



**MOTOROLA**



TESTING CERT # 2518.01

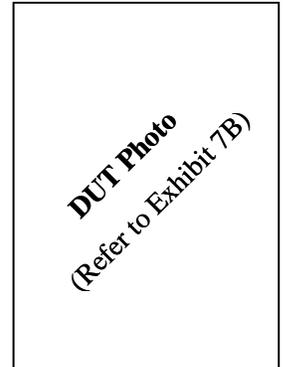
FCC ID: AZ489FT4886

**DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 3**

**Enterprise Mobility Solutions**  
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**Date of Report:** 10/16/09  
**Report Revision:** 0  
**Report ID:** SAR rpt\_H97TGD9PW1AN (WITH QA00570AA AND QA00575AA)\_Rev O\_091016\_SR7715

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**Date/s Tested:** 09/16/09-09/22/09, 9/24/09-9/26/09, 9/30/09, 10/07/09, 10/08/09, 10/12/09, 10/14/09  
**Manufacturer/Location:** Penang  
**Sector/Group/Div.:** EMS  
**Date submitted for test:** 09/21/09  
**DUT Description:** 380-470 MHz 1-5W, 136-174 MHz 1-6W, 6.25 kHz / 12.5 kHz / 25 kHz, Basic Model W/GPS. Capable of digital and analog FM transmission. Also capable of TDMA transmission  
**Test TX mode(s):** CW  
**Max. Power output:** 5.7W (UHF1), 6.6W (VHF)  
**Nominal Power:** 5.0W (UHF1), 6.0W (VHF)  
**Tx Frequency Bands:** 380-470 MHz (UHF1) & 136-174 MHz (VHF)  
**Signaling type:** FM and TDMA  
**Model(s) Tested:** H97TGD9PW1AN (WITH QA00570AA AND QA00575AA)  
**Model(s) Certified:** H97TGD9PW1AN (WITH QA00570AA AND QA00575AA)  
**Serial Number(s):** Q0FKL039  
**Classification:** Occupational/Controlled  
**Rule Part(s):** 90 (406.1-470MHz, 150.8-173.4MHz)



**Max. Calc. : 1-g Avg. SAR: 7.27 W/kg (Body); 10-g Avg. SAR: 4.97 W/kg (Body)**  
**Max. Calc. : 1-g Avg. SAR: 4.21 W/kg (Face); 10-g Avg. SAR: 3.16 W/kg (Face)**

The test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of 8 W/kg averaged over 1 gram per the requirements of 47 CFR 2.1093(d). The 10 grams result is not applicable to FCC filing. The test results clearly demonstrate compliance with ICNIRP (1998) Guidelines for limiting exposure in time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz), Health Physics 74, 494-522 RF Exposure limits of 10 W/kg averaged over 10grams of contiguous tissue.

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 3.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola EME Laboratory. I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements. This reporting format is consistent with the suggested guidelines of the TIA TSB-150 December 2004. The results and statements contained in this report pertain only to the device(s) evaluated.

*Signature on file*  
**Deanna Zakharia**  
 EMS EME Lab Senior Resource Manager,  
 Laboratory Director

**Approval Date:** 10/16/09

**Certification Date:**

**Certification No.:**

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**Report Revision History**

Date	Revision	Comments
10/16/09	O	Initial release

## 1.0 Introduction

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (SAR) measurements performed at the EMS EME Test Laboratory for model number H97TGD9PW1AN (WITH QA00570AA AND QA00575AA) and FCC ID: AZ489FT4886. The results herein reflect prototype test results.

## 2.0 Abbreviations / Definitions

CNR: Calibration Not Required  
CQPSK: Compatible Quadrature Phase-Shift Keying  
CW: Continues Wave  
DUT: Device Under Test  
FM: Frequency Modulation  
NA: Not Applicable  
PTT: Push to Talk  
RSM: Remote Speaker Microphone  
TDMA: Time Division Multiple Access  
SAR: Specific Absorption Rate

Audio accessories: These accessories allow communication while the DUT is worn on the body.

Body worn accessories: These accessories allow the DUT to be worn on the body of the user.

Maximum Power: Defined as the upper limit of the production line final test station.

## 3.0 Referenced Standards and Guidelines

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

- IEC62209-1\*(2005) Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)
- United States Federal Communications Commission, Code of Federal Regulations; Rule Part 47CFR § 2.1093 sub-part J:1999
- Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.
- 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 Electronics Engineers (IEEE) C95. 1-1992
- Institute of Electrical and Electronics Engineers (IEEE) C95.1-2005
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998

- Ministry of Health (Canada) Safety Code 6 (1999), Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz
- Australian Communications Authority Radio communications (Electromagnetic Radiation - Human Exposure) Standard (2003)
- ANATEL, Brazil Regulatory Authority, Resolution No. 303 of July 2, 2002 "Regulation of the limitation of exposure to electrical, magnetic, and electromagnetic fields in the radio frequency range between 9kHz and 300 GHz." and "Attachment to resolution # 303 from July 2, 2002"
- Draft of IEC62209-2 Ed.1, Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices – Human models, Instrumentation, and Procedures Part 2: Procedure to determine the specific absorption rate (SAR) for mobile wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz), revised on Oct 3, 2008.

\* The IEC62209-1 and IEEE1528 are applicable for hand-held devices used in close proximity to the ear only.

**4.0 SAR Limits**

**TABLE 1**

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average - ANSI - (averaged over the whole body)	0.08	0.4
Spatial Peak - ANSI - (averaged over any 1-g of tissue)	1.6	8.0
Spatial Peak – ICNIRP/ANSI - (hands/wrists/feet/ankles averaged over 10-g)	4.0	20.0
Spatial Peak - ICNIRP - (Head and Trunk 10-g)	2.0	10.0

**5.0 SAR Result Scaling Methodology**

The calculated 1-gram and 10-gram averaged SAR results indicated as “Max Calc. 1g-SAR” and “Max Calc.10g-SAR” in the data tables is determined by scaling the measured SAR to account for power leveling variations and power slump. A table and graph of output power versus time is provided in APPENDIX G. For this device the “Max Calc. 1g-SAR” and “Max Calc.10g-SAR” are scaled using the following formula:

$$Max\_Calc = SAR\_meas \cdot 10^{\frac{-Drift}{10}} \cdot \frac{P\_max}{P\_int} \cdot DC$$

P\_max = Maximum Power (W)  
P\_int = Initial Power (W)  
Drift = DASY drift results (dB)  
SAR\_meas = Measured 1-g or 10-g Avg. SAR (W/kg)  
DC = Transmission mode duty cycle in % where applicable  
50% duty cycle is applied for PTT operation

Note: for conservative results, the following are applied:

If  $P_{int} > P_{max}$ , then  $P_{max}/P_{int} = 1$ .

