Certificate Number: 1449-02

ACCREDITED

MOTOROLA

CGISS EME Test Laboratory
8000 West Sunrise Blvd
Fort Lauderdale, FL. 33322

S.A.R. EME Compliance Test Report

Attention:	Federal Communication Commission
Date of Report:	April 15, 2002
Report Revision:	Rev. O
Device Manufacturer:	Motorola
Device Description:	Hand Held Wireless Data Terminal
FCC ID:	AZ489FT5802
Device Model:	F5027A

Test Period:	3/19/02 – 3/20/02
Test Engineer:	Stephen Whalen Sr. Test Engineer
Author:	Michael Sailsman EME Regulatory Affairs Liaison

Note: Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 2.0 of this report.

Ken Enger
Senior Resource Manager, Product Safety and EME Director

Date Approved

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REVISION HISTORY

Date	Revision	Comments
4/15/02	O	Initial release

1.0 Introduction

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (S.A.R.) measurements performed at the Motorola CGISS EME Test Lab for the Handheld Data Terminal with wireless LAN, model number F5027A, FCC ID AZ489FT5802. The results presented herein reflect disclosure of additional performance data when the device is operated while in a users shirt pocket as well as in a new holster offered for this product.

The applicable exposure environment is General Population/Uncontrolled.

The test results included herein represent the highest S.A.R. levels applicable to this product and clearly demonstrate compliance with FCC General Population/Uncontrolled RF Exposure limits of 1.6 mW/g per the requirements of 47 CFR 2.1093(d).

2.0 Reference Standards and Guidelines

This product is designed to comply with the following national and international standards and guidelines.

- United States Federal Communications Commission, Code of Federal Regulations; 47CFR part 2 sub-part J
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Terminal frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz, 1999
- Australian Communications Authority Terminal communications (Electromagnetic Radiation - Human Exposure) Standard 2001
- ANATEL, Brazil Regulatory Authority, Resolution 256 (April 11, 2001) "additional requirements for SMR, cellular and PCS product certification."

3.0 Description of Test Sample

Model F5027A is a hand held data terminal. The terminal's intended use will be for data acquisition during delivery of packages. It is used while in a holster next to the body, in a users shirt pocket, or handheld in front of the operator.

The device contains a 900MHz wireless LAN radio manufactured by RIM. The OEM radio module (FCC ID L6AR902M-2-0) transmits in the Gaussian Minimum Shift Keying (GMSK) mode with a maximum output of 2.0 watts and a maximum duty cycle of 25%.

The device incorporates an internal ¼ wave monopole antenna. The transmit frequency range for this device is 896 to 901 MHz.

The sample device tested for this report represent an identical prototype to those intended for production.

This device is offered with the following options and accessories:

Batteries:

FNN6001B Li Ion 1400 mAH

Additional Body-Worn Accessory:

ABF960 Air Borne Specific Holster

Antenna:

Internal ¼ wave Monopole

3.1 Test Signal

Test Signal mode:

Test Mode	X	Base Station		Simulator	

Transmission Mode:

CW	**X**
Native Transmission	
TDMA	
Other	

3.2 Test Output Power

This data terminal uses an inaccessible internal antenna. For this reason a power vs. time characteristic curve was generated prior to S.A.R. measurements on the device for a time interval greater than the expected S.A.R. measurement duration. This curve is then used to determine the power slump characteristics at the actual end of the S.A.R. measurement.

4.0 Description of Test Equipment

4.1 Descriptions of S.A.R. Measurement System

The laboratory utilizes the latest version of a Dosimetric Assessment System (DASY3™) S.A.R. measurement system manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The S.A.R. measurements were conducted with probe model/serial number ET3DV6/SN1547. The system performance check was conducted daily and within 24 hours prior to testing. A copy of the probe calibration certificates and the DASY output files of the system performance test results are included in APPENDIX C. The table below summarizes the system performance check results normalized to 1W.

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	System Perf. Result when normalized to 1W (mW/g)	Reference S.A.R. @ 1W (mW/g)	Test Date
1547	FCC Body	11/16/01	D835V2 SN # 427	10.74	10.82	3/19/02
1547	FCC Body	11/16/01	D835V2 SN # 427	10.54	10.82	3/20/02

The DASY3™ system is operated per the instructions in the DASY3™ Users Manual. The complete manual is available directly from SPEAG™.

4.2 Description of Phantom

4.2.1 Body Phantom:

Flat Phantom:

A rectangular shaped box made of high-density polyethylene (HDPE) with a dielectric constant of 2.26 and a loss tangent of less than 0.00031. The phantom is mounted on a wooden supporting structure that has a loss tangent of < 0.05. The structure has a 68.6 cm x 25.4 cm opening at its center to allow positioning the DUT to the phantom's surface. The supporting structure is assembled with wooden pegs and glue. The table below shows the flat phantom dimensions.

Length	80cm
Width	30cm
Height	20cm
Surface Thickness	0.2cm

4.3 Simulated Tissue Properties:

4.3.1 Type of Simulated Tissue

The simulated tissue used is compliant to that specified in FCC Supplement C (Edition 01 - 01) to OET Bulletin 65 (Edition 97 - 01).

