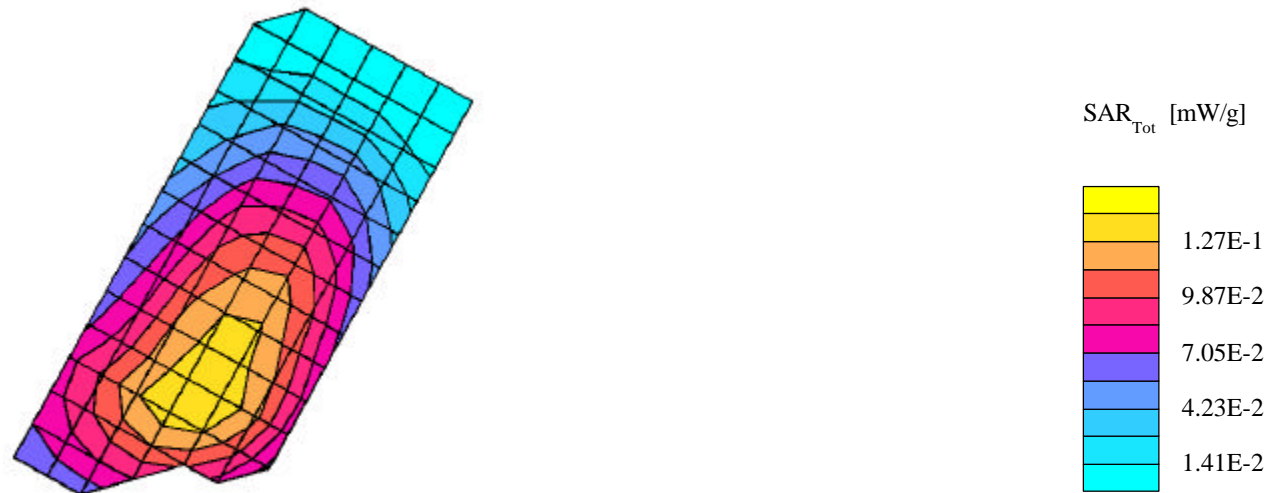
Probe: ET3DV6R - SN1522 - IEEE Head; ConvF(4.60,4.60,4.60); Crest factor: 8.0; 835 MHz Head & Body: $\sigma = 0.93$ mho/m $\epsilon_r = 42.6$ $\rho = 1.00$ g/cm³

Cube 7x7x7: SAR (1g): 0.140 mW/g, SAR (10g): 0.102 mW/g, (Worst-case extrapolation)

Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0

Penetration depth: 17.3 (14.6, 20.5) [mm]

Powerdrift: -0.03 dB



SN# T7Z0021

Ch# 189 / Pwr Step: 7 / Antenna Position: FIXED / Battery Model #:SNN5582B / DEVICE POSITION (cheek or rotated): CHEEK

R3: SUGAR TP-1155 (rev 3) Phantom; Right Hand Section; Position: (90°,180°); Frequency: 836 MHz

Probe: ET3DV6R - SN1522 - IEEE Head; ConvF(4.60,4.60,4.60); Crest factor: 8.0; 835 MHz Head & Body: $\sigma = 0.93$ mho/m $\epsilon_r = 42.6$ $\rho = 1.00$ g/cm³

Cube 7x7x7: SAR (1g): 0.695 mW/g, SAR (10g): 0.448 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0

Penetration depth: 13.7 (11.6, 16.5) [mm]

Powerdrift: -0.07 dB



SN# T7Z0021

Ch# 189 / Pwr Step: 7 / Antenna Position: FIXED / Battery Model #: SN5582B / DEVICE POSITION (cheek or rotated): TILTED

R3: SUGAR TP-1155 (rev 3) Phantom; Right Hand Section; Position: (90°,180°); Frequency: 836 MHz