Drift = 1 for positive drift

Additional SAR scaling was applied using the methodologies outlined in FCC KDB450824 using tissue sensitivity values. SAR was scaled for conditions where the tissue permittivity was measured above the nominal target and for tissue conductivity that was measured below the nominal target.

## 6.0 Description of Device Under Test (DUT)

FCC ID: AZ489FT4886 operates using digital and analog frequency modulation (FM) as well as TDMA signaling incorporating traditional simplex two-way radio transmission protocol.

Time Division Multiple Access (TDMA) is used to allocate portions of the RF signal by dividing time into two slots. Time allocation enables each unit to transmit its voice information without interference from other transmitting units. Transmission from a unit or base station is accommodated during two time-slot lengths of 30 milliseconds with frame length of 60 milliseconds. C4FM CQPSK modulation is used and includes the following channel spaces; 6.25 kHz (equivalent), 12.5 kHz and 25 kHz. The TDMA technique requires sophisticated algorithms and a digital signal processor (DSP) to perform voice compressions/decompressions and RF modulation/demodulation. The maximum duty cycle for TDMA is 2:1 and is controlled by software. The FM signal is continuous. However because of hand shaking or Push-To-Talk (PTT) between users and/or base stations a conservative 50% duty cycle is applied. The TDMA mode was not tested because its duty cycle is inherently 50% and would include an additional 50% duty cycle for PTT.

The model represented under this filing utilizes removable antennas and is capable of transmitting in the 380-470 MHz and 136-174 MHz bands. The nominal output power is 5.0 watts at 380-470 MHz and 6.0 watts at 136-174 MHz with maximum output powers of 5.7 watts at 380-470 MHz and 6.6 watts at 136-174 MHz as defined by upper limit of the production line final test station. The intended operating positions are “at the face” with the DUT at least 1 inch from the mouth, and “at the body” by means of the offered body worn accessories. Body worn audio and PTT operation is accomplished by means of optional remote accessories that are connected to the radio.

**7.0 Optional Accessories and Test Criteria**

FCC ID: AZ489FT4886 is offered with optional accessories. All accessories were individually evaluated during the test plan creation to determine if testing was required. The following sections identify the test criteria and details for each accessory category.

**7.1 Antennas**

All antennas were tested. The table below lists the antennas, antenna descriptions and separation distances.

**TABLE 2**

Antenna Models	Description	Tested	* Separation distances between DUT antenna and phantom surface for given test configurations		
			Body Test Configuration		Face Test Configuration DUT @ 2.5cm
			Tested Carry Accessories	2.5cm Assessment DUT @ 2.5cm	
PMAE4065A	UHF/GPS 380-520 MHz, 1575 MHz ¼ wave, -2dBd	Yes	26-75mm	41-47mm	41-47mm
PMAT4001A	VHF/UHF/GPS 136-174MHz, 380-470MHz, 1575MHz ¼ wave, -8dBd	Yes	26-94mm	25-56mm	41-56mm

\* The 1st number indicated the minimum separation distance that measured at the antenna’s base while the second number reflects the separation distance measured at the antenna’s tip.

**7.2 Batteries**

The only offered battery was tested.

**TABLE 3**

Battery Models	Description	Tested	Comments
NNTN7038A	Hi Cap Impres Li Ion 2500mAh	Yes	NA

**7.3 Body worn Accessories**

All body worn accessories were evaluated during the test plan generation. The two belt clips contain unique metallic content and were tested. The holster does not contain a unique metallic content and can not be used without either belt clip. The combination of holster and belt clip increases the separation distance as compared to only the belt clip. The holster was not tested, as indicated in the table below, based on these conditions.

**TABLE 4**

Body worn Models	Description	Tested	* Separation distances between DUT antenna and phantom surface. (mm)	Comments
NTN8266B	2.5” Belt Clip	Yes	26-40	NA
HLN6875A	3.0” Belt Clip	Yes	45-94	NA
PMLN5331A	Holster / Carry Holder	No	39-63 (NTN8266B) 51-112 (HLN6875A)	Plastic holster (i.e. no unique metallic content) that requires either belt clip (NTN8266B or HLN6875A). The holster increases separation distance between DUT and user.

\* The 1st number indicated the minimum separation distance that measured at the antenna’s base while the second number reflects the separation distance measured at the antenna’s tip.

**7.4 Audio Accessories**

All audio accessories were tested. Accessories were grouped by categories; Remote Speaker Microphone (RSM) and headsets. The table below lists the audio accessories, their descriptions and test status.

**TABLE 5**

Audio Acc. Models	Description	Tested	Comments
Remote Speaker Microphone (RSM)			
PMMN4024A	RSM - Small core	Yes	
Headsets w/ Microphone			
RMN5058A	Headset - Lightweight core w/PTT & VOX	Yes	

**Note:** Exhibit 7B illustrates the DUT with RSM PMMN4024A audio accessory along with individual photos of the two audio accessories.

**8.0 Description of Test System**



**8.1 Descriptions of Robotics/Probes/Readout Electronics**

The laboratory utilizes a Dosimetric Assessment System (DASY4™) SAR measurement system Version 4.7 build 80 manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot, DAE4, and ES3DV2 E-field probe. The DASY4™ system is operated per the instructions in the DASY4™ Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess EME SAR compliance was calibrated according to ISO/IEC 17025 A2LA guidelines. Section 9.0 presents additional test equipment information. Appendices B and C present the applicable calibration certificates. The E-field probe first scans a coarse grid over a large area inside the phantom in order to locate the interpolated maximum SAR 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.

**8.2 Description of Phantom(s)**

**8.2.1 Dual Flat Phantom**

Not Applicable

**8.2.2 SAM Phantom**

Not Applicable

**8.2.3 Elliptical Flat Phantom**

**TABLE 6**

Phantom ID (s)	Material Parameters	Phantom Dimensions LxWxD (mm)	Material Thickness (mm)	Support Structure Material	Loss Tangent (wood)
OVAL1011	300MHz -6GHz; Er = 4+/- 1, Loss Tangent = ≤0.05	600x400x190	2mm +/- 0.2mm	Wood	< 0.05
OVAL1016					
OVAL1018					
OVAL1019					
OVAL1020					

**8.3 Description 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) and IEEE Std 1528 - 2003 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques". The simulated tissue used is also compliant to that specified in IEC62209-1 (2005) and adopted by CENELEC as EN62209-1 (2006).