Simulated Tissue	Body Position
Body	Abdomen

4.3.2 Simulated Tissue Composition

Frequency (898 MHz)	
Body	
Sugar	44.9
Water	53.06
Salt	0.94
HEC	1.0
Bactericide	0.1

Characterization of Simulated tissue materials and ambient conditions:

Simulated tissue prepared for S.A.R. measurements is measured daily and within 24 hours prior to actual S.A.R. testing to verify that the tissue is within 5% of target parameters at the center of the transmit band. This measurement is done using the Agilent (HP) probe kit model 85070C and a HP8753D Network Analyzer calibration date 12/4/01.

Target tissue parameters

Body		
Frequency(MHz)	**Di-electric Constant**	**Conductivity – S/m**
898	55.01	1.05

4.4 Test conditions:

The EME Laboratory ambient environment is well controlled resulting in very stable simulated tissue temperature and therefore stable dielectric properties. Simulated tissue temperature is measured prior to each scan to insure it is within +/ - 2^{o}C of the temperature at which the dielectric properties were determined. Additional precautions are routinely taken to ensure the stability of the simulated tissue such as covering the phantoms when scans are not actively in process in order to minimize evaporation. The lab environment is continuously monitored. The table below represents the average environmental conditions during the S.A.R. tests reported herein:

Ambient Temperature	20.9 °C
Relative Humidity	49.9 %
Tissue Temperature	21.8 °C

The EME Lab RF environment uses a Spectrum Analyzer to monitor for extraneous large signal RF contaminants that could possibly affect the test results. If such unwanted signals are discovered the S.A.R. scans are repeated. However, the lab environment is sufficiently protected such that no S.A.R. impacting interference has been experienced to date.

5.0 Description of Test Procedure

All options and accessories listed in section 3.0 were included in the S.A.R. test plan in order to determine the highest S.A.R. levels. S.A.R. measurements were taken at the abdomen. Tests were performed with the device output power set to 500 mW. This reflects a normal operating duty cycle characteristic of 25%. The device was operating in a continuous wave (CW) test mode for all measurements. Each S.A.R. scan was taken with a fully charged battery.

5.1 Device Test Positions

S.A.R. measurements were performed with the display facing towards and away from the phantom using battery model FNN6001B and body-worn accessory model ABF960 at the center frequency of transmit band. Additional measurements were performed with the device adjacent to the phantom with out the body worn accessory to assess shirt pocket user configuration performance.

5.1.0 Abdomen

A flat phantom containing simulated body tissue consistent with applicable standards was used to assess S.A.R. performance of the device.

