


MOTOROLA

MFRL EME Test Laboratory

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S.A.R. EME Compliance Test Report
Part 1 of 2

Attention: FCC
Date of Report: June 5, 2003
Report Revision: Rev. A
Manufacturer: Motorola South - ARAD
Product Description: Data Terminal w/ GPRS: 1.8W EGSM, 0.8W DCS1800 & PCS1900; TDMA: 1:8 duty cycle, GMSK modulation; WLAN: 100mW, Direct Spread Spectrum; Bluetooth: 1mW, Frequency Hopping Spread Spectrum (FHSS)
FCC ID: **AZ489FT7003**
Device Model: F4415A (VA00016AC, VA00024AD)

Test Period: 12/10/02 – 2/04/03

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 Global 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.

Signature on File

 C.K. Chou
 Motorola Chief EME Scientist

Signature on File

 Ken Enger
 Senior Resource Manager, Product Safety and EME Director

6/5/03

 Date Approved

Note: This report shall not be reproduced without written approval from an officially designated representative of the Motorola EME Laboratory.

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REVISION HISTORY

Date	Revision	Comments
2/5/03	O	Release of Pilot Results
6/5/03	A	<ul style="list-style-type: none">- Tagged results for non-US bands as not regulated by the FCC.- Inserted in part 2 of 2 new Motorola generated body targets for each respective dipole for which SPEAG provided head targets for.- Corrected "CW" test condition typo in section 3.1 and 5.0- Corrected incorrect target values stated on scans presented in APPENDIX C.- Corrected test frequency typo on pages 32, 33, 39, 40, 42, and 46 of part 2 of 2 of Rev O (page 11, 12, 18, 19, 21, and 26 of part 2 of 2 of Rev A).

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 MFRL EME Test Lab for model number F4415A (VA00016AC, VA00024AD), FCC ID: AZ489FT7003.

The applicable exposure environment is Occupational/Controlled.

The test results included herein represent the highest S.A.R. levels applicable to this product and clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of 8.0 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



FCC ID: AZ489FT7003 is a hand held data terminal equipped with GSM/GPRS, WLAN, and Bluetooth radio modems. The GSM/GPRS radio modem operates within the EGSM, DCS*, and PCS bands. The maximum transmit duty cycle is 12.5% using TDMA 1:8 (577 micro seconds out of 4.165 milliseconds). The GPRS modem is used for packet switching data applications. The GPRS modem can also be used for voice applications in circuit switching mode. TDMA 1:8 protocol is used for both packet and voice applications. The WLAN radio modem uses Direct Sequence Spread Spectrum (DSSS) technology to transmit readings obtained from its bar-code scanner. The maximum transmit duty cycle of the WLAN modem is 2%. The Bluetooth radio modem uses Frequency hopping Spread Spectrum (FHSS) modulation. The Bluetooth modem is used for applications where data is exchanged between an external Bluetooth device. The Bluetooth modem's maximum duty cycle is set by the 802.11 standards. For single-slot operation the Bluetooth device transmits 366 out of 625 micro seconds. This device is used for data acquisition. This device does not contain any integral audio transducers and all voice applications are via separate Bluetooth devices such as a headset. The co-located transmitters within the device do not transmit simultaneously except for the E-GSM and Bluetooth transmitters. Note that the WLAN and the Bluetooth have an operational duty cycle of 80% and 20% respectively. The maximum transmit duty cycle approved for the WLAN is 2%. This device will be marketed to and used by employees solely for work-related operations, such as public safety agencies, e.g. police, fire and emergency medical. User training is the responsibility of these agencies, who can be expected to employ the usage instructions, safety information and operational cautions set forth in the user's manual, instructional sessions or other means. Motorola also makes available to its customers training classes on the proper use of two-way radios and wireless data devices.

