Certificate Number: 1449-01

MOTOROLA

ACCREDITED

CGISS EME Test Laboratory
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Fort Lauderdale, FL. 33322

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

Date of Report:	February 19, 2004
Report Revision:	Rev. O
Manufacturer:	Motorola
Product Description:	i325; Dual mode iDEN: 1:6, 1:3, 81:120, 1:12 TDMA; 64 QAM, 16 QAM & QPSK Modulation; 0.6 W Pulse average nominal; MOTOtalk: 114:120 8FSK, 0.85W nominal GPS capable
FCC ID:	**AZ489FT5830**
Device Model:	H68XAH6RR1AN

Test Period:	2/8/04-2/13/04
EME Tech:	Ed Church
EME Eng.:	Stephen Whalen (Sr. EME Eng.), Deanna Zakharia (Elect. Principle Staff Eng.)
Author:	Michael Sailsman 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 — 2/19/04

Ken Enger
Senior Resource Manager, Laboratory Director, CGISS EME Lab

Date Approved

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REVISION HISTORY

Date	Revision	Comments
2/19/04	O	Release of Prototype results

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 CGISS EME Test Lab for model number H68XAH6RR1AN, FCC ID: AZ489FT5830.

The applicable exposure environment is General Population/Uncontrolled.

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
- ∉ IEEE 1528, 2003 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques"
- ∉ 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 Radiocommunications (Electromagnetic Radiation - Human Exposure) Standard 2003
- ∉ 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: AZ489FT5830 is a dual mode digital multi-service device with data capability that employs time division multiplexing transmission technology having a duty cycle ranging from 16.67% to 33.33% and using 16-QAM modulation for voice or circuit data transmission. There is a Split 1:3 mode that operates using a 16.67% transmission duty cycle. In this mode two 7.5ms pulses occur during the six time slots within the 90-msec frame format. The Split 1:3 mode is available in both the 806-825MHz and 896-902MHz bands but only when in the telephone interconnect mode. Packet data transmission is also supported up to a maximum duty cycle of 67.5% using quad QPSK modulation. MOTOtalk is a knifeswitch transmitting mode that employs Frequency Hopping Digital Spread Spectrum within the 900MHz ISM band, having a duty cycle of 114:120, and using 8FSK modulation. MOTOtalk also incorporates a high audio output feature.
This device will be marketed to and used by the general population. This device may be used while held against the head in voice mode, in front of the face in PTT mode, and against the body in voice, PTT and data modes. In the MOTOtalk mode the device can only be used for dispatch (i.e. PTT) operations. In MOTOtalk mode the device may be positioned in front of the face or against the body (in high audio mode).
FCC ID: AZ489FT5830 is capable of operating in the 806-825 MHz and 896-902MHz bands. Packet data transmission is not available while transmitting in the 896-902 MHz band. In the standard iDEN mode the nominal conducted power is 0.60 watts pulse average and the maximum conducted output power is 0.70 watts pulse average. In MOTOtalk mode the nominal conducted output power is 0.85 watts and the maximum conducted output power is 0.89 watts. The stated maximum power outputs are as defined by the upper limit of the production line final test station.

FCC ID: AZ489FT5830 is offered with the following options and accessories:

Antenna	**Description**
8585424F01	Top Helical Flex ½ wave antenna; 806-941 MHz; -0.4 dBd gain (813MHz), -0.3dBd gain (896MHz) -0.8 dBd gain (915 MHz)

Batteries

SNN5705B	Hi performance 750 mAh Lithium Ion
SNN5706A	Extra capacity 1050 mAh Lithium Ion
NNTN4655A	Max capacity 1450 mAh Lithium Ion

Body-worn Accessories

NNTN5210A	i325 Holster

A**pplicable Audio accessories**

SYN8390B	Privacy Earpiece and Mic
NNTN4033A	Privacy earpiece and Mic w/ PTT
NNTN5208A	Ruggedized RSM
NNTN4620A	Silver Earbud
SYN8146C	Lightweight over the ear headset w/boom Mic
SYN7875C	Hearing Aid Neck loop
NTN8496A	Lightweight Headset w/mic
NTN8513B	Lightweight Headband
NNTN5004A	PTT; Over-the-ear Headset
NNTN5005A	PTT; Over-the-head Headset

Other applicable options:

NKN6560A	RS232 Data Cable
NKN6559A	USB Data Cable

3.1 Test Signal

Test Signal mode:

Test Mode	X	Base Station		Simulator	

Transmission Mode:

CW	
Native Transmission	**X**
TDMA: 1:6, 1:3, 81:120, 114:120	**X**
Other:	**X**

3.2 Test Output Power

A table of the characteristic power slump versus time is provided in Appendix A for the worst case tested battery.

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/SN1384. 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. 1-g S.A.R. Result when normalized to 1W (mW/g)	Reference 1-g S.A.R @ 1W (mW/g)	Test Date(s)
1384	FCC Body	5/15/03	D900V2/85	11.200 +/- 0.080	11.17 +/- 10%	2/10/04-2/11/04 2 test days
1384	IEEE Head	5/15/03	D900V2/85	11.945 +/- 0.165	12.00 +/- 10%	2/8/04-2/13/04 4 test days

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 S.A.R. EME compliance was calibrated according to 17025 A2LA guidelines.