Figure 1: Highest S.A.R. configuration

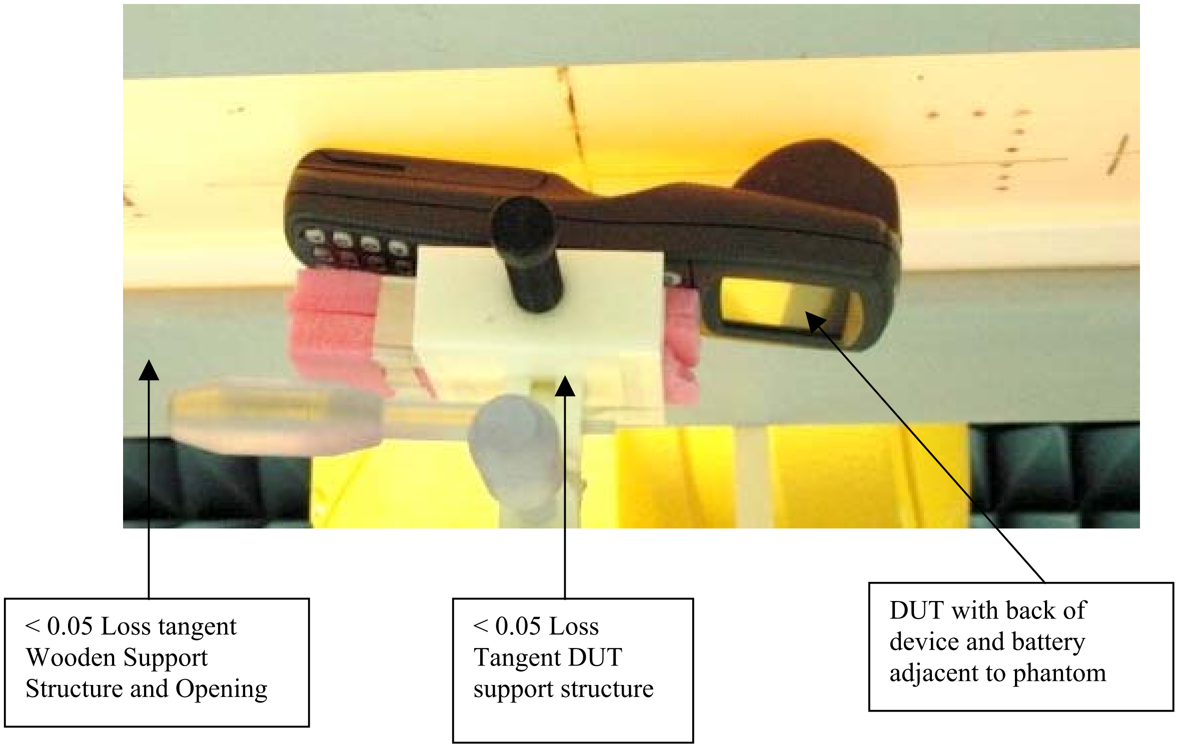
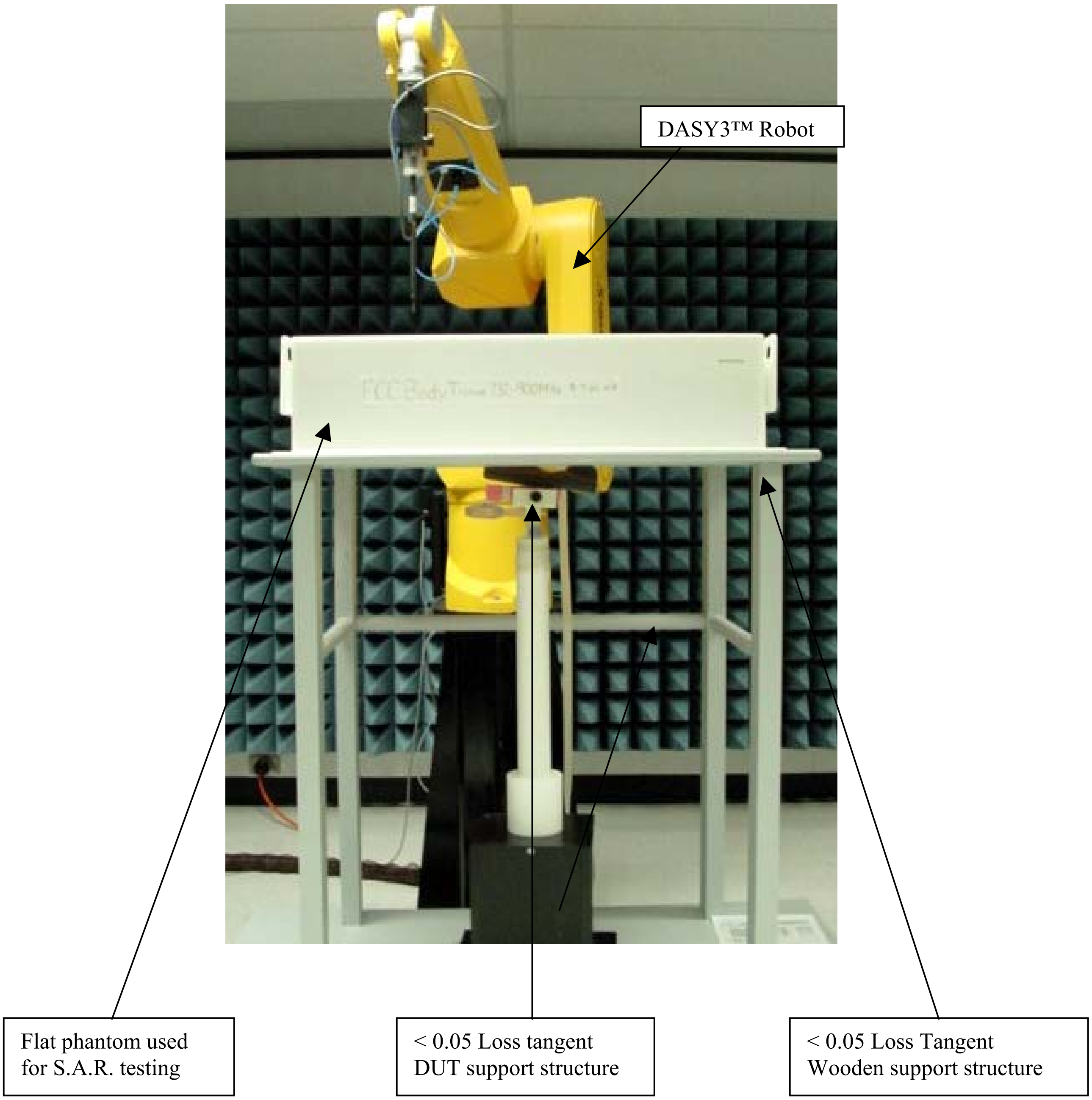


Figure 2: Robot Test System



5.2 Probe Scan Procedures

The E-field probe is first scanned in a coarse grid over a large area inside the phantom in order to locate the interpolated maximum S.A.R. distribution. After the coarse scan measurement, the probe is automatically moved to a position at the interpolated maximum. The subsequent scan can directly use this position as reference for the cube evaluations.

6.0 Measurement Uncertainty:

The table below lists the uncertainty estimate of the possible errors that are associated with the measurement system.

Uncertainty Description	Standard Uncertainty
Probe Uncertainty	
- Axial Isotropy	± 2.4 %
- Spherical Isotropy	± 4.8 %
- Spatial Resolution	± 0.5 %
- Linearity Error	± 2.7 %
- Calibration Error	± 8 %
Evaluation Uncertainty	
- Data Acquisition Error	± 0.60 %
- ELF and RF Disturbances	± 0.25 %
- Conductivity Assessment	± 5 %
Spatial Peak SAR Evaluation Uncertainty	
- Extrapolation and boundary effects	± 3%
- Probe positioning	± 1 %
- Integration and cube orientation	± 3 %
- Cube shape inaccuracies	± 1.2 %
- Device positioning	± 1.0 %

The Total Measurement Uncertainty is ± 12.1 %. The Expanded Measurement Uncertainty is ± 24.2 % (k=2)

7.0 S.A.R. Test Results:

All S.A.R. results obtained by the tests described in Section 5.0 are listed in section 7.1 below. The initial power stated in section 7.1 reflects a 25% duty cycle of the maximum reported conducted power output of this device. The bolded result indicates the highest observed S.A.R. performance. No scaling was done to obtain the S.A.R. results presented. DASY3™ S.A.R. measurement scans are provided in APPENDIX A for the highest observed S.A.R.

