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Supplement to SAR Test Report for Motorola portable cellular phone (FCC ID GKRMPX001)

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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 GKRMPX001). The requested information is addressed below in the same numbering sequence received.

3) Please describe any use conditions and device test settings where GSM and LAN transmit at the same time, or describe device settings to prevent this if applicable.

RESPONSE: GSM850, GSM900, GSM1800, GSM1900 can transmit simultaneously with WLAN.

4) For any cotransmitting conditions of 3), please describe how reported SAR results are applicable for exposure evaluation.

RESPONSE: The reported SAR values represent the maximum measured values for each transmitting mode/band. A sum of the GSM and Wi-Fi value would represent an overestimate of the SAR for a simultaneous transmitting condition.

f (MHz)	Description	Conducted Output Power (dBm)	Cheek / Touch Position							
			Left Head				Right Head			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 850MHz	Channel 128	33.11								
	Channel 190	33.27	**0.305**	**0.28**	**0.31**	**19.6**	**0.264**	**-0.5**	**0.30**	**19.6**
	Channel 251	33.17								
Digital 1900MHz	Channel 512	30.14								
	Channel 661	30.11	**0.112**	**0.57**	**0.11**	**19.6**	**0.143**	**-0.53**	**0.16**	**19.0**
	Channel 810	29.96								
WiFi 2400Mhz	Channel 1	14.77								
	Channel 6	14.77	**0.0262**	**0.07**	**0.03**	**19.0**	**0.0197**	**-0.15**	**0.02**	**19.8**
	Channel 11	14.77								

Table 1: SAR measurement results for the portable cellular telephone FCC ID GKRMPX001 at highest possible output power. Measured against the left head in the Cheek/Touch Position.

Combining the SAR values of the GSM modes and the Wi-Fi yields the following SAR values. These values are an overestimate of the SAR since these maxima don't occur in the same location on the phone.

f (MHz)	Description	Conducted Output Power (dBm)	Cheek / Touch Position	
			Left Head	Right Head
			Measured (W/kg)	Measured (W/kg)
Digital 850MHz	Channel 128	33.11		
	Channel 190	33.27	**0.33**	**0.32**
	Channel 251	33.17		
Digital 1900MHz	Channel 512	30.14		
	Channel 661	30.11	**0.14**	**0.18**
	Channel 810	29.96		

Table 2: SAR measurement results for the portable cellular telephone FCC ID GKRMPX001 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)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 850MHz	Channel 128	33.11								
	Channel 190	33.27	**0.105**	**-0.01**	**0.11**	**19.8**	**0.107**	**-0.26**	**0.11**	**19.4**
	Channel 251	33.17								
Digital 1900MHz	Channel 512	30.14								
	Channel 661	30.11	**0.055**	**-0.09**	**0.06**	**19.3**	**0.0484**	**-0.05**	**0.05**	**19.0**
	Channel 810	29.96								
WiFi 2400Mhz	Channel 1	14.77								
	Channel 6	14.77	**0.0064**	**0.62**	**0.01**	**19.8**	**0.0076**	**-0.33**	**0.01**	**19.8**
	Channel 11	14.77								

Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT56EV1 at highest possible output power. Measured against the left head in the 15° Tilt Position.

Combining the SAR values of the GSM modes and the Wi-Fi yields the following SAR values. These values are an overestimate of the SAR since these maxima don't occur in the same location on the phone.

f (MHz)	Description	Conducted Output Power (dBm)	15° Tilt Position	
			Left Head	Right Head
			Measured (W/kg)	Measured (W/kg)
Digital 850MHz	Channel 128	33.11		
	Channel 190	33.27	**0.12**	**0.12**
	Channel 251	33.17		
Digital 1900MHz	Channel 512	30.14		
	Channel 661	30.11	**0.07**	**0.06**
	Channel 810	29.96		

Table 4: SAR measurement results for the portable cellular telephone FCC ID IHDT56EV1 at highest possible output power. Measured against the left head in the 15° Tilt Position.