4.2 Description of Phantom

4.2.1 Flat Phantom

A rectangular shaped box made of low loss acrylic material. The phantom is mounted on a wooden supporting structure that has a loss tangent of < 0.05. The structure has a 60.96 cm x 15.24 cm opening at its center to allow positioning the DUT to the phantom's surface. The flat phantom dimensions used for S.A.R. performance assessment are L = 40cm, W = 23cm, H = 20cm, Surface Thickness = 0.2cm.

4.2.2 SAM Phantom

A SAM TP1234 phantom supplied by SPEAG was used to assess S.A.R. performance at the head.

4.3 Simulated Tissue Properties

4.3.1 Type of Simulated Tissue

The simulated tissues used are compliant to that specified in FCC Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01) and IEEE 1528, 2003 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques"

Simulated Tissue	Body Position
FCC Body	Torso
IEEE Head	Head/Face

4.3.2 Simulated Tissue Composition (System Performance)

	Tissue Ingredients (%)					
	900MHz		NA		NA	
	Head	Body	Head	Body	Head	Body
Sugar	56.50	44.90	NA	NA	NA	NA
DGBE (Glycol)	NA	NA	NA	NA	NA	NA
De ionized -Water	40.95	53.06	NA	NA	NA	NA
Salt	1.45	0.94	NA	NA	NA	NA
HEC	1	1	NA	NA	NA	NA
Bact.	0.1	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.

Tested Tissue Target Parameters

FCC Body				
Frequency (MHz)	**Di-electric Constant Target**	**Di-electric Constant Meas. (Range)**	**Conductivity Target S/m**	**Conductivity Meas. (Range) S/m**
813	55.3	53.5-54.1	0.97	0.94-0.95
899	55.0	52.6-53.2	1.05	1.03-1.04
915	55.0	52.4-53.0	1.06	1.05-1.06

IEEE Head				
Frequency (MHz)	**Di-electric Constant Target**	**Di-electric Constant Meas. (Range)**	**Conductivity Target S/m**	**Conductivity Meas. (Range) S/m**
813	41.6	41.9-42.6	0.90	0.92-0.93
899	41.5	40.6-41.5	0.97	0.99-1.01
915	41.5	40.4-40.7	0.98	1.01-1.02

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. The liquid depth in the phantom used for measurements was 15cm +/- 0.5cm. 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: 20.0-22.56˚C Avg. 21.76˚C
Relative Humidity	30 - 70 %	Range: 37.2-57.3% Avg. 46.77%
Tissue Temperature	NA	Range: 20.2-22.0˚C Avg. 20.78˚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 body and a SAM phantom to assess performance at the side of the head and in front of the face using the applicable transmission modes.

Assessments at the head and face (806-825MHz)

The DUT was assessed at the TX center frequency of the band, in the 1:3 transmission mode, using the offered batteries, in the cheek touch position, at the left ear of the SAM phantom.

The DUT was assessed at the TX center frequency of the band, in the 1:3 transmission mode, using the worst case battery from above, in the 15˚ tilt position, at the left ear of the SAM phantom.

The DUT was assessed at the TX band edges, in 1:3 transmission mode, using the test configuration from above that produced the highest S.A.R results.

The DUT was assessed at the TX center frequency of the band, in the 1:3 transmission mode, using the worst case battery from the left ear assessment above, in the cheek touch and 15˚ tilt positions, at the right ear of the SAM phantom.

The DUT was assessed at the TX band edges, in 1:3 transmission mode, at the right ear of the SAM phantom, using the test configuration from above that produced the highest S.A.R results.

The DUT was assessed across the TX band, in the 1:6 transmission mode, with the DUT front at 2.5cm separation distance from the flat area of the SAM phantom, using the worst case battery from above.

Assessments at the head and face (896-902MHz)

The DUT was assessed at the TX center frequency of the band, in the 1:3 transmission mode, using the offered batteries, in the cheek touch position, at the left ear of the SAM phantom.

The DUT was assessed at the TX center frequency of the band, in the 1:3 transmission mode, using the worst case battery from above, in the 15˚ tilt position, at the left ear of the SAM phantom.

The DUT was assessed at the TX band edges, in 1:3 transmission mode, using the test configuration from above that produced the highest S.A.R results.

The DUT was assessed at the TX center frequency of the band, in the 1:3 transmission mode, using the worst case battery from the left ear assessment above, in the cheek touch and 15˚ tilt positions,

at the right ear of the SAM phantom.

The DUT was assessed at the TX band edges, in 1:3 transmission mode, at the right ear of the SAM phantom, using the test configuration from above that produced the highest S.A.R results.

The DUT was assessed across the TX band, in the 1:6 transmission mode, with the DUT front at 2.5cm separation distance from the flat area of the SAM phantom, using the worst case battery from above.

Assessment at the face MOTOtalk mode (902-928MHz)

The DUT was assessed at the TX center frequency of the band, in 114:120 transmission mode, with the DUT front at 2.5cm separation distance from the flat area of the SAM phantom, using each of the offered batteries.

The DUT was assessed at the TX band edges, in 114:120 transmission mode, with the DUT front at 2.5cm separation distance from the flat area of the SAM phantom, using the worst case battery from above.

Shortened scan assessment at the head

A "shortened" scan assessment was done using the test configuration from above that produced the highest S.A.R. results overall at the head.