7.1 S.A.R. results at the abdomen:

Run Number	Freq. (MHz)	Battery	Carry Case	Initial Power (mW)	End Power (mW)	Measured 1g-S.A.R. 25% duty cycle (mW/g)
Ab_R1_020320-03	898	FNN6001B	None Front Position	0.500	0.511	0.13
Ab_R1_020320-02	898	FNN6001B	None Back Position	0.500	0.511	**0.45**
Ab_R1_020319-07	898	FNN6001B	ABF960 Front Position	0.500	0.511	0.16
Ab_R1_020319-08	898	FNN6001B	ABF960 Back Position	0.500	0.511	0.37

7.3 Peak S.A.R. location

The peak S.A.R. was observed near the bottom of the device.
Refer to APPENDIX A for detailed S.A.R. scan distributions.

8.0 Conclusion

The highest Operational 1-gram average S.A.R values found for the hand held data terminal model number F5027A with the new body worn accessory and user configuration at the abdomen is **0.45 mW/g**. This reflects higher results than the previously reported value of **0.14mW/g.**

The updated test result clearly demonstrate compliance with FCC General Population/Uncontrolled RF Exposure limits of **1.6 mW/g** per the requirements of 47 CFR 2.1093(d)

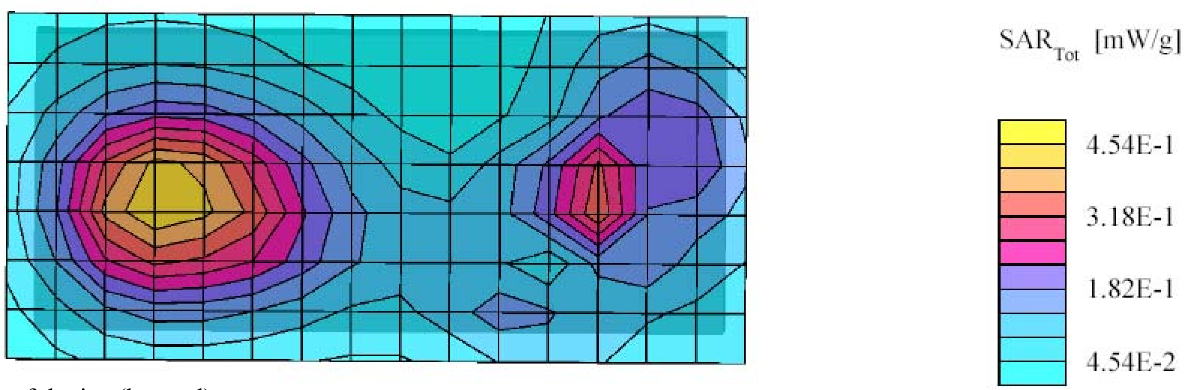
APPENDIX A

DATA RESULTS

Data Terminal F5027A; Test Date: 03/20/02
Motorola CGISS EME Laboratory
Model #: F5027A SN: 312SAS0079
Run #: Ab_R1_020320-02
Tissue Temp: 20.5 (Celsius)
TX Freq: 898.5 MHz

Accessories:
Antenna: internal; Battery Kit: FNN6001B
Flat Phantom; Device Section; Position: (90°,0°);
Probe: ET3DV6 - SN1547; ConvF(6.20,6.20,6.20); Probe cal date: 11/16/01; Crest factor: 1.0; FCC Body_898MHz: σ = 1.06 mho/m ε = 52.6 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 08/22/01
Cube 7x7x7:SAR (1g): 0.449 mW/g, (Worst-case extrapolation);Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 48.0, 51.0, 4.0

Device Back/Battery Towards Phantom

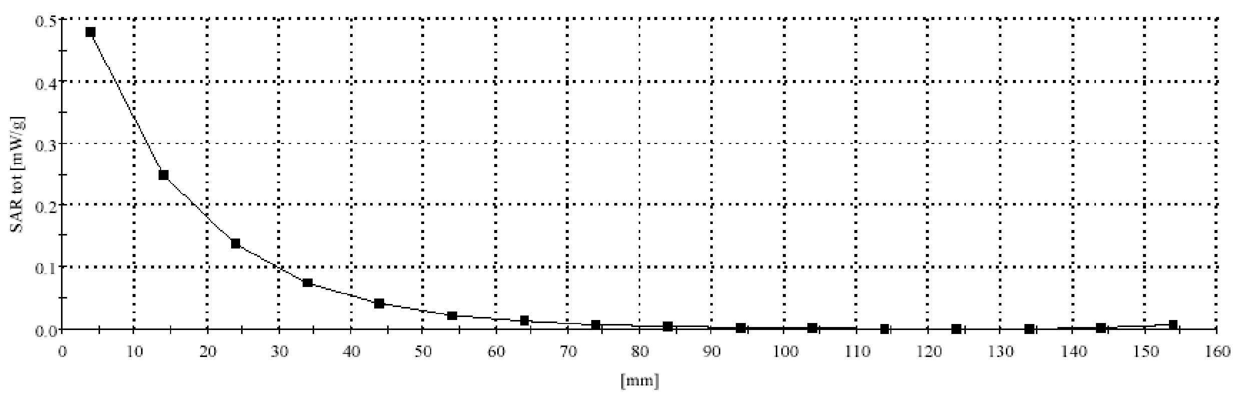


Bottom of device (keypad)