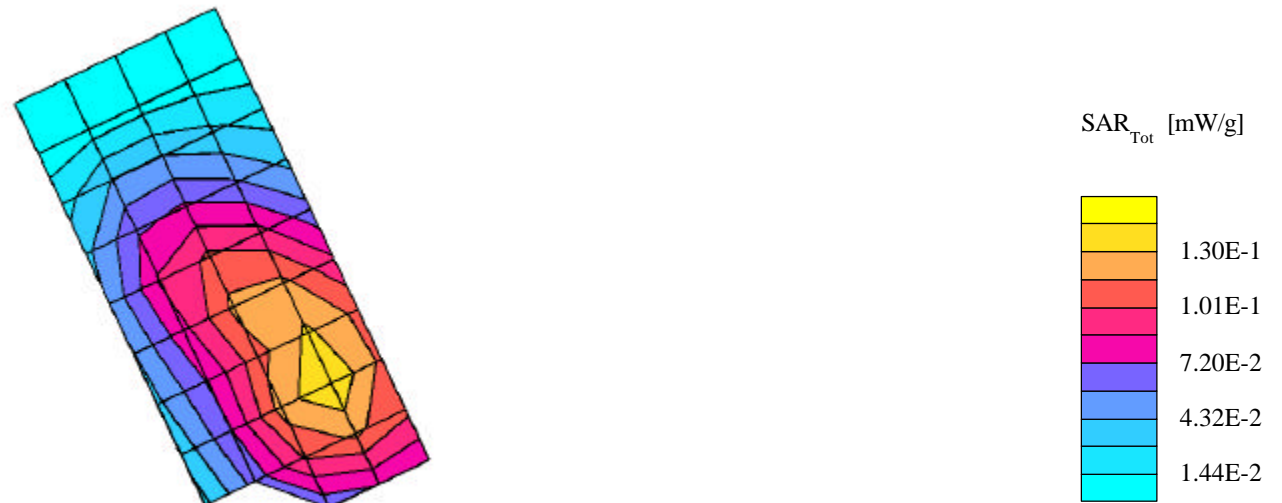
Probe: ET3DV6R - SN1522 - IEEE Head; ConvF(4.60,4.60,4.60); Crest factor: 8.0; 835 MHz Head & Body: $\sigma = 0.93$ mho/m $\epsilon_r = 42.6$ $\rho = 1.00$ g/cm³

Cube 7x7x7: SAR (1g): 0.143 mW/g, SAR (10g): 0.102 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0

Penetration depth: 17.3 (14.6, 20.5) [mm]

Powerdrift: 0.00 dB



SN# T7Z0021

Ch# 661 / Pwr Step: 0 OTA / Antenna Position: FIXED / Battery Model #: SNN5582B / DEVICE POSITION (cheek or rotated): CHEEK

R3: Glycol TP-1157 (rev. 3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 1880 MHz

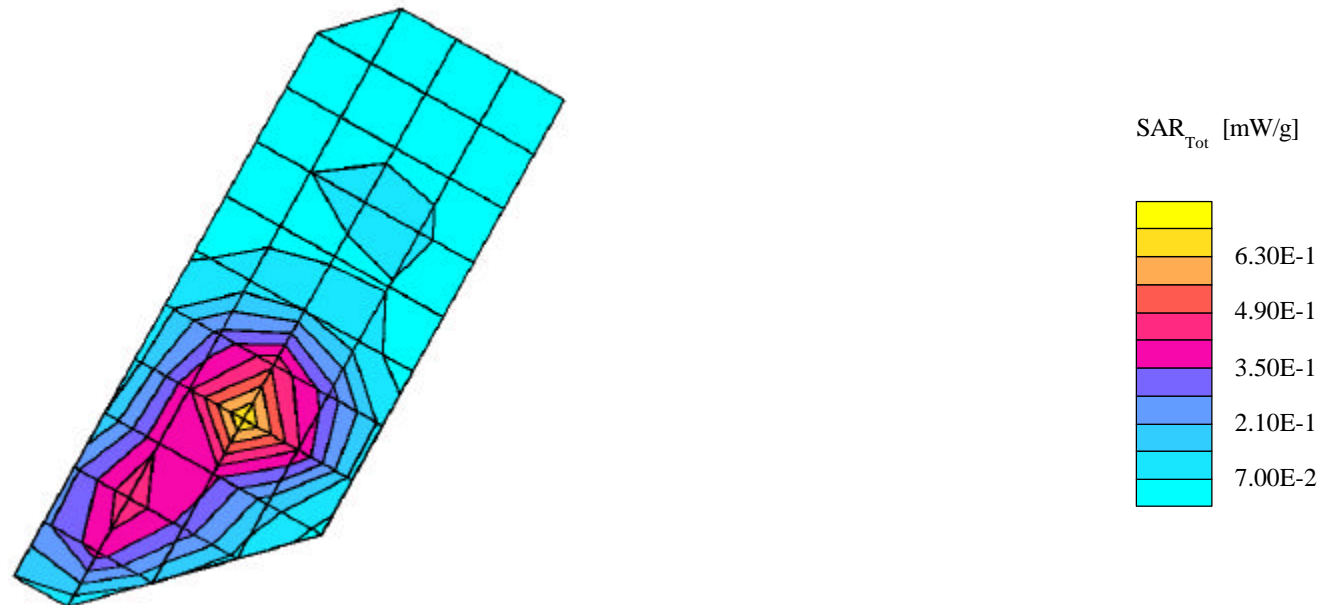
Probe: ET3DV6R - SN1522 - IEEE Head; ConvF(3.40,3.40,3.40); Crest factor: 8.0; 1880 MHz Head & Body: $\sigma = 1.43$ mho/m $\epsilon_r = 39.0$ $\rho = 1.00$ g/cm³