Assessments at the Body (806-825MHz)

The DUT was assessed at the TX center frequency of the band, in the 81:120 transmission mode, against the flat phantom, with each of the offered batteries, using the offered body worn holster.

The DUT was assessed at the TX center frequency of the band, in the 81:120 transmission mode, using the worst case battery from above, with each of the offered data cables attached.

The DUT was assessed at the TX center frequency of the band, in the 1:3 and 1:6 transmission modes, against the flat phantom, using the worst case battery from above, with the worst case audio accessories from the 896-902MHz band assessment at the body, as well as with the worst case audio accessory from the 902-928MHz MOTOtalk assessment at the body.

The DUT was assessed at the edges of the TX band, in the 81:120 transmission mode, using the over all worst case test configuration from above.

Assessments at the Body (896-902MHz)

The DUT was assessed at the TX center frequency of the band, in the 1:3 transmission mode, against the flat phantom, using each of the offered batteries along with the offered body worn holster and audio accessories model SYN8390B.

The DUT was assessed at the TX center frequency of the band, in the 1:3 transmission mode, against the flat phantom, using the worst case battery from above, and the offered body worn holster, along with each of the other offered non PTT audio accessories.

The DUT was assessed at the low and high frequencies of the TX band, in the 1:3 transmission mode, against the flat phantom, using the worst case test configuration from above.

Note that 81:120 data mode is not a user option in the 896-902MHz band therefore this test condition was not assessed.

Assessments at the Body MOTOtalk mode (902-928MHz)

The DUT was assessed at the TX center frequency of the band, in the 114:120 transmission mode, against the flat phantom, using each of the offered batteries along with the offered body worn holster, and PTT audio accessories model NNTN5208A.

The DUT was assessed at the TX center frequency of the band, in the 114:120 transmission mode, against the flat phantom, using the worst case battery from above, and the offered body worn holster, along with each of the other offered PTT audio accessories.

The DUT was assessed at the low and high frequencies of the TX band, in the 114:120 transmission mode, against the flat phantom, using the worst case test configuration from above.

Assessments at the body 2.5cm separation (806-825MHz)

The DUT was assessed at the TX center frequency of the band, in 81:120 transmission mode, with the DUT's back housing towards the phantom and separated 2.5cm, with the DUT's back housing towards the phantom with the antenna separated 2.5cm, and with the DUT's front towards the phantom and separated 2.5cm, using the worst case battery from the body assessments above.

Shortened scan assessment at the body

A "shortened" scan was performed using the test configuration that produced the highest S.A.R. results overall at the body.

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 Body

The DUT was positioned such that it was centered against the flat phantom with the offered body worn accessories and applicable attachments. The DUT was positioned with its back towards the phantom with the housing and antenna 2.5cm from the flat phantom, and with its front housing at 2.5cm separation from the flat phantom.

5.1.2 Head

The DUT was placed in the cheek touch and 15° tilt positions at the left and right ears of the SAM phantom.

5.1.3 Face

The DUT was placed with 2.5cm separation from the flat area of the SAM phantom.

5.2 Test Position Photographs

Figure 1: Highest S.A.R. Test Position (@ Body)
DUT back towards the flat phantom with the antenna separated 2.5cm.

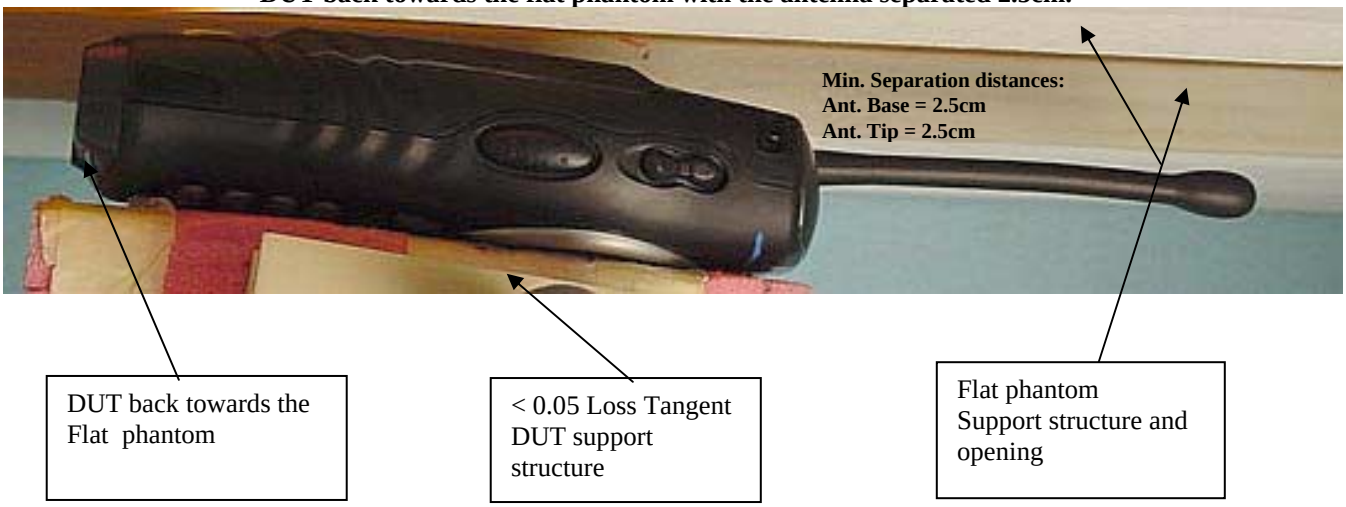

Figure 2. Assessment @ the Left ear.
DUT in 15° tilt position.