Top of device (display)

Data Terminal F5027A; Test Date: 03/20/02
Motorola CGISS EME Laboratory
Model #: F5027A SN: 312SAS0079
Run #: Ab_R1_020320-02
Tissue Temp: 20.5 (Celsius)
TX Freq: 898.5 MHz

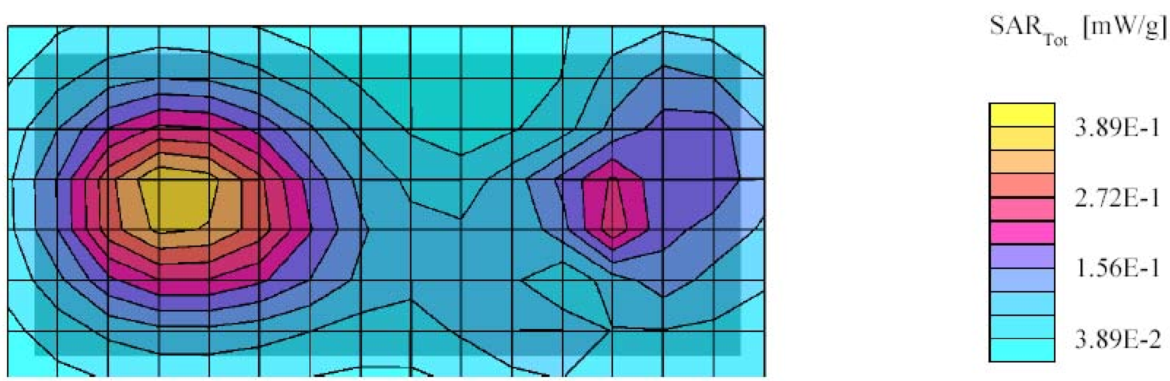
Accessories:
Antenna: internal; Battery Kit: FNN6001B
Flat Phantom Phantom; Section; Position: ; Frequency: 899 MHz
Probe: ET3DV6 - SN1547; ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body_898MHz: σ = 1.06 mho/m ε = 52.6 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 08/22/01
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 10.0,



Data Terminal F5027A; Test Date: 03/19/02
Motorola CGISS EME Laboratory
Model #: F5027A SN: 312SAS0079
Run #: Ab_R1_020319-08
Tissue Temp: 20.5 (Celsius)
TX Freq: 898.5 MHz

Accessories:
Antenna: internal; Battery Kit: FNN6001B
Holster: ABF960.
Flat Phantom; Device Section; Position: (90°,0°);
Probe: ET3DV6 - SN1547; ConvF(6.20,6.20,6.20); Probe cal date: 11/16/01; Crest factor: 1.0; FCC Body_898MHz: σ = 1.06 mho/m ε = 52.5 ρ= 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 08/22/01
Cube 7x7x7:SAR (1g): 0.372 mW/g, (Worst-case extrapolation); Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 48.0, 55.5, 4.0

Device Back/Battery Towards Phantom

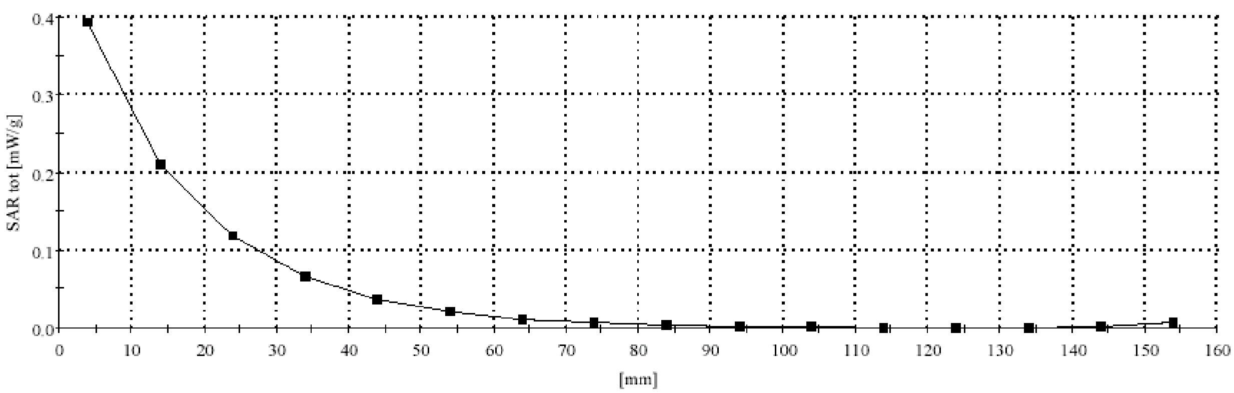


Bottom of device (keypad)

Top of device (display)

Data Terminal F5027A; Test Date: 03/19/02
Motorola CGISS EME Laboratory
Model #: F5027A SN: 312SAS0079
Run #: Ab_R1_020319-08
Tissue Temp: 20.5 (Celsius)
TX Freq: 898.5 MHz