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn GSM							
			with SYN1070A				with SYN1070A & Bluetooth			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 850MHz	Channel 128	33.11								
	Channel 190	33.27	**0.626**	**-0.11**	**0.64**	**20.0**	**0.678**	**-0.11**	**0.70**	**20.0**
	Channel 251	33.17								
Digital 1900MHz	Channel 512	30.14								
	Channel 661	30.11	**0.617**	**0.00**	**0.62**	**19.5**	**0.513**	**-0.12**	**0.53**	**19.5**
	Channel 810	29.96								

Table 5: SAR measurement results for the portable cellular telephone FCC ID GKRMPX001 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn WiFi							
			with SYN1070A				with SYN1070A & SNN5751A			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
WiFi 2400Mhz	Channel 1	14.77								
	Channel 6	14.77	**0.186**	**0.04**	**0.19**	**19.8**	**0.167**	**-0.03**	**0.17**	**19.5**
	Channel 11	14.77								

Table 6: SAR measurement results for the portable cellular telephone FCC ID GKRMPX001 at highest possible output power. Measured against the body.

Combining the SAR values of the GSM modes and the Wi-Fi yields the following SAR values. These values are an overestimate of the SAR since these maxima don't occur in the same location on the phone.

f (MHz)	Description	Conducted Output Power (dBm)	15° Tilt Position	
			w/o BT	w/ BT
			Measured (W/kg)	Measured (W/kg)
Digital 850MHz	Channel 128	33.11		
	Channel 190	33.27	**0.83**	**0.89**
	Channel 251	33.17		
Digital 1900MHz	Channel 512	30.14		
	Channel 661	30.11	**0.81**	**0.72**
	Channel 810	29.96		

Table 4: SAR measurement results for the portable cellular telephone FCC ID IHDT56EV1 at highest possible output power. Measured against the left head in the 15° Tilt Position.

5) Please describe intended use positions while transmitting in landscape mode.

RESPONSE: The intended use position while transmitting in landscape mode would be handheld use.

6) Please describe any special setup and test considerations for DASY3 off-vertical probe axis scanning, including explanation/justification that peak SAR locations have been captured.

RESPONSE: Determination of the need for off-vertical probe axis scanning is determined from the measurement location points. If evaluation of the locations result in a measurement surface, in the area scan, that is off-horizontal by more than 20degrees, the probe is tilted along the M-B line away from the angle of the surface. This brings the angle of the probe axis closer to normal to the measurement surface. The SAR plots of the cube scans from the resulting measurements are included in Appendix A. These cube plots demonstrate that the peak SAR locations have been captured.

The setup and test considerations for the DASY3 off-vertical probe axis scanning is given below.

This document outlines the method utilized by the EME SAR Laboratories for measuring units exhibiting a boundary effect when using the DASY3 system.

- DASY SAM-Expanded Phantom Definition.
  This phantom definition contains the boundaries and coarse grid definitions allowing for scans in both the front and back of the SAM head incorporating a probe tilted 20 degrees.

  The origins and boundaries of the tilted sections should not be changed.
  Additional user defined reference points may be added to the configuration file for re-locating reference/drift measurements.

6.0 Procedure:

6.1 Determine test conditions per the type of required test (left head vs. right head, cheek touch vs. 15 Degree tilt).
6.2 Position device against head phantom.
6.3 Perform the SAR measurement process per the appropriate procedure,
  6.3.1 When selecting the phantom in the DASY software, choose the “SAM-Expanded” phantom definition.
  6.3.2 There are 2 additional Sections available for each side in the “SAM-Expanded” configuration file. They are intended for reducing probe slide & boundary effects during measurement of devices with high SAR locations near the edges of the phantom by tilting the probe.
  6.3.3 The sections are defined as “Rt. Tilt Back 20”, “Rt. Tilt Front 20”, “Lt. Tilt Back 20”, and “Lt. Tilt Front 20”.
  6.3.4 When a “Back 20” section is selected, the job(s) are performed with the probe tilted at a 20 degree angle toward the back of the head, roughly along the MB line. This section should be used when the hot spot is located near the back of the head and significant probe slide is noticed.
  6.3.5 Likewise, when a “Front 20” section is selected, the job(s) are performed with the probe tilted 20 degrees forward, for measurements in the mouth region of the SAM.
  6.3.6 Additional special considerations:

6.3.6.1 **The origins and boundaries of the tilted sections should not be changed.**

6.3.7 Perform scans.

6.3.7.1 The cube scan should incorporate the same tilt as defined in the coarse scan.

6.3.7.2 Different jobs within the same test sequence can be performed with different probe orientations by selecting the corresponding section (within the same head) for each specific job.

6.3.8 **Caution:** The “origin” of the tilted probe sections does not necessarily correspond exactly with the ERP. This is due to the convention used by DASY when the probe is tilted.