FCC ID: AZ489FT7003 operates at 880.2 - 914.8 MHz in the EGSM band, 1710.2 - 1784.8 MHz in the *DCS1800 band, 1850.2 - 1909.8 MHz in the PCS1900 band, 2.412 - 2.462 GHz for WLAN in the IEEE 802.11 band, and 2.40-2.48 GHz for Bluetooth in the IEEE 802.11 band. The rated power is 1.8W for EGSM, 0.8W for *DCS1800 and PCS1900, 100mW for WLAN (DSSS), and 1mW for the Bluetooth transmitter. The maximum output is 2W for the EGSM, 1W for *DCS1800 and PCS1900, 160mW for WLAN (DSSS), and 1.15mW for the Bluetooth (FHSS). [*Note: The DCS 1800 MHz band is not regulated by the FCC.](#)

FCC ID: AZ489FT7003 is offered with the following options and accessories:

Antenna

FAF5211A Internal ¼ wave Monopole Tri-band antenna: EGSM 880.2-914.8MHz, 1.3dBi; *DCS1800 170.2-1784.8 MHz, -1.0dBi; PCS1900 1850.2-1909.8 MHz; 0.8dBi.

**Note: The DCS 1800 MHz band is not regulated by the FCC.*

FAG5011A Internal Inverted F ¼ wave antenna, 2.412-2.462 GHz; -3.0 dBi
FCG6003A Bluetooth Internal ¼ wave Inverted F antenna; 2.402-2.48GHz; 3dBi

Batteries

FNN5105A 7.2V/1400mAh Lithium Ion Rechargeable Battery

Body-worn Accessories

FHN6394A Leather Pocket style carry case w/ D-ring belt loop
FHN6395A Leather shoulder strap carry case w/ D-Ring belt loop
FHN6396A Leather shoulder strap carry case w/ fixed belt loop

3.1 Test Signal

Test Signal mode:

Test Mode	<input checked="" type="checkbox"/>	Base Station	<input type="checkbox"/>	Simulator	<input type="checkbox"/>
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Transmission Mode:

CW	<input type="checkbox"/>
Native Transmission	<input checked="" type="checkbox"/>
TDMA:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

3.2 Test Output Power

A table of the characteristic power slump versus time is provided in Appendix A for all tested batteries.

4.0 Description of Test Equipment

4.1 Descriptions of S.A.R. Measurement System

The laboratory utilizes a Dosimetric Assessment System (DASY3™) S.A.R. measurement system manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot with an ET3DV6 E-Field probe. Please reference the SPEAG user manual and application notes for detailed probe, robot, and S.A.R. computational procedures.

The S.A.R. measurements were conducted with probe model/serial number ET3DV6/SN1418. The system performance check was conducted daily and within 24 hours prior to testing. DASY output files of the system performance test results and the probe/dipole calibration certificates are included in appendices C and D respectively. 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(s)
1418	FCC Body	4/21/02	D900V2/158	10.90 +/- 0.37	11.44 +/- 10%	12/10/02-1/3/03 6 test days
1418	FCC Body	4/21/02	D1800V2/2d043	39.59 +/- 1.095	38.16 +/- 10%	12/19/02-2/4/03 5 test days
1418	FCC Body	4/21/02	D2450V2/703	60.27 +/- 0.13	56.65 +/- 10%	12/26/02-12/27/02 2 test days

Note: see APPENDIX C for an explanation of the reference S.A.R. targets stated above.

The DASY3™ system is operated per the instructions in the DASY3™ Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess EME S.A.R. compliance was calibrated according to 17025 A2LA guidelines.

4.2 Description of Phantom

4.2.1 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 68.58 cm x 20.32 cm opening at its center to allow positioning the DUT to the phantom's surface. The table below shows the flat phantom dimensions used for S.A.R. performance assessment.

Length	30cm
Width	40cm
Height	20cm
Surface Thickness	0.2cm

4.2.2 SAM Phantom

SAM Phantom assessment was not applicable for this filing.

