MOTOROLA

ACCREDITED

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

Date of Report:	February 26, 2004
Report Revision:	Rev. O
Manufacturer:	Motorola
Product Description:	XTS2500 digital; 136-174MHz, 5.0 watts nominal; 48 channel
FCC ID:	**AZ489FT3807**
Device Model:	H46KDH9PW7AN

Test Period:	2/6/04-2/16/04
EME Tech:	Clint Miller
EME Eng.:	Kim Uong (Sr. EME 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 — 2/27/04

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

Date Approved

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REVISION HISTORY

Date	Revision	Comments
2/26/04	O	Release of Pilot 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 H46KDH9PW7AN, FCC ID: AZ489FT3807.

The applicable exposure environment is Occupational/Controlled.

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: AZ489FT3807 is an APCO 25(C4FM) digital voice FM modulated PTT device.
The intended operating positions are “at the face” with the DUT 1 to 2 inches from the mouth, and “at the body” by means of the offered body-worn accessories. Audio and PTT operation while the radio is at the body is accomplished by means of optional remote accessories that connect to the radio. The maximum transmit duty cycle is a conservative 50% and is controlled by the user via the PTT function.
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, which 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: AZ489FT3807 is capable of operating in the 136-174 MHz band. The nominal conducted output power is 5.0 watts and the maximum conducted output power is 5.7 watts. The stated maximum output powers are as defined by the upper limit of the production line final test station.

FCC ID: AZ489FT3807 is offered with the following options and accessories:

Antenna	**Description**
NAD6563A	Whip antenna; 136-174 MHz; 20.3 cm ¼ wave -10 dBi
NAD6566A	VHF antenna; 136–150.8 MHz; 19.3 cm ¼ wave -9.0 dBi
NAD6567A	VHF antenna; 150.8–162 MHz; 17.8 cm ¼ wave -8.0 dBi
NAD6568A	VHF antenna; 162–174 MHz; 16.4 cm ¼ wav -7.0 dBi

Batteries

NTN9857A	1800mAh NiMH FM battery
NTN9816A	1525mAh Nicd FM battery
NTN9815A	1525mAh Nicd battery
NTN9858AR	1800mAh NiMH battery

Body-worn Accessories

NNTN4115A	Bonded case 3 inch loop w/ swivel
NNTN4116A	Bonded case 2.5 inch loop w/ swivel
NNTN4117A	Bonded case 3 inch belt loop
HLN9844A	2 inch belt clip
HLN6853A	2.25 inch belt clip
TDN9675A	Wrist strap for carrying device. (Not intended for use with audio accessories)
NLN6349A	Shoulder strap for carrying device. (Not intended for use with audio accessories)
NTN5243A	Shoulder strap for carrying device. (Not intended for use with audio accessories)

A**pplicable Audio accessories**

BDN6664A	Earpiece with std. earphone
BDN6665A	Earpiece with extra loud earphone (exceeds OSHA limits)
BDN6666A	Earpiece with volume control
BDN6667A	Earpiece, Mic and PTT combined
BDN6668A	Earpiece, Mic and PTT separate
BDN6669A	Earpiece, Mic and PTT with extra loud earphone (exceeds OSHA limits)
BDN6670A	Earpiece, Mic and PTT separate with extra loud earphone (exceeds OSHA limits)
BDN6719A	Earpad, w/3.5 MM threaded plug
BDN6780A	Earbud, Single with Mic and PTT combined (black)
BDN6781A	Earbud, Single, Receive Only, Black
NMN6191C	Jedi Noise Canceling Remote Speaker Mic
NMN6193C	Jedi Remote Speaker Mic
BDN6677A	Standard Ear Mic - 95 DB (black)
BDN6678A	Standard Ear Mic - 95 DB (beige)

BDN6641A	High noise level Ear Mic - up to 105 DB (Black)
BDN6708B	Push to Talk Interface Module
BDN6671B	Voice-activated Interface Module
BDN6645A	Noise Canceling Boom Mic Headset with PTT on ear cup (use with BDN6673B)
BDN6673B	Headset Adapter Cable
BDN6726A	Earpiece with standard ear phone, black
BDN6727A	Earpiece with extra loud ear phone, black, (exceeds OSHA limits)
BDN6728A	Earpiece with volume control, black
BDN6729A	Earpiece, mic and PTT combined, black
BDN6730A	Earpiece, mic and PTT seperate, black
BDN6731A	Earpiece, mic and PTT combined, with extra loud earphone (exceeds OSHA limits), black
BDN6732A	Earpiece, mic and PTT seperate, with extra loud earphone (exceeds OSHA limits), black
BDN6635C	Heavy-duty VOX headset with noise-cancelling boom mic
BDN6636C	Heavy-duty VOX headset with throat mic
BDN6676D	Jedi adapter ADAPTER 3.5MM W/PTT SWITCH
NMN1020A	Safety helmet headset
NMN6245A	Light weight headset
NMN6246B	Ultralite headset with boom mic
NMN6258A	Over the head headset with in line PTT
NMN6259A	Medium weight, dual headset with NC mic
RMN4049A	Temple Transducer

Other applicable options:

NA

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

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 ET3DV6R/SN1545. 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)
1545	FCC Body	8/28/03	D300V2/1001	2.81 +/- 0.090	2.72 +/- 10%	2/6/04-2/10/04 5 test days
1545	IEEE Head	8/28/03	D300V2/1001	2.83 +/- 0.020	2.81 +/- 10%	2/11/04-2/16/04 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 68.58 cm x 25.4 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 = 80cm, W = 60cm, H = 20cm, Surface Thickness = 0.2cm.

4.2.2 SAM Phantom

NA

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)

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

4.3.2 Simulated Tissue Composition (System Performance)

	Tissue Ingredients (%)					
	300MHz		NA		NA	
	Head	Body	Head	Body	Head	Body
Sugar	56.0	47.1	NA	NA	NA	NA
DGBE (Glycol)	NA	NA	NA	NA	NA	NA
De ionized -Water	37.5	49.48	NA	NA	NA	NA
Salt	5.4	2.32	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
156	61.8	60.8-62.4	0.80	0.77-0.81

IEEE Head				
Frequency (MHz)	Di-electric Constant Target	Di-electric Constant Meas. (Range)	Conductivity Target S/m	Conductivity Meas. (Range) S/m
156	52.0	52.7-54.5	0.76	0.73-0.74

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. 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: 20.0-26.17˚C Avg. 21.93˚C
Relative Humidity	30 - 70 %	Range: 37.20-57.30% Avg. 47.22%
Tissue Temperature	NA	Range: 20.7-21.7˚C Avg. 21.2˚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 in front of the face in CW mode.

Assessments at the body (136-174 MHz)

The DUT was assessed at the center frequency of all offered antennas, in CW mode, using battery model NTN9857A, belt clip model HLN9844A, and RSM model NMN6193C.

The DUT was assessed at the center frequency of the antenna with highest S.A.R. results from above, in CW mode, with each of the other offered batteries, with belt clip model HLN9844A, and audio accessory model NMN6193C.

The DUT was assessed at the center frequency of the antenna from above, in CW mode, with each of the other offered body worn accessories, using the battery with the highest S.A.R. results from above, along with the audio accessory model NMN6193C.

The DUT was assessed at the center frequency of the antenna from above, in CW mode, with each of the other applicable offered audio accessories, using the battery and body worn accessory with the highest S.A.R. results from above.

The DUT was assessed at the center frequency of all the other offered antennas not tested in the audio accessories assessment above, in CW mode, using the worst case audio accessory, battery, and body worn accessory from above.

The DUT was assessed at the band edges of the worst case antenna overall from the body assessment above, in CW mode, along with the audio and body worn accessories tested above.

The DUT was assessed at the center frequency of the worst case antenna, in CW mode, using the worst case antenna, and audio accessory from above with the back of the DUT separated 2.5cm from the phantom, with the DUT back towards the phantom with the antenna separated 2.5cm, and with front of the DUT separated 2.5 cm from the phantom.

Assessments at the face (136-174MHz)

The DUT was assessed at the center frequency of all offered antennas, in CW mode, with 2.5 cm separation from the phantom, using the worst case battery from the body assessment above.

The DUT was assessed at the center frequency of the worst case antenna from above, in CW mode, with 2.5 cm separation from the phantom, along with each of the other offered batteries.

The DUT was assessed using the worst case test configuration from above, in CW mode, with 2.5 cm separation from the phantom, using each of the offered applicable audio accessories.

The DUT was assessed at the center frequencies of each of the other offered antennas', in CW mode, using the worst case battery from above.

The DUT was assessed at the TX band edges of the worst case antenna overall from face assessment above, in CW mode, with 2.5 cm separation from the phantom, using the worst case battery from above.

Shortened scan assessment at the Face

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

5.1 Device Test Positions

Reference Figure 1 for the device orientation and position which exhibits 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 2.5cm from the flat phantom as well as with the antenna 2.5cm from the phantom, and with its front housing at 2.5cm from the flat phantom.

5.1.2 Head

NA

5.1.3 Face

The DUT was placed with 2.5cm separation from the phantom.

5.2 Test Position Photographs

Figure 1. Highest SAR Test Position @ the face.
DUT front towards the phantom with 2.5cm separation.
Same position used with applicable audio accessory attached

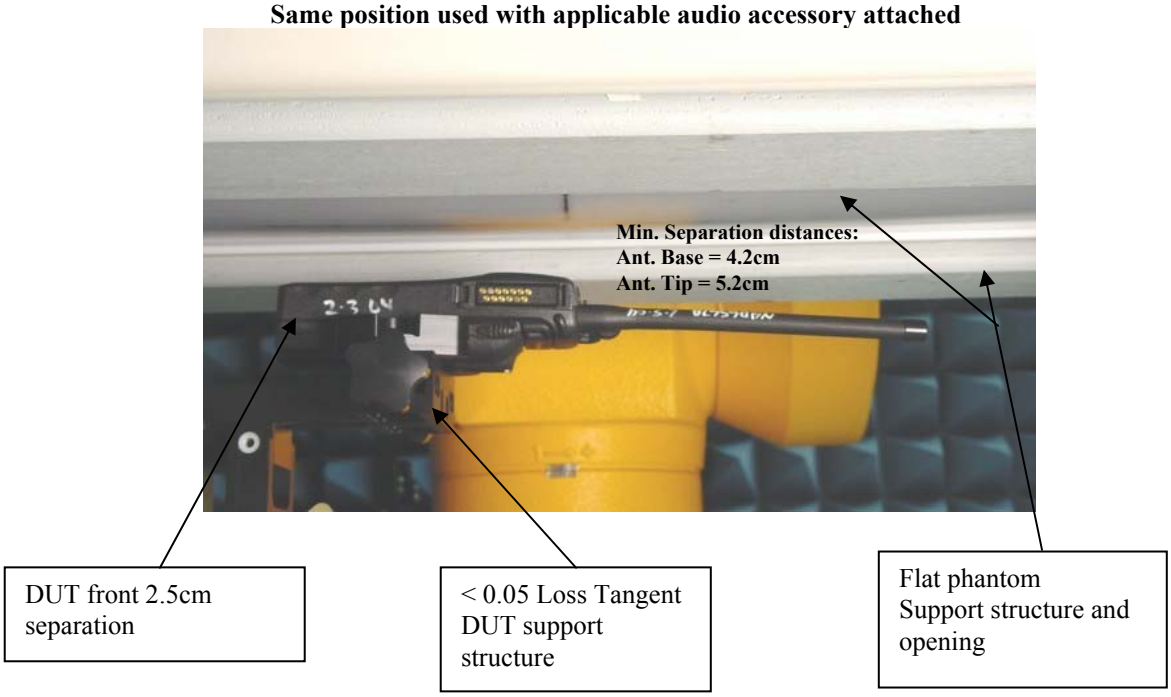


Figure 2. Assessment @ the body.
DUT with body worn model NNTN4115A against the phantom.

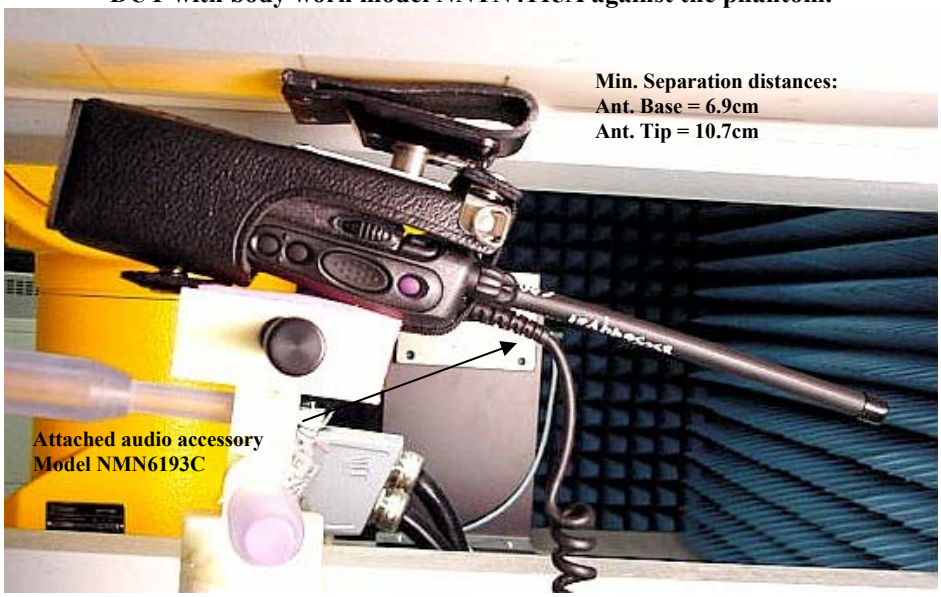


Figure 3. Assessment @ body.
DUT with body worn model NNTN4116A.

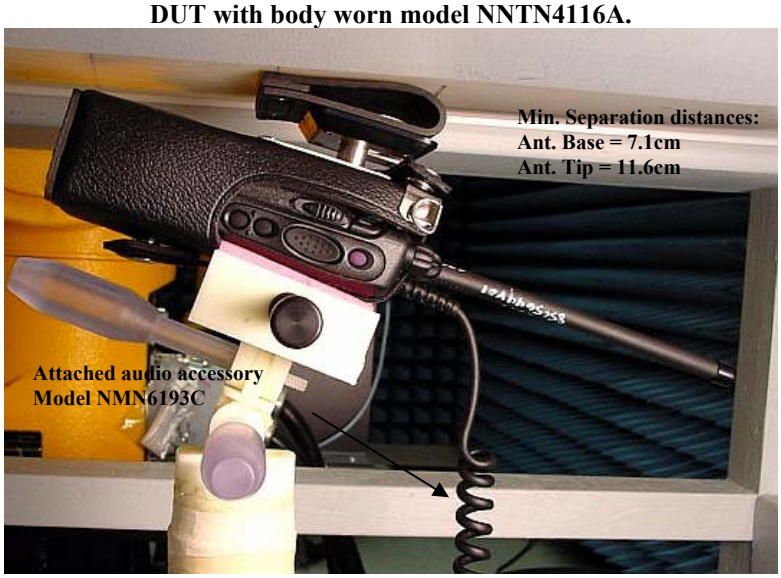


Figure 4. Assessment @ the body.
DUT with body worn model NNTN4117A.

Figure 5. Assessment @ the body.
DUT with body worn model HLN6853A.

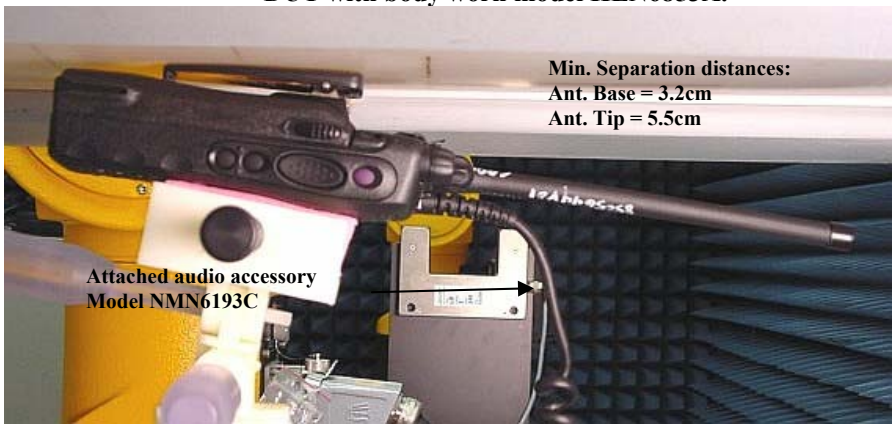


Figure 6. Assessment @ the body.
DUT with body worn model HLN9844A.
Same position used for all other tested audio accessories

Figure 7. Assessment @ body.
DUT with back housing separated 2.5cm from phantom.
Same position used for antenna separated 2.5cm

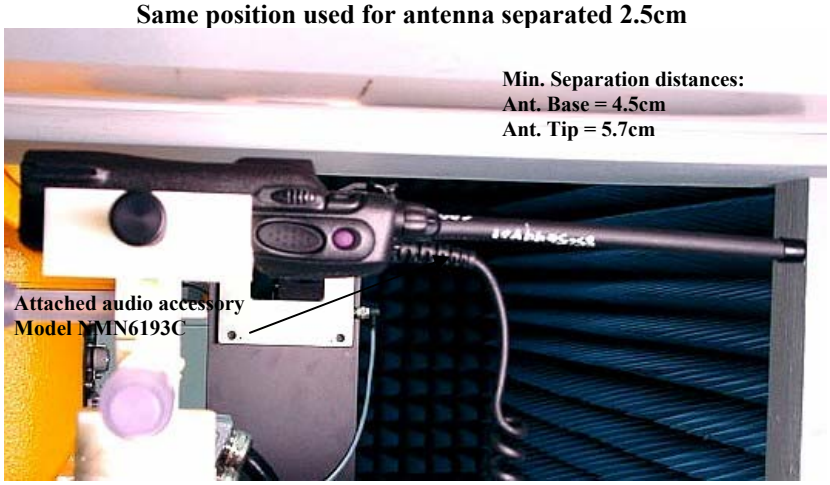


Figure 8. Assessment @ the body.
DUT front towards the phantom with 2.5cm separation.

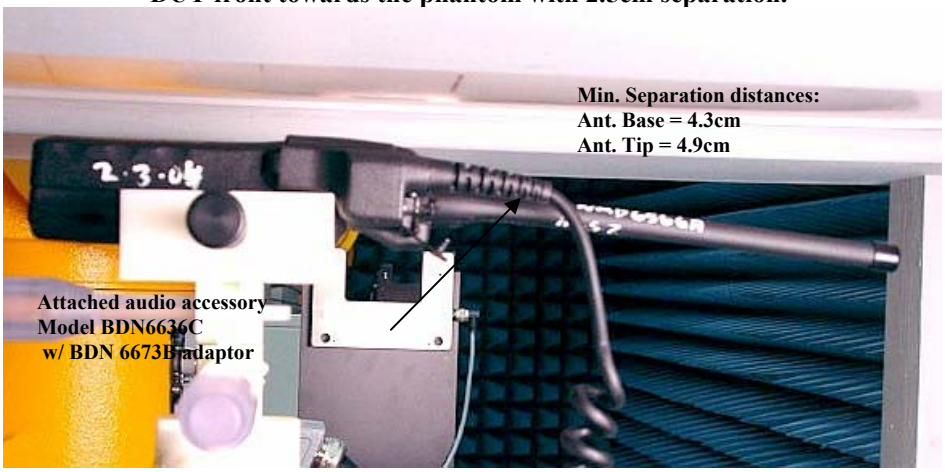
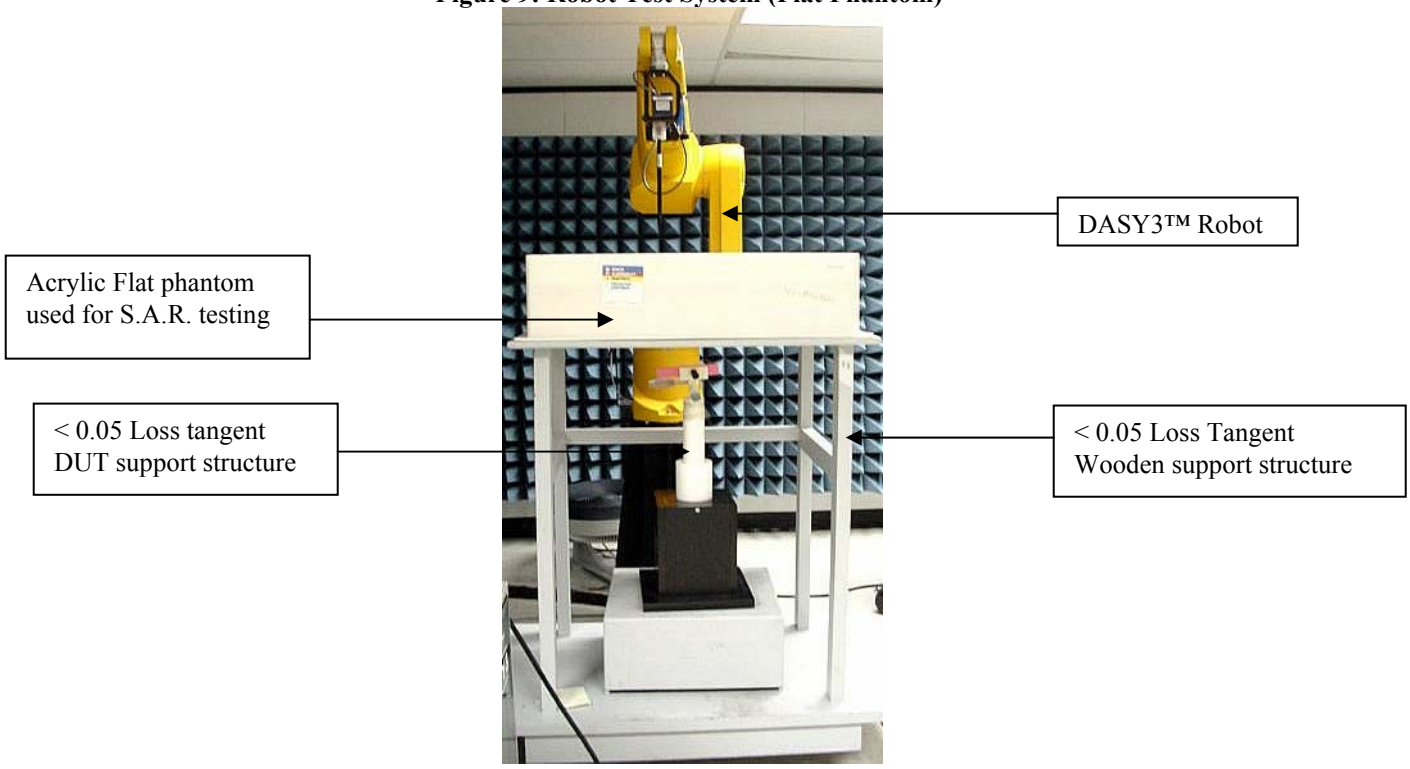


Figure 9: Robot Test System (Flat Phantom)



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 body; CW mode; 136-174 MHz												
Run Number/ SN	**Antenna model**	**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)**
Antenna search assessment along with belt clip and RSM												
CM-R2-040206-08/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	NMN6193C	5.700	-1.340	1.150	0.758	**0.78**	0.52
CM-R2-040206-14/407TDY0011	NAD6566A	143.0250	NTN9857A	Against phantom	HLN9844A	NMN6193C	5.79	-1.050	0.632	0.423	0.40	0.27
CM-R2-040206-15/407TDY0011	NAD6567A	156.0250	NTN9857A	Against phantom	HLN9844A	NMN6193C	5.87	-0.310	1.060	0.698	0.57	0.37
CM-R2-040206-16/407TDY0011	NAD6568A	169.0250	NTN9857A	Against phantom	HLN9844A	NMN6193C	5.80	-0.920	0.761	0.509	0.47	0.31
Battery assessment with worst case antenna from above along with belt clip and RSM												
CM-R2-040206-17/407TDY0011	NAD6563A	156.0250	NTN9816A	Against phantom	HLN9844A	NMN6193C	5.94	-1.360	1.120	0.739	**0.77**	0.51
CM-R2-040206-18/407TDY0011	NAD6563A	156.0250	NTN9815A	Against phantom	HLN9844A	NMN6193C	5.97	-1.220	1.080	0.714	0.72	0.47
CM-R2-040207-02/407TDY0011	NAD6563A	156.0250	NTN9858A	Against phantom	HLN9844A	NMN6193C	5.94	-0.910	1.090	0.727	0.67	0.45

DUT assessment at the body; CW mode; 136-174 MHz (Continued)												
Run Number/ SN	**Antenna model**	**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)**
Body worn accessories assessment with worst case configuration from above												
CM-R2-040207-03/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	NNTN4115A	NMN6193C	5.97	-0.890	0.337	0.263	0.21	0.16
CM-R2-040207-04/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	NNTN4116A	NMN6193C	5.95	-0.990	0.283	0.221	0.18	0.14
CM-R2-040207-05/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	NNTN4117A	NMN6193C	5.94	-0.990	0.460	0.358	0.29	0.22
CM-R2-040207-06/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN6853A	NMN6193C	5.95	-0.970	1.060	0.713	**0.66**	0.45
Audio accessories assessment with worst case configuration from above.												
CM-R2-040207-07/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6667A w/ BDN6676D	5.90	-0.640	1.300	0.844	0.75	0.49
CM-R2-040207-08/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6668A w/ BDN6676D	5.89	-1.290	1.240	0.812	0.83	0.55
CM-R2-040207-09/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6669A w/ BDN6676D	5.91	-1.070	1.320	0.863	0.84	0.55
CM-R2-040207-10/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6670A w/ BDN6676D	5.97	-1.120	1.280	0.843	0.83	0.55
CM-R2-040208-02/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6780A w/ BDN6676D	5.97	-1.130	1.020	0.670	0.66	0.43
CM-R2-040208-03/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6645A BDN6673B	5.93	-0.970	1.460	0.954	0.91	0.60
CM-R2-040208-04/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	NMN6191C	5.95	-1.040	1.170	0.777	0.74	0.49
CM-R2-040208-05/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6708B w/ BDN6678A	5.94	-1.130	1.380	0.878	0.90	0.57
CM-R2-040208-06/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6671B BDN6641A	5.95	-0.830	1.710	1.080	1.04	0.65
CM-R2-040208-07/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6635C w/ BDN6673B	5.96	-1.130	1.560	1.020	1.01	0.66
CM-R2-040208-08/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6636C w/ BDN6673B	5.93	-0.920	1.730	1.120	**1.07**	0.69
CM-R2-040208-09/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	NMN1020A w/ BDN6676D	5.94	-0.790	1.390	0.886	0.83	0.53
CM-R2-040208-10/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	NMN6245A	5.96	-1.240	1.550	1.010	1.03	0.67
KU-R2-040209-02/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	NMN6246B w/ BDN6676D	5.93	-1.180	1.450	0.942	0.95	0.62
KU-R2-040209-03/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	NMN6258A	5.83	-0.620	1.380	0.896	0.80	0.52

KU-R2-040209-04/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	NMN6259A	5.92	-1.100	1.340	0.873	0.86	0.56
KU-R2-040209-05/407TDY0011	NAD6563A	156.0250	NTN9857A	Against phantom	HLN9844A	RMN4049A	5.95	-1.090	1.310	0.859	0.84	0.55

DUT assessment at the body; CW mode; 136-174 MHz

Run Number/ SN	Antenna model	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)
Assessment of other antennas with worst case test configuration from audio accessory above												
KU-R2-040209-07/407TDY0011	NAD6566A	143.0250	NTN9857A	Against phantom	HLN9844A	BDN6636C w/ BDN6673B	5.82	-0.540	1.330	0.824	0.75	0.47
KU-R2-040209-08/407TDY0011	NAD6567A	156.0250	NTN9857A	Against phantom	HLN9844A	BDN6636C w/ BDN6673B	5.83	-0.270	1.640	1.070	**0.87**	0.57
KU-R2-040209-09/407TDY0011	NAD6568A	169.0250	NTN9857A	Against phantom	HLN9844A	BDN6636C w/ BDN6673B	5.70	-1.280	1.120	0.760	0.75	0.51
Assessment of antenna TX band edges using worst case antenna from above												
CM-R2-040209-11/407TDY0011	NAD6563A	136.0250	NTN9857A	Against phantom	HLN9844A Belt clip	BDN6636C w/ BDN6673B adaptor	5.84	-1.430	0.568	0.383	0.39	0.27
CM-R2-040209-12/407TDY0011	NAD6563A	173.9850	NTN9857A	Against phantom	HLN9844A Belt clip	BDN6636C w/ BDN6673B adaptor	5.75	-0.570	0.960	0.652	**0.55**	0.37

Assessment at the body; 2.5cm separation; CW mode; 136-174 MHz

Run Number/ SN	Antenna model	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)
CM-R2-040209-13/407TDY0011	NAD6563A	156.0250	NTN9857A	DUT back 2.5cm	None	BDN6636C w/ BDN6673B adaptor	5.84	-0.590	1.130	0.879	0.65	0.50
KU-R2-040210-03/407TDY0011	NAD6563A	156.0250	NTN9857A	DUT back with ant. 2.5cm	None	BDN6636C w/ BDN6673B adaptor	5.80	-0.850	1.600	1.200	**0.97**	0.73
KU-R2-040210-02/407TDY0011	NAD6563A	156.0250	NTN9857A	DUT front 2.5cm	None	BDN6636C w/ BDN6673B adaptor	5.85	-0.820	1.110	0.854	0.67	0.52

DUT assessment at the Face; 2.5cm separation; 136-174 MHz												
Run Number/ SN	**Antenna model**	**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)**
Assessment of offered antennas												
CM-R2-040212-03/407TDY0011	NAD6563A	156.0250	NTN9857A	DUT front 2.5cm	None	None	5.87	-0.860	0.857	0.666	0.52	0.41
CM-R2-040211-03/407TDY0011	NAD6566A	143.0250	NTN9857A	DUT front 2.5cm	None	None	5.82	-0.590	3.000	2.330	**1.72**	1.33
CM-R2-040211-04/407TDY0011	NAD6567A	156.0250	NTN9857A	DUT front 2.5cm	None	None	5.87	-0.400	2.180	1.680	1.20	0.92
CM-R2-040211-05/407TDY0011	NAD6568A	169.0250	NTN9857A	DUT front 2.5cm	None	None	5.84	-0.620	2.000	1.540	1.15	0.89
Assessment of batteries with the worst case antenna from above												
CM-R2-040211-06/407TDY0011	NAD6566A	143.0250	NTN9816A	DUT front 2.5cm	None	None	5.85	-0.410	3.150	2.450	1.73	1.35
CM-R2-040212-02/407TDY0011	NAD6566A	143.0250	NTN9815A	DUT front 2.5cm	None	None	5.82	-0.370	3.070	2.380	1.67	1.30
CM-R2-040212-04/407TDY0011	NAD6566A	143.0250	NTN9858A	DUT front 2.5cm	None	None	5.81	-0.710	3.010	2.330	**1.77**	1.37

DUT assessment at the Face; 2.5cm separation; 136-174 MHz												
Run Number/ SN	**Antenna model**	**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)**
Assessment of audio accessories with worst case test configuration from above												
CM-R2-040212-05/407TDY0011	NAD6566A	143.0250	NTN9858A	DUT front 2.5cm	None	BDN6719A w/ BDN6676D	5.84	-1.280	1.280	0.998	0.86	0.67
CM-R2-040212-06/407TDY0011	NAD6566A	143.0250	NTN9858A	DUT front 2.5cm	None	BDN6666A w/ BDN6676D	5.80	-1.260	0.889	0.688	0.59	0.46
CM-R2-040212-07/407TDY0011	NAD6566A	143.0250	NTN9858A	DUT front 2.5cm	None	BDN6665A w/ BDN6676D	5.81	-0.630	0.599	0.463	0.35	0.27
CM-R2-040212-08/407TDY0011	NAD6566A	143.0250	NTN9858A	DUT front 2.5cm	None	BDN6781A w/ BDN6676D	5.82	-1.090	1.160	0.902	0.75	0.58
CM-R2-040212-09/407TDY0011	NAD6566A	143.0250	NTN9858A	DUT front 2.5cm	None	BDN6782A w/ BDN6676D	5.84	-1.200	1.350	1.050	**0.89**	0.69

DUT assessment at the Face; 2.5cm separation; 136-174 MHz												
Run Number/ SN	**Antenna model**	**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)**
Assessment of additional antennas using the worst case test configuration from above												
CM-R2-040212-10/407TDY0011	NAD6563A	156.0250	NTN9858A	DUT front 2.5cm	None	None	5.80	-0.550	0.907	0.703	0.51	0.40
CM-R2-040212-11/407TDY0011	NAD6567A	156.0250	NTN9858A	DUT front 2.5cm	None	None	5.80	-0.160	2.250	1.750	1.17	0.91
CM-R2-040212-12/407TDY0011	NAD6568A	169.0250	NTN9858A	DUT front 2.5cm	None	None	5.75	-0.550	2.080	1.610	**1.18**	0.91
Assessment of antenna TX band edges using overall worst case antenna observed at the face from above												
KU-R2-040213-02/407TDY0011	NAD6566A	136.025	NTN9858A	DUT front 2.5cm	None	None	5.84	-0.170	2.420	1.890	**1.26**	0.98
KU-R2-040213-03/407TDY0011	NAD6566A	150.025	NTN9858A	DUT front 2.5cm	None	None	5.75	-0.420	0.913	0.708	0.50	0.39

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.

8.0 Conclusion

The highest Operational Maximum Calculated 1-gram and 10-gram average S.A.R. values found for FCC ID: AZ489FT3807 model H46KDH9PW7AN.

At the Body: **1-g Avg. = 1.07 mW/g; 10-g Avg. = 0.69 mW/g**
At the Face: **1-g Avg. = 1.77 mW/g; 10-g Avg. = 1.37 mW/g**

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