The sugar based simulate tissue is produced by placing the correct measured amount of De-ionized water into a large container. Each of the dried ingredients are weighed and added to the water carefully to avoid clumping. If the solution has a high sugar concentration the water is pre-heated to aid in dissolving the ingredients. For Diacetin and similar type simulates, sugar and HEC ingredients are not needed. The solution is mixed thoroughly, covered, and allowed to sit overnight prior to use.

### Simulated Tissue Composition (by mass)

**TABLE 7**

% of listed ingredients	450MHz		300MHz	
	Head	Body	Head	Body
Sugar	56.0	46.5	56.0	47.1
Diacetin	0	0	0	0
De ionized -Water	39.1	50.53	37.5	49.48
Salt	3.8	1.87	5.4	2.32
HEC	1.0	1.0	1.0	1.0
Bact.	0.1	0.1	0.1	0.1

Reference section 10.1 for target parameters

### 9.0 Additional Test Equipment

The table below lists additional test equipment used during the SAR assessment.

**TABLE 8**

Equipment Type	Model Number	Serial Number	Calibration Due Date
Power Meter (Agilent)	E4419B	MY45103725	8/24/2010
Power Meter (Agilent)	E4418B	GB40206553	4/16/2010
E-Series Avg. Power Sensor (Agilent)	E9301B	MY41495730	4/15/2010
E-Series Avg. Power Sensor (Agilent)	E9301B	MY41495733	4/15/2010
Power Sensor (HP)	8482B	3318A06773	5/6/2010
Bi-Directional Coupler	3020A	40296	2/7/2010
Signal Generator (Agilent)	E4428C	MY47381119	7/14/2010
AMP (Amplifier Research)	1W1000	16625	CNR
Dickson Temperature Recorder	TM125	1195889	2/14/2010
Omega Digital Thermometer with J Type TC Probe	HH202A	18800	10/27/2009
Omega Digital Thermometer with J Type TC Probe	HH202A	18801	4/1/2010
Omega Digital Thermometer with J Type TC Probe	HH202A	18812	5/22/2010
Agilent PNA-L Network Analyzer	N5230A	MY45001092	5/22/2010
Dielectric Probe Kit (HP)	85070C	US99360076	CNR
Speag Dipole	D450V2	1002	9/26/2010
Speag Dipole	D300V2	1002	1/25/2010

**10.0 SAR Measurement System Verification**

The SAR measurements were conducted with probe model/serial number ES3DV2/SN3007. The system performance check was conducted daily and within 24 hours prior to testing. DASY output files of the probe/dipole calibration certificates and system performance test results are included in appendices B, C, D respectively.

Dipole validation scans using head tissue equivalent medium are provided in APPENDIX D. The EMS EME lab validated the dipole to the applicable IEEE 1528-2003 system performance targets. Within the same day system validation was performed using FCC body tissue parameters to generate the system performance target values for body at the applicable frequency. The results of the EMS EME system performance validation are provided herein.

**10.1 Equivalent Tissue Test Results**

Simulated tissue prepared for SAR measurements is measured daily and within 24 hours prior to actual SAR 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 applicable equipment indicated in section 9.0. The table below summarizes the measured tissue parameters used for the SAR assessment.

**TABLE 9**

Frequency (MHz)	Tissue Type	Conductivity Target & Range (S/m)	Dielectric Constant Target & Range	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
422	FCC Body	0.94 (0.89-0.98)	57.0 (54.1-59.8)	0.95	56	10/8/2009
				0.96	56.3	10/7/2009
				0.92	56.4	9/29/2009
				0.89	54.6	9/19/2009
				0.90	54.6	9/18/2009
				0.91	54.9	9/17/2009
				0.90	55.2	9/16/2009
422	IEEE/ IEC Head	0.87 (0.83-0.91)	43.8 (41.6-46.0)	0.83	42.5	9/20/2009
				0.86	43.4	9/19/2009
438	FCC Body	0.94 (0.89-0.98)	56.8 (53.9-59.6)	0.90	54.3	9/19/2009
				0.91	54.3	9/18/2009
				0.92	54.5	9/17/2009
				0.92	54.9	9/16/2009
438	IEEE/ IEC Head	0.87 (0.83-0.91)	43.6 (41.4-45.8)	0.84	42.1	9/20/2009
				0.88	43.0	9/19/2009
450	FCC Body	0.94 (0.89-0.99)	56.7 (53.9-59.5)	0.97	55.6	10/8/2009
				0.98	55.9	10/7/2009
				0.91	54.1	9/19/2009
				0.93	54.0	9/18/2009
				0.93	54.3	9/17/2009
				0.93	54.6	9/16/2009
450	IEEE/IEC Head	0.87 (0.83-0.91)	43.5 (41.3-45.7)	0.88	42.9	9/26/2009
				0.85	41.8	9/20/2009

**TABLE 9 (Continued)**

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
454	FCC Body	0.94 (0.89-0.99)	56.7 (53.9-59.5)	0.92	54.0	9/19/2009
				0.93	54.0	9/18/2009
				0.94	54.2	9/17/2009
				0.93	54.5	9/16/2009
454	IEEE/IEC Head	0.87 (0.83-0.91)	43.5 (41.3-45.7)	0.86	41.7	9/20/2009
				0.89	42.6	9/19/2009
156	FCC Body	0.80 (0.76-0.84)	61.8 (58.7-64.9)	0.80	59.6	10/14/2009
				0.80	63.3	9/30/2009
				0.79	61.2	9/24/2009
				0.80	61.4	9/22/2009
				0.81	61.5	9/21/2009
156	IEEE/IEC Head	0.76 (0.72-0.80)	52.0 (49.4-54.6)	0.75	50.7	9/25/2009
				0.76	50.9	9/21/2009
				0.77	51.1	9/20/2009
168	FCC Body	0.81 (0.77-0.85)	61.5 (58.4-64.6)	0.82	59.4	10/12/2009
				0.84	58.7	10/7/2009
				0.81	62.7	9/30/2009
				0.80	60.8	9/24/2009
				0.80	60.9	9/22/2009
168	IEEE/IEC Head	0.77 (0.73-0.81)	51.5 (48.9-54.1)	0.76	50.0	9/25/2009
				0.77	50.2	9/21/2009
				0.78	50.3	9/20/2009
300	IEEE/IEC Head	0.87 (0.83-0.91)	45.3 (43.0-47.6)	0.85	44.0	10/14/2009
				0.86	44.2	10/12/2009
				0.86	44.8	9/30/2009
				0.87	44.1	9/25/2009
				0.89	44.2	9/24/2009
				0.89	44.2	9/22/2009
				0.88	44.1	9/21/2009
				0.89	44.5	9/20/2009

**10.2 System Check Test Results**

System performance checks were conducted each day during the SAR assessment. The results are normalized to 1W. APPENDIX D explains how the targets were set and includes DASY plots for each day during the SAR assessment. The table below summarizes the daily system check results used for the SAR assessment.