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
FCC Body	Abdomen

4.3.2 Simulated Tissue Composition

	Tissue Ingredients (%)					
	900 MHz		1800 MHz		2450MHz	
	Head	Body	Head	Body	Head	Body
Sugar	NA	44.9	NA		NA	NA
DGBE (Glycol)	NA	NA	NA	30.8	NA	30
De ionized -Water	NA	53.06	NA	68.8	NA	70
Salt	NA	0.94	NA	0.8	NA	NA
HEC	NA	1	NA	NA	NA	NA
Bact.	NA	0.1	NA	NA	NA	NA

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.

Target tissue parameters

FCC Body				
Frequency (MHz)	Di-electric Constant Target	Di-electric Constant Meas. (Range)	Conductivity Target S/m	Conductivity Meas. (Range) S/m
900	55	54.7-56.9	1.05	1.02-1.04
1800	53.3	53.1-53.4	1.52	1.48-1.59

Frequency (MHz)	Di-electric Constant Target	Di-electric Constant Meas. (Range)	Conductivity Target S/m	Conductivity Meas. (Range) S/m
2450	52.7	53.6-53.8	1.95	1.99-2.03

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°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 presents the range and average environmental conditions during the S.A.R. tests reported herein:

	Target	Measured
Ambient Temperature	20 - 25 °C	Range: 22.7-23.7°C Avg. 23.37°C
Relative Humidity	30 - 70 %	Range: 39.7-48.5 % Avg. 43.26%
Tissue Temperature	NA	Range: 22.3-23.2°C Avg. 22.67 °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 considered in order to develop the S.A.R. test plan for this product. S.A.R. measurements were performed using a flat phantom to assess performance at the abdomen and hand. All assessments were done using the flat phantom with the DUT in its native transmission mode.

The DUT was assessed at center channel of the E-GSM transmit band with the offered battery, and body worn accessories. Measurements were performed with the backside of the DUT against the phantom to assess hand held performance. Measurements with the display side against the phantom were not performed because this is not a user configuration. Measurements were performed with the back and display sides of the DUT towards the phantom with the body worn accessories. Measurements were performed with the back and display sides of the DUT at 2.5cm separation distance from the phantom. Assessment with the co-located Bluetooth transmitter on was also performed. Band edge assessment was done using the configuration that produced the highest S.A.R. results.

The DUT was assessed at the center channel of the PCS transmit band with the offered battery, and body worn accessories. Measurements were performed with the backside of the DUT against the phantom to assess hand held performance. Measurements with the display side against the phantom

were not performed because this is not a user configuration. Measurements were performed with the back and display sides of the DUT towards the phantom with the body worn accessories. Measurements were performed with the back and display sides of the DUT at 2.5cm separation distance from the phantom.

Band edge assessment was done using the configuration that produced the highest S.A.R. results. The DUT was assessed at the center channel of the DCS transmit band ([Note: The DCS band not regulated by the FCC](#)), with the offered battery, and body worn accessories. Measurements were performed with the backside of the DUT against the phantom to assess hand held performance. Measurements with the display side against the phantom were not performed because this is not a user configuration. Measurements were performed with the back and display sides of the DUT towards the phantom with the body worn accessories. Measurements were performed with the back and display sides of the DUT at 2.5cm separation distance from the phantom.

Band edge assessment was done using the configuration that produced the highest S.A.R. results. The DUT was assessed at the center channel of the WLAN transmit band with the offered battery, and body worn accessories. Measurements were performed with the backside of the DUT against the phantom to assess hand held performance. Measurements with the display side against the phantom were not performed because this is not a user configuration. Measurements were performed with the back and display sides of the DUT towards the phantom with the body worn accessories. Measurements were performed with the back and display sides of the DUT at 2.5cm separation distance from the phantom.

5.1 Device Test Positions

Reference figure 1 for the device orientation and position which exhibited the highest S.A.R. performance.

5.1.1 Abdomen

The DUT was positioned such that the display side and backside of the DUT were centered against the flat phantom with and without the applicable carry case accessories. The DUT was positioned 2.5cm separation distance from the phantom.

