



August 26, 1999
Supplement to SAR Test Report for Motorola portable cellular phone (FCC ID IHDT56ZJ1).

Prepared by:
Paul Moller, Principal Staff Engineer
Motorola Personal Communications Sector Product Safety Laboratory
Harvard, Illinois

Contents

- 1) Summary of FCC request for additional information
- 2) Body Worn Configuration Evaluation
- 3) PCMCIA Card Utilization
- 4) Battery Options affect on Compliance with the RF Guidelines

Appendix A: Included data

Appendix B: Measurement Probe Calibration Certificate

Appendix C: Printout from the Dasy™ measurement system validation test

Appendix D: Dasy™ Users Manual (first page)

1. Summary of FCC request for additional information

There was a request for additional information regarding relationship between the use of the product and the SAR test data submitted with the Report for Motorola's portable cellular phone (FCC ID IHDT56ZJ1) dated June 30, 1999. The requested information may be summarized as follows:

1. Whether the use of the holster for body worn operations meets the RF Guidelines.
2. Whether the PCMCIA card can be used when the phone is in a "body-worn" configuration and, if so, will the RF Guidelines be met.
3. Whether the product's battery options affect compliance with the RF Guidelines.

2. Body Worn Configuration Evaluation

The cellular phone (FCC ID IHDT56ZJ1) can be used in a body-worn configuration using the supplied holster. With proper usage of this holster the antenna is kept at least one inch away from the user's body. We have performed an evaluation to show RF exposure compliance when used with the holster. Figure 1 shows the test unit as it is placed onto the phantom. The test sample is capable of operation in a test mode that allows control of the transmitter without the need to place actual phone calls. This guarantees that the unit does not change its transmitter power, and that the resultant SAR values will not be affected by external connections. For the purposes of this test the unit is commanded to test mode and manually set to the proper channel, transmitter power level and transmit mode of operation.



Figure 1. Phone In Supplied Belt Clip Against Phantom

The following table shows the SAR values for the body worn condition for 800MHz. A full data set output of two test conditions with the highest SAR values from the Dasy™ measurement system is included as appendix A. The test condition included are indicated as a bold number in the following table. All other test conditions measured lower SAR values than those included.

	800MHz	
	Retraced	Extended
Channel	Antenna	Antenna
991	0.21	0.47
384	0.4	0.47
799	0.47	0.48

Probe serial number 1375 was used for the measurements. It was calibrated at SPEAG™, and has a calibration date July 1, 1999. A copy of the calibration certificate is included as appendix B. Dipole Validation Kit type D900V2, serial number 036 was used to validate the system accuracy at 800MHz. The validation SAR value is 9.56 mW/g normalized to 1 Watt, and the Dasy™ system used for the test phone measured 10.28 mW/g normalized to 1 Watt. This is within the required accuracy, and thus the measured SAR values are considered correct. See appendix C for printout of the validation test from the Dasy™ measurement system.

Also, the manual is currently under revision to include the following text:

"For body-worn operation, the antenna should be kept at least one inch from the body when transmitting. A carry holder with a belt clip is provided with the radio for body-worn use."

3. PCMCIA Card Utilization

The cellular phone (FCC ID IHDT56ZJ1) can be used with a PCMCIA card connection while in a body worn configuration. The use of the PCMCIA card connection does not affect the transmitter output power and thus will not increase the maximum SAR value.

4. Battery Options affect on Compliance with the RF Guidelines

The cellular phone (FCC ID IHDT56ZJ1) does have several battery options when used in a body-worn configuration. There are two 'main' battery options that fit in the pocket of the upper portion of the phone which, when the phone is closed and placed in the supplied holster, is the side nearer the body. This holster has a pocket that will allow either of two 'main' batteries ('slim' or 'extended') to fit in the holster so there is no impact on distance between the body and the antenna.

There are two 'auxiliary' batteries options that clip on the lower portion of the phone and are slightly narrower than the main body of the phone. When the phone is closed and in the supplied holster, the lower portion of the phone is the side away from the body so, again, there is no impact on distance between the body and the antenna.

The 'Extended Main LiON (900 mAH)' is the battery option that was used for body-worn testing. Since the SAR found for body worn use was lower than what was found for head adjacent use, and the margins are believed sufficient for head adjacent use, they should also be sufficient for

body worn use. By making this statement, Motorola should not be considered to have agreed that there is 15% performance variation due to the battery options that would give rise to SAR differences of the magnitude of 15%.