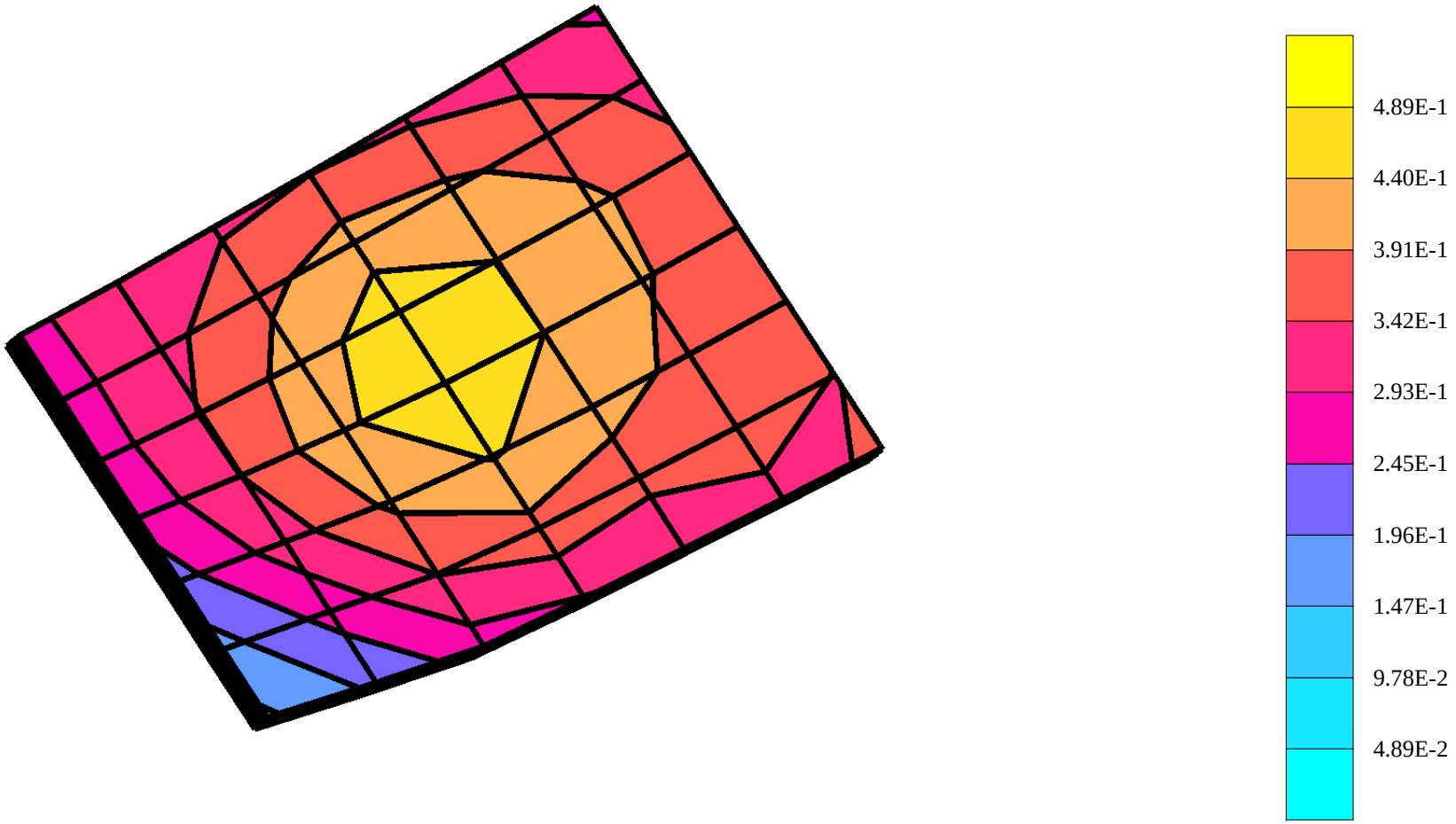
Appendix A

Cube Scans from Off-Vertical Probe Axis Scans

08/21/04

s/n: 4400007088915

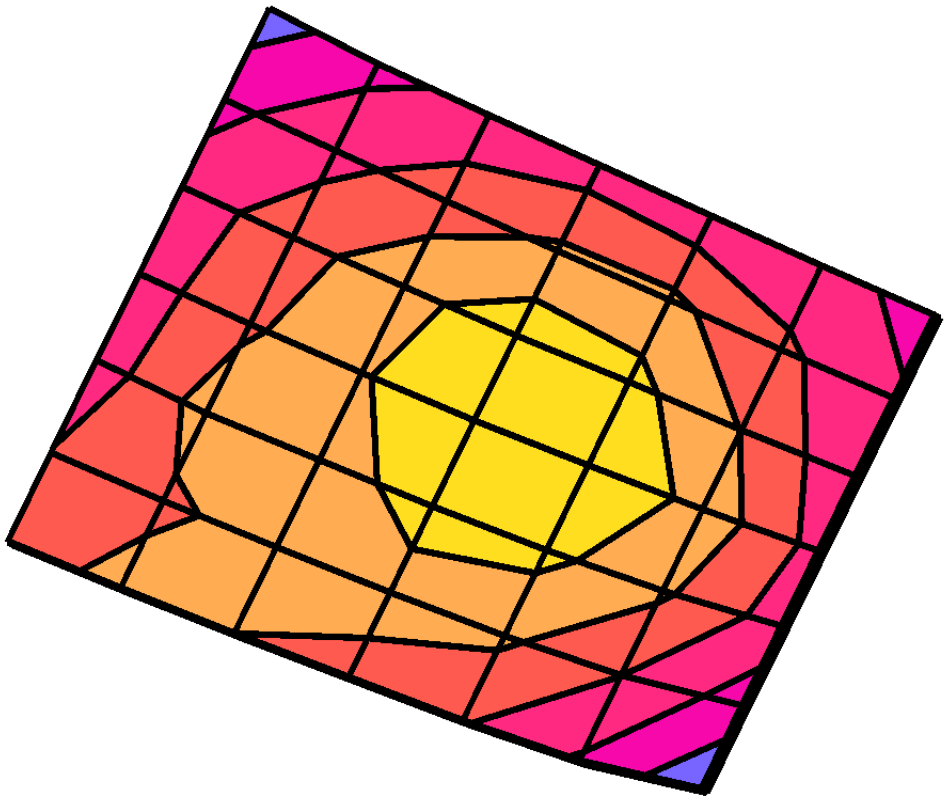
Ch# 190 Pwr Step: 5 ota
Antenna Position: INTERNAL
Type of Modulation: 800 gsm
Battery Model #: SNN5750A
DEVICE POSITION: CHEEK
Accessory Model #: none
R4 TP-1131 SUGAR SAM Expanded (Rev. 2)-9Jan03 Phantom; LH Front Tilt 20 Section; Position: (80°,180°); Frequency: 837 MHz
Probe: ET3DV6 - SN1514-IEEE Head2; ConvF(6.08,6.08,6.08); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.92 mho/m ε_r = 43.2 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.305 mW/g, SAR (10g): 0.204 mW/g, (Worst-case extrapolation)
Cube 7x7x7: Dx = 5.0, Dy = 5.0, Dz = 5.0
Penetration depth: 12.4 (10.5, 14.9) [mm]
Powerdrift: 0.28 dB