5.1.2 Head

Assessment at the head was not applicable for this filing

5.1.3 Face

Assessment at the head was not applicable for this filing

5.2 Test Position Photographs

Figure 1: Highest S.A.R. Test Position
(DUT with back against the phantom with battery model FNN5105A)

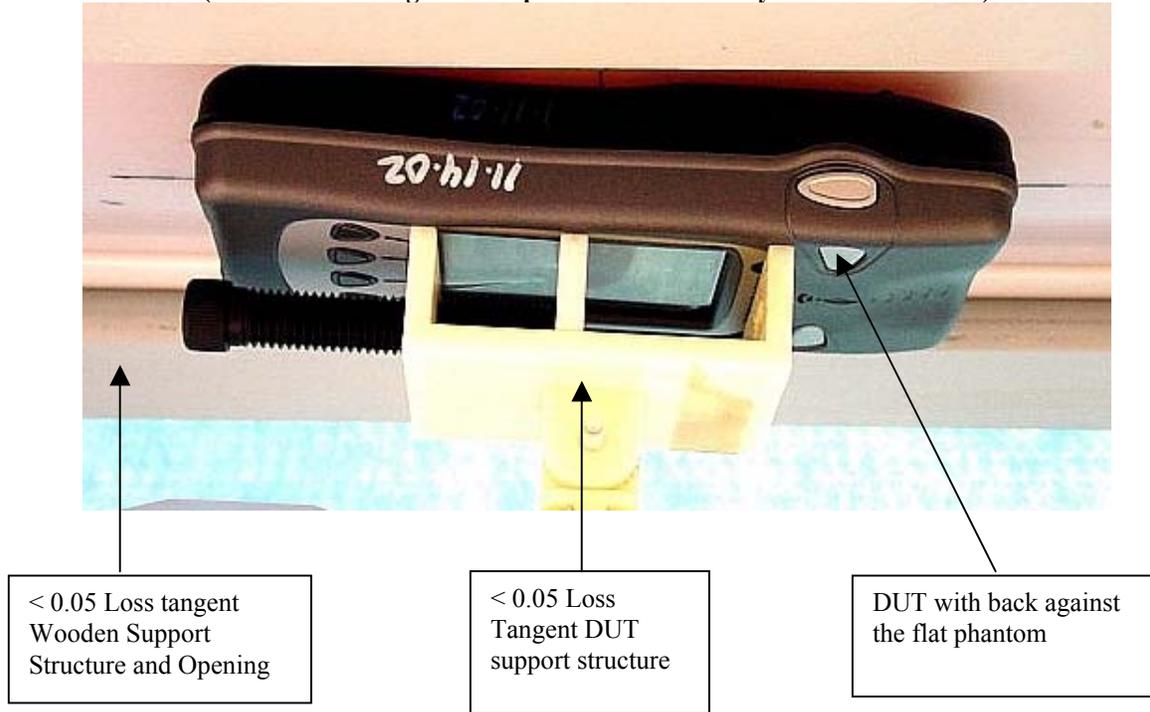


Figure 2. Assessment @ the Abdomen; backside of DUT towards the phantom w/ battery model FNN5105A and carry case model FHN6396A



Figure 3. Assessment @ abdomen; Back of DUT towards the phantom w/ battery model FNN5105A and carry case FHN6394A