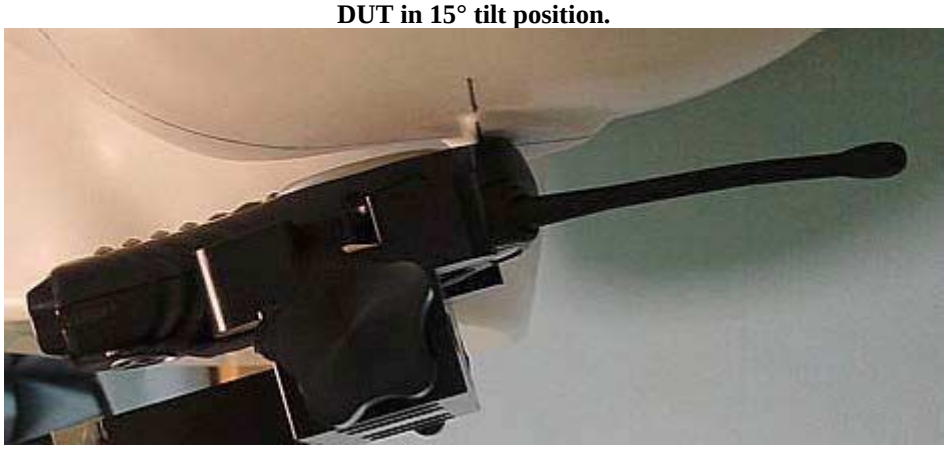

Figure 3. Assessment @ the Left ear.
DUT in cheek touch position.

Figure 4. Assessment @ the Right ear.
DUT in 15° tilt position.

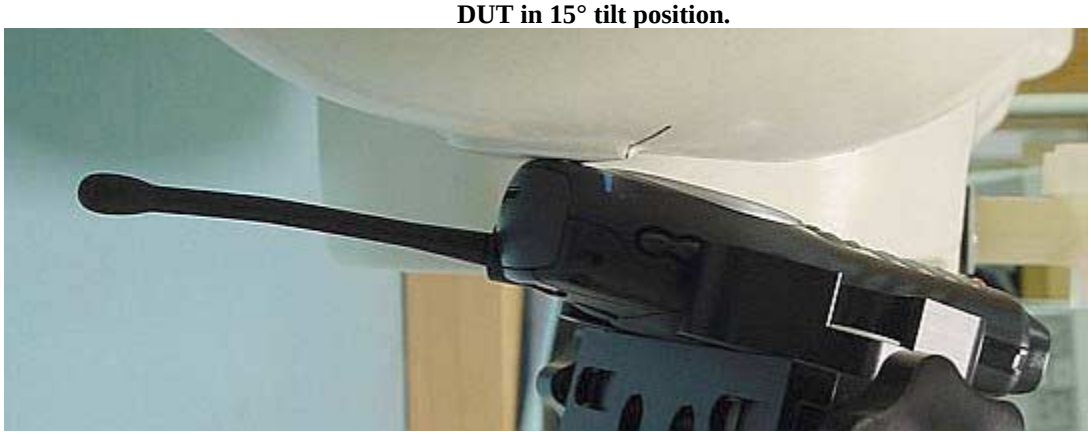

Figure 5. Assessment @ the Right ear.
DUT in cheek touch position.

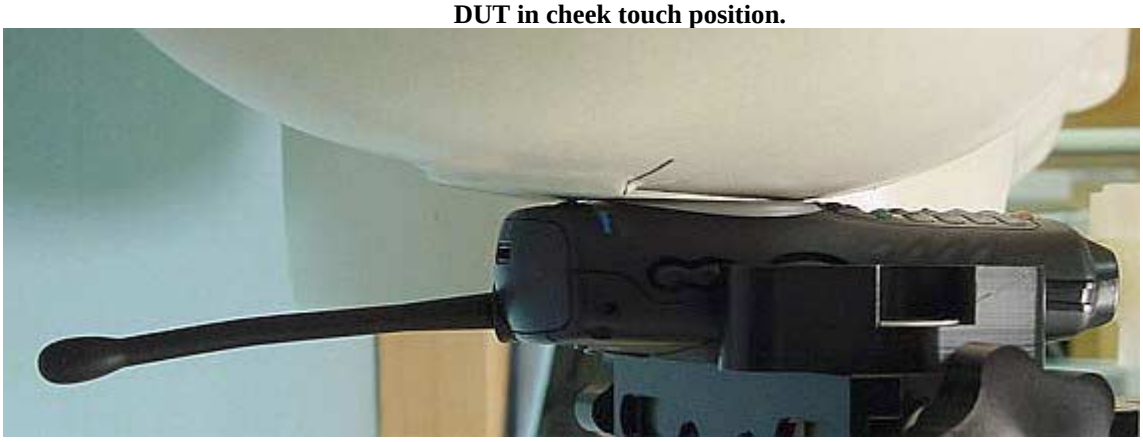

Figure 6. Assessment @ the Face.

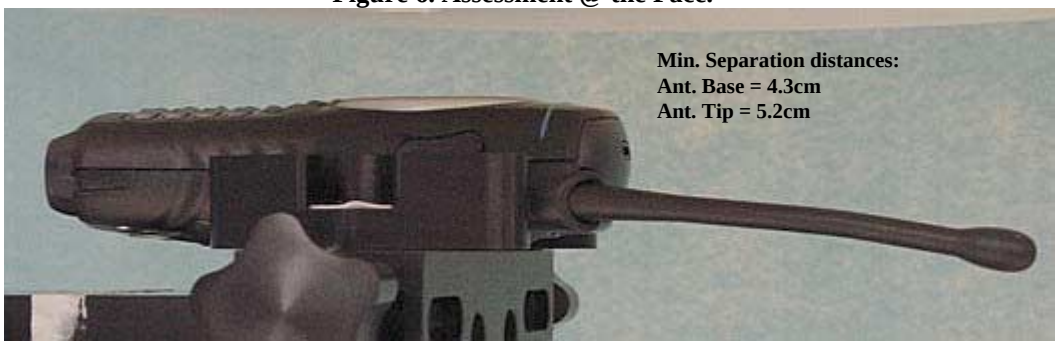

Figure 7. Assessment @ Body.
DUT with holster model NNTN5210A against the flat phantom and attached audio accessory model NNTN5208A.
(Same position used with and without the offered data cable attached,
as well as with each of the other offered audio accessories.)

Figure 8. Assessment @ the Body.
DUT back towards the phantom with 2.5cm separation.

Figure 9. Assessment @ the Body.
DUT front towards the phantom with 2.5cm separation.

Figure 10: Robot Test System (Flat Phantom)

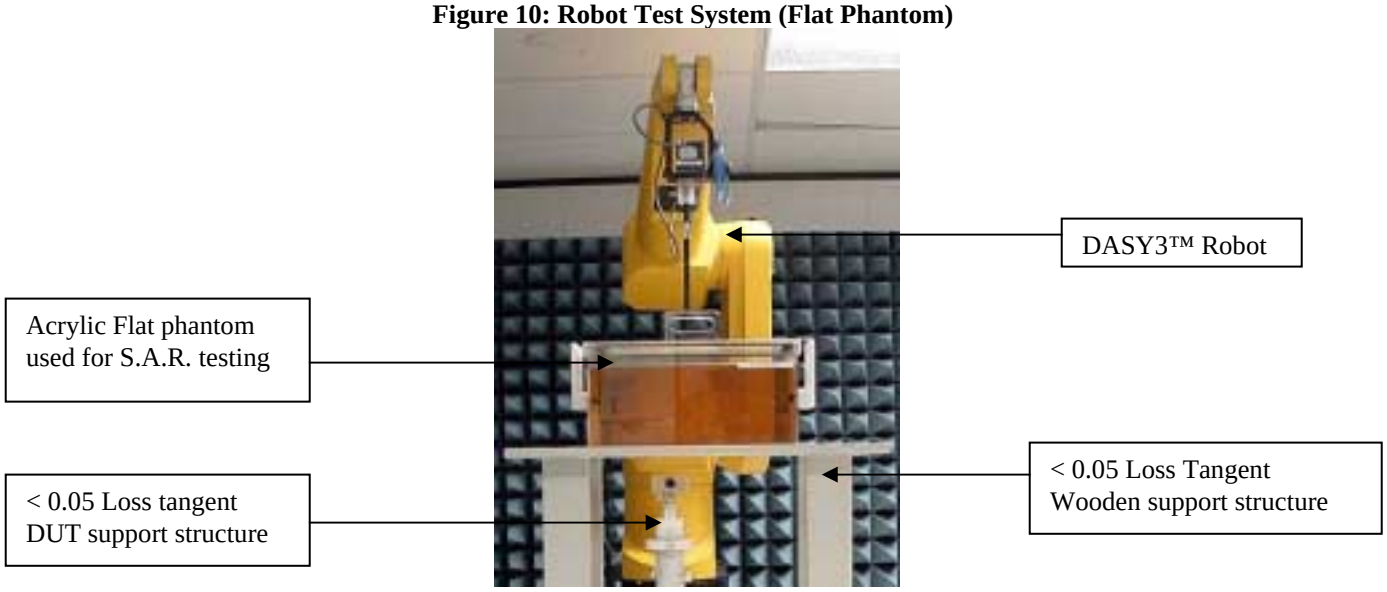

Figure 11: Robot Test System (SAM phantom)

5.3 Probe Scan Procedures

The E-field probe scans 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: 75 – 3000 MHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	IEEE 1528 section	Tol. (± %)	Prob Dist	Div.	c_i (1 g)	c_i (10 g)	1 g u_i (±%)	10 g u_i (±%)	v_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	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
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 - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mech. Tolerance	E.6.2	1.0	R	1.73	1	1	0.6	0.6	∞
Probe Positioning w.r.t Phantom	E.6.3	4.0	R	1.73	1	1	2.3	2.3	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.4	N	1.00	1	1	3.4	3.4	29
Device Holder Uncertainty	E.4.1	3.8	N	1.00	1	1	3.8	3.8	8
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	6.5	N	1.00	0.64	0.43	4.2	2.8	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	4.0	N	1.00	0.6	0.49	2.4	2.0	∞
Combined Standard Uncertainty			RSS				12	11	601
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				23	22	

Table 2: Uncertainty Budget for System Check: 75 – 3000 MHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
		Tol.	Prob.		c_i	c_i	1 g	10 g	
	IEEE 1528	(± %)	Dist.		(1 g)	(10 g)	u_i	u_i	
Uncertainty Component	section			Div.			(±%)	(±%)	v_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	1.0	R	1.73	1	1	0.6	0.6	∞
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 - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t. Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	2.0	R	1.73	1	1	1.2	1.2	∞
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	6.0	R	1.73	0.64	0.43	2.2	1.5	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	6.0	R	1.73	0.6	0.49	2.1	1.7	∞
Combined Standard Uncertainty			RSS				9	8	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				17	17	

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) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - 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 shortened S.A.R. cube scans 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.

7.1 S.A.R. results

DUT assessment at the head; Cheek Touch, Tilt, and band edges; 1:3 mode; 806-825MHz band												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
Left Ear												
EC-Lear-R1-040211-10/364ADY005C	Fixed	813.5125	SNN5705B	Cheek touch	None	None	0.686	0.04	0.621	0.407	0.63	0.42
EC-Lear-R1-040211-11/364ADY005C	Fixed	813.5125	SNN5706A	Cheek touch	None	None	0.692	0.91	0.690	0.476	0.70	0.48
EC-Lear-R1-040211-12/364ADY005C	Fixed	813.5125	NNTN4655A	Cheek touch	None	None	0.690	0.67	0.647	0.448	0.66	0.45
EC-Lear-R1-040211-13/364ADY005C	Fixed	813.5125	SNN5706A	15D tilt	None	None	0.682	0.66	0.725	0.501	0.74	0.51
EC-Lear-R1-040211-14/364ADY005C	Fixed	806.0125	SNN5706A	15D tilt	None	None	0.696	0.65	0.753	0.516	0.76	0.52
EC-Lear-R1-040211-15/364ADY005C	Fixed	824.9875	SNN5706A	15D tilt	None	None	0.701	0.43	0.718	0.494	0.72	0.49
Right Ear												
EC-Rear-R1-040211-16/364ADY005C	Fixed	813.5125	SNN5706A	Cheek touch	None	None	0.689	0.79	0.678	0.465	0.69	0.47
EC-Rear-R1-040211-17/364ADY005C	Fixed	813.5125	SNN5706A	15D tilt	None	None	0.693	-0.70	0.605	0.421	0.72	0.50
EC-Rear-R1-040211-18/364ADY005C	Fixed	806.0125	SNN5706A	15D tilt	None	None	0.695	-0.38	0.726	0.470	**0.80**	0.52
EC-Rear-R1-040211-19/364ADY005C	Fixed	824.9875	SNN5706A	15D tilt	None	None	0.699	0.48	0.667	0.460	0.67	0.46

DUT assessment at the Face; 2.5cm separation; 1:6 mode; 806-825MHz band												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
EC-Face-R1-040211-20/364ADY005C	Fixed	813.5125	SNN5706A	DUT front 2.5cm	None	None	0.687	0.67	0.120	0.086	**0.06**	0.04
EC-Face-R1-040211-21/364ADY005C	Fixed	806.0125	SNN5706A	DUT front 2.5cm	None	None	0.697	0.67	0.118	0.085	0.06	0.04
EC-Face-R1-040211-22/364ADY005C	Fixed	824.9875	SNN5706A	DUT front 2.5cm	None	None	0.702	0.24	0.109	0.078	0.05	0.04

DUT assessment at the head; Cheek Touch, Tilt, and Band edges; 1:3 mode; 896-902 MHz band												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
Left Ear												
EC-Lear-R1-040208-11/364ADY005C	Fixed	898.49375	SNN5705B	Cheek touch	None	None	0.676	-0.34	0.484	0.333	0.54	0.37
EC-Lear-R1-040208-12/364ADY005C	Fixed	898.49375	SNN5706A	Cheek touch	None	None	0.678	0.05	0.508	0.343	0.52	0.35
EC-Lear-R1-040208-13/364ADY005C	Fixed	898.49375	NNTN4655A	Cheek touch	None	None	0.685	0.04	0.515	0.347	0.53	0.35
EC-Lear-R1-040208-14/364ADY005C	Fixed	898.49375	SNN5705B	15D tilt	None	None	0.680	-0.46	0.922	0.599	**1.06**	0.69
EC-Lear-R1-040208-15/364ADY005C	Fixed	896.01875	SNN5705B	15D tilt	None	None	0.684	-0.50	0.895	0.604	1.03	0.69
EC-Lear-R1-040208-16/364ADY005C	Fixed	901.98125	SNN5705B	15D tilt	None	None	0.682	-0.34	0.872	0.583	0.97	0.65
Right Ear												
EC-Rear-R1-040213-03/364ADY005C	Fixed	898.49375	SNN5705B	Cheek touch	None	None	0.670	-0.54	0.536	0.353	0.63	0.42
EC-Rear-R1-040212-04/364ADY005C	Fixed	898.49375	SNN5705B	15D tilt	None	None	0.689	-0.36	0.625	0.427	0.69	0.47
EC-Rear-R1-040212-05/364ADY005C	Fixed	896.01875	SNN5705B	15D tilt	None	None	0.685	-0.26	0.676	0.458	0.73	0.50
EC-Rear-R1-040212-06/364ADY005C	Fixed	901.98125	SNN5705B	15D tilt	None	None	0.683	-0.25	0.666	0.447	0.72	0.49

DUT assessment at the Face; 2.5cm separation; 1:6mode; 896-902MHz band												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
EC-Face-R1-040212-07/364ADY005C	Fixed	898.49375	SNN5705B	DUT front 2.5cm	None	None	0.657	0.21	0.128	0.090	**0.07**	0.05
EC-Face-R1-040212-08/364ADY005C	Fixed	896.01875	SNN5705B	DUT front 2.5cm	None	None	0.661	0.08	0.124	0.088	0.07	0.05
EC-Face-R1-040212-09/364ADY005C	Fixed	901.98125	SNN5705B	DUT front 2.5cm	None	None	0.668	0.11	0.123	0.087	0.06	0.05

DUT assessment at the Face; 2.5cm separation; 114:120 MOTOtalk mode; 902-928MHz band												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
EC-Face-R1-040212-10/364ADY005C	Fixed	915.5250	SNN5705B	DUT front 2.5cm	None	None	0.857	0.20	0.868	0.600	0.45	0.31
EC-Face-R1-040212-12/364ADY005C	Fixed	915.5250	SNN5706A	DUT front 2.5cm	None	None	0.851	0.17	0.890	0.622	0.47	0.33
EC-Face-R1-040212-13/364ADY005C	Fixed	915.5250	NNTN4655A	DUT front 2.5cm	None	None	0.853	0.29	0.864	0.605	0.45	0.32
EC-Face-R1-040212-14/364ADY005C	Fixed	902.5250	SNN5706A	DUT front 2.5cm	None	None	0.846	0.26	0.929	0.650	**0.49**	0.34
EC-Face-R1-040212-15/364ADY005C	Fixed	927.4750	SNN5706A	DUT front 2.5cm	None	None	0.850	0.31	0.764	0.532	0.40	0.28

DUT assessment at the body; Battery, body worn, data cables; 81:120 mode; 806-825MHz band												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
EC-Ab-R1-040210-09/364ADY005C	Fixed	813.5125	SNN5705B	Against phantom	NNTN5210A	None	0.702	-0.83	0.582	0.411	0.70	0.50
EC-Ab-R1-040210-11/364ADY005C	Fixed	813.5125	SNN5706A	Against phantom	NNTN5210A	None	0.722	-0.50	0.685	0.484	**0.77**	0.54
EC-Ab-R1-040210-13/364ADY005C	Fixed	813.5125	NNTN4655A	Against phantom	NNTN5210A	None	0.705	0.12	0.665	0.477	0.67	0.48
EC-Ab-R1-040210-14/364ADY005C	Fixed	813.5125	SNN5706A	Against phantom	NNTN5210A	NKN6559A	0.725	-0.11	0.535	0.381	0.55	0.39
EC-Ab-R1-040210-15/364ADY005C	Fixed	813.5125	SNN5706A	Against phantom	NNTN5210A	NKN6560A	0.727	0.40	0.461	0.320	0.46	0.32

DUT assessment at the body; worst case (non PTT) and MOTOtalk PTT audio accessories; Band edges; 1:3, 1:6, 81:120 modes; 806-825MHz band												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
EC-Ab-R1-040210-16/364ADY005C	Fixed	813.5125	SNN5706A	Against phantom	NNTN5210A	SYN7875C	0.685	0.44	0.333	0.239	0.34	0.24
EC-Ab-R1-040210-17/364ADY005C	Fixed	813.5125	SNN5706A	Against phantom	NNTN5210A	NNTN5208A	0.679	-0.04	0.086	0.061	0.04	0.03
EC-Ab-R1-040211-02/364ADY005C	Fixed	806.0125	SNN5706A	Against phantom	NNTN5210A	None	0.705	-0.33	0.600	0.430	**0.65**	0.46
EC-Ab-R1-040211-03/364ADY005C	Fixed	824.9875	SNN5706A	Against phantom	NNTN5210A	None	0.708	-0.68	0.528	0.381	0.62	0.45

DUT assessment at the body; offered batteries and audio accessories 1:3 mode; 896-902MHz band												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
EC-Ab-R1-040209-11/364ADY005C	Fixed	898.49375	SNN5705B	Against phantom	NNTN5210A	SYN8390B	0.674	-0.35	0.221	0.156	0.25	0.18
EC-Ab-R1-040209-12/364ADY005C	Fixed	898.49375	SNN5706A	Against phantom	NNTN5210A	SYN8390B	0.672	-0.03	0.199	0.142	0.21	0.15
EC-Ab-R1-040209-13/364ADY005C	Fixed	898.49375	NNTN4655A	Against phantom	NNTN5210A	SYN8390B	0.679	0.00	0.189	0.132	0.19	0.14
EC-Ab-R1-040209-14/364ADY005C	Fixed	898.49375	SNN5705B	Against phantom	NNTN5210A	SYN8146C	0.677	-0.38	0.199	0.140	0.22	0.16
EC-Ab-R1-040209-15/364ADY005C	Fixed	898.49375	SNN5705B	Against phantom	NNTN5210A	NTN8496A	0.676	-0.42	0.208	0.147	0.24	0.17
EC-Ab-R1-040209-16/364ADY005C	Fixed	898.49375	SNN5705B	Against phantom	NNTN5210A	NNTN4033A	0.675	0.00	0.220	0.157	0.23	0.16
EC-Ab-R1-040210-02/364ADY005C	Fixed	898.49375	SNN5705B	Against phantom	NNTN5210A	NNTN4620A	0.665	-0.43	0.189	0.134	0.22	0.16
EC-Ab-R1-040210-03/364ADY005C	Fixed	898.49375	SNN5705B	Against phantom	NNTN5210A	SYN7875C	0.675	-0.41	0.223	0.156	**0.25**	0.18
EC-Ab-R1-040210-04/364ADY005C	Fixed	898.49375	SNN5705B	Against phantom	NNTN5210A	NTN8513B	0.673	0.03	0.198	0.141	0.21	0.15
EC-Ab-R1-040210-05/364ADY005C	Fixed	898.49375	SNN5705B	Against phantom	NNTN5210A	NNTN5208A	0.669	-0.42	0.255	0.176	0.15	0.10
EC-Ab-R1-040211-08/364ADY005C	Fixed	896.01875	SNN5705B	Against phantom	NNTN5210A	SYN7875C	0.673	0.11	0.207	0.146	0.22	0.15
EC-Ab-R1-040211-09/364ADY005C	Fixed	901.98125	SNN5705B	Against phantom	NNTN5210A	SYN7875C	0.678	-0.54	0.216	0.148	0.25	0.17

DUT assessment at the body; MOTOtalk with PTT audio accessories; Band edges; 114:120 mode; 902-928MHz band												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
EC-Ab-R1-040209-03/364ADY005C	Fixed	915.5250	SNN5705B	Against phantom	NNTN5210A	NNTN5208A	0.845	0.31	1.100	0.764	**0.58**	0.40
EC-Ab-R1-040209-04/364ADY005C	Fixed	915.5250	SNN5706A	Against phantom	NNTN5210A	NNTN5208A	0.867	0.20	1.070	0.742	0.55	0.38
EC-Ab-R1-040209-05/364ADY005C	Fixed	915.5250	NNTN4655A	Against phantom	NNTN5210A	NNTN5208A	0.873	0.18	1.110	0.765	0.57	0.39
EC-Ab-R1-040209-06/364ADY005C	Fixed	915.5250	SNN5705B	Against phantom	NNTN5210A	NNTN5004A	0.844	0.22	0.714	0.506	0.38	0.27
EC-Ab-R1-040209-07/364ADY005C	Fixed	915.5250	SNN5705B	Against phantom	NNTN5210A	NNTN5005A	0.847	0.20	0.853	0.603	0.45	0.32
EC-Ab-R1-040209-08/364ADY005C	Fixed	915.5250	SNN5705B	Against phantom	NNTN5210A	NNTN4033A	0.845	0.31	0.936	0.663	0.49	0.35
EC-Ab-R1-040209-09/364ADY005C	Fixed	902.5250	SNN5705B	Against phantom	NNTN5210A	NNTN5208A	0.864	0.02	1.100	0.763	0.57	0.39
EC-Ab-R1-040209-10/364ADY005C	Fixed	927.4750	SNN5705B	Against phantom	NNTN5210A	NNTN5208A	0.884	-0.01	1.120	0.777	0.57	0.39

DUT assessment at the body; 2.5cm separation-ant., back, front; w/ overall worst case test configuration at the body; 81:120mode												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
EC-Ab-R1-040211-04/364ADY0J12	Fixed	813.5125	SNN5706A	DUT back to phantom Ant @ 2.5cm	None	None	0.715	0.62	0.952	0.659	0.95	0.66
EC-Ab-R1-040213-04/364ADY004L	Fixed	813.5125	SNN5706A	DUT back to phantom Ant @ 2.5cm	None	None	0.685	-0.76	0.897	0.634	**1.09**	0.77
EC-Ab-R1-040211-06/364ADY0J12	Fixed	813.5125	SNN5706A	DUT back @ 2.5cm	None	None	0.728	0.19	0.684	0.483	0.68	0.48
EC-Ab-R1-040211-07/364ADY0J12	Fixed	813.5125	SNN5706A	DUT front @ 2.5cm	None	None	0.720	-0.52	0.368	0.265	0.41	0.30

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 and 10-gram averaged S.A.R. values are determined by scaling the measured S.A.R. to account for power leveling variations and power slump. For this device the Maximum Calculated 1-gram and 10-gram averaged peak S.A.R. is calculated using the following formula:

Max. Calc. 1-g Avg. SAR = ((S.A.R. meas. / (10^(Pdrift/10))*(Pmax/Pint))* DC%
P_{max} = Maximum Power (W)
P_{int} = Initial Power (W)
Pdrift = DASY drift results (dB)
SAR_{meas}. = Measured 1 gram averaged peak S.A.R. (mW/g)
DC % = Transmission mode duty cycle in % where applicable
Note that the use of the above formula should consider the relationship between the initial power, max power, and drift. Also, a 50% duty cycle is applied for PTT operation.

8.0 Conclusion

The highest Operational Maximum Calculated 1-gram and 10-gram average S.A.R. values found for FCC ID: AZ489FT5830 model H68XAH6RR1AN.

At the Body: **1-g Avg. = 1.09 mW/g; 10-g Avg. = 0.77 mW/g**
At the Face: **1-g Avg. = 0.49 mW/g; 10-g Avg. = 0.34 mW/g**
At the Head: **1-g Avg. = 1.06 mW/g; 10-g Avg. = 0.69 mW/g**

These test results 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)