**TABLE 10**

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	Reference SAR @ 1W (W/kg)	System Check Test Results when normalized to 1W (W/kg)	Tested Date
3007	FCC Body	3/12/2009	SPEAG D450V2 /1002	4.52 +/- 10%	4.44	10/8/2009
					4.48	10/7/2009
					4.32	9/19/2009
					4.36	9/18/2009
					4.36	9/17/2009
					4.32	9/16/2009
3007	IEEE/ IEC Head	3/12/2009	SPEAG D450V2 /1002	4.68 +/- 10%	4.72	9/26/2009
					4.60	9/20/2009
3007	IEEE/ IEC Head	3/12/2009	SPEAG D300V2 /1002	2.58 +/- 10%	2.68	10/14/2009
					2.71	10/12/2009
					2.48	9/30/2009
					2.76	9/25/2009
					2.82	9/24/2009
					2.80	9/22/2009
					2.78	9/21/2009
					2.81	9/20/2009

Note: See APPENDIX D for an explanation of the reference SAR targets stated above.

**11.0 Environmental 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 within the phantom used for measurements was at least 15cm. 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 SAR tests reported herein:

**TABLE 11**

	Target	Measured
Ambient Temperature	18 - 25 °C	Range: 18.6-24.9°C Avg. 21.6°C
Relative Humidity	30 - 70 %	Range: 48.2-63.4% Avg. 54.5%
Tissue Temperature	NA	Range: 19.3-22.3°C Avg. 20.4°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 SAR scans are repeated.

## 12.0 DUT Test Methodology

### 12.1 Measurements

SAR measurements were performed using the DASY system described in section 8.0 using coarse and 5x5x7 zoom scan. Elliptical flat phantoms filled with applicable simulated tissue were used for body and face testing.

### 12.2 DUT Configuration(s)

The DUT is a portable device operational at the body and face as described in section 6.0 while using the applicable accessories listed in section 7.0. All accessories listed in section 7.0 of this report were evaluated and only those identified for testing were used to test all possible accessory combinations.

### 12.3 Device Positioning Procedures

The positioning of the device for each body location is described below and illustrated in APPENDIX G.

#### 12.3.1 Body

The DUT was positioned in normal use configuration against the phantom with the offered body worn accessory.

The DUT was positioned with its' front side separated 2.5cm and the back side with DUT or antenna separated 2.5cm from the phantom. Testing at 2.5cm is done to satisfy the conditions noted in the safety section of the manual.

#### 12.3.2 Head

Not applicable.

#### 12.3.3 Face

The DUT was positioned with its' front and back side separated 2.5cm from the phantom. Note that this product has two microphones, one on the front and one on the back of the DUT and therefore both sides were assessed.

### 12.4 DUT Test Mode(s)

All modes of operation identified in section 6.0 were considered during the development of the test plan. The mode which presented the highest duty cycle was chosen for SAR assessment.

### 12.5 DUT Test Channels

The number of test channels was determined by the following equation.

$$N_c = 2 * \text{roundup}[10 * (f_{\text{high}} - f_{\text{low}}) / f_c] + 1$$

Where

$N_c$  = Number of channels

$F_{\text{high}}$  = Upper channel

$F_{\text{low}}$  = Lower channel

$F_c$  = Center channel

13.0 DUT Test Data

13.1 UHF Test Data

Assessments at the Body (CW mode)

Assessment of the offered antenna PMAE4065A: All possible accessory combinations, battery (NNTN7038A), belt clips (NTN8266B & HLN6875A) and audios (PMMN4024A & RMN5058A) were tested with antenna PMAE4065A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 1.0 - UHF Assessment of the offered antenna PMAE4065A.

TABLE 12

406.1-470MHz Band Assessments at Body with body worn accessories												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)
<b>Assessment with belt clip NTN8266B and audio PMMN4024A</b>												
HvH-Ab-090916-02 / Q0FKL039	PMAE4065A	406.125	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	5.72	-0.237	11.61	8.00	6.13	4.23
HvH-Ab-090916-03 / Q0FKL039	PMAE4065A	422.125	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	5.72	-0.108	10.10	6.90	5.18	3.54
MeC-Ab-090916-04 / Q0FKL039	PMAE4065A	438.125	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	5.74	-0.116	9.33	6.36	4.79	3.27
MeC-Ab-090916-05 / Q0FKL039	PMAE4065A	454.013	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	5.79	-0.165	7.84	5.39	4.07	2.80
MeC-Ab-090916-06 / Q0FKL039	PMAE4065A	469.988	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	5.82	-0.250	8.24	5.49	4.36	2.91
<b>Assessment with belt clip HLN6875A and audio PMMN4024A</b>												
MeC-Ab-090916-07 / Q0FKL039	PMAE4065A	406.125	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	5.73	-0.197	6.70	3.06	3.51	1.60
MeC-Ab-090916-08 / Q0FKL039	PMAE4065A	422.125	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	5.72	-0.041	5.05	2.65	2.55	1.34
MeC-Ab-090916-09 / Q0FKL039	PMAE4065A	438.125	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	5.76	-0.159	5.25	3.90	2.72	2.02
MeC-Ab-090916-10 / Q0FKL039	PMAE4065A	454.013	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	5.77	-0.175	4.48	3.33	2.33	1.73
MeC-Ab-090916-11 / Q0FKL039	PMAE4065A	469.988	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	5.80	-0.270	4.54	3.36	2.42	1.79
<b>Assessment with belt clip NTN8266B and audio RMN5058A</b>												
HvH-Ab-090917-02 / Q0FKL039	PMAE4065A	406.125	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.80	-0.158	11.15	7.73	5.78	4.01
HvH-Ab-090917-03 / Q0FKL039	PMAE4065A	422.125	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.80	-0.162	10.13	6.95	5.26	3.61
HvH-Ab-090917-04 / Q0FKL039	PMAE4065A	438.125	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.82	-0.137	9.42	6.35	4.86	3.28
HvH-Ab-090917-05 / Q0FKL039	PMAE4065A	454.013	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.87	-0.123	8.77	5.94	4.51	3.06
HvH-Ab-090917-06 / Q0FKL039	PMAE4065A	469.988	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.87	-0.233	8.17	5.47	4.31	2.89
<b>Assessment with belt clip HLN6875A and audio RMN5058A</b>												
HvH-Ab-090926-13 / Q0FKL039	PMAE4065A	406.125	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	5.85	-0.332	8.30	3.15	4.48	1.70
HvH-Ab-090917-09 / Q0FKL039	PMAE4065A	422.125	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	5.80	-0.022	5.34	3.96	2.68	1.99
HvH-Ab-090917-10 / Q0FKL039	PMAE4065A	438.125	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	5.81	-0.101	5.26	3.89	2.69	1.99
HvH-Ab-090917-11 / Q0FKL039	PMAE4065A	454.013	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	5.87	-0.161	5.09	3.78	2.64	1.96
MeC-Ab-090917-12 / Q0FKL039	PMAE4065A	469.988	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	5.82	-0.295	4.83	3.57	2.58	1.91