08/21/04

s/n: 4400007088915

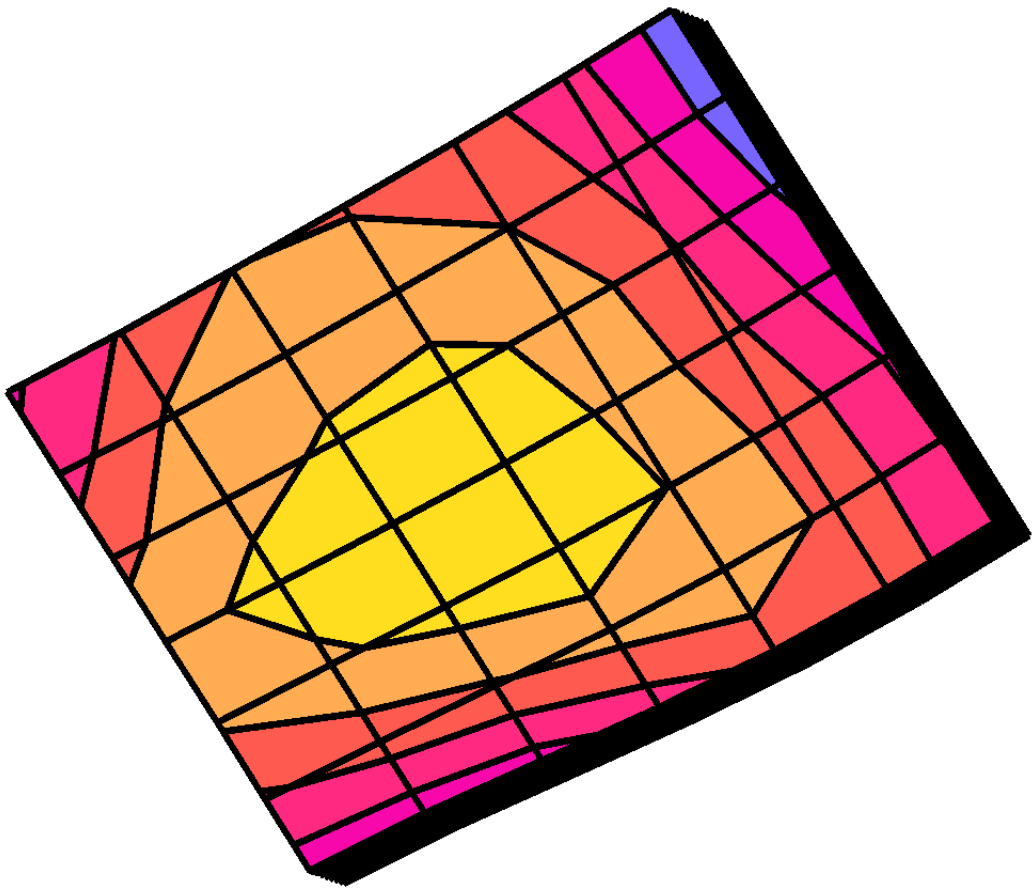
Ch# 190 Pwr Step: 5 ota
Antenna Position: INTERNAL
Type of Modulation: 800 gsm
Battery Model #: SNN5750A
DEVICE POSITION: CHEEK
Accessory Model #: none
R4 TP-1131 SUGAR SAM Expanded (Rev. 2)-9Jan03 Phantom; RH Front Tilt 20 Section; Position: (80°,180°); Frequency: 837 MHz
Probe: ET3DV6 - SN1514-IEEE Head2; ConvF(6.08,6.08,6.08); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.92 mho/m ε_r = 43.2 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.264 mW/g, SAR (10g): 0.176 mW/g, (Worst-case extrapolation)
Cube 7x7x7: Dx = 5.0, Dy = 5.0, Dz = 5.0
Penetration depth: 13.9 (11.0, 17.8) [mm]
Powerdrift: -0.50 dB



08/20/04

s/n: 4400007088915

Ch# 661 / Pwr Step: 0 Antenna Position: Internal
Type of Modulation: GSM 1900 Battery Model #: SNN5750A
DEVICE POSITION (cheek or rotated): Cheek
Accesspry Model #: N/A
Simulate Temp when Measured: 19.5 C Simulate Temp After Test: 19.6C
R4 TP-1250 GLYCOL SAM Expanded (Rev. 2)-9Jan03 Phantom; LH Front Tilt 20 Section; Position: (80°,180°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1514-IEEE Head2; ConvF(5.03,5.03,5.03); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.44 mho/m ε_r = 38.5 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.112 mW/g, SAR (10g): 0.0739 mW/g, (Worst-case extrapolation)
Cube 7x7x7: Dx = 5.0, Dy = 5.0, Dz = 5.0
Penetration depth: 12.2 (10.4, 15.0) [mm]
Powerdrift: 0.57 dB



08/21/04

s/n: 4400007088915

Ch# 661 / Pwr Step: 0 Antenna Position: non
Type of Modulation: gsm Battery Model #: snn5750a
DEVICE POSITION (cheek
tilted probe
R4 TP-1250 GLYCOL SAM Expanded (Rev. 2)-9Jan03 Phantom; RH Front Tilt 20 Section; Position: (80°,180°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1514-IEEE Head2; ConvF(5.03,5.03,5.03); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.46 mho/m ε_r = 38.0 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.143 mW/g, SAR (10g): 0.0884 mW/g, (Worst-case extrapolation)
Cube 7x7x7: Dx = 5.0, Dy = 5.0, Dz = 5.0
Penetration depth: 11.0 (8.7, 14.8) [mm]
Powerdrift: -0.53 dB