Accessories:
Antenna: internal; Battery Kit: FNN6001B
Holster: ABF960
Flat Phantom; Section; Position: Frequency: 899 MHz
Probe: ET3DV6 - SN1547; ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body_898MHz: σ = 1.06 mho/m ε = 52.5 ρ = 1.00 g/cm^3; DAE3: 363-V1 DAE Cal Date: 08/22/01
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 10.0,

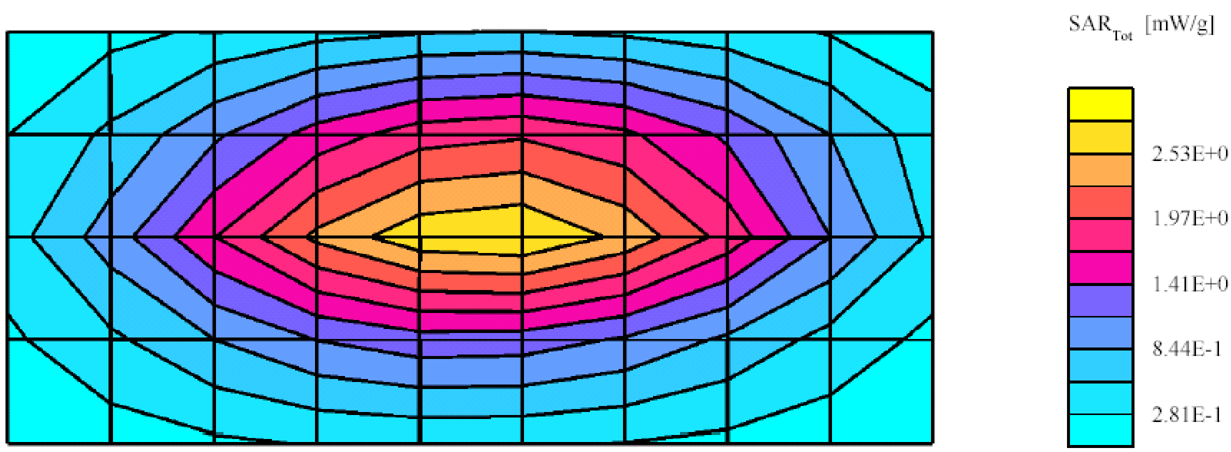


APPENDIX B

Dipole System Performance Check Results

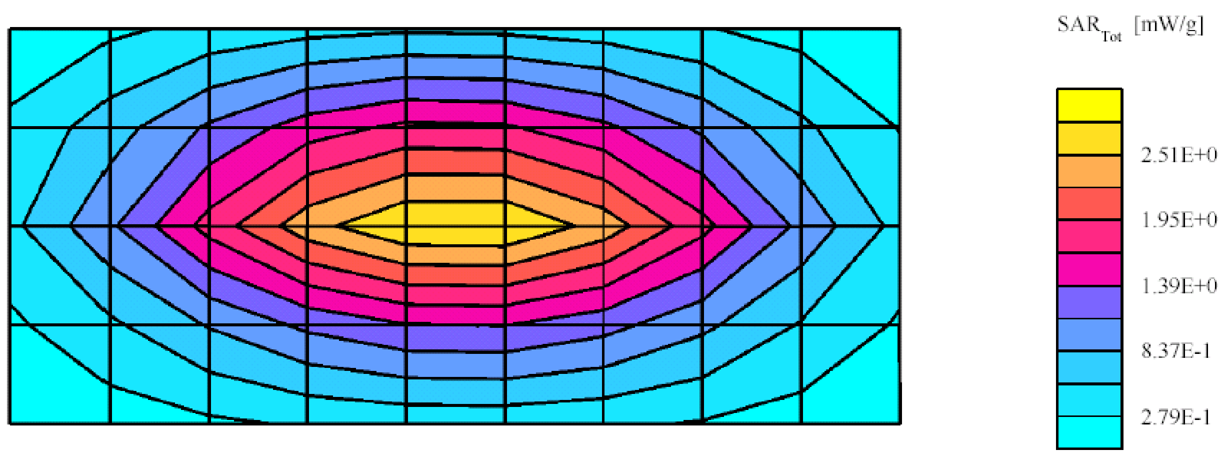
SPEAG Dipole 835MHz. Test Date:03/20/02
Motorola CGISS EME Laboratory
Model #: D835V2 SN: 427
Run #: Sys Val_R1_020320-01
Tissue Temp: 21.8 (Celsius)
TX Freq: 835 MHz
Start Power; 250mW

Target at 1W is 10.82
SAR calculated is 10.74mW/g,
Flat Phantom; Device
Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body_835 MHz: $\sigma = 0.99$ mho/m $\varepsilon = 53.3$ $\rho = 1.00$ g/cm3; DAE3: SN363-V1 DAE Cal Date: 08/22/01
Cube 7x7x7: Peak: 4.25 mW/g, SAR (1g): 2.68 mW/g, SAR (10g): 1.71 mW/g, (Worst-case extrapolation)
Penetration depth: 12.3 (10.9, 14.1) [mm]
Power drift: 0.01 dB



SPEAG Dipole 835MHz. Test Date:03/19/02
Motorola CGISS EME Lab
Run #: Sys Val_R1_020319-01
Model #: D835V2 SN: 427
TX Freq: 835 MHz
Start Power; 250mW