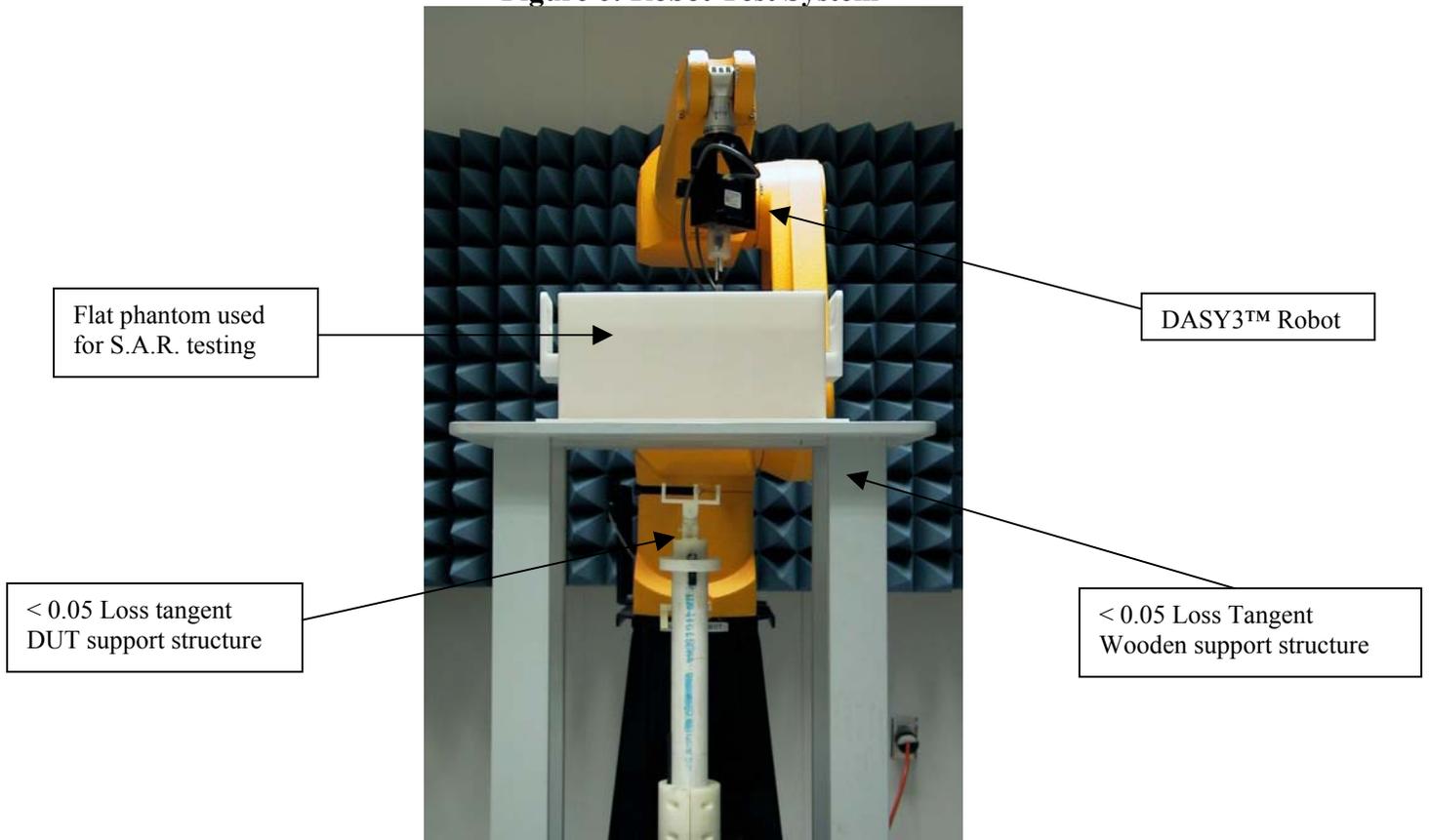
Figure 4. Assessment @ abdomen; Back of DUT 2.5cm separation distance w/ battery model FNN5105A



Figure 5. Assessment @ the Abdomen; Display of DUT 2.5cm separation distance w/ battery model FNN5105A