Appendix A

Measurement Results of Cellular Phone FCC ID IHDT56ZJ1 used in a Body-Worn Holster Data

CDMA SWF0280A EDDDF8F7 CH 799 ANTOUT

CH 799 ANT OUT/BELT CLIP /SC

Belt Clip Phantom; Section; Position: ; Frequency: 849 MHz

Probe: ET3DV6 - SN1375; ConvF(6.59,6.59,6.59); Crest factor: 1.0; Muscle 800 MHz: $\sigma = 1.10$ mho/m $\epsilon_r = 52.0$ $\rho = 1.00$ g/cm³

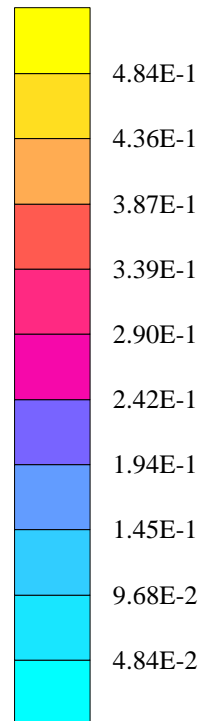
Cube 5x5x7: SAR (1g): 0.480 [mW/g], SAR (10g): 0.323 [mW/g], (Worst-case extrapolation)

Coarse: Dx = 10.0, Dy = 10.0, Dz = 0.0

Powerdrift: -0.05 dB



SAR_{Tot} [mW/g]



Appendix B

The following page is a copy of the Calibration Certificate for Dasy™ probe serial number 1375.

Calibration Certificate

Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1375

Place of Calibration:

Zurich

Date of Calibration:

July 1, 1999

Calibration Interval:

12 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:

C. Schilli

Approved by:

C. Schilli

Appendix C

The following page is the printout from the Dasy™ measurement system validation tests.

Dipole 900MHz

Forward Power : 0.25W

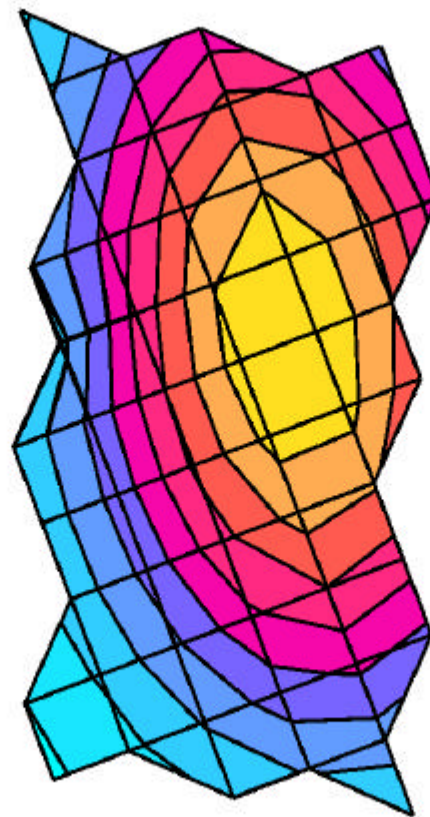
MOT FLAT Phantom; MOTO FLAT Section; Position: (0°,0°); Frequency: 900 MHz

Probe: ET3DV6 - SN1375; ConvF(6.59,6.59,6.59); Crest factor: 1.0; Brain 900Mhz: $\sigma = 0.85$ mho/m $\epsilon_r = 43.0$ $\rho = 1.00$ g/cm³

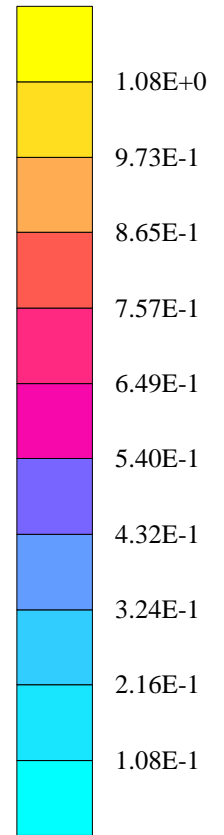
Cube 5x5x7: SAR (1g): 2.57 [mW/g], SAR (10g): 1.67 [mW/g], (Worst-case extrapolation)

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

Powerdrift: -0.07 dB



SAR_{Tot} [mW/g]



Appendix D

The following page is a copy of the first page of the Dasy™ Users Manual

Schmid & Partner Engineering AG

Staffelstrasse 8, 8045 Zurich, Switzerland, Telefon +41 1 280 08 60, Fax +41 1 280 08 64

Preliminary Manual

DASY3 V1.0b

for Windows 95

March 98 Edition
Schmid & Partner Engineering AG
Staffelstrasse 8
8045 Zurich
Switzerland
Tel +41 1 280 08 60
Fax +41 1 280 08 64
Email: speag@access.ch
WWW: www.access.ch/speag