Target at 1W is 10.82
SAR calculated is 10.54mW/g,
Flat Phantom; Probe: ET3DV6 - SN1547;Probe Cal Date: 11/16/01ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body_835 MHz: σ = 0.99 mho/m ε = 53.2 ρ =1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 08/22/01
Cube 7x7x7: Peak: 4.17 mW/g, SAR (1g): 2.63 mW/g, SAR (10g): 1.68 mW/g, (Worst-case extrapolation)
Penetration depth: 12.2 (10.8, 14.0) [mm]
Power drift: -0.01 dB



APPENDIX C

Calibration Certificates

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate

Dosimetric E-Field Probe

Type	**ET3DV6**
Serial Number:	**1547**
Place of Calibration:	**Zurich**
Date of Calibration:	**November 16, 2001**
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:	Nikoloski Neviana
Approved by	[signature]

ET3DV6 SN:1547

DASY3 - Parameters of Probe: ET3DV6 SN:1547

Sensitivity in Free Space

NormX	1.37 $\mu V/(V/m)^2$
NormY	1.25 $\mu V/(V/m)^2$
NormZ	1.24 $\mu V/(V/m)^2$

Diode Compression

DCP X	92 mV
DCP Y	92 mV
DCP Z	92 mV

Sensitivity in Tissue Simulating Liquid

Head 450 MHz $\varepsilon_r = 43.5 \pm 5\%$ $\sigma = 0.87 \pm 10\%$ mho/m

ConvF X	6.86	extrapolated	Boundary effect:	
ConvF Y	6.86	extrapolated	Alpha	0.33
ConvF Z	6.86	extrapolated	Depth	2.54

Head 800 - 1000 MHz $\varepsilon_r = 39.0 - 43.5$ $\sigma = 0.80 - 1.10$ mho/m

ConvF X	6.30	± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.30	± 9.5% (k=2)	Alpha	0.41
ConvF Z	6.30	± 9.5% (k=2)	Depth	2.45

Head 1500 MHz $\varepsilon_r = 40.4 \pm 5\%$ $\sigma = 1.23 \pm 10\%$ mho/m

ConvF X	5.54	interpolated	Boundary effect:	
ConvF Y	5.54	interpolated	Alpha	0.52
ConvF Z	5.54	interpolated	Depth	2.33

Head 1700 - 1910 MHz $\varepsilon_r = 39.5 - 41.0$ $\sigma = 1.20 - 1.55$ mho/m

ConvF X	5.17	± 9.5% (k=2)	Boundary effect:	
ConvF Y	5.17	± 9.5% (k=2)	Alpha	0.57
ConvF Z	5.17	± 9.5% (k=2)	Depth	2.27

Sensor Offset

Probe Tip to Sensor Center	2.7
Optical Surface Detection	1.4 ± 0.2

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	ET3DV6
Serial Number:	1547
Place of Assessment:	Zurich
Date of Assessment:	November 17, 2001
Probe Calibration Date:	November 16, 2001

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1800 MHz.

Assessed by:

Dosimetric E-Field Probe ET3DV6 SN:1547

Conversion factor (± standard deviation)

150 MHz	ConvF	**7.9 ± 8%**	**ε_r = 61.9** **σ = 0.80 mho/m** (muscle tissue)
236 MHz	ConvF	**7.7 ± 8%**	**ε_r = 59.8** **σ = 0.87 mho/m** (muscle tissue)
300 MHz	ConvF	**7.6 ± 8%**	**ε_r = 58.2** **σ = 0.92 mho/m** (muscle tissue)
350 MHz	ConvF	**7.4 ± 8%**	**ε_r = 57.7** **σ = 0.93 mho/m** (muscle tissue)
450 MHz	ConvF	**7.2 ± 8%**	**ε_r = 56.7** **σ = 0.94 mho/m** (muscle tissue)
784 MHz	ConvF	**6.3 ± 8%**	**ε_r = 55.4** **σ = 0.97 mho/m** (muscle tissue)
835 MHz	ConvF	**6.2 ± 8%**	**ε_r = 55.2** **σ = 0.97 mho/m** (muscle tissue)
925 MHz	ConvF	**6.0 ± 8%**	**ε_r = 55.0** **σ = 1.06 mho/m** (muscle tissue)
1450 MHz	ConvF	**5.5 ± 8%**	**ε_r = 54.0** **σ = 1.30 mho/m** (muscle tissue)
1900 MHz	ConvF	**4.8 ± 8%**	**ε_r = 53.3** **σ = 1.52 mho/m** (muscle tissue)
2450 MHz	ConvF	**4.0 ± 8%**	**ε_r = 52.7** **σ = 1.95 mho/m** (muscle tissue)

Dosimetric E-Field Probe ET3DV6 SN:1547

Conversion factor (± standard deviation)