Figure 6: Robot Test System



5.3 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

Table 1: Uncertainty Budget for Device Under Test

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e = f(d,k)</i>	<i>f</i>	<i>g</i>	<i>h = c x f / e</i>	<i>i = c x g / e</i>	<i>k</i>
Uncertainty Component	Section of IEEE P1528	Tol. (± %)	Prob. Dist.	Divisor	<i>c_i</i> (1 g)	<i>c_i</i> (10 g)	1 g <i>u_i</i> (±%)	10 g <i>u_i</i> (±%)	<i>v_i</i>
Measurement System									
Probe Calibration	E.2.1	4.8	N	1.00	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	5.8	R	1.73	1	1	3.3	3.3	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	1.0	N	1.00	1	1	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	∞
Integration Time	E.2.8	1.3	R	1.73	1	1	0.8	0.8	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.3	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	1.1	R	1.73	1	1	0.6	0.6	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.6	N	1.00	1	1	3.6	3.6	29
Device Holder Uncertainty	E.4.1	2.8	N	1.00	1	1	2.8	2.8	8
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	10.0	R	1.73	0.64	0.43	3.7	2.5	∞
Liquid Permittivity - deviation from target values	E.3.2	10.0	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity - measurement uncertainty	E.3.3	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Combined Standard Uncertainty			RSS				11.72	11.09	1363
Expanded Uncertainty (95% CONFIDENCE LEVEL)			<i>k</i> =2				22.98	21.75	

Table 2: Uncertainty Budget for System Performance Check

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e =</i>		<i>h =</i>		<i>i =</i>		<i>k</i>
				<i>f(d,k)</i>	<i>f</i>	<i>g</i>	<i>c x f / e</i>	<i>c x g / e</i>		
Uncertainty Component	Section of IEEE P1528	Tol. (± %)	Prob. Dist.	Div.	<i>c_i</i>	<i>c_i</i>	1 g	10 g	<i>v_i</i>	
					(1 g)	(10 g)	<i>u_i</i>	<i>u_i</i>		
Measurement System										
Probe Calibration	E.2.1	4.8	N	1.00	1	1	4.8	4.8	∞	
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7	∞	
Spherical Isotropy	E.2.2	9.6	R	1.73	0	0	0.0	0.0	∞	
Boundary Effect	E.2.3	5.8	R	1.73	1	1	3.3	3.3	∞	
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞	
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞	
Readout Electronics	E.2.6	1.0	N	1.00	1	1	1.0	1.0	∞	
Response Time	E.2.7	0.0	R	1.73	1	1	0.0	0.0	∞	
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞	
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞	
Probe Positioner Mechanical Tolerance	E.6.2	0.3	R	1.73	1	1	0.2	0.2	∞	
Probe Positioning with respect to Phantom Shell	E.6.3	1.1	R	1.73	1	1	0.6	0.6	∞	
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	∞	
Dipole										
Dipole Axis to Liquid Distance	8, E.4.2	1.0	R	1.73	1	1	0.6	0.6	∞	
Input Power and SAR Drift Measurement	8, 6.6.2	4.7	R	1.73	1	1	2.7	2.7	∞	
Phantom and Tissue Parameters										
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞	
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞	
Liquid Conductivity - measurement uncertainty	E.3.3	10.0	R	1.73	0.64	0.43	3.7	2.5	∞	
Liquid Permittivity - deviation from target values	E.3.2	10.0	R	1.73	0.6	0.49	3.5	2.8	∞	
Liquid Permittivity - measurement uncertainty	E.3.3	5.0	R	1.73	0.6	0.49	1.7	1.4	∞	
Combined Standard Uncertainty			RSS				10.16	9.43	∞	
Expanded Uncertainty (95% CONFIDENCE LEVEL)			<i>k=2</i>				19.92	18.48		

Notes for Tables 1 and 2

- a) Column headings *a-k* are given for reference.
- b) Tol. - tolerance in influence quantity.
- c) Prob. Dist. – Probability distribution
- d) N, R - normal, rectangular probability distributions
- e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
- f) *c_i* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
- g) *u_i* – SAR uncertainty
- h) *v_i* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty.

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 bolded result indicates the highest observed S.A.R. performance. DASY3™ S.A.R. measurement scans are provided in APPENDIX B for the highest observed S.A.R.