Cube 7x7x7: SAR (1g): 0.672 mW/g, SAR (10g): 0.377 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0

Penetration depth: 9.2 (8.7, 10.1) [mm]

Powerdrift: -0.06 dB



SN# T7Z0021

Ch# 661 / Pwr Step: 0 OTA / Antenna Position: FIXED / Battery Model #: SNN5582B / DEVICE POSITION (cheek or rotated): TILT

R3: Glycol TP-1157 (rev. 3) Phantom; Left Hand Section; Position: (90°,180°); Frequency: 1880 MHz

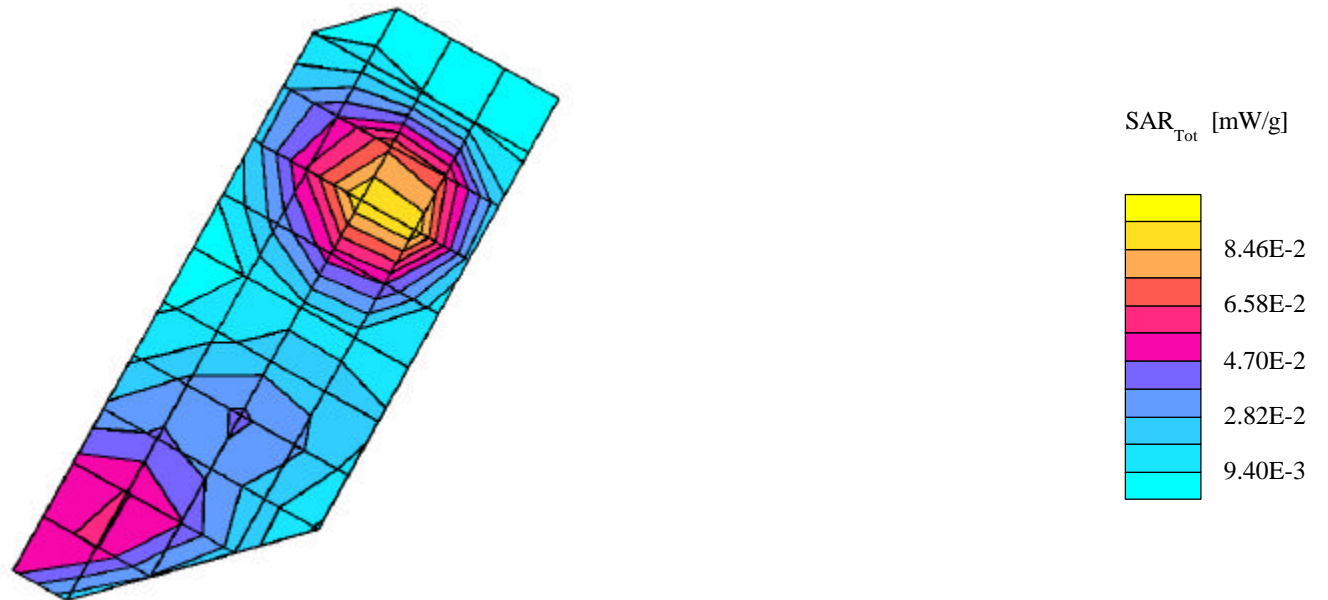
Probe: ET3DV6R - SN1522 - IEEE Head; ConvF(3.40,3.40,3.40); Crest factor: 8.0; 1880 MHz Head & Body: $\sigma = 1.43$ mho/m $\epsilon_r = 39.0$ $\rho = 1.00$ g/cm³

Cube 7x7x7: SAR (1g): 0.101 mW/g, SAR (10g): 0.0606 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0

Penetration depth: 11.4 (10.4, 12.5) [mm]

Powerdrift: -0.05 dB



SN# T7Z0021

Ch# 661 / Pwr Step: 0 OTA / Antenna Position: FIXED/ Battery Model #: SNN5582B / DEVICE POSITION (cheek or rotated): CHEEK