150 MHz	ConvF	**8.6 ± 8%**	ε_r = 52.3 σ = 0.76 mho/m (head tissue)
236 MHz	ConvF	**7.8 ± 8%**	ε_r = 48.3 σ = 0.82 mho/m (head tissue)
300 MHz	ConvF	**7.4 ± 8%**	ε_r = 45.3 σ = 0.87 mho/m (head tissue)
350 MHz	ConvF	**7.3 ± 8%**	ε_r = 44.7 σ = 0.87 mho/m (head tissue)
400 MHz	ConvF	**7.2 ± 8%**	ε_r = 44.4 σ = 0.87 mho/m (head tissue - CENELEC)
450 MHz	ConvF	**7.1 ± 8%**	ε_r = 43.5 σ = 0.87 mho/m (head tissue)
784 MHz	ConvF	**6.5 ± 8%**	ε_r = 41.8 σ = 0.90 mho/m (head tissue)
835 MHz	ConvF	**6.4 ± 8%**	ε_r = 41.5 σ = 0.90 mho/m (head tissue)
835 MHz	ConvF	**6.4 ± 8%**	ε_r = 42.5 σ = 0.98 mho/m (head tissue - CENELEC)
925 MHz	ConvF	**6.2 ± 8%**	ε_r = 41.5 σ = 0.98 mho/m (head tissue)
900 MHz	ConvF	**6.3 ± 8%**	ε_r = 42.3 σ = 0.99 mho/m (head tissue - CENELEC)

Dosimetric E-Field Probe ET3DV6 SN:1547

Conversion factor (± standard deviation)

1500 MHz	ConvF	**5.8 ± 8%**	ε_r = 40.4 σ = 1.23 mho/m (head tissue)
1900 MHz	ConvF	**5.2 ± 8%**	ε_r = 40.0 σ = 1.40 mho/m (head tissue)
2450 MHz	ConvF	**4.4 ± 8%**	ε_r = 39.2 σ = 1.80 mho/m (head tissue)

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate

835 MHz System Validation Dipole

Type:	**D835V2**
Serial Number:	**427**
Place of Calibration:	**Zurich**
Date of Calibration:	**Nov. 2, 2000**
Calibration Interval:	**24 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:	Nikoloski Neviana
Approved by:	Pokovic Katja

SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	2/12/2002	Frequency (MHz):	835
Lab Location:	CGISS	Mixture Type:	FCC Body
Robot System:	CGISS 1	Ambient Temp.(°C):	22
Probe Serial #:	1547	Tissue Temp.(°C):	20.5
DAE Serial #:	363		

Tissue Characteristics

Permitivity:	52.6	Phantom Type/SN:	80302002A
Conductivity:	1.00	Distance (mm):	15

Reference Source: D835V2 (Dipole)

Reference SN: 427

Power to Dipole: 250 mW

Measured SAR Value: 2.7 mW/g, 1.72 mW/g (10g avg.)

Power Drift: -0.01 dB

New Target/Measured SAR Value: 10.82 mW/g, 6.90 mW/g (10g avg.)

(normalized to 1.0 W, including drift)

Test performed by: Stephen C. Whalen Initial: SCW 2/27/02

SYSTEM VALIDATION

Date:	__2/12/02__	Frequency (MHz):	__835__
Lab Location:	__CGISS____	Mixture Type:	__IEEE Head_
Robot System:	__CGISS-1___	Ambient Temp.(°C):	__22______
Probe Serial #:	__1547______	Tissue Temp. (°C):	__21.0_____
DAE Serial #:	___363_____		

Tissue Characteristics		Phantom Type/SN:	_ACL40232002A__
Permitivity:	____40.2_____	Distance:	__15mm__________
Conductivity:	____0.89_____		

Reference Source: __D835V2___(Dipole/Handset)
Reference SN: __427_______

Power to Dipole: ___250_____ mW
Power Output (radio): ____N/A____ mW

Target SAR Value: (normalized to 1.0 W)	__9.5_ mW/g,	__6.2__ mW/g (10g avg.)
Measured SAR Value:	__2.43__ mW/g,	__1.55_ mW/g (10g avg.)
Power Drift:	__-.01_ dB	
Measured SAR Value: (normalized to 1.0 W, with drift compensation)	__9.74__ mW/g,	__6.21__ mW/g (10g avg.)

Percent Difference From Target (must be within System Uncertainty): _2.5__ % (1g avg)
_0.2__ % (10g avg)

Test performed by: ______Stephen Whalen________ Initial: SGW 2/12/02

APPENDIX D: Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the new body-worn carry accessories and new user position for the device model F5027A. The device depicted in the following photos represents the device used to obtain the results presented herein and was used solely to demonstrate the different body-worn carry case accessories.

Photo 1.
Model F5027A
Back View in
ABF960 case

Photo 2.
Model F5027A
Front view in
ABF960 case

Photo 3.
Model F5027A in
ABF960
Side view

Photo 4.
Back view of
ABF960 case

Photo 5.
Model F5027A
In ABF960
User position
Front to body

Photo 6.
Model F5027A
In ABF960
User position
Back to body

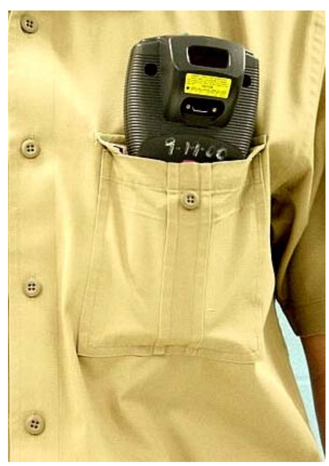


Photo 7.
Model F5027A
Shirt pocket
User position
Front to body

Photo 8.
Model F5027A
Shirt pocket
User position
Back to body

The following table summarizes the body spacing distance provided by each of the body-worn accessories:

Carry Case Model	Separation distance between device and phantom surface. (mm)
ABF960	4@ loop/ 2 elsewhere