**Assessments at the Body (CW mode)**

**Assessment of the offered antenna PMAT4001A:** All possible accessory combinations, battery (NNTN7038A), belt clips (NTN8266B & HLN6875A) and audios (PMMN4024A & RMN5058A) were tested with antenna PMAT4001A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 2.0 - UHF Assessment of the offered antenna PMAT4001A.

**TABLE 13**

406.1-470MHz Band Assessments at Body with body worn accessories												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)
<b>Assessment with belt clip NTN8266B and audio PMMN4024A</b>												
MeC-Ab-090917-13 / Q0FKL039	PMAT4001A	406.125	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	5.75	-0.111	13.07	9.02	6.70	4.63
<b>MeC-Ab-090917-14 / Q0FKL039</b>	PMAT4001A	422.125	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	5.74	-0.127	13.98	9.56	7.20	4.92
MeC-Ab-090917-15 / Q0FKL039	PMAT4001A	438.125	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	5.74	-0.228	10.80	7.40	5.69	3.90
MeC-Ab-090917-16 / Q0FKL039	PMAT4001A	454.013	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	5.81	-0.121	7.78	5.28	4.00	2.71
MeC-Ab-090917-17 / Q0FKL039	PMAT4001A	469.988	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	5.80	-0.132	5.75	3.84	2.96	1.98
<b>Assessment with belt clip HLN6875A and audio PMMN4024A</b>												
<b>MeC-Ab-090917-18 / Q0FKL039</b>	PMAT4001A	406.125	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	5.78	-0.231	8.00	3.30	4.22	1.74
MeC-Ab-090917-19 / Q0FKL039	PMAT4001A	422.125	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	5.76	-0.052	7.56	3.39	3.83	1.72
MeC-Ab-090918-02 / Q0FKL039	PMAT4001A	438.125	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	5.79	-0.050	4.94	2.46	2.50	1.24
MeC-Ab-090918-03 / Q0FKL039	PMAT4001A	454.013	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	5.77	-0.149	4.18	3.10	2.16	1.60
MeC-Ab-090918-04 / Q0FKL039	PMAT4001A	469.988	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	5.83	-0.152	3.40	2.52	1.76	1.30
<b>Assessment with belt clip NTN8266B and audio RMN5058A</b>												
MeC-Ab-090918-05 / Q0FKL039	PMAT4001A	406.125	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.75	-0.056	12.53	8.66	6.35	4.39
<b>MeC-Ab-090918-06 / Q0FKL039</b>	PMAT4001A	422.125	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.79	-0.150	14.05	9.61	7.27	4.97
MeC-Ab-090918-07 / Q0FKL039	PMAT4001A	438.125	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.76	-0.224	10.96	7.44	5.77	3.92
HvH-Ab-090919-02 / Q0FKL039	PMAT4001A	454.013	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.87	-0.205	7.79	5.22	4.08	2.74
HvH-Ab-090919-03 / Q0FKL039	PMAT4001A	469.988	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.87	-0.193	5.46	3.63	2.85	1.90
<b>Assessment with belt clip HLN6875A and audio RMN5058A</b>												
<b>HvH-Ab-090919-04 / Q0FKL039</b>	PMAT4001A	406.125	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	5.80	-0.105	7.70	3.13	3.94	1.60
HvH-Ab-090919-05 / Q0FKL039	PMAT4001A	422.125	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	5.80	-0.050	7.16	3.19	3.62	1.61
HvH-Ab-090919-06 / Q0FKL039	PMAT4001A	438.125	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	5.82	-0.133	5.41	2.58	2.79	1.33
HvH-Ab-090919-07 / Q0FKL039	PMAT4001A	454.013	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	5.87	-0.112	4.60	3.41	2.36	1.75
HvH-Ab-090919-08 / Q0FKL039	PMAT4001A	469.988	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	5.87	-0.234	3.54	2.61	1.87	1.38

**Assessments at the Body (CW mode)**

**Assessment without body worn accessories at 2.5cm:** Each offered antenna was tested with a separation distance of 2.5cm (front & back) from the phantom using the highest SAR configurations from table 12 (antenna PMAE4065A and audio PMMN4024A) and table 13 (antenna PMAT4001A and audio RMN5058A). The highest SAR result (bolded) from the table below is provided in APPENDIX F Section 3.0 - UHF Assessment without body worn accessories at 2.5cm.

Note: The 2.5cm assessments included the following configurations:

- Back of the device facing the phantom, positioned at 2.5cm from the phantom surface. Results for this test configuration may or may not be included depending on the location of the hot spot. If the peak SAR is located on the antenna then SAR result for this configuration would be lower due to increased separation distance.
- Back of the device facing the phantom, the antenna at 2.5cm from the phantom surface. Results for this test configuration may or may not be included depending on the location of the hot spot. This test position would not be applicable for cases where the peak is located on the DUT body and not the antenna.
- Front of the device facing the phantom, at 2.5cm from the phantom surface.