R3: Glycol TP-1157 (rev. 3) Phantom; Right Hand Section; Position: (90°,180°); Frequency: 1880 MHz

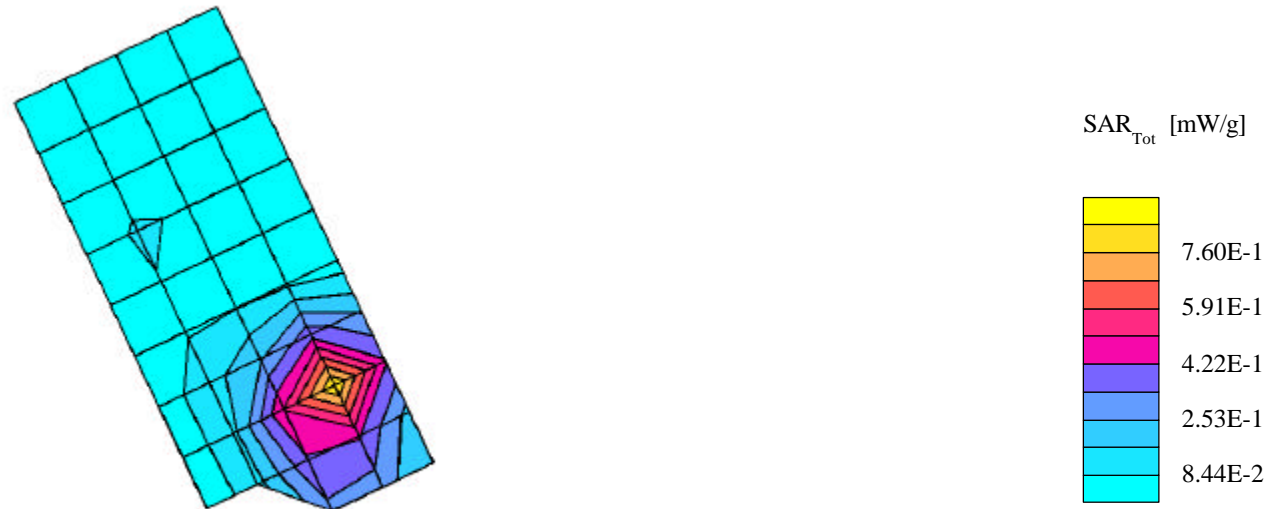
Probe: ET3DV6R - SN1522 - IEEE Head; ConvF(3.40,3.40,3.40); Crest factor: 8.0; 1880 MHz Head & Body: $\sigma = 1.43$ mho/m $\epsilon_r = 39.0$ $\rho = 1.00$ g/cm³

Cube 7x7x7: SAR (1g): 0.809 mW/g, SAR (10g): 0.433 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0

Penetration depth: 8.9 (8.4, 9.8) [mm]

Powerdrift: -0.06 dB



SN# T7Z0021

Ch# 661 / Pwr Step: 0 OTA / Antenna Position: FIXED / Battery Model #: SNN5582B / DEVICE POSITION (cheek or rotated): TILTED

R3: Glycol TP-1157 (rev. 3) Phantom; Right Hand Section; Position: (90°,180°); Frequency: 1880 MHz

Probe: ET3DV6R - SN1522 - IEEE Head; ConvF(3.40,3.40,3.40); Crest factor: 8.0; 1880 MHz Head & Body: $\sigma = 1.43$ mho/m $\epsilon_r = 39.0$ $\rho = 1.00$ g/cm³

Cube 7x7x7: SAR (1g): 0.111 mW/g, SAR (10g): 0.0668 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0

Penetration depth: 11.3 (10.6, 12.1) [mm]

Powerdrift: 0.29 dB



Appendix 2

SAR Time Sweep Plot

T7Z021

TIME SWEEP TEMPLATE

Original Scan Drift Value: .29

Ch# 661 / Pwr Step: 0 / Type of Modulation: 1900 GSM / Battery Model #: SNN5588A

DEVICE POSITION (check or rotated): CHEEK

R2: TP-1159 GLYCOL SAM (rev. 4) Phantom; Section; Position: ; Frequency: 1880 MHz

Probe: ET3DV6 - SN1503 - IEEE Head; ConvF(5.24,5.24,5.24); Crest factor: 8.0; 1880 MHz Head & Body: $\sigma = 1.43$ mho/m $\epsilon_r = 39.0$ $\rho = 1.00$ g/cm³

: , 0

Time sweep:

