



June 21, 2002

Supplement to SAR Test Report for Motorola portable cellular phone (FCC ID IHDT56CA2)

Prepared by:

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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 IHDT56CA2). The requested information is addressed below in the same numbering sequence received.

1) Justification for the conversion factor used for the body measurements. The calibration certificate states that a CF of 5.0 was given at 1800 MHz. The SAR plots show 5.0 was used for testing at 1900 MHz. Provide new SAR data as appropriate.

RESPONSE: Since there were two probes used for these measurements therefore some scans have two different conversion factors. These probes were indicated in section 3.1 of the original SAR report. The 835MHz conversion factor of 6.4 for probe SN1391 and 6.5 for probe SN1508 is shown on the "Additional Conversion Factors" section of the attached probe calibration sheets for each probe, supplied with the original SAR report.

Since the conversion factor for both 1800 & 1900 MHz head is the same '5.43' (Original SAR report "Probe SN1391 Attached Calibration Certificate), it is also true for body worn that both 1800 and 1900 MHz share the same conversion factor of '5.0'.

2) Clarification if the substitution method was used for the radiated power measurement. Substitution method does not appear to have been used according to the procedure provided. Provided new data using the substitution method if not.

RESPONSE: Yes, the radiated power measurement procedure uses the dipole substitution method.

3) Additional descriptive information of the SAR measurement system to meet Supplement C Appendix B part II recommendations. Please include details of the E-field probe, scan procedures, calculations, Robot and computer.

RESPONSE: The DASY v3.1 system specified in section 3.1 of the original filing SAR Test report was utilized within the intended operations as set by the SPEAG™ setup. The default style of "coarse" and "cube" scans were chosen and use for measurements. The grid spacing of the course scan was 15cm as shown in the SAR plots. Please refer to the DASY manual for additional information on SAR scanning procedures and algorithms used.

4) SAR system manufacturer system verification data.

RESPONSE: The calibration certificate for the dipoles used for system accuracy verification is attached in Appendix 1 of this document.

5) Clarification of maximum conducted power of the device. For the AMPS mode the occupied BW and conducted power measurements do not agree. For the two digital modes the statement of 28 dBm in the operational description disagrees with the conducted power measurements.

RESPONSE: In the test report (exhibit 6), please refer directly to the "RF POWER OUTPUT" section for the maximum conducted power levels. These measurements are taken by equipment specifically designed for precise power measurements using the phone described in exhibit 11. In addition, the "RF power output" procedure includes precise compensation for connector and adapter losses. Similarly, Motorola agrees that the 28 dBm statement in the Operational Description (exhibit 12) is applicable only as a general reference.

6) New 1900 MHz body SAR data. It appears from the scan plot in figure 6 that the peak was not fully scanned. Also, please provide SAR measurement data for both peaks shown in the plot

RESPONSE: The coarse scan of the body worn configuration is the preliminary function of the DSAY 3.1d system to locate the highest peak. The more precise measurement is performed in the cube scan. The hot spot in the actual cube scan is fully captured. Please look at appendix 2.

As per the TCB workshop held at the end of August 2001, the SAR plot included in the original filing represents the peak with the highest measured SAR value. Attached in appendix 2 is the plot for the second peak.

7) Data demonstrating compliance with band edge compliance for the 800 MHz TDMA mode.

RESPONSE: 800 MHz TDMA Band Edge Compliance plots follow:

800 MHz TDMA – Lower Band Edge (Channel 991 824.04 MHz)



800 MHz TDMA – Upper Band Edge (Channel 799 848.97 MHz)



8) Clarification of tune frequency range for the part 24 E mode. The range stated on the grant differs from that stated on page 3 of the SAR report and page 5 of the EMC report. Please also provide tuned frequency used for the band edge measurement plots. Please update the grant as appropriate.

RESPONSE: Plots updated with frequency and channel specifications follow:

TDMA 1900 – Lower Band Edge (Channel 2 1850.04 MHz)



TDMA 1900 – Upper Band Edge (Channel 1998 1909.92 MHz)



Appendix 1

Dipole Calibration Sheet

Interim Dipole Correlation Certificate

FCD-0359, Rev.001

Dipole Serial Number:

F 092

Last Calibration Date:

3-Jan-01

Dipole Type (MHz):

900 MHz

Calibration Due:

3-Jan-03

Manufacturer:

SPEAG

-Manufacturer's Original Calibration Information-

Dipole to be correlated: [Serial Number: 092]

1g SAR normalized to 1W forward power (mW/g):	10.12 mW/g
Relative Dielectric:	40.6
Conductivity:	0.85
Probe Serial Number:	SN 1507
Forward Power:	250mW +/- 3%

Primary Dipole Referenced: [Serial Number: 077]

1g SAR normalized to 1W forward power (mW/g):	11.4 mW/g
Relative Dielectric:	40.3
Conductivity:	0.95
Probe Serial Number:	SN 1507
Forward Power:	250mW +/- 3%

-Correlation Method Utilized- per DOI-1265

(select one)

By Similarity:

By Transfer Calibration:

-Measured Data-

Probe S/N:

SN 1513

Conductivity (meas.):

0.97

Robot Cell #:

RVD #8

Permittivity (meas.):

42.3

Primary Standard (average of 0-degree & 90-degree 1g cubes):

2.875 mW/g	N/R	N/R
(if required)	(if required)	(if required)

Secondary Standard (average of 0-degree & 90-degree 1g cubes):

2.885 mW/g	N/R	N/R
(if required)	(if required)	(if required)

-NEW Correlated Target-

1g SAR normalized to 1W forward power (mW/g):	11.4 mW/g
Relative Dielectric:	40.3
Conductivity:	0.95

Approved by:

Antonio Fenech

Date:

11/13/2001

Comments:

Secondary dipole measured -2.4% from primary dipole.

Interim Dipole Correlation Certificate

FCD-0359, Rev.001

Dipole Serial Number:	283(TR)	Last Calibration Date:	5-Jan-01
Dipole Type (MHz):	D1800V2 w/ Teflon Rings	Calibration Due:	5-Jan-03
		Manufacturer:	SPRAG

-Manufacturer's Original Calibration Information-

Dipole to be correlated: [Serial Number: 283(TR)]

1g SAR normalized to 1W forward power (mW/g):	44.0mW/g
Relative Dielectric:	40.0
Conductivity:	1.71
Probe Serial Number:	1507
Forward Power:	250mW

Primary Dipole Referenced: [Serial Number: 246(TR)]

1g SAR normalized to 1W forward power (mW/g):	38.8 mW/g
Relative Dielectric:	39.6
Conductivity:	1.37
Probe Serial Number:	1507
Forward Power:	250 mW

-Correlation Method Utilized- per DOI-1265

(select one)

By Similarity: By Transfer Calibration:

-Measured Data-

Probe S/N:	1375	Conductivity (meas.):	1.38
Robot Cell #:	RPD-4	Permittivity (meas.):	38.4

Primary Standard (average of 0-degree & 90-degree 1g cubes):

0.515 mW/g		
(if required)	(if required)	(if required)

Secondary Standard (average of 0-degree & 90-degree 1g cubes):

2.593 mW/g		
(if required)	(if required)	(if required)

-NEW Correlated Target-

1g SAR normalized to 1W forward power (mW/g):	38.8 mW/g
Relative Dielectric:	39.6
Conductivity:	1.37

Approved by: Antonio Flesca Date: 3/8/02

Comments: Secondary dipole measured +0.8 % from primary dipole.

Interim Dipole Correlation Certificate

FCD-0359, Rev.001

Dipole Serial Number:

095

Last Calibration Date:

3-Jan-01

Dipole Type (MHz):

900 MHz

Calibration Due:

3-Jan-03

Manufacturer:

SPEAG

-Manufacturer's Original Calibration Information-

Dipole to be correlated: [Serial Number: 095]

1g SAR normalized to 1W forward power (mW/g):	10.24 mW/g
Relative Dielectric:	40.6
Conductivity:	0.95
Probe Serial Number:	SN 1307
Forward Power:	230mW +/- 3%

Primary Dipole Referenced: [Serial Number: 077]

1g SAR normalized to 1W forward power (mW/g):	11.4 mW/g
Relative Dielectric:	40.3
Conductivity:	0.95
Probe Serial Number:	SN 1307
Forward Power:	230mW +/- 3%

-Correlation Method Utilized- per DOI-1265

(select one)

By Similarity:

By Transfer Calibration:

-Measured Data-

Probe S/N: SN 1315

Conductivity (meas.): 0.97

Robot Cell #: BVD 08

Permittivity (meas.): 42.5

Primary Standard (average of 0-degree & 90-degree 1g cubes):

2.873 mW/g	N/R	N/R
	(if required)	(if required)

Secondary Standard (average of 0-degree & 90-degree 1g cubes):

2.88 mW/g	N/R	N/R
	(if required)	(if required)

-NEW Correlated Target-

1g SAR normalized to 1W forward power (mW/g):	11.4 mW/g
Relative Dielectric:	40.3
Conductivity:	0.95

Approved by: Antonio Feneane

Date: 11/13/2001

Comments:

Secondary dipole measured -1.2% from primary dipole.

Interim Dipole Correlation Certificate

FCD-0359, Rev.001

Dipole Serial Number:	284(TR)	Last Calibration Date:	5-Jan-01
Dipole Type (MHz):	D1800V2 w/ Teflon Rings	Calibration Due:	5-Jan-03
		Manufacturer:	SPEAG

-Manufacturer's Original Calibration Information-

Dipole to be correlated: [Serial Number: 284(TR)]

1g SAR normalized to 1W forward power (mW/g):	44.4mW/g
Relative Dielectric:	40.0
Conductivity:	1.71
Probe Serial Number:	1507
Forward Power:	250mW

Primary Dipole Referenced: [Serial Number: 246(TR)]

1g SAR normalized to 1W forward power (mW/g):	38.8 mW/g
Relative Dielectric:	39.6
Conductivity:	1.37
Probe Serial Number:	1507
Forward Power:	250 mW

-Correlation Method Utilized- per DOI-1265

(select one)

By Similarity: By Transfer Calibration:

-Measured Data-

Probe S/N: 1574 Conductivity (meas.): 1.38
Robot Cell #: HVD-4 Permittivity (meas.): 38.4

Primary Standard (average of 0-degree & 90-degree 1g cubes):

2.315 mW/g (if required) (if required)

Secondary Standard (average of 0-degree & 90-degree 1g cubes):

2.265 mW/g (if required) (if required)

-NEW Correlated Target-

1g SAR normalized to 1W forward power (mW/g):	38.8 mW/g
Relative Dielectric:	39.6
Conductivity:	1.37

Approved by: *Astr. Ferrelle* Date: 3/8/02

Comments:

Secondary dipole measured +1.6 % from primary dipole.

Appendix 2

DASY3 Plots

s/n: 525FE8A8

Ch# 1001 / Pwr Step: 02 / Antenna Position: Fixed / Type of Modulation: 1900 TDMA / Battery Model #: SNN5571A

Simulant TEMP: When Measured = 20.7 °C After Test = 20.7 °C

Accessory Model # = Belt Clip SHN7175A

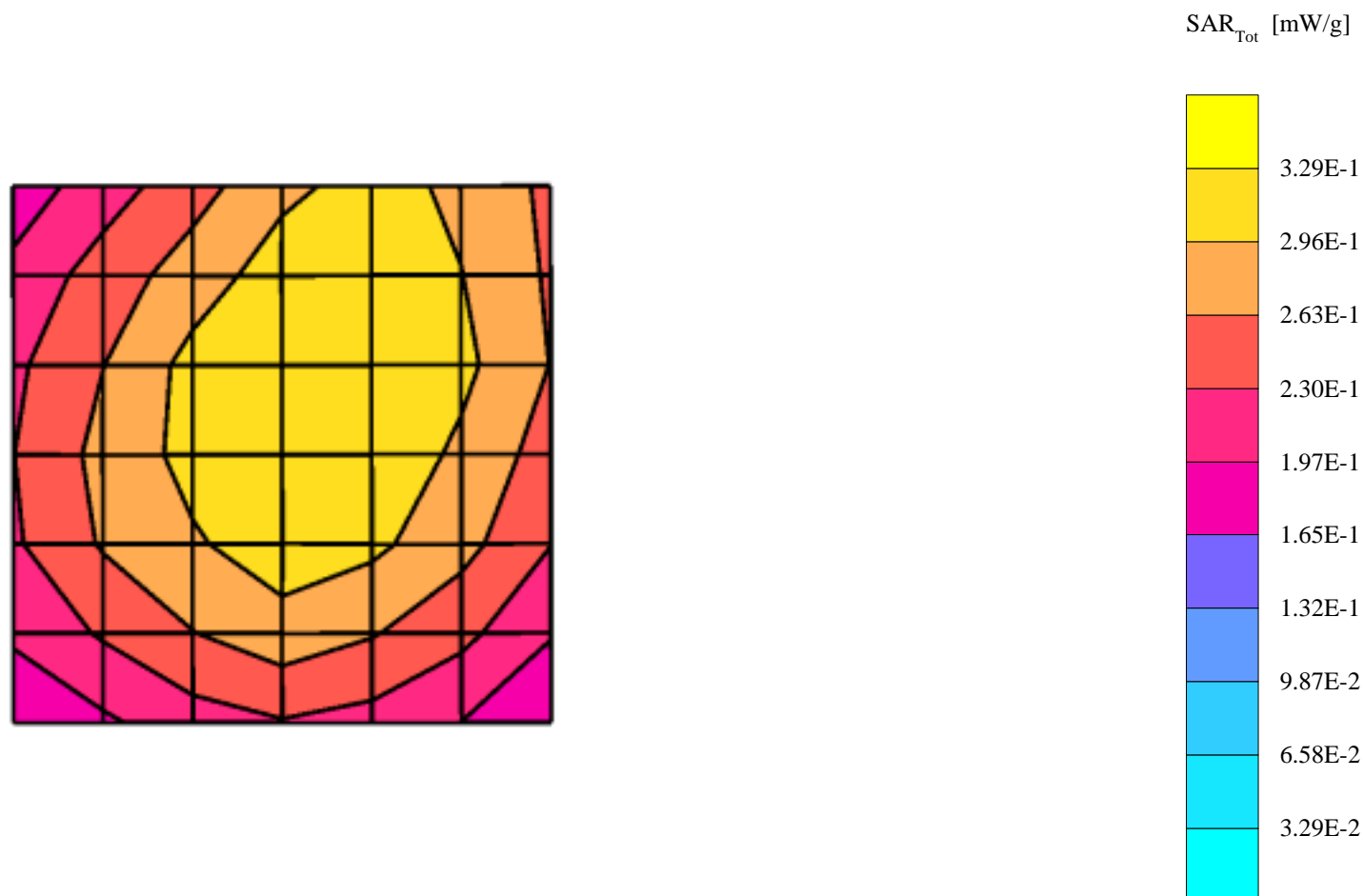
R5 Amy Twin Phantom Rev.3 Phantom; section 1 Section; Position: (0°,0°); Frequency: 1880 MHz

Probe: ET3DV6 - SN1391 - FCC Body; ConvF(5.00,5.00,5.00); Crest factor: 3.0; 1880 MHz Head & Body: $\sigma = 1.58$ mho/m $\epsilon_r = 51.1$ $\rho = 1.00$ g/cm³

Cube 7x7x7: SAR (1g): 0.195 mW/g, SAR (10g): 0.119 mW/g, (Worst-case extrapolation)

Cube 7x7x7: Dx = 5.0, Dy = 5.0, Dz = 5.0

Penetration depth: 10.3 (9.1, 12.1) [mm]



s/n 525FE8A8

Ch# 1001 / Pwr Step: 02 (OTA) / Antenna Position: Fixed / Battery Model #: SNN5571A / SIMT TEMP: When Measured = 20.7 °C After Test = 20.7 °C Accessory Model # = Belt Clip SHN7175A

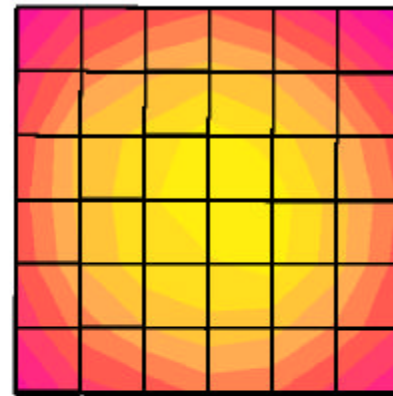
R5 Amy Twin Phantom Rev.3 Phantom; section 1 Section; Position: (0°,0°); Frequency: 1880 MHz

Probe: ET3DV6 - SN1391 - FCC Body; ConvF(5.00,5.00,5.00); Crest factor: 3.0; 1880 MHz Head & Body: $\sigma = 1.58$ mho/m $\epsilon_r = 51.1$ $\rho = 1.00$ g/cm³

Cube 7x7x7: SAR (1g): 0.163 mW/g, SAR (10g): 0.0996 mW/g, (Worst-case extrapolation)

Cube 7x7x7: Dx = 5.0, Dy = 5.0, Dz = 5.0

Penetration depth: 10.7 (9.5, 12.3) [mm]



SAR_{Tot} [mW/g]