**TABLE 14**

406.1-470MHz Band Assessments at Body												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)
Assessment at 2.5cm												
MeC-Ab-091007-07 / Q0FKL039	PMAE4065A	406.125	NNTN7038A short	Against phantom	None, back of DUT @ 2.5cm	PMMN4024A RSM	5.78	-0.097	5.79	4.39	2.96	2.24
MeC-Ab-091007-08 / Q0FKL039	PMAE4065A	406.125	NNTN7038A short	Against phantom	None, front of DUT @ 2.5cm	PMMN4024A RSM	5.81	-0.169	4.68	3.59	2.43	1.87
<b>JsT-Ab-091008-05 / Q0FKL039</b>	PMAT4001A	422.125	NNTN7038A short	Against phantom	None, back of DUT @ 2.5cm	RMN5058A (headset)	5.90	-0.315	6.86	5.19	3.69	2.79
JsT-Ab-091008-06 / Q0FKL039	PMAT4001A	422.125	NNTN7038A short	Against phantom	None, front of DUT @ 2.5cm	RMN5058A (headset)	5.93	-0.102	6.29	4.79	3.22	2.45

**Assessments at the Face (CW mode)**

**Assessment of the offered antennas:** All five frequencies for each antenna were tested with the front and back of the radio positioned at 2.5cm from the phantom. Note that this product has two microphones, one on the front and one on the back of the DUT and therefore both sides were assessed. The highest SAR results (bolded) from the table below are provided in APPENDIX F Section 4.0 - UHF Assessment at the face.

**TABLE 15**

406.1-470MHz Band Assessments at Face												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)
<b>Assessment with antenna PMAE4065A with DUT front @ 2.5cm</b>												
<b>MeC-Face-090919-10 / Q0FKL039</b>	PMAE4065A	406.125	NNTN7038A short	Front 2.5cm	none	none	5.77	-0.208	6.59	4.95	3.46	2.60
MeC-Face-090919-11 / Q0FKL039	PMAE4065A	422.125	NNTN7038A short	Front 2.5cm	none	none	5.80	-0.113	5.33	4.01	2.74	2.06
MeC-Face-090919-12 / Q0FKL039	PMAE4065A	438.125	NNTN7038A short	Front 2.5cm	none	none	5.78	-0.149	4.68	3.53	2.42	1.83
MeC-Face-090919-13 / Q0FKL039	PMAE4065A	454.013	NNTN7038A short	Front 2.5cm	none	none	5.75	-0.168	4.11	3.11	2.14	1.62
MeC-Face-090919-14 / Q0FKL039	PMAE4065A	469.988	NNTN7038A short	Front 2.5cm	none	none	5.77	-0.348	3.79	2.87	2.05	1.55
<b>Assessment with antenna PMAE4065A with DUT back @ 2.5cm</b>												
<b>MeC-Face-090919-15 / Q0FKL039</b>	PMAE4065A	406.125	NNTN7038A short	Back 2.5cm	none	none	5.80	-0.192	6.33	4.79	3.31	2.50
MeC-Face-090919-16 / Q0FKL039	PMAE4065A	422.125	NNTN7038A short	Back 2.5cm	none	none	5.76	-0.042	5.45	4.12	2.75	2.08
MeC-Face-090919-17 / Q0FKL039	PMAE4065A	438.125	NNTN7038A short	Back 2.5cm	none	none	5.77	-0.132	4.78	3.61	2.46	1.86
MeC-Face-090919-18 / Q0FKL039	PMAE4065A	454.013	NNTN7038A short	Back 2.5cm	none	none	5.78	-0.181	4.26	3.21	2.22	1.67
MeC-Face-090919-19 / Q0FKL039	PMAE4065A	469.988	NNTN7038A short	Back 2.5cm	none	none	5.82	-0.313	4.00	3.01	2.15	1.62
<b>Assessment with antenna PMAT4001A with DUT front @ 2.5cm</b>												
HvH-Face-090920-02 / Q0FKL039	PMAT4001A	406.125	NNTN7038A short	Front 2.5cm	none	none	5.83	-0.041	5.71	4.33	2.88	2.19
<b>HvH-Face-090920-03 / Q0FKL039</b>	PMAT4001A	422.125	NNTN7038A short	Front 2.5cm	none	none	5.84	-0.048	6.52	4.93	3.30	2.49
HvH-Face-090920-04 / Q0FKL039	PMAT4001A	438.125	NNTN7038A short	Front 2.5cm	none	none	5.85	-0.109	4.62	3.50	2.37	1.79
HvH-Face-090920-05 / Q0FKL039	PMAT4001A	454.013	NNTN7038A short	Front 2.5cm	none	none	5.90	-0.033	3.23	2.46	1.63	1.24
HvH-Face-090920-06 / Q0FKL039	PMAT4001A	469.988	NNTN7038A short	Front 2.5cm	none	none	5.90	-0.094	2.31	1.75	1.18	0.89
<b>Assessment with antenna PMAT4001A with DUT back @ 2.5cm</b>												
HvH-Face-090920-07 / Q0FKL039	PMAT4001A	406.125	NNTN7038A short	Back 2.5cm	none	none	5.84	0.173	6.31	4.74	3.16	2.37
<b>HvH-Face-090920-08 / Q0FKL039</b>	PMAT4001A	422.125	NNTN7038A short	Back 2.5cm	none	none	5.85	-0.088	8.25	6.19	4.21	3.16
HvH-Face-090920-09 / Q0FKL039	PMAT4001A	438.125	NNTN7038A short	Back 2.5cm	none	none	5.87	-0.137	5.99	4.49	3.09	2.32
HvH-Face-090920-10 / Q0FKL039	PMAT4001A	454.013	NNTN7038A short	Back 2.5cm	none	none	5.92	-0.103	4.04	3.03	2.07	1.55
HvH-Face-090920-11 / Q0FKL039	PMAT4001A	469.988	NNTN7038A short	Back 2.5cm	none	none	5.92	-0.113	2.79	2.10	1.43	1.08

13.2 VHF Test Data

Assessments at the Body (CW mode)

**Assessment of the offered antenna PMAT4001A:** All possible accessory combinations, battery (NNTN7038A), belt clips (NTN8266B & HLN6875A) and audios (PMMN4024A & RMN5058A) were tested with antenna PMAT4001A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 5.0 - VHF Assessment of the offered antenna PMAT4001A.

TABLE 16

150.8-173.4MHz Band Assessments at Body with body worn accessories												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)
<b>Assessment with belt clip NTN8266B and audio PMMN4024A</b>												
HvH-Ab-090924-05 / Q0FKL039	PMAT4001A	150.988	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	6.84	-0.062	3.24	1.89	1.64	0.96
MeC-Ab-090921-07 / Q0FKL039	PMAT4001A	156.013	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	6.85	-0.068	3.49	2.14	1.77	1.09
<b>MeC-Ab-090921-08 / Q0FKL039</b>	PMAT4001A	162.013	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	6.81	-0.766	3.90	2.40	2.33	1.43
MeC-Ab-090930-05 / Q0FKL039	PMAT4001A	168.013	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	6.83	-0.381	1.96	1.27	1.07	0.69
MeC-Ab-090924-06 / Q0FKL039	PMAT4001A	173.013	NNTN7038A short	Against phantom	NTN8266B belt clip	PMMN4024A RSM	6.82	-0.250	0.69	0.53	0.37	0.28
<b>Assessment with belt clip HLN6875A and audio PMMN4024A</b>												
MeC-ab-090924-07 / Q0FKL039	PMAT4001A	150.988	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	6.80	-0.127	3.70	1.41	1.90	0.73
MeC-Ab-090930-06 / Q0FKL039	PMAT4001A	156.013	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	6.80	-0.108	3.65	1.46	1.87	0.75
<b>MeC-Ab-090922-02 / Q0FKL039</b>	PMAT4001A	162.013	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	6.79	0.019	6.32	2.27	3.16	1.14
HvH-Ab-090924-04 / Q0FKL039	PMAT4001A	168.013	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	6.85	-0.474	5.63	2.03	3.14	1.13
MeC-Ab-090924-08 / Q0FKL039	PMAT4001A	173.013	NNTN7038A short	Against phantom	HLN6875A belt clip	PMMN4024A RSM	6.83	-0.335	1.39	0.56	0.75	0.30
<b>Assessment with belt clip NTN8266B and audio RMN5058A</b>												
MeC-Ab-090924-09 / Q0FKL039	PMAT4001A	150.988	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	6.77	-0.031	3.88	2.21	1.95	1.11
MeC-Ab-090922-06 / Q0FKL039	PMAT4001A	156.013	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	6.77	0.013	4.50	2.57	2.25	1.29
<b>MeC-Ab-090922-07 / Q0FKL039</b>	PMAT4001A	162.013	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	6.77	-0.456	5.87	3.44	3.26	1.91
MeC-Ab-090922-08 / Q0FKL039	PMAT4001A	168.013	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	6.80	-0.451	3.22	1.91	1.79	1.06
MeC-Ab-090924-10 / Q0FKL039	PMAT4001A	173.013	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	6.80	-0.177	0.94	0.57	0.49	0.30
<b>Assessment with belt clip HLN6875A and audio RMN5058A</b>												
ErC-Ab-091014-02 / Q0FKL039	PMAT4001A	150.988	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	6.79	-0.236	5.36	1.82	2.83	0.96
ErC-Ab-091014-03 / Q0FKL039	PMAT4001A	156.013	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	6.85	-0.379	5.19	1.89	2.83	1.03
<b>ErC-Ab-091014-04 / Q0FKL039</b>	PMAT4001A	162.013	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	6.90	-0.160	10.11	3.28	5.24	1.70
HvH-Ab-091012-03 / Q0FKL039	PMAT4001A	168.013	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	6.83	-0.461	9.34	3.30	5.19	1.83
MeC-Ab-090924-12 / Q0FKL039	PMAT4001A	173.013	NNTN7038A short	Against phantom	HLN6875A belt clip	RMN5058A (headset)	6.82	-0.375	2.44	0.94	1.33	0.51

**Assessments at the Body (CW mode)**

**Assessment without body worn accessories at 2.5cm:** Antenna PMAT4001A was tested with a separation distance of 2.5cm (front & back) from the phantom using the highest SAR configuration from table 16 (antenna PMAT4001A and audio RMN5058A). The highest SAR result (bolded) from the table below is provided in APPENDIX F Section 6.0 - VHF Assessment without body worn accessories at 2.5cm.

Note: The 2.5cm assessments included the following configurations:

- Back of the device facing the phantom, positioned at 2.5cm from the phantom surface. Results for this test configuration may or may not be included depending on the location of the hot spot. If the peak SAR is located on the antenna then SAR result for this configuration would be lower due to increased separation distance.
- Back of the device facing the phantom, the antenna at 2.5cm from the phantom surface. Results for this test configuration may or may not be included depending on the location of the hot spot. This test position would not be applicable for cases where the peak is located on the DUT body and not the antenna.
- Front of the device facing the phantom, at 2.5cm from the phantom surface.

**TABLE 17**

150.8-173.4MHz Band Assessments at Body												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)
<b>Assessment at 2.5cm</b>												
<b>MeC-Ab-091014-07 / Q0FKL039</b>	PMAT4001A	162.013	NNTN7038A short	Against phantom	None, back of DUT w/ antenna @ 2.5cm	RMN5058A (headset)	6.85	-0.740	4.53	3.44	2.69	2.04
MeC-Ab-091014-08 / Q0FKL039	PMAT4001A	162.013	NNTN7038A short	Against phantom	None, front of DUT @ 2.5cm	RMN5058A (headset)	6.82	0.037	1.55	1.22	0.78	0.61

**Assessments at the Face (CW mode)**

**Assessment of the offered antennas:** All five frequencies for antenna PMAT4001A were tested with the front and back of the radio positioned at 2.5cm from the phantom. Note that this product has two microphones, one on the front and one on the back of the DUT and therefore both sides were assessed. The highest SAR results (bolded) from the table below are provided in APPENDIX F Section 7.0 - VHF Assessment at the face.