Appendix A presents a shortened S.A.R. cube scan to assess the validity of the calculated results presented herein.

Note: The results of the shortened cube scans presented in Appendix A demonstrate that the scaling methodology used to determine the calculated S.A.R. results presented herein are valid.

Note: The Bluetooth transmitter only transmits simultaneously with the E-GSM co-located transmitter and does not transmit simultaneously with the PCS, DCS, or WLAN co-located transmitters.

7.1 S.A.R. results

*Note: The DCS 1800 MHz band is not regulated by the FCC.

Compliance assessment at the abdomen CW mode										
Run Number/ SN	Freq. (MHz)	Antenna	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	End Power (W)	Measured 1g-S.A.R. (mW/g)	Max Calc. 1g-S.A.R. (mW/g)
Assessment of the E-GSM transmission band										
021210-01/ 296SCQ0210	902.4	FAF5211A	FNN5105A	Backside against phantom	None	None	1.960	1.940	0.80	0.82
021213-01/ 296SCQ0210	902.4	FAF5211A	FNN5105A	Display towards phantom	FHN6396A	None	1.960	1.940	0.23	0.24
021213-02/ 296SCQ0210	902.4	FAF5211A	FNN5105A	Backside towards phantom	FHN6394A	None	1.960	1.940	0.13	0.14
021213-03/ 296SCQ0210	902.4	FAF5211A	FNN5105A	Display towards phantom	FHN6394A	None	1.960	1.940	0.25	0.26
021213-04F/ 296SCQ0210	902.4	FAF5211A	FNN5105A	Front 2.5cm	None	None	1.960	1.940	0.19	0.20
021213-05B/ 296SCQ0210	902.4	FAF5211A	FNN5105A	Back 2.5cm	None	None	1.960	1.940	0.13	0.14
021214-01/ 296SCQ0210	902.4	FAF5211A/ FCG6003A	FNN5105A	Backside against phantom	None	Blue tooth on	1.960	1.940	0.78	0.80
030129- 01/296SCQ0210	880.20	FAF5211A	FNN5105A	Backside against phantom	None	None	1.980	1.940	0.79	0.81
030129- 01/296SCQ0210	914.8	FAF5211A	FNN5105A	Backside against phantom	None	None	1.970	1.940	0.76	0.78

Run Number/ SN	Freq. (MHz)	Antenna	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	End Power (W)	Measured 1g-S.A.R. (mW/g)	Max Calc. 1g-S.A.R. (mW/g)
Assessment of the PCS transmission band										
021219-01/ 296SCQ0210	1880.0	FAF5211A	FNN5105A	Back against phantom	None	None	1.016	1.000	0.20	0.20
021220-03/ 296SCQ0210	1880.0	FAF5211A	FNN5105A	Display towards phantom	FHN6396A	None	1.016	1.000	0.08	0.08
021220-02B/ 296SCQ0210	1880.0	FAF5211A	FNN5105A	Back towards phantom	FHN6394A	None	1.016	1.000	0.05	0.05
021220-01F/ 296SCQ0210	1880.0	FAF5211A	FNN5105A	Display towards phantom	FHN6394A	None	1.016	1.000	0.60	0.06
021219-02B/ 296SCQ0210	1880.0	FAF5211A	FNN5105A	Back 2.5cm	None	None	1.016	1.000	0.03	0.03
021219-03F/ 296SCQ0210	1880.0	FAF5211A	FNN5105A	Display 2.5cm	None	None	1.016	1.000	0.07	0.07
030204-03/ 296SCQ0210	1850.2	FAF5211A	FNN5105A	Display towards phantom	FHN6394A	None	1.016	1.00	0.359	0.36
030204-04/ 296SCQ0210	1909.8	FAF5211A	FNN5105A	Display towards phantom	FHN6394A	None	1.016	1.00	0.323	0.32
Assessment of DCS transmission band										
021221-01/ 296SCQ0210	1747.4*	FAF5211A	FNN5105A	Back against phantom	None	None	1.045	1.030	0.280	0.27
021221-05/ 296SCQ0210	1747.4*	FAF5211A	FNN5105A	Display towards phantom	FHN6396A	None	1.045	1.030	0.170	0.16
021221-03B/ 296SCQ0210	1747.4*	FAF5211A	FNN5105A	Back towards phantom	FHN6394A	None	1.045	1.030	0.120	0.11
021221-04F/ 296SCQ0210	1747.4*	FAF5211A	FNN5105A	Display towards phantom	FHN6394A	None	1.045	1.030	0.120	0.11
021221-07/ 296SCQ0210	1747.4*	FAF5211A	FNN5105A	Back 2.5cm	None	None	1.045	1.030	0.040	0.04
021221-06/ 296SCQ0210	1747.4*	FAF5211A	FNN5105A	Display 2.5cm	None	None	1.045	1.030	0.095	0.09
030204-01/ 296SCQ0210	1710.2*	FAF5211A	FNN5105A	Back against phantom	None	None	1.045	1.030	0.357	0.35
030204-02/ 296SCSQ0210	1784.8*	FAF5211A	FNN5105A	Back against phantom	None	None	1.045	1.030	0.280	0.27

Run Number/ SN	Freq. (MHz)	Antenna	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	End Power (W)	Measured 1g-S.A.R. (mW/g)	Max Calc. 1g-S.A.R. 2% DC (mW/g)
Assessment at the center channel of WLAN transmission band										
021226-01/ 296SCQ0210	2437.0	FAG5011A	FNN5105A	Back against phantom	None	None	0.156	0.148	0.390	0.007
021226-04/ 296SCQ0210	2437.0	FAG5011A	FNN5105A	Display towards phantom	FHN6396A	None	0.156	0.148	0.200	0.002
021226-02F/ 296SCQ0210	2437.0	FAG5011A	FNN5105A	Display towards phantom	FHN6394A	None	0.156	0.148	0.110	0.004
021226-03B/ 296SCQ0210	2437.0	FAG5011A	FNN5105A	Back towards phantom	FHN6394A	None	0.156	0.148	0.240	0.003
021227-02B/ 296SCQ0210	2437.0	FAG5011A	FNN5105A	Back 2.5cm	None	None	0.156	0.148	0.110	0.006
021227-01F/ 296SCQ0210	2437.0	FAG5011A	FNN5105A	Display 2.5cm	None	None	0.156	0.148	0.330	0.002

7.2 Peak S.A.R. location

Refer to APPENDIX B for detailed S.A.R. scan distributions.

7.3 Highest S.A.R. results calculation methodology

The calculated maximum 1-gram averaged S.A.R. value is determined by scaling the measured S.A.R. to account for power leveling variations and power output slump below the reported maximum power during the S.A.R. measurements. For this device the Maximum Calculated 1-gram averaged peak S.A.R. is calculated using the following formula:

$$\text{Max. Calc. 1-g Avg. SAR} = (P_{\max}/P_{\text{int}}) \times ((P_{\text{int}}/P_{\text{end}}) \times \text{DC \%} \times \text{S.A.R. meas.})$$

P_{\max} = Maximum Power (W)

P_{int} = Initial Power (W)

P_{end} = End Power (W)

$\text{SAR}_{\text{meas.}}$ = Measured 1 gram averaged peak S.A.R. (mW/g)

DC % = (Transmission mode duty cycle in % where applicable)

Note: for the WLAN mode only the transmit DC is 2% of the operation duty cycle of 80%

8.0 Conclusion

The highest Operational Maximum Calculated 1-gram average S.A.R. values found for FCC ID: AZ489FT7003.

At the abdomen: 0.82 mW/g

At the Face: N/A

At the Head: N/A

These test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of **8.0 mW/g** per the requirements of 47 CFR 2.1093(d).