**TABLE 18**

406.1-470MHz Band Assessments at Face												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)
<b>Assessment with antenna PMAT4001A with DUT front @ 2.5cm</b>												
MeC-Face-090925-04 / Q0FKL039	PMAT4001A	150.988	NNTN7038A short	Front 2.5cm	none	none	6.85	-0.484	0.92	0.72	0.52	0.40
MeC-Face-090920-15 / Q0FKL039	PMAT4001A	156.013	NNTN7038A short	Front 2.5cm	none	none	6.84	-0.229	1.16	0.90	0.61	0.47
MeC-Face-090920-16 / Q0FKL039	PMAT4001A	162.013	NNTN7038A short	Front 2.5cm	none	none	6.84	-0.077	1.71	1.33	0.87	0.68
<b>MeC-Face-090920-17 / Q0FKL039</b>	PMAT4001A	168.013	NNTN7038A short	Front 2.5cm	none	none	6.85	-0.398	3.18	2.46	1.74	1.35
MeC-Face-090925-05 / Q0FKL039	PMAT4001A	173.013	NNTN7038A short	Front 2.5cm	none	none	6.82	-0.411	1.14	0.88	0.63	0.48
<b>Assessment with antenna PMAT4001A with DUT back @ 2.5cm</b>												
MeC-Face-090925-09 / Q0FKL039	PMAT4001A	150.988	NNTN7038A short	Back 2.5cm	none	none	6.84	-0.370	1.08	0.85	0.59	0.46
MeC-Face-090920-20 / Q0FKL039	PMAT4001A	156.013	NNTN7038A short	Back 2.5cm	none	none	6.85	-0.108	1.31	1.02	0.67	0.52
HvH-Face-090921-03 / Q0FKL039	PMAT4001A	162.013	NNTN7038A short	Back 2.5cm	none	none	6.84	0.005	2.06	1.60	1.03	0.80
<b>HvH-Face-090921-04 / Q0FKL039</b>	PMAT4001A	168.013	NNTN7038A short	Back 2.5cm	none	none	6.84	-0.395	3.25	2.51	1.78	1.37
MeC-Face-090925-10 / Q0FKL039	PMAT4001A	173.013	NNTN7038A short	Back 2.5cm	none	none	6.82	-0.381	1.13	0.88	0.62	0.48

### 13.3 Shorten Scan Assessment

**Short scan assessment of the overall SAR highest configuration (UHF TABLE 13 pg16) A** “shortened” scan was performed, using the test configuration and unit that produced the highest SAR results overall (in bold with \*) below, to validate the SAR drift of the full DASY4™ coarse and 5x5x7 zoom scans. Note that the shortened scan represents the zoom scan performance result; this is obtained by first running a coarse scan to find the peak area and then, using a newly charged battery, a 5x5x7 zoom scan only was performed. The results of the shortened cube scan presented in APPENDIX E demonstrate that the scaling methodology used to determine the calculated SAR results presented herein are valid. The both SAR results from the table below are provided in APPENDIX E.

**TABLE 19**

Shorten Scan												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)
<b>*MeC-Ab-090918-06 / Q0FKL039</b>	PMAT4001A	422.125	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.79	-0.150	14.05	9.61	7.27	4.97
Shorten scan HvH-Ab-090926-15 / Q0FKL039	PMAT4001A	422.125	NNTN7038A short	Against phantom	NTN8266B belt clip	RMN5058A (headset)	5.88	-0.032	14.32	9.80	7.21	4.94

### 14.0 Conclusion

The highest Operational Maximum Calculated 1-gram and 10-gram average SAR values found for FCC ID: AZ489FT4886 model H97TGD9PW1AN (WITH QA00570AA AND QA00575AA).

**Max. Calc.: 1-g Avg. SAR: 7.27 W/kg (Body); 10-g Avg. SAR: 4.97 W/kg (Body)**  
**Max. Calc.: 1-g Avg. SAR: 4.21 W/kg (Face); 10-g Avg. SAR: 3.16 W/kg (Face)**

The test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of **8 W/kg** per the requirements of 47 CFR 2.1093(d).

## **APPENDIX A**

### **Measurement Uncertainty**

The Measurement Uncertainty tables indicated in this APPENDIX are applicable to the DUT ranging from 100MHz to 800MHz and for Dipole test frequency ranging from 300MHz to 800MHz. Therefore, the highest tolerance for the probe calibration uncertainty is indicated.

**Table 1A: Uncertainty Budget for Device Under Test, for 100MHz to 800MHz**

<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	IEEE 1528 section	Tol. (± %)	Prob Dist	Div.	<i>c<sub>i</sub></i> (1 g)	<i>c<sub>i</sub></i> (10 g)	1 g <i>u<sub>i</sub></i> (±%)	10 g <i>u<sub>i</sub></i> (±%)	<i>v<sub>i</sub></i>
<b>Measurement System</b>									
Probe Calibration	E.2.1	10.0	N	1.00	1	1	10.0	10.0	∞
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	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	1.1	R	1.73	1	1	0.6	0.6	∞
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	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	∞
<b>Test sample Related</b>									
Test Sample Positioning	E.4.2	3.2	N	1.00	1	1	3.2	3.2	29
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0	8
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
<b>Phantom and Tissue Parameters</b>									
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	3.3	N	1.00	0.64	0.43	2.1	1.4	∞
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	1.9	N	1.00	0.6	0.49	1.1	0.9	∞
<b>Combined Standard Uncertainty</b>			RSS				14	13	965
<b>Expanded Uncertainty (95% CONFIDENCE LEVEL)</b>			<i>k</i> =2				27	27	

**Table 2A: Uncertainty Budget for System Validation (dipole & flat phantom) for 300MHz to 800MHz**

<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	IEEE 1528 section	Tol. (± %)	Prob. Dist.	Div.	<i>c<sub>i</sub></i> (1 g)	<i>c<sub>i</sub></i> (10 g)	1 g <i>u<sub>i</sub></i> (±%)	10 g <i>u<sub>i</sub></i> (±%)	<i>v<sub>i</sub></i>
<b>Measurement System</b>									
Probe Calibration	E.2.1	9.0	N	1.00	1	1	9.0	9.0	∞
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	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
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	∞
<b>Dipole</b>									
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	∞
<b>Phantom and Tissue Parameters</b>									
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	3.3	R	1.73	0.64	0.43	1.2	0.8	∞
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	1.9	R	1.73	0.6	0.49	0.6	0.5	∞
<b>Combined Standard Uncertainty</b>			RSS				11	11	99999
<b>Expanded Uncertainty (95% CONFIDENCE LEVEL)</b>			<i>k</i> =2				22	22	

Notes for Tables 1, 2, 3 and 4

- 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<sub>i</sub>* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
- g) *u<sub>i</sub>* – SAR uncertainty
- h) *v<sub>i</sub>* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty