



**MOTOROLA**



TESTING CERT # 2518.01

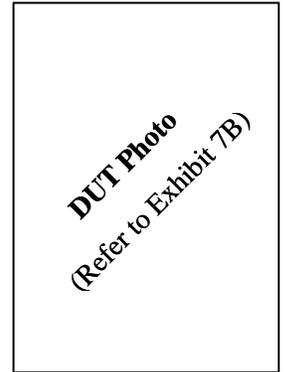
FCC ID: AZ489FT4893

**DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 2**

**Enterprise Mobility Solutions**  
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**Date of Report:** 3/12/10  
**Report Revision:** 0  
**Report ID:** SAR rpt\_H97TGD9PW1AN (With  
 QA00570AA and QA00576AA)\_Rev  
 O\_100312\_SR8103

**Responsible Engineer:** Kim Uong (Principal Staff Eng.)  
**Report Author:** Kim Uong (Principal Staff Eng.)  
**Date/s Tested:** 2/18/10 – 3/9/10  
**Manufacturer/Location:** Penang  
**Sector/Group/Div.:** EMS  
**Date submitted for test:** 2/19/10  
**DUT Description:** 450-520 MHz 1-5W, 136-174 MHz 1-6W, 6.25K/12.5K/25K,  
 Basic Top Display Model W/GPS. Capable of digital and analog  
 FM transmission. Also capable of TDMA transmission  
**Test TX mode(s):** CW  
**Max. Power output:** 5.6W (UHF R2), 6.6W (VHF)  
**Nominal Power:** 5.0W (UHF R2), 6.0W (VHF)  
**Tx Frequency Bands:** 450-520 MHz(UHF R2) & 136-174 MHz(VHF)  
**Signaling type:** FM and TDMA  
**Model(s) Tested:** H97TGD9PW1AN (with QA00570AA and QA00576AA)  
**Model(s) Certified:** H97TGD9PW1AN (with QA00570AA and QA00576AA)  
**Serial Number(s):** Q0PLT00M  
**Classification:** Occupational/Controlled  
**Rule Part(s):** 90 (450-512MHz, 150.8-173.4MHz)



**Max. Calc. : 1-g Avg. SAR: 6.00 W/kg (Body); 10-g Avg. SAR: 3.62 W/kg (Body)**  
**Max. Calc. : 1-g Avg. SAR: 2.78 W/kg (Face); 10-g Avg. SAR: 2.09 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 – Stephen Whalen for Deanna Zakharia  
**Deanna Zakharia**  
**EMS EME Lab Senior Resource Manager,**  
**Laboratory Director**

**Approval Date:** 3/12/2010

**Certification Date:**

**Certification No.:**

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**Report Revision History**

| Date    | Revision | Comments        |
|---------|----------|-----------------|
| 3/12/10 | 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 QA00576AA) and FCC ID: AZ489FT4893. 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: AZ489FT4893 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 12.5kHz channel spacing. 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 450-520 MHz and 136-174 MHz bands. However, this report includes

only the data for part 90 frequency ranging from 450-512MHz (UHF) and 150.8-173.4MHz (VHF). The nominal output power is 5.0 watts at 450-520 MHz and 6.0 watts at 136-174 MHz with maximum output powers of 5.6 watts at 450-520 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: AZ489FT4893 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<br>DUT @ 2.5cm |
|                |   |        | Tested Carry Accessories   | 2.5cm Assessment DUT @ 2.5cm |  |
| PMAE4065A      | UHF/GPS<br>380-520 MHz, 1575 MHz<br>¼ wave, -2dBd               | Yes    | 26-75mm  | 25-48 mm                     | 39-48mm                                |
| PMAT4001A      | VHF/UHF/GPS<br>136-174MHz, 380-520MHz, 1575MHz<br>¼ wave, -8dBd | Yes    | 26-84mm  | 25-56mm                      | 39-52mm                                |

\* 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:**

All batteries were tested. The table below lists the batteries, and battery descriptions.

**TABLE 3**

| Battery Models | Description                  | Tested | Comments       |
|----------------|------------------------------|--------|----------------|
| NNTN7038A      | Hi Cap Impres Li Ion 2900mAh | Yes    | Height = 85mm  |
| NNTN7034A      | Impres Li Ion 4200 mAh       | Yes    | Height = 130mm |

**7.3 Body worn Accessories:**

All body worn accessories were tested. The table below lists the body worn accessories, and body worn accessory descriptions.

**TABLE 4**

| Body worn Models | Description    | Tested | * Separation distances between DUT antenna and phantom surface. (mm) | Comments |
|------------------|----------------|--------|--|----------|
| NTN8266B         | 2.5" Belt Clip | Yes    | 26-36  | NA       |
| HLN6875A         | 3.0" Belt Clip | Yes    | 42-84  | NA       |

\* 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 |
|-------------------|--|--------|----------|
| HMN4104A          | RSM - IMPRES Display Submersible RSM w/jack & Ch. Selector | Yes    | NA       |
| PMLN5101A         | Headset - Impress Temple Transducer                        | Yes    | NA       |

**Note:** Exhibit 7B illustrates the DUT with RSM HMN4104A 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, DAE3, 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<br>OVAL1016<br>OVAL1021<br>OVAL1022 | 300MHz -6GHz;<br>Er = 4+/- 1,<br>Loss Tangent = ≤0.05 | 600x400x190                   | 2mm<br>+/- 0.2mm        | Wood                       | < 0.05              |

### 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**

| <b>Equipment Type</b>                          | <b>Model Number</b> | <b>Serial Number</b> | <b>Calibration Due Date</b> |
|--|---------------------|----------------------|-----------------------------|
| Power Meter (Agilent)                          | E4419B              | MY45103725           | 8/24/2010                   |
| Power Meter (HP)                               | E4418B              | US39251150           | 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               | 3318A07392           | 3/18/2010                   |
| Bi-Directional Coupler (NARDA)                 | 3020A               | 40295                | 6/9/2010                    |
| Signal Generator (Agilent)                     | E4428C              | MY47381119           | 1/14/2012                   |
| AMP (Amplifier Research)                       | 10WD1000            | 28782                | CNR                         |
| Dickson Temperature Recorder                   | TM320               | 7081356              | 8/14/2010                   |
| Dickson Temperature Recorder                   | TM125               | 1195889              | 2/16/2011                   |
| Omega Digital Thermometer with J Type TC Probe | HH202A              | 18800                | 11/10/2010                  |
| 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*                  |
| <b>Tissue Station</b>                          |                     |                      |                             |
| Agilent PNA-L Network Analyzer                 | N5230A              | MY45001092           | 5/22/2010                   |
| Dielectric Probe Kit (HP)                      | 85070C              | US99360076           | CNR                         |
| <b>Dipole</b>                                  |                     |                      |                             |
| Speag Dipole                                   | D450V2              | 1002                 | 9/26/2010                   |
| Speag Dipole                                   | D300V2              | 1001                 | 7/23/2010                   |

\* Note – equipment was removed from service on 2/24/2010.

**10.0 SAR Measurement System Verification:**

The SAR measurements were conducted with probe model/serial number ES3DV2/SN3007 and ES3DV2/SN3006. 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 |
|-----------------|----------------|-----------------------------------|------------------------------------|--------------------------|---------------------------|-------------|
| 450             | FCC Body       | 0.94<br>(0.89-0.99)               | 56.7<br>(53.9-59.5)                | 0.95                     | 54.4                      | 2/18/10     |
|                 |                |                                   |                                    | 0.90                     | 55.3                      | 2/19/10     |
|                 |                |                                   |                                    | 0.92                     | 54.8                      | 2/20/10     |
|                 |                |                                   |                                    | 0.92                     | 54.6                      | 2/21/10     |
|                 |                |                                   |                                    | 0.92                     | 54.7                      | 2/22/10     |
|                 |                |                                   |                                    | 0.91                     | 54.6                      | 2/23/10     |
|                 |                |                                   |                                    | 0.91                     | 54.8                      | 2/24/10     |
| 450             | IEEE/ IEC Head | 0.87<br>(0.83-0.91)               | 43.5<br>(41.3-45.7)                | 0.85                     | 42.7                      | 2/26/10     |
|                 |                |                                   |                                    | 0.83                     | 49.1                      | 2/27/10     |
|                 |                |                                   |                                    | 0.85                     | 42.7                      | 2/28/10     |
|                 |                |                                   |                                    | 0.84                     | 42.6                      | 3/5/10      |
| 467             | FCC Body       | 0.94<br>(0.89-0.99)               | 56.6<br>(53.8-59.4)                | 0.91                     | 54.7                      | 2/18/10     |
|                 |                |                                   |                                    | 0.94                     | 54.4                      | 2/20/10     |
|                 |                |                                   |                                    | 0.93                     | 54.3                      | 2/21/10     |
|                 |                |                                   |                                    | 0.94                     | 54.4                      | 2/22/10     |
|                 |                |                                   |                                    | 0.93                     | 54.3                      | 2/23/10     |
|                 |                |                                   |                                    | 0.92                     | 54.5                      | 2/24/10     |
|                 |                |                                   |                                    | 0.92                     | 54.5                      | 2/25/10     |
| 467             | IEEE/ IEC Head | 0.87<br>(0.83-0.91)               | 43.4<br>(41.2-46.0)                | 0.86                     | 43.0                      | 2/25/10     |
|                 |                |                                   |                                    | 0.87                     | 42.3                      | 2/26/10     |
|                 |                |                                   |                                    | 0.84                     | 41.4                      | 2/27/10     |
|                 |                |                                   |                                    | 0.87                     | 42.3                      | 2/28/10     |
| 503             | FCC Body       | 0.94<br>(0.89-0.99)               | 56.5<br>(53.7-59.3)                | 0.95                     | 54.2                      | 2/18/10     |
|                 |                |                                   |                                    | 0.95                     | 54.4                      | 2/19/10     |
|                 |                |                                   |                                    | 0.97                     | 53.8                      | 2/20/10     |
|                 |                |                                   |                                    | 0.96                     | 53.7                      | 2/21/10     |
|                 |                |                                   |                                    | 0.97                     | 53.9                      | 2/22/10     |
|                 |                |                                   |                                    | 0.96                     | 53.8                      | 2/23/10     |
|                 |                |                                   |                                    | 0.95                     | 53.9                      | 2/24/10     |
|                 |                |                                   |                                    | 0.95                     | 53.9                      | 2/25/10     |
|                 |                |                                   |                                    | 0.97                     | 53.8                      | 3/5/10      |
| 503             | IEEE/ IEC Head | 0.87<br>(0.83-0.91)               | 43.2<br>(41.0-45.4)                | 0.89                     | 42.2                      | 2/25/10     |
|                 |                |                                   |                                    | 0.90                     | 41.5                      | 2/26/10     |
|                 |                |                                   |                                    | 0.90                     | 41.5                      | 2/27/10     |
|                 |                |                                   |                                    | 0.90                     | 41.5                      | 2/28/10     |
|                 |                |                                   |                                    | 0.88                     | 41.3                      | 3/5/10      |

TABLE 9 (Continued)

| Frequency (MHz) | Tissue Type    | Conductivity Target (S/m) | Dielectric Constant Target | Conductivity Meas. (S/m) | Dielectric Constant Meas. | Tested Date |
|-----------------|----------------|---------------------------|----------------------------|--------------------------|---------------------------|-------------|
| 155             | FCC Body       | 0.80<br>(0.76-0.84)       | 61.8<br>(58.7-64.9)        | 0.78                     | 61.1                      | 2/28/10     |
|                 |                |                           |                            | 0.80                     | 61.6                      | 3/1/10      |
|                 |                |                           |                            | 0.78                     | 61.0                      | 3/1/10      |
|                 |                |                           |                            | 0.83                     | 61.0                      | 3/2/10      |
|                 |                |                           |                            | 0.84                     | 60.2                      | 3/9/10      |
| 155             | IEEE/ IEC Head | 0.76<br>(0.72-0.80)       | 52.1<br>(49.5-54.7)        | 0.74                     | 52.6                      | 3/2/10      |
|                 |                |                           |                            | 0.73                     | 52.4                      | 3/3/10      |
|                 |                |                           |                            | 0.73                     | 52.7                      | 3/4/10      |
| 168             | FCC Body       | 0.81<br>(0.77-0.85)       | 61.5<br>(58.4-64.6)        | 0.79                     | 60.6                      | 2/28/10     |
|                 |                |                           |                            | 0.79                     | 60.5                      | 3/1/10      |
|                 |                |                           |                            | 0.84                     | 60.5                      | 3/2/10      |
|                 |                |                           |                            | 0.83                     | 61.1                      | 3/4/10      |
|                 |                |                           |                            | 0.85                     | 59.7                      | 3/9/10      |
| 168             | IEEE/ IEC Head | 0.77<br>(0.73-0.81)       | 51.5<br>(48.9-54.1)        | 0.74                     | 51.6                      | 3/3/10      |
|                 |                |                           |                            | 0.74                     | 51.9                      | 3/4/10      |
| 300             | FCC Body       | 0.92<br>(0.87-0.97)       | 58.2<br>(55.3-61.1)        | 0.88                     | 56.6                      | 2/28/10     |
|                 |                |                           |                            | 0.90                     | 56.5                      | 3/1/10      |
|                 |                |                           |                            | 0.93                     | 56.2                      | 3/2/10      |
| 300             | IEEE/ IEC Head | 0.87<br>(0.83-0.91)       | 45.3<br>(43.0-47.6)        | 0.86                     | 54.7                      | 3/3/10      |
|                 |                |                           |                            | 0.86                     | 46.1                      | 3/4/10      |
|                 |                |                           |                            | 0.84                     | 45.3                      | 3/9/10      |

**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    | 4.40 +/- 10%              | 4.16   | 2/18/10     |
|                |                |                |                       |                           | 4.52   | 2/19/10     |
|                |                |                |                       |                           | 4.12   | 2/20/10     |
|                |                |                |                       |                           | 4.08   | 2/21/10     |
|                |                |                |                       |                           | 4.12   | 2/22/10     |
|                |                |                |                       |                           | 4.16   | 2/23/10     |
|                |                |                |                       |                           | 4.20   | 2/24/10     |
| 4.24           | 2/25/10        |                |                       |                           |  |             |
| 3007           | IEEE/ IEC Head | 3/12/2009      | SPEAG D450V2 /1002    | 4.58 +/- 10%              | 4.52   | 2/26/10     |
|                |                |                |                       |                           | 4.48   | 2/27/10     |
|                |                |                |                       |                           | 4.52   | 2/28/10     |
|                |                |                |                       |                           | 4.52   | 3/5/10      |
| 3007           | FCC Body       | 3/12/2009      | SPEAG D300V2 /1001    | 2.48 +/- 10%              | 2.66   | 2/28/10     |
|                |                |                |                       |                           | 2.66   | 3/1/10      |
|                |                |                |                       |                           | 2.59   | 3/2/10      |
| 3007           | IEEE/ IEC Head | 3/12/2009      | SPEAG D300V2 /1001    | 2.77 +/- 10%              | 2.74   | 3/3/10      |
|                |                |                |                       |                           | 2.73   | 3/4/10      |
| 3006           | IEEE/ IEC Head | 5/19/2009      | SPEAG D300V2 /1001    | 2.77 +/- 10%              | 2.72   | 3/9/10      |

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**

|                            | <b>Target</b> | <b>Measured</b>                    |
|----------------------------|---------------|------------------------------------|
| <b>Ambient Temperature</b> | 18 - 25 °C    | Range: 21.2 -25.4°C<br>Avg. 21.7°C |
| <b>Relative Humidity</b>   | 30 - 70 %     | Range: 25.7-66.5%<br>Avg. 45%      |
| <b>Tissue Temperature</b>  | NA            | Range: 19.8-22.4°C<br>Avg. 21.1°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 used to test all possible accessory combinations.

**12.3 DUT 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.

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

Where

$N_c$  = Number of channels

$F_{high}$  = Upper channel

$F_{low}$  = 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, battery NNTN7034A and audio cable HMN4104A:

All possible accessory combinations, belt clips (NTN8266B and HLN6875A) were tested with antenna PMAE4065A, battery NNTN7034A, and audio cable HMN4104A 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, battery NNTN7034A, and audio cable HMN4104A.

TABLE 12

| 450-512MHz Band Assessments at Body with body worn accessories           |                             |                |                      |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
|--|-----------------------------|----------------|----------------------|--------------------|-----------------------|---------------------------|-------------------------|----------------------|----------------------------|----------------------------|----------------------------------|-----------------------------------|
| Run Number/<br>SN  | Antenna                     | Freq.<br>(MHz) | Battery              | Test<br>position   | Carry Case            | Additional<br>attachments | Initial<br>Power<br>(W) | SAR<br>Drift<br>(dB) | Meas. 1g-<br>SAR<br>(W/kg) | Meas.<br>10g-SAR<br>(W/kg) | Max<br>Calc.1g-<br>SAR<br>(W/kg) | Max<br>Calc.10g-<br>SAR<br>(W/kg) |
| Assessment with battery NNTN7034A, belt clip NTN8266B and audio HMN4104A |                             |                |                      |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
| JsT-Ab-100218-04/<br>Q0PLT00M  | PMAE4065A<br>(380-520, GPS) | 450            | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | HMN4104A                  | 5.6                     | 0.112                | 10.27                      | 6.68                       | 5.14                             | 3.34                              |
| JsT-Ab-100218-03/<br>Q0PLT00M  | PMAE4065A<br>(380-520, GPS) | 465.5          | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | HMN4104A                  | 5.46                    | 0.0352               | 9.93                       | 6.42                       | 5.09                             | 3.29                              |
| JsT-Ab-100218-05/<br>Q0PLT00M  | PMAE4065A<br>(380-520, GPS) | 485            | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | HMN4104A                  | 5.54                    | -0.0854              | 10.17                      | 6.34                       | 5.24                             | 3.27                              |
| JsT-Ab-100218-06/<br>Q0PLT00M  | PMAE4065A<br>(380-520, GPS) | 502.5          | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | HMN4104A                  | 5.56                    | -0.265               | 10.00                      | 6.01                       | 5.35                             | 3.22                              |
| <b>MeC-Ab-100218-07 / Q0PLT00M</b>                                       | PMAE4065A<br>(380-520, GPS) | 512            | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | HMN4104A                  | 5.55                    | -0.281               | 10.30                      | 6.23                       | 5.54                             | 3.35                              |
| Assessment with battery NNTN7034A, belt clip HLN6875A and audio HMN4104A |                             |                |                      |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
| MeC-Ab-100218-09<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 450            | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | HMN4104A                  | 5.61                    | 0.0344               | 5.32                       | 3.95                       | 2.66                             | 1.98                              |
| <b>MeC-Ab-100218-10 / Q0PLT00M</b>                                       | PMAE4065A<br>(380-520, GPS) | 465.5          | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | HMN4104A                  | 5.57                    | -0.116               | 5.40                       | 4.00                       | 2.79                             | 2.07                              |
| MeC-Ab-100218-12<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 485            | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | HMN4104A                  | 5.53                    | -0.183               | 3.85                       | 2.84                       | 2.03                             | 1.50                              |
| MeC-Ab-100219-03<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 502.5          | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | HMN4104A                  | 5.51                    | -0.142               | 3.69                       | 2.57                       | 1.94                             | 1.35                              |
| MeC-Ab-100219-04<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 512            | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | HMN4104A                  | 5.62                    | -0.132               | 4.15                       | 2.90                       | 2.14                             | 1.49                              |

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

**Assessment of the offered antenna PMAE4065A, battery NNTN7034A and audio cable PMLN5101A:**

All possible accessory combinations, belt clips (NTN8266B and HLN6875A) were tested with antenna PMAE4065A, battery NNTN7034A, and audio cable PMLN5101A 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 PMAE4065A, battery NNTN7034A, and audio cable PMLN5101A.

**TABLE 13**

| 450-512MHz Band Assessments at Body with body worn accessories                   |                             |                |                      |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
|--|-----------------------------|----------------|----------------------|--------------------|-----------------------|---------------------------|-------------------------|----------------------|----------------------------|----------------------------|----------------------------------|-----------------------------------|
| Run Number/<br>SN  | Antenna                     | Freq.<br>(MHz) | Battery              | Test<br>position   | Carry Case            | Additional<br>attachments | Initial<br>Power<br>(W) | SAR<br>Drift<br>(dB) | Meas. 1g-<br>SAR<br>(W/kg) | Meas.<br>10g-SAR<br>(W/kg) | Max<br>Calc.1g-<br>SAR<br>(W/kg) | Max<br>Calc.10g-<br>SAR<br>(W/kg) |
| <b>Assessment with battery NNTN7034A, belt clip NTN8266B and audio PMLN5101A</b> |                             |                |                      |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
| HvH-Ab-100222-02<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 450            | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.59                    | 0.028                | 9.87                       | 6.52                       | 4.94                             | 3.27                              |
| HvH-Ab-100222-03<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 465.5          | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.46                    | 0.107                | 9.38                       | 6.05                       | 4.81                             | 3.10                              |
| HvH-Ab-100222-04<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 485            | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.6                     | -0.069               | 10.51                      | 6.56                       | 5.34                             | 3.33                              |
| <b>HvH-Ab-100222-05 / Q0PLT00M</b>   | PMAE4065A<br>(380-520, GPS) | 502.5          | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.54                    | -0.292               | 11.10                      | 6.70                       | 6.00                             | 3.62                              |
| HvH-Ab-100222-06<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 512            | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.65                    | -0.253               | 10.50                      | 6.22                       | 5.56                             | 3.30                              |
| <b>Assessment with battery NNTN7034A, belt clip HLN6875A and audio PMLN5101A</b> |                             |                |                      |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
| MeC-Ab-100222-08<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 450            | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.61                    | 0.137                | 4.74                       | 3.53                       | 2.37                             | 1.77                              |
| MeC-Ab-100222-09<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 465.5          | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.55                    | 0.0335               | 4.88                       | 3.62                       | 2.46                             | 1.83                              |
| MeC-Ab-100222-10<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 485            | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.51                    | -0.473               | 4.97                       | 2.06                       | 2.82                             | 1.17                              |
| MeC-Ab-100222-14<br>/ Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 502.5          | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.52                    | -0.307               | 5.69                       | 4.19                       | 3.10                             | 2.28                              |
| <b>MeC-Ab-100222-15 / Q0PLT00M</b>   | PMAE4065A<br>(380-520, GPS) | 512            | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.48                    | -0.0901              | 6.17                       | 4.54                       | 3.22                             | 2.37                              |

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

**Assessment of the offered antenna PMAE4065A, battery NNTN7038A and audio cable HMN4104A:**

All possible accessory combinations, belt clips (NTN8266B & HLN6875A) were tested with antenna PMAE4065A, battery NNTN7038A, and audio cable HMN4104A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 3.0 - UHF Assessment of the offered antenna PMAE4065A, battery NNTN7038A, and audio cable HMN4104A.

**TABLE 14**

| 450-512MHz Band Assessments at Body with body worn accessories                  |                             |                |                     |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
|---|-----------------------------|----------------|---------------------|--------------------|-----------------------|---------------------------|-------------------------|----------------------|----------------------------|----------------------------|----------------------------------|-----------------------------------|
| Run Number/<br>SN   | Antenna                     | Freq.<br>(MHz) | Battery             | Test<br>position   | Carry Case            | Additional<br>attachments | Initial<br>Power<br>(W) | SAR<br>Drift<br>(dB) | Meas. 1g-<br>SAR<br>(W/kg) | Meas.<br>10g-SAR<br>(W/kg) | Max<br>Calc.1g-<br>SAR<br>(W/kg) | Max<br>Calc.10g-<br>SAR<br>(W/kg) |
| <b>Assessment with battery NNTN7038A, belt clip NTN8266B and audio HMN4104A</b> |                             |                |                     |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
| <b>JsT-Ab-100225-02 / Q0PLT00M</b>  | PMAE4065A<br>(380-520, GPS) | 450            | NNTN7038A<br>(85mm) | Against<br>phantom | NTN8266B<br>belt clip | HMN4104A                  | 5.61                    | 0.0783               | 10.32                      | 6.86                       | 5.16                             | 3.43                              |
| JsT-Ab-100225-03 / Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 465.5          | NNTN7038A<br>(85mm) | Against<br>phantom | NTN8266B<br>belt clip | HMN4104A                  | 5.48                    | 0.0466               | 9.73                       | 6.43                       | 4.97                             | 3.29                              |
| JsT-Ab-100225-04 / Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 485            | NNTN7038A<br>(85mm) | Against<br>phantom | NTN8266B<br>belt clip | HMN4104A                  | 5.55                    | -0.136               | 9.33                       | 6.15                       | 4.86                             | 3.20                              |
| JsT-Ab-100225-05 / Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 502.5          | NNTN7038A<br>(85mm) | Against<br>phantom | NTN8266B<br>belt clip | HMN4104A                  | 5.58                    | -0.264               | 8.41                       | 5.48                       | 4.48                             | 2.92                              |
| JsT-Ab-100225-06 / Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 512            | NNTN7038A<br>(85mm) | Against<br>phantom | NTN8266B<br>belt clip | HMN4104A                  | 5.63                    | -0.161               | 8.58                       | 5.58                       | 4.45                             | 2.90                              |
| <b>Assessment with battery NNTN7038A, belt clip HLN6875A and audio HMN4104A</b> |                             |                |                     |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
| MeC-Ab-100224-18 / Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 450            | NNTN7038A<br>(85mm) | Against<br>phantom | HLN6875A<br>Belt clip | HMN4104A                  | 5.63                    | 0.132                | 4.60                       | 3.40                       | 2.30                             | 1.70                              |
| MeC-Ab-100224-19 / Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 465.5          | NNTN7038A<br>(85mm) | Against<br>phantom | HLN6875A<br>Belt clip | HMN4104A                  | 5.57                    | 0.312                | 4.56                       | 3.31                       | 2.29                             | 1.66                              |
| MeC-Ab-100224-20 / Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 485            | NNTN7038A<br>(85mm) | Against<br>phantom | HLN6875A<br>Belt clip | HMN4104A                  | 5.51                    | -0.205               | 3.81                       | 2.79                       | 2.03                             | 1.49                              |
| MeC-Ab-100224-21 / Q0PLT00M   | PMAE4065A<br>(380-520, GPS) | 502.5          | NNTN7038A<br>(85mm) | Against<br>phantom | HLN6875A<br>Belt clip | HMN4104A                  | 5.49                    | -0.204               | 4.62                       | 3.39                       | 2.47                             | 1.81                              |
| <b>MeC-Ab-100224-22 / Q0PLT00M</b>  | PMAE4065A<br>(380-520, GPS) | 512            | NNTN7038A<br>(85mm) | Against<br>phantom | HLN6875A<br>Belt clip | HMN4104A                  | 5.52                    | -0.0991              | 5.60                       | 4.11                       | 2.91                             | 2.13                              |

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

**Assessment of the offered antenna PMAE4065A, battery NNTN7038A and audio cable PMLN5101A:**

All possible accessory combinations, belt clips (NTN8266B & HLN6875A) were tested with antenna PMAE4065A, battery NNTN7038A, and audio cable PMLN5101A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 4.0 - UHF Assessment of the offered antenna PMAE4065A, battery NNTN7038A, and audio cable PMLN5101A.

**TABLE 15**

| 450-512MHz Band Assessments at Body with body worn accessories                   |                          |                |                  |                  |                    |                           |                         |                      |                            |                            |                                  |                                   |
|--|--------------------------|----------------|------------------|------------------|--------------------|---------------------------|-------------------------|----------------------|----------------------------|----------------------------|----------------------------------|-----------------------------------|
| Run Number/<br>SN  | Antenna                  | Freq.<br>(MHz) | Battery          | Test<br>position | Carry Case         | Additional<br>attachments | Initial<br>Power<br>(W) | SAR<br>Drift<br>(dB) | Meas. 1g-<br>SAR<br>(W/kg) | Meas.<br>10g-SAR<br>(W/kg) | Max<br>Calc.1g-<br>SAR<br>(W/kg) | Max<br>Calc.10g-<br>SAR<br>(W/kg) |
| <b>Assessment with battery NNTN7038A, belt clip NTN8266B and audio PMLN5101A</b> |                          |                |                  |                  |                    |                           |                         |                      |                            |                            |                                  |                                   |
| <b>JsT-Ab-100225-08 / Q0PLT00M</b>   | PMAE4065A (380-520, GPS) | 450            | NNTN7038A (85mm) | Against phantom  | NTN8266B belt clip | PMLN5101A                 | 5.7                     | 0.0492               | 10.07                      | 6.67                       | 5.04                             | 3.34                              |
| JsT-Ab-100225-09 / Q0PLT00M  | PMAE4065A (380-520, GPS) | 465.5          | NNTN7038A (85mm) | Against phantom  | NTN8266B belt clip | PMLN5101A                 | 5.54                    | 0.0116               | 9.53                       | 6.30                       | 4.82                             | 3.18                              |
| JsT-Ab-100225-10 / Q0PLT00M  | PMAE4065A (380-520, GPS) | 485            | NNTN7038A (85mm) | Against phantom  | NTN8266B belt clip | PMLN5101A                 | 5.62                    | -0.0905              | 9.22                       | 6.04                       | 4.71                             | 3.08                              |
| JsT-Ab-100225-11 / Q0PLT00M  | PMAE4065A (380-520, GPS) | 502.5          | NNTN7038A (85mm) | Against phantom  | NTN8266B belt clip | PMLN5101A                 | 5.62                    | -0.256               | 9.28                       | 6.10                       | 4.92                             | 3.24                              |
| JsT-Ab-100225-12 / Q0PLT00M  | PMAE4065A (380-520, GPS) | 512            | NNTN7038A (85mm) | Against phantom  | NTN8266B belt clip | PMLN5101A                 | 5.64                    | -0.189               | 8.83                       | 5.74                       | 4.61                             | 3.00                              |
| <b>Assessment with battery NNTN7038A, belt clip HLN6875A and audio PMLN5101A</b> |                          |                |                  |                  |                    |                           |                         |                      |                            |                            |                                  |                                   |
| MeC-Ab-100222-11 / Q0PLT00M  | PMAE4065A (380-520, GPS) | 450            | NNTN7038A (85mm) | Against phantom  | HLN6875A Belt clip | PMLN5101A                 | 5.58                    | 0.0833               | 5.16                       | 3.83                       | 2.59                             | 1.92                              |
| MeC-Ab-100222-12 / Q0PLT00M  | PMAE4065A (380-520, GPS) | 465.5          | NNTN7038A (85mm) | Against phantom  | HLN6875A Belt clip | PMLN5101A                 | 5.56                    | -0.0557              | 5.01                       | 3.71                       | 2.56                             | 1.89                              |
| MeC-Ab-100222-13 / Q0PLT00M  | PMAE4065A (380-520, GPS) | 485            | NNTN7038A (85mm) | Against phantom  | HLN6875A Belt clip | PMLN5101A                 | 5.5                     | -0.115               | 5.63                       | 4.15                       | 2.94                             | 2.17                              |
| MeC-Ab-100222-17 / Q0PLT00M  | PMAE4065A (380-520, GPS) | 502.5          | NNTN7038A (85mm) | Against phantom  | HLN6875A Belt clip | PMLN5101A                 | 5.53                    | -0.225               | 5.44                       | 4.00                       | 2.90                             | 2.13                              |
| <b>MeC-Ab-100222-18 / Q0PLT00M</b>   | PMAE4065A (380-520, GPS) | 512            | NNTN7038A (85mm) | Against phantom  | HLN6875A Belt clip | PMLN5101A                 | 5.5                     | -0.0999              | 5.87                       | 4.31                       | 3.06                             | 2.25                              |

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

**Assessment of the offered antenna PMAT4001A, battery NNTN7034A and audio cable HMN4104A:**

All possible accessory combinations, belt clips (NTN8266B & HLN6875A) were tested with antenna PMAT4001A, battery NNTN7034A, and audio cable HMN4104A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 5.0 - UHF Assessment of the offered antenna PMAT4001A, battery NNTN7034A, and audio cable HMN4104A.

**TABLE 16**

| <b>450-512MHz Band Assessments at Body with body worn accessories</b>           |                                   |                        |                   |                          |                    |                                   |                                  |                               |                                     |                                     |  |   |
|---|-----------------------------------|------------------------|-------------------|--------------------------|--------------------|-----------------------------------|----------------------------------|-------------------------------|-------------------------------------|-------------------------------------|--|---|
| <b>Run Number/<br/>SN</b>   | <b>Antenna</b>                    | <b>Freq.<br/>(MHz)</b> | <b>Battery</b>    | <b>Test<br/>position</b> | <b>Carry Case</b>  | <b>Additional<br/>attachments</b> | <b>Initial<br/>Power<br/>(W)</b> | <b>SAR<br/>Drift<br/>(dB)</b> | <b>Meas. 1g-<br/>SAR<br/>(W/kg)</b> | <b>Meas.<br/>10g-SAR<br/>(W/kg)</b> | <b>Max<br/>Calc.1g-<br/>SAR<br/>(W/kg)</b> | <b>Max<br/>Calc.10g-<br/>SAR<br/>(W/kg)</b> |
| <b>Assessment with battery NNTN7034A, belt clip NTN8266B and audio HMN4104A</b> |                                   |                        |                   |                          |                    |                                   |                                  |                               |                                     |                                     |  |   |
| <b>JsT-Ab-100220-02 / Q0PLT00M</b>  | PMAT4001A (136-174, 380-520, GPS) | 450                    | NNTN7034A (130mm) | Against phantom          | NTN8266B belt clip | HMN4104A                          | 5.59                             | -0.0749                       | 11.31                               | 7.38                                | 5.76                                       | 3.76  |
| JsT-Ab-100220-03 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 465.5                  | NNTN7034A (130mm) | Against phantom          | NTN8266B belt clip | HMN4104A                          | 5.46                             | 0.0191                        | 9.24                                | 5.90                                | 4.74                                       | 3.03  |
| JsT-Ab-100220-04 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 485                    | NNTN7034A (130mm) | Against phantom          | NTN8266B belt clip | HMN4104A                          | 5.56                             | -0.095                        | 6.29                                | 3.93                                | 3.24                                       | 2.02  |
| JsT-Ab-100220-05 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 502.5                  | NNTN7034A (130mm) | Against phantom          | NTN8266B belt clip | HMN4104A                          | 5.57                             | -0.041                        | 4.73                                | 2.87                                | 2.40                                       | 1.46  |
| JsT-Ab-100220-06 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 512                    | NNTN7034A (130mm) | Against phantom          | NTN8266B belt clip | HMN4104A                          | 5.56                             | -0.352                        | 3.20                                | 1.91                                | 1.75                                       | 1.04  |
| <b>Assessment with battery NNTN7034A, belt clip HLN6875A and audio HMN4104A</b> |                                   |                        |                   |                          |                    |                                   |                                  |                               |                                     |                                     |  |   |
| <b>JsT-Ab-100220-08 / Q0PLT00M</b>  | PMAT4001A (136-174, 380-520, GPS) | 450                    | NNTN7034A (130mm) | Against phantom          | HLN6875A Belt clip | HMN4104A                          | 5.67                             | -0.0548                       | 5.44                                | 4.04                                | 2.75                                       | 2.05  |
| JsT-Ab-100220-09 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 465.5                  | NNTN7034A (130mm) | Against phantom          | HLN6875A Belt clip | HMN4104A                          | 5.44                             | 0.0907                        | 4.76                                | 3.53                                | 2.45                                       | 1.82  |
| JsT-Ab-100220-11 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 485                    | NNTN7034A (130mm) | Against phantom          | HLN6875A Belt clip | HMN4104A                          | 5.54                             | -0.0231                       | 3.57                                | 1.33                                | 1.81                                       | 0.68  |
| MeC-Ab-100221-02 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 502.5                  | NNTN7034A (130mm) | Against phantom          | HLN6875A Belt clip | HMN4104A                          | 5.56                             | 0.00302                       | 3.24                                | 2.38                                | 1.63                                       | 1.20  |
| MeC-Ab-100221-03 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 512                    | NNTN7034A (130mm) | Against phantom          | HLN6875A Belt clip | HMN4104A                          | 5.51                             | -0.209                        | 2.66                                | 1.96                                | 1.42                                       | 1.05  |

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

**Assessment of the offered antenna PMAT4001A, battery NNTN7034A and audio cable PMLN5101A:**

All possible accessory combinations, belt clips (NTN8266B & HLN6875A) were tested with antenna PMAT4001A, battery NNTN7034A, and audio cable PMLN5101A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 6.0 - UHF Assessment of the offered antenna PMAT4001A, battery NNTN7034A, and audio cable PMLN5101A.

**TABLE 17**

| 450-512MHz Band Assessments at Body with body worn accessories                   |                                      |                |                      |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
|--|--------------------------------------|----------------|----------------------|--------------------|-----------------------|---------------------------|-------------------------|----------------------|----------------------------|----------------------------|----------------------------------|-----------------------------------|
| Run Number/<br>SN  | Antenna                              | Freq.<br>(MHz) | Battery              | Test<br>position   | Carry Case            | Additional<br>attachments | Initial<br>Power<br>(W) | SAR<br>Drift<br>(dB) | Meas. 1g-<br>SAR<br>(W/kg) | Meas.<br>10g-SAR<br>(W/kg) | Max<br>Calc.1g-<br>SAR<br>(W/kg) | Max<br>Calc.10g-<br>SAR<br>(W/kg) |
| <b>Assessment with battery NNTN7034A, belt clip NTN8266B and audio PMLN5101A</b> |                                      |                |                      |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
| <b>MeC-Ab-100221-05 / QOPLT00M</b>   | PMAT4001A<br>(136-174, 380-520, GPS) | 450            | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.63                    | -0.105               | 11.47                      | 7.49                       | 5.88                             | 3.84                              |
| MeC-Ab-100221-06 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 465.5          | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.61                    | 0.0574               | 9.39                       | 6.00                       | 4.70                             | 3.00                              |
| MeC-Ab-100221-07 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 485            | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.58                    | 0.0771               | 7.11                       | 4.41                       | 3.57                             | 2.21                              |
| MeC-Ab-100221-08 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 502.5          | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.55                    | -0.0794              | 5.05                       | 3.00                       | 2.59                             | 1.54                              |
| MeC-Ab-100221-09 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 512            | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.52                    | -0.347               | 3.06                       | 1.79                       | 1.68                             | 0.98                              |
| <b>Assessment with battery NNTN7034A, belt clip HLN6875A and audio PMLN5101A</b> |                                      |                |                      |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
| <b>MeC-Ab-100221-11 / QOPLT00M</b>   | PMAT4001A<br>(136-174, 380-520, GPS) | 450            | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.61                    | -0.0807              | 5.92                       | 4.39                       | 3.02                             | 2.24                              |
| MeC-Ab-100221-12 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 465.5          | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.6                     | 0.0327               | 4.70                       | 3.46                       | 2.35                             | 1.73                              |
| MeC-Ab-100221-13 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 485            | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.56                    | -0.0163              | 4.18                       | 3.08                       | 2.11                             | 1.56                              |
| MeC-Ab-100221-14 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 502.5          | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.51                    | -0.0148              | 3.48                       | 2.56                       | 1.77                             | 1.31                              |
| MeC-Ab-100221-15 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 512            | NNTN7034A<br>(130mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.54                    | -0.185               | 2.57                       | 1.89                       | 1.36                             | 1.00                              |

Assessments at the Body (CW mode)

Assessment of the offered antenna PMAT4001A, battery NNTN7038A and audio cable HMN4104A:

All possible accessory combinations, belt clips (NTN8266B & HLN6875A) were tested with antenna PMAT4001A, battery NNTN7038A, and audio cable HMN4104A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 7.0 - UHF Assessment of the offered antenna PMAT4001A, battery NNTN7038A, and audio cable HMN4104A.

TABLE 18

| 450-512MHz Band Assessments at Body with body worn accessories           |                                   |                |                  |                  |                    |                           |                         |                      |                            |                            |                                  |                                   |
|--|-----------------------------------|----------------|------------------|------------------|--------------------|---------------------------|-------------------------|----------------------|----------------------------|----------------------------|----------------------------------|-----------------------------------|
| Run Number/<br>SN  | Antenna                           | Freq.<br>(MHz) | Battery          | Test<br>position | Carry Case         | Additional<br>attachments | Initial<br>Power<br>(W) | SAR<br>Drift<br>(dB) | Meas. 1g-<br>SAR<br>(W/kg) | Meas.<br>10g-SAR<br>(W/kg) | Max<br>Calc.1g-<br>SAR<br>(W/kg) | Max<br>Calc.10g-<br>SAR<br>(W/kg) |
| Assessment with battery NNTN7038A, belt clip NTN8266B and audio HMN4104A |                                   |                |                  |                  |                    |                           |                         |                      |                            |                            |                                  |                                   |
| JsT-Ab-100223-02 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 450            | NNTN7038A (85mm) | Against phantom  | NTN8266B belt clip | HMN4104A                  | 5.6                     | -0.0237              | 11.67                      | 7.77                       | 5.87                             | 3.91                              |
| JsT-Ab-100223-03 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 465.5          | NNTN7038A (85mm) | Against phantom  | NTN8266B belt clip | HMN4104A                  | 5.49                    | 0.0478               | 8.68                       | 5.77                       | 4.43                             | 2.94                              |
| MeC-Ab-100223-04 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 485            | NNTN7038A (85mm) | Against phantom  | NTN8266B belt clip | HMN4104A                  | 5.52                    | 0.037                | 9.11                       | 5.99                       | 4.62                             | 3.04                              |
| MeC-Ab-100223-05 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 502.5          | NNTN7038A (85mm) | Against phantom  | NTN8266B belt clip | HMN4104A                  | 5.5                     | -0.108               | 4.28                       | 2.77                       | 2.23                             | 1.45                              |
| MeC-Ab-100223-06 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 512            | NNTN7038A (85mm) | Against phantom  | NTN8266B belt clip | HMN4104A                  | 5.52                    | -0.309               | 2.56                       | 1.70                       | 1.39                             | 0.93                              |
| Assessment with battery NNTN7038A, belt clip HLN6875A and audio HMN4104A |                                   |                |                  |                  |                    |                           |                         |                      |                            |                            |                                  |                                   |
| JsT-Ab-100224-02 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 450            | NNTN7038A (85mm) | Against phantom  | HLN6875A Belt clip | HMN4104A                  | 5.61                    | 0.0428               | 6.63                       | 2.74                       | 3.32                             | 1.37                              |
| JsT-Ab-100224-03 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 465.5          | NNTN7038A (85mm) | Against phantom  | HLN6875A Belt clip | HMN4104A                  | 5.46                    | 0.0554               | 4.42                       | 3.26                       | 2.27                             | 1.67                              |
| JsT-Ab-100224-04 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 485            | NNTN7038A (85mm) | Against phantom  | HLN6875A Belt clip | HMN4104A                  | 5.58                    | 0.116                | 3.63                       | 1.63                       | 1.82                             | 0.82                              |
| JsT-Ab-100224-05 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 502.5          | NNTN7038A (85mm) | Against phantom  | HLN6875A Belt clip | HMN4104A                  | 5.61                    | 0.0129               | 2.46                       | 1.14                       | 1.23                             | 0.57                              |
| JsT-Ab-100224-06 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 512            | NNTN7038A (85mm) | Against phantom  | HLN6875A Belt clip | HMN4104A                  | 5.61                    | -0.0509              | 2.08                       | 0.949                      | 1.05                             | 0.48                              |

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

**Assessment of the offered antenna PMAT4001A, battery NNTN7038A and audio cable PMLN5101A:**

All possible accessory combinations, belt clips (NTN8266B & HLN6875A) were tested with antenna PMAT4001A, battery NNTN7038A, and audio cable PMLN5101A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 8.0 - UHF Assessment of the offered antenna PMAT4001A, battery NNTN7038A, and audio cable PMLN5101A.

**TABLE 19**

| 450-512MHz Band Assessments at Body with body worn accessories                   |                                      |                |                     |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
|--|--------------------------------------|----------------|---------------------|--------------------|-----------------------|---------------------------|-------------------------|----------------------|----------------------------|----------------------------|----------------------------------|-----------------------------------|
| Run Number/<br>SN  | Antenna                              | Freq.<br>(MHz) | Battery             | Test<br>position   | Carry Case            | Additional<br>attachments | Initial<br>Power<br>(W) | SAR<br>Drift<br>(dB) | Meas. 1g-<br>SAR<br>(W/kg) | Meas.<br>10g-SAR<br>(W/kg) | Max<br>Calc.1g-<br>SAR<br>(W/kg) | Max<br>Calc.10g-<br>SAR<br>(W/kg) |
| <b>Assessment with battery NNTN7038A, belt clip NTN8266B and audio PMLN5101A</b> |                                      |                |                     |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
| <b>MeC-Ab-100223-08 / QOPLT00M</b>   | PMAT4001A<br>(136-174, 380-520, GPS) | 450            | NNTN7038A<br>(85mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.62                    | -0.109               | 10.76                      | 7.30                       | 5.52                             | 3.74                              |
| MeC-Ab-100223-09 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 465.5          | NNTN7038A<br>(85mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.53                    | 0.0813               | 8.28                       | 5.57                       | 4.19                             | 2.82                              |
| MeC-Ab-100223-10 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 485            | NNTN7038A<br>(85mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.51                    | 0.0222               | 5.83                       | 3.90                       | 2.96                             | 1.98                              |
| JsT-Ab-100224-08 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 502.5          | NNTN7038A<br>(85mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.63                    | -0.0963              | 3.91                       | 2.58                       | 2.00                             | 1.32                              |
| JsT-Ab-100224-09 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 512            | NNTN7038A<br>(85mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.62                    | -0.306               | 2.51                       | 1.64                       | 1.35                             | 0.88                              |
| <b>Assessment with battery NNTN7038A, belt clip HLN6875A and audio PMLN5101A</b> |                                      |                |                     |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
| <b>JsT-Ab-100224-11 / QOPLT00M</b>   | PMAT4001A<br>(136-174, 380-520, GPS) | 450            | NNTN7038A<br>(85mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.7                     | 0.0161               | 6.38                       | 2.75                       | 3.19                             | 1.38                              |
| MeC-Ab-100224-12 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 465.5          | NNTN7038A<br>(85mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.62                    | 0.0737               | 5.14                       | 3.78                       | 2.57                             | 1.89                              |
| MeC-Ab-100224-13 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 485            | NNTN7038A<br>(85mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.53                    | 0.0219               | 3.85                       | 2.82                       | 1.95                             | 1.43                              |
| MeC-Ab-100224-14 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 502.5          | NNTN7038A<br>(85mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.5                     | 0.0711               | 3.17                       | 2.33                       | 1.61                             | 1.19                              |
| MeC-Ab-100224-16 / QOPLT00M  | PMAT4001A<br>(136-174, 380-520, GPS) | 512            | NNTN7038A<br>(85mm) | Against<br>phantom | HLN6875A<br>Belt clip | PMLN5101A                 | 5.5                     | -0.167               | 2.29                       | 1.68                       | 1.21                             | 0.89                              |

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

**Assessment without body worn accessories at 2.5cm:** Each offered antennas was tested with a separation distance of 2.5cm (front & back) from the phantom using the highest SAR configurations from table 13 (antenna PMAE4065A and audio PMLN5101A) and table 17 (antenna PMAT4001A and audio PMLN5101A). The highest SAR result (bolded) from the table below is provided in APPENDIX F Section 9.0 - 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 20**

| 450-512 MHz 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 for antenna PMAE4065A |                                   |            |                   |                      |            |                        |                   |                |                     |                      |                         |                          |
| <b>ErC-Ab-100305-04/ Q0PLT00M</b>         | PMAE4065A (380-520, GPS)          | 502.5      | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | PMLN5101A              | 5.57              | 0.0663         | 2.27                | 1.69                 | 1.14                    | 0.85                     |
| ErC-Ab-100305-05/ Q0PLT00M                | PMAE4065A (380-520, GPS)          | 502.5      | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | PMLN5101A              | 5.6               | 0.074          | 1.75                | 1.32                 | 0.88                    | 0.66                     |
| Assessment at 2.5cm for antenna PMAT4001A |                                   |            |                   |                      |            |                        |                   |                |                     |                      |                         |                          |
| <b>ErC-Ab-100305-08/ Q0PLT00M</b>         | PMAT4001A (136-174, 380-520, GPS) | 450        | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | PMLN5101A              | 5.72              | 0.0198         | 4.05                | 3.04                 | 2.03                    | 1.52                     |
| ErC-Ab-100305-09/ Q0PLT00M                | PMAT4001A (136-174, 380-520, GPS) | 450        | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | PMLN5101A              | 5.67              | 0.0444         | 2.96                | 2.25                 | 1.48                    | 1.13                     |

Assessments at the Face (CW mode)

**Assessment of the offered antenna PMAE4065A and battery NNTN7034A:**

The antenna PMAE4065A and battery NNTN7034A were tested across 5 frequency test channels 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 10.0 - UHF Assessment at the face with antenna PMAE4065A and battery NNTN7034A.

TABLE 21

| 450-512 MHz 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 of antenna PMAE4065A and battery NNTN7034A with back of DUT @ 2.5cm</b>  |                          |            |                   |                      |            |                        |                   |                |                     |                      |                         |                          |
| MeC-Face-100225-15/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 450        | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.61              | 0.0199         | 4.58                | 3.42                 | 2.29                    | 1.71                     |
| MeC-Face-100225-16/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 465.5      | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.52              | -0.281         | 4.06                | 3.02                 | 2.20                    | 1.63                     |
| MeC-Face-100225-17/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 485        | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.54              | -0.574         | 4.01                | 2.96                 | 2.31                    | 1.71                     |
| MeC-Face-100225-18/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 502.5      | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.51              | -0.201         | 4.18                | 3.08                 | 2.22                    | 1.64                     |
| <b>MeC-Face-100225-19/ Q0PLT00M</b>  | PMAE4065A (380-520, GPS) | 512        | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.48              | -0.0846        | 4.67                | 3.44                 | 2.43                    | 1.79                     |
| <b>Assessment of antenna PMAE4065A and battery NNTN7034A with front of DUT @ 2.5cm</b> |                          |            |                   |                      |            |                        |                   |                |                     |                      |                         |                          |
| JsT-Face-100226-08/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 450        | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 5.65              | 0.103          | 3.44                | 2.62                 | 1.72                    | 1.31                     |
| JsT-Face-100226-09/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 465.5      | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 5.51              | -0.21          | 2.83                | 2.15                 | 1.51                    | 1.15                     |
| JsT-Face-100226-10/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 485        | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 5.59              | -0.451         | 3.19                | 2.41                 | 1.77                    | 1.34                     |
| JsT-Face-100226-11/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 502.5      | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 5.61              | -0.136         | 3.51                | 2.65                 | 1.81                    | 1.37                     |
| <b>JsT-Face-100226-12/ Q0PLT00M</b>  | PMAE4065A (380-520, GPS) | 512        | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 5.57              | 0.1            | 3.94                | 2.97                 | 1.98                    | 1.49                     |

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

**Assessment of the offered antenna PMAE4065A and battery NNTN7038A:**

The antenna PMAE4065A and battery NNTN7038A were tested across 5 frequency test channels 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 11.0 - UHF Assessment at the face with antenna PMAE4065A and battery NNTN7038A.

**TABLE 22**

| 450-512 MHz 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 of antenna PMAE4065A and battery NNTN7038A with back of DUT @ 2.5cm</b>  |                          |            |                  |                      |            |                        |                   |                |                     |                      |                         |                          |
| <b>JsT-Face-100226-02/ Q0PLT00M</b>  | PMAE4065A (380-520, GPS) | 450        | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.62              | 0.0612         | 4.61                | 3.47                 | 2.31                    | 1.74                     |
| JsT-Face-100226-03/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 465.5      | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.48              | -0.0886        | 3.96                | 2.98                 | 2.07                    | 1.55                     |
| JsT-Face-100226-04/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 485        | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.58              | -0.331         | 3.85                | 2.87                 | 2.08                    | 1.55                     |
| JsT-Face-100226-05/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 502.5      | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.6               | -0.238         | 3.81                | 2.83                 | 2.01                    | 1.49                     |
| JsT-Face-100226-06/ Q0PLT00M   | PMAE4065A (380-520, GPS) | 512        | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.59              | -0.108         | 3.88                | 2.86                 | 1.99                    | 1.47                     |
| <b>Assessment of antenna PMAE4065A and battery NNTN7038A with front of DUT @ 2.5cm</b> |                          |            |                  |                      |            |                        |                   |                |                     |                      |                         |                          |
| <b>CM-Face-100226-14/ Q0PLT00M</b>   | PMAE4065A (380-520, GPS) | 450        | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 5.6               | 0.0744         | 4.12                | 3.15                 | 2.06                    | 1.58                     |
| CM-Face-100226-15/ Q0PLT00M  | PMAE4065A (380-520, GPS) | 465.5      | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 5.45              | -0.236         | 3.42                | 2.59                 | 1.86                    | 1.40                     |
| CM-Face-100226-16/ Q0PLT00M  | PMAE4065A (380-520, GPS) | 485        | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 5.5               | -0.473         | 3.38                | 2.56                 | 1.92                    | 1.45                     |
| CM-Face-100226-17/ Q0PLT00M  | PMAE4065A (380-520, GPS) | 502.5      | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 5.56              | -0.151         | 3.33                | 2.50                 | 1.74                    | 1.30                     |
| CM-Face-100226-18/ Q0PLT00M  | PMAE4065A (380-520, GPS) | 512        | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 5.54              | -0.12          | 3.34                | 2.50                 | 1.74                    | 1.30                     |

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

**Assessment of the offered antenna PMAT4001A and battery NNTN7034A:**

The antenna PMAT4001A and battery NNTN7034A were tested across 5 frequency test channels 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 12.0 - UHF Assessment at the face with antenna PMAT4001A and battery NNTN7034A.

**TABLE 23**

| 450-512 MHz 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 of antenna PMAT4001A and battery NNTN7034A with back of DUT @ 2.5cm</b>  |                                   |            |                   |                      |            |                        |                   |                |                     |                      |                         |                          |
| ErC-Face-100305-02/ Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 450        | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.62              | -0.0253        | 5.06                | 3.79                 | 2.54                    | 1.91                     |
| ErC-Face-100227-05/ Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 465.5      | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.58              | 0.0073<br>1    | 3.94                | 2.94                 | 1.98                    | 1.48                     |
| ErC-Face-100227-06/ Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 485        | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.61              | 0.0615         | 3.27                | 2.44                 | 1.64                    | 1.22                     |
| ErC-Face-100227-07/ Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 502.5      | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.54              | 0.0418         | 3.04                | 2.25                 | 1.54                    | 1.14                     |
| ErC-Face-100227-08/ Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 512        | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.6               | -0.136         | 2.60                | 1.92                 | 1.34                    | 0.99                     |
| <b>Assessment of antenna PMAT4001A and battery NNTN7034A with front of DUT @ 2.5cm</b> |                                   |            |                   |                      |            |                        |                   |                |                     |                      |                         |                          |
| JsT-Face-100227-16/ Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 450        | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 5.71              | 0.149          | 3.28                | 2.50                 | 1.64                    | 1.25                     |
| JsT-Face-100227-17/ Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 465.5      | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 5.54              | 0.115          | 2.90                | 2.21                 | 1.47                    | 1.12                     |
| JsT-Face-100227-18/ Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 485        | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 5.6               | 0.117          | 2.54                | 1.93                 | 1.27                    | 0.97                     |
| JsT-Face-100227-20/ Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 502.5      | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 5.62              | 0.187          | 2.46                | 1.85                 | 1.23                    | 0.93                     |
| JsT-Face-100227-21/ Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 512        | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 5.62              | 0.0309         | 2.31                | 1.73                 | 1.16                    | 0.87                     |

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

**Assessment of the offered antenna PMAT4001A and battery NNTN7038A:**

The antenna PMAT4001A and battery NNTN7038A were tested across 5 frequency test channels 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 13.0 - UHF Assessment at the face with antenna PMAT4001A and battery NNTN7038A.

**TABLE 24**

| 450-512 MHz 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 of antenna PMAT4001A and battery NNTN7038A with back of DUT @ 2.5cm</b>  |                                   |            |                  |                      |            |                        |                   |                |                     |                      |                         |                          |
| <b>JsT-Face-100227-10/ QOPLT00M</b>  | PMAT4001A (136-174, 380-520, GPS) | 450        | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.59              | 0.0182         | 5.56                | 4.17                 | 2.78                    | 2.09                     |
| JsT-Face-100227-11/ QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 465.5      | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.47              | 0.18           | 4.06                | 3.04                 | 2.08                    | 1.56                     |
| JsT-Face-100227-12/ QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 485        | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.58              | 0.0217         | 2.81                | 2.1                  | 1.41                    | 1.05                     |
| JsT-Face-100227-13/ QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 502.5      | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.59              | -0.0362        | 2.14                | 1.58                 | 1.08                    | 0.80                     |
| JsT-Face-100227-14/ QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 512        | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 5.6               | -0.155         | 1.68                | 1.24                 | 0.87                    | 0.64                     |
| <b>Assessment of antenna PMAT4001A and battery NNTN7038A with front of DUT @ 2.5cm</b> |                                   |            |                  |                      |            |                        |                   |                |                     |                      |                         |                          |
| <b>HvH-Face-100228-02/ QOPLT00M</b>  | PMAT4001A (136-174, 380-520, GPS) | 450        | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 5.61              | 0.105          | 4.73                | 3.58                 | 2.37                    | 1.79                     |
| HvH-Face-100228-03/ QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 465.5      | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 5.48              | 0.167          | 3.58                | 2.7                  | 1.83                    | 1.38                     |
| HvH-Face-100228-04/ QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 485        | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 5.57              | 0.158          | 2.59                | 1.95                 | 1.30                    | 0.98                     |
| HvH-Face-100228-05/ QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 502.5      | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 5.59              | 0.117          | 1.95                | 1.46                 | 0.98                    | 0.73                     |
| HvH-Face-100228-06/ QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 512        | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 5.6               | -0.45          | 1.63                | 1.21                 | 0.90                    | 0.67                     |

13.2 VHF Test Data:

Assessments at the Body (CW mode)

Assessment of the offered antenna PMAT4001A, battery NNTN7034A and audio cable HMN4104A:

All possible accessory combinations, belt clips (NTN8266B & HLN6875A) were tested with antenna PMAT4001A, battery NNTN7034A, and audio cable HMN4104A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 14.0 - VHF Assessment of the offered antenna PMAT4001A, battery NNTN7034A, and audio cable HMN4104A.

TABLE 25

| 150.8-173.4 MHz 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 with battery NNTN7034A, belt clip NTN8266B and audio HMN4104A</b> |                                   |            |                   |                 |                    |                        |                   |                |                     |                      |                         |                          |
| HvH-Ab-100228-11 / QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7034A (130mm) | Against phantom | NTN8266B belt clip | HMN4104A               | 6.6               | -0.174         | 1.77                | 1.16                 | 0.92                    | 0.60                     |
| HvH-Ab-100228-12 / QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7034A (130mm) | Against phantom | NTN8266B belt clip | HMN4104A               | 6.61              | -0.0209        | 1.61                | 1.06                 | 0.81                    | 0.53                     |
| HvH-Ab-100228-13 / QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7034A (130mm) | Against phantom | NTN8266B belt clip | HMN4104A               | 6.65              | 0.127          | 1.78                | 1.19                 | 0.89                    | 0.60                     |
| HvH-Ab-100228-14 / QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7034A (130mm) | Against phantom | NTN8266B belt clip | HMN4104A               | 6.7               | -0.5           | 1.59                | 1.08                 | 0.89                    | 0.61                     |
| <b>CM-Ab-100228-15 / QOPLT00M</b>   | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7034A (130mm) | Against phantom | NTN8266B belt clip | HMN4104A               | 6.54              | -0.551         | 1.92                | 1.45                 | 1.10                    | 0.83                     |
| <b>Assessment with battery NNTN7034A, belt clip HLN6875A and audio HMN4104A</b> |                                   |            |                   |                 |                    |                        |                   |                |                     |                      |                         |                          |
| CM-Ab-100228-18 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7034A (130mm) | Against phantom | HLN6875A Belt clip | HMN4104A               | 6.65              | -0.164         | 5.21                | 1.83                 | 2.71                    | 0.95                     |
| CM-Ab-100228-19 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7034A (130mm) | Against phantom | HLN6875A Belt clip | HMN4104A               | 6.55              | -0.0549        | 3.88                | 1.54                 | 1.98                    | 0.79                     |
| CM-Ab-100228-20 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7034A (130mm) | Against phantom | HLN6875A Belt clip | HMN4104A               | 6.68              | 0.165          | 5.25                | 1.78                 | 2.63                    | 0.89                     |
| CM-Ab-100228-22 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7034A (130mm) | Against phantom | HLN6875A Belt clip | HMN4104A               | 6.67              | -0.42          | 4.64                | 1.72                 | 2.56                    | 0.95                     |
| <b>CM-Ab-100228-23 / QOPLT00M</b>   | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7034A (130mm) | Against phantom | HLN6875A Belt clip | HMN4104A               | 6.55              | -0.697         | 6.21                | 2.09                 | 3.67                    | 1.24                     |

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

**Assessment of the offered antenna PMAT4001A, battery NNTN7034A and audio cable PMLN5101A:**

All possible accessory combinations, belt clips (NTN8266B & HLN6875A) were tested with antenna PMAT4001A, battery NNTN7034A, and audio cable PMLN5101A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 15.0 - VHF Assessment of the offered antenna PMAT4001A, battery NNTN7034A, and audio cable PMLN5101A.

**TABLE 26**

| 150.8-173.4 MHz 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 with battery NNTN7034A, belt clip NTN8266B and audio PMLN5101A</b> |                                   |            |                   |                 |                    |                        |                   |                |                     |                      |                         |                          |
| MeC-Ab-100301-06 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7034A (130mm) | Against phantom | NTN8266B belt clip | PMLN5101A              | 6.57              | -0.0583        | 1.66                | 1.08                 | 0.85                    | 0.55                     |
| MeC-Ab-100301-07 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7034A (130mm) | Against phantom | NTN8266B belt clip | PMLN5101A              | 6.58              | 0.254          | 1.14                | 0.814                | 0.57                    | 0.41                     |
| MeC-Ab-100301-08 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7034A (130mm) | Against phantom | NTN8266B belt clip | PMLN5101A              | 6.5               | 0.232          | 1.32                | 0.919                | 0.67                    | 0.47                     |
| MeC-Ab-100301-09 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7034A (130mm) | Against phantom | NTN8266B belt clip | PMLN5101A              | 6.53              | -0.552         | 1.43                | 0.956                | 0.82                    | 0.55                     |
| <b>JsT-Ab-100301-10 / QOPLT00M</b>   | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7034A (130mm) | Against phantom | NTN8266B belt clip | PMLN5101A              | 6.52              | -0.543         | 1.80                | 1.18                 | 1.03                    | 0.68                     |
| <b>Assessment with battery NNTN7034A, belt clip HLN6875A and audio PMLN5101A</b> |                                   |            |                   |                 |                    |                        |                   |                |                     |                      |                         |                          |
| JsT-Ab-100301-13 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7034A (130mm) | Against phantom | HLN6875A Belt clip | PMLN5101A              | 6.57              | -0.11          | 1.38                | 0.637                | 0.71                    | 0.33                     |
| JsT-Ab-100301-14 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7034A (130mm) | Against phantom | HLN6875A Belt clip | PMLN5101A              | 6.56              | -0.136         | 1.15                | 0.526                | 0.60                    | 0.27                     |
| JsT-Ab-100301-15 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7034A (130mm) | Against phantom | HLN6875A Belt clip | PMLN5101A              | 6.63              | 0.257          | 1.29                | 0.593                | 0.65                    | 0.30                     |
| JsT-Ab-100301-16 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7034A (130mm) | Against phantom | HLN6875A Belt clip | PMLN5101A              | 6.57              | -0.307         | 1.42                | 0.634                | 0.77                    | 0.34                     |
| <b>JsT-Ab-100301-17 / QOPLT00M</b>   | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7034A (130mm) | Against phantom | HLN6875A Belt clip | PMLN5101A              | 6.58              | -0.52          | 1.68                | 0.75                 | 0.95                    | 0.42                     |

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

**Assessment of the offered antenna PMAT4001A, battery NNTN7038A and audio cable HMN4104A:**

All possible accessory combinations, belt clips (NTN8266B & HLN6875A) were tested with antenna PMAT4001A, battery NNTN7038A, and audio cable HMN4104A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 16.0 – VHF Assessment of the offered antenna PMAT4001A, battery NNTN7038A, and audio cable HMN4104A.

**TABLE 27**

| 150.8-173.4 MHz 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 with battery NNTN7038A, belt clip NTN8266B and audio HMN4104A</b> |                                   |            |                  |                 |                    |                        |                   |                |                     |                      |                         |                          |
| CM-Ab-100301-20 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7038A (85mm) | Against phantom | NTN8266B belt clip | HMN4104A               | 6.65              | -0.0649        | 1.14                | 0.728                | 0.58                    | 0.37                     |
| CM-Ab-100301-21 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7038A (85mm) | Against phantom | NTN8266B belt clip | HMN4104A               | 6.65              | 0.0307         | 1.14                | 0.756                | 0.57                    | 0.38                     |
| CM-Ab-100301-23 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7038A (85mm) | Against phantom | NTN8266B belt clip | HMN4104A               | 6.69              | 0.247          | 1.37                | 0.92                 | 0.69                    | 0.46                     |
| CM-Ab-100301-24 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7038A (85mm) | Against phantom | NTN8266B belt clip | HMN4104A               | 6.53              | -0.605         | 1.33                | 0.894                | 0.77                    | 0.52                     |
| <b>CM-Ab-100301-25 / QOPLT00M</b>   | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7038A (85mm) | Against phantom | NTN8266B belt clip | HMN4104A               | 6.61              | -0.669         | 1.62                | 1.09                 | 0.94                    | 0.64                     |
| <b>Assessment with battery NNTN7038A, belt clip HLN6875A and audio HMN4104A</b> |                                   |            |                  |                 |                    |                        |                   |                |                     |                      |                         |                          |
| JsT-Ab-100309-07 / QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7038A (85mm) | Against phantom | HLN6875A Belt clip | HMN4104A               | 6.56              | -0.175         | 3.93                | 1.39                 | 2.06                    | 0.73                     |
| JsT-Ab-100309-09 / QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7038A (85mm) | Against phantom | HLN6875A Belt clip | HMN4104A               | 6.65              | -0.0709        | 3.15                | 1.13                 | 1.60                    | 0.57                     |
| JsT-Ab-100309-10 / QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7038A (85mm) | Against phantom | HLN6875A Belt clip | HMN4104A               | 6.7               | 0.179          | 3.47                | 1.23                 | 1.74                    | 0.615                    |
| JsT-Ab-100309-11 / QOPLT00M   | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7038A (85mm) | Against phantom | HLN6875A Belt clip | HMN4104A               | 6.68              | -0.284         | 3.55                | 1.26                 | 1.89                    | 0.673                    |
| <b>JsT-Ab-100309-12 / QOPLT00M</b>  | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7038A (85mm) | Against phantom | HLN6875A Belt clip | HMN4104A               | 6.63              | -0.645         | 3.65                | 1.30                 | 2.12                    | 0.75                     |

Assessments at the Body (CW mode)

Assessment of the offered antenna PMAT4001A, battery NNTN7038A and audio cable PMLN5101A:

All possible accessory combinations, belt clips (NTN8266B & HLN6875A) were tested with antenna PMAT4001A, battery NNTN7038A, and audio cable PMLN5101A across 5 frequency test channels. The highest SAR results (bolded) from the table below are included in APPENDIX F Section 17.0 – VHF Assessment of the offered antenna PMAT4001A, battery NNTN7038A, and audio cable PMLN5101A.

TABLE 28

| 150.8-173.4 MHz 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 with battery NNTN7038A, belt clip NTN8266B and audio PMLN5101A</b> |                                   |            |                  |                 |                    |                        |                   |                |                     |                      |                         |                          |
| JsT-Ab-100302-17 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7038A (85mm) | Against phantom | NTN8266B belt clip | PMLN5101A              | 6.69              | -0.271         | 2.04                | 1.21                 | 1.09                    | 0.64                     |
| JsT-Ab-100302-18 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7038A (85mm) | Against phantom | NTN8266B belt clip | PMLN5101A              | 6.68              | -0.0684        | 1.78                | 1.06                 | 0.90                    | 0.54                     |
| JsT-Ab-100302-19 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7038A (85mm) | Against phantom | NTN8266B belt clip | PMLN5101A              | 6.72              | 0.218          | 1.98                | 1.20                 | 0.99                    | 0.60                     |
| CM-Ab-100302-20 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7038A (85mm) | Against phantom | NTN8266B belt clip | PMLN5101A              | 6.55              | -0.588         | 1.81                | 1.09                 | 1.04                    | 0.63                     |
| <b>CM-Ab-100302-21 / Q0PLT00M</b>  | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7038A (85mm) | Against phantom | NTN8266B belt clip | PMLN5101A              | 6.5               | -0.58          | 1.97                | 1.45                 | 1.14                    | 0.84                     |
| <b>Assessment with battery NNTN7038A, belt clip HLN6875A and audio PMLN5101A</b> |                                   |            |                  |                 |                    |                        |                   |                |                     |                      |                         |                          |
| JsT-Ab-100302-10 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7038A (85mm) | Against phantom | HLN6875A Belt clip | PMLN5101A              | 6.56              | -0.247         | 2.65                | 0.985                | 1.41                    | 0.52                     |
| JsT-Ab-100302-11 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7038A (85mm) | Against phantom | HLN6875A Belt clip | PMLN5101A              | 6.57              | -0.0687        | 1.89                | 0.729                | 0.96                    | 0.37                     |
| JsT-Ab-100302-12 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7038A (85mm) | Against phantom | HLN6875A Belt clip | PMLN5101A              | 6.63              | 0.208          | 2.04                | 0.80                 | 1.02                    | 0.40                     |
| JsT-Ab-100302-13 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7038A (85mm) | Against phantom | HLN6875A Belt clip | PMLN5101A              | 6.61              | -0.128         | 2.49                | 0.946                | 1.28                    | 0.49                     |
| <b>JsT-Ab-100302-14 / Q0PLT00M</b>   | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7038A (85mm) | Against phantom | HLN6875A Belt clip | PMLN5101A              | 6.58              | -0.626         | 3.01                | 1.08                 | 1.74                    | 0.63                     |

**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 configurations from table 25 (antenna PMAT4001A and audio HMN4104A). The highest SAR result (bolded) from the table below is provided in APPENDIX F Section 18.0 - 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 29**

| 150.8-173.4 MHz 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-100304-11 / Q0PLT00M</b>      | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7034A (130mm) | Back - Ant at 2.5cm  | None       | HMN4104A               | 6.52              | -0.371         | 2.31                | 1.70                 | 1.27                    | 0.94                     |
| MeC-Ab-100304-13 / Q0PLT00M              | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7034A (130mm) | Front-Radio at 2.5cm | None       | HMN4104A               | 6.5               | -0.644         | 1.19                | 0.904                | 0.70                    | 0.53                     |

Assessments at the Face (CW mode)

Assessment of the offered antenna PMAT4001A and battery NNTN7034A:

The antenna PMAT4001A and battery NNTN7034A were tested across 5 frequency test channels 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 19.0 - VHF Assessment at the face with antenna PMAT4001A and battery NNTN7034A.

TABLE 30

| 150.8-173.4 MHz 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 of antenna PMAT4001A and battery NNTN7034A with Back of DUT @ 2.5cm</b>  |                                   |            |                   |                      |            |                        |                   |                |                     |                      |                         |                          |
| CM-Face-100302-25 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 6.57              | -0.21          | 1.21                | 0.936                | 0.64                    | 0.49                     |
| CM-Face-100302-26 / Q0PLT00M   | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 6.65              | -0.179         | 0.972               | 0.751                | 0.51                    | 0.39                     |
| JsT-Face-100303-03 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 6.63              | 0.187          | 1.08                | 0.833                | 0.54                    | 0.42                     |
| JsT-Face-100303-04 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 6.57              | -0.251         | 1.20                | 0.921                | 0.64                    | 0.49                     |
| <b>JsT-Face-100303-05 / Q0PLT00M</b>   | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7034A (130mm) | Back of DUT @ 2.5cm  | None       | None                   | 6.55              | -0.672         | 1.34                | 1.03                 | 0.79                    | 0.61                     |
| <b>Assessment of antenna PMAT4001A and battery NNTN7034A with Front of DUT @ 2.5cm</b> |                                   |            |                   |                      |            |                        |                   |                |                     |                      |                         |                          |
| MeC-Face-100303-15 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 6.64              | -0.341         | 1.18                | 0.915                | 0.64                    | 0.49                     |
| MeC-Face-100303-16 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 6.6               | -0.658         | 0.905               | 0.708                | 0.53                    | 0.41                     |
| MeC-Face-100303-17 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 6.62              | -0.0336        | 1.06                | 0.817                | 0.53                    | 0.41                     |
| MeC-Face-100303-18 / Q0PLT00M  | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 6.59              | -0.228         | 1.25                | 0.97                 | 0.66                    | 0.51                     |
| <b>JsT-Face-100304-02 / Q0PLT00M</b>   | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7034A (130mm) | Front of DUT @ 2.5cm | None       | None                   | 6.52              | -0.689         | 1.35                | 1.03                 | 0.80                    | 0.61                     |

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

**Assessment of the offered antenna PMAT4001A and battery NNTN7038A:**

The antenna PMAT4001A and battery NNTN7038A were tested across 5 frequency test channels 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 20.0 - VHF Assessment at the face with antenna PMAT4001 and battery NNTN7038A.

**TABLE 31**

| 150.8-173.4 MHz 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 of antenna PMAT4001A and battery NNTN7038A with Back of DUT @ 2.5cm</b>  |                                   |            |                  |                      |            |                        |                   |                |                     |                      |                         |                          |
| JsT-Face-100303-08 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 6.72              | -0.691         | 1.12                | 0.87                 | 0.66                    | 0.51                     |
| JsT-Face-100303-09 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 6.68              | -0.279         | 1                   | 0.776                | 0.53                    | 0.41                     |
| JsT-Face-100303-10 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 6.72              | 0.113          | 1.09                | 0.841                | 0.55                    | 0.42                     |
| JsT-Face-100303-11 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 6.68              | -0.196         | 1.27                | 0.983                | 0.66                    | 0.51                     |
| <b>MeC-Face-100303-12 / QOPLT00M</b>   | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7038A (85mm) | Back of DUT @ 2.5cm  | None       | None                   | 6.61              | -0.802         | 1.32                | 1.01                 | 0.79                    | 0.61                     |
| <b>Assessment of antenna PMAT4001A and battery NNTN7038A with Front of DUT @ 2.5cm</b> |                                   |            |                  |                      |            |                        |                   |                |                     |                      |                         |                          |
| JsT-Face-100304-05 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 150.8      | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 6.6               | -0.76          | 1.07                | 0.826                | 0.64                    | 0.49                     |
| JsT-Face-100304-06 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 155        | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 6.6               | -0.252         | 0.978               | 0.753                | 0.52                    | 0.40                     |
| JsT-Face-100304-07 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 161.3      | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 6.65              | 0.101          | 1.08                | 0.828                | 0.54                    | 0.41                     |
| JsT-Face-100304-08 / QOPLT00M  | PMAT4001A (136-174, 380-520, GPS) | 167.7      | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 6.63              | -0.0126        | 1.26                | 0.97                 | 0.63                    | 0.49                     |
| <b>JsT-Face-100304-09 / QOPLT00M</b>   | PMAT4001A (136-174, 380-520, GPS) | 173.4      | NNTN7038A (85mm) | Front of DUT @ 2.5cm | None       | None                   | 6.58              | -0.694         | 1.32                | 1.01                 | 0.78                    | 0.59                     |

### 13.3 Shorten Scan Assessment

**Short scan assessment of the overall SAR highest configuration (UHF TABLE 13 pg 18)** 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 32**

| Shorten scan                        |                             |                |                      |                    |                       |                           |                         |                      |                            |                            |                                  |                                   |
|-------------------------------------|-----------------------------|----------------|----------------------|--------------------|-----------------------|---------------------------|-------------------------|----------------------|----------------------------|----------------------------|----------------------------------|-----------------------------------|
| Run Number/<br>SN                   | Antenna                     | Freq.<br>(MHz) | Battery              | Test<br>position   | Carry Case            | Additional<br>attachments | Initial<br>Power<br>(W) | SAR<br>Drift<br>(dB) | Meas. 1g-<br>SAR<br>(W/kg) | Meas.<br>10g-SAR<br>(W/kg) | Max<br>Calc.1g-<br>SAR<br>(W/kg) | Max<br>Calc.10g-<br>SAR<br>(W/kg) |
| <b>*HvH-Ab-100222-05 / Q0PLT00M</b> | PMAE4065A<br>(380-520, GPS) | 502.5          | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>belt clip | PMLN5101A                 | 5.54                    | -0.292               | 11.1                       | 6.7                        | 6.00                             | 3.62                              |
| <b>*MeC-Ab-100305-11 / Q0PLT00M</b> | PMAE4065A<br>(380-520, GPS) | 502.5          | NNTN7034A<br>(130mm) | Against<br>phantom | NTN8266B<br>Belt clip | PMLN5101A                 | 5.50                    | -0.0926              | 11.0                       | 6.58                       | 5.72                             | 3.42                              |

### 14.0 Conclusion:

The highest Operational Maximum Calculated 1-gram and 10-gram average SAR values found for FCC ID: AZ489FT4893 model H97TGD9PW1AN (with QA00570AA and QA00576AA).

**Max. Calc.: 1-g Avg. SAR: 6.00W/kg (Body); 10-g Avg. SAR: 3.62W/kg (Body)**  
**Max. Calc.: 1-g Avg. SAR: 2.78W/kg (Face); 10-g Avg. SAR: 2.09W/kg (Face)**

The test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of **8W/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 A1: Uncertainty Budget for Device Under Test, for 100MHz to 800MHz**  
**Uncertainty Budget for Device Under Test, for 100 MHz to 800 MHz**

| <i>a</i>  | <i>b</i>          | <i>c</i>   | <i>d</i>  | $e = f(d,k)$ | <i>f</i>    | <i>g</i>     | $h = c \times f / e$ | $i = c \times g / e$ | <i>k</i> |
|---|-------------------|------------|-----------|--------------|-------------|--------------|----------------------|----------------------|----------|
| Uncertainty Component                                 | IEEE 1528 section | Tol. (± %) | Prob Dist | Div.         | $c_i$ (1 g) | $c_i$ (10 g) | 1 g $u_i$ (±%)       | 10 g $u_i$ (±%)      | $v_i$    |
| <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</b><br>(95% CONFIDENCE LEVEL) |                   |            | $k=2$     |              |             |              | 27                   | 27                   |          |

FCD-0558, Rev.7

**Table A2: 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

**APPENDIX B**  
**Probe Calibration Certificates**

**Calibration Laboratory of  
Schmid & Partner  
Engineering AG**  
Zeughausstrasse 43, 8004 Zurich, Switzerland



**S** Schweizerischer Kalibrierdienst  
**S** Service suisse d'étalonnage  
**C** Servizio svizzero di taratura  
**S** Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola Plantation EME Lab**

Certificate No: **ES3-3007\_Mar09**

**CALIBRATION CERTIFICATE**

Object **ES3DV2 - SN:3007**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-12.v5, QA CAL-14.v3 and QA CAL-23.v3  
Calibration procedure for dosimetric E-field probes**

Calibration date: **March 12, 2009**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #            | Cal Date (Certificate No.)        | Scheduled Calibration  |
|----------------------------|-----------------|-----------------------------------|------------------------|
| Power meter E4419B         | GB41293874      | 1-Apr-08 (No. 217-00789)          | Apr-09                 |
| Power sensor E4412A        | MY41495277      | 1-Apr-08 (No. 217-00788)          | Apr-09                 |
| Power sensor E4412A        | MY41498087      | 1-Apr-08 (No. 217-00788)          | Apr-09                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 1-Jul-08 (No. 217-00865)          | Jul-09                 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 31-Mar-08 (No. 217-00787)         | Apr-09                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 1-Jul-08 (No. 217-00866)          | Jul-09                 |
| Reference Probe ES3DV2     | SN: 3013        | 2-Jan-09 (No. ES3-3013_Jan09)     | Jan-10                 |
| DAE4                       | SN: 660         | 9-Sep-08 (No. DAE4-660_Sep08)     | Sep-09                 |
| Secondary Standards        | ID #            | Check Date (in house)             | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (in house check Oct-07)  | In house check: Oct-09 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (in house check Oct-08) | In house check: Oct-09 |

|                | Name          | Function          | Signature |
|----------------|---------------|-------------------|-----------|
| Calibrated by: | Katja Pokovic | Technical Manager |           |
| Approved by:   | Fin Bomholt   | R&D Director      |           |

Issued: March 16, 2009

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

**Calibration Laboratory of  
Schmid & Partner  
Engineering AG**  
Zoughausstrasse 43, 8004 Zurich, Switzerland



**S** Schweizerischer Kallbrierdienst  
**S** Service suisse d'étalonnage  
**C** Servizio svizzero di taratura  
**S** Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

### Glossary:

|                          |  |
|--------------------------|--|
| TSL                      | tissue simulating liquid   |
| NORM <sub>x,y,z</sub>    | sensitivity in free space  |
| ConvF                    | sensitivity in TSL / NORM <sub>x,y,z</sub>   |
| DCP                      | diode compression point  |
| Polarization $\varphi$   | $\varphi$ rotation around probe axis   |
| Polarization $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

### Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not effect the E<sup>2</sup>-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* *frequency\_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

**ES3DV2 SN:3007**

**March 12, 2009**

# Probe ES3DV2

## SN:3007

|                  |                  |
|------------------|------------------|
| Manufactured:    | October 22, 1999 |
| Last calibrated: | April 23, 2008   |
| Recalibrated:    | March 12, 2009   |

**Calibrated for DASYS Systems**

**(Note: non-compatible with DASYS2 system!)**

ES3DV2 SN:3007

March 12, 2009

### DASY - Parameters of Probe: ES3DV2 SN:3007

| Sensitivity in Free Space <sup>A</sup> |              |                       | Diode Compression <sup>B</sup> |       |
|--|--------------|-----------------------|--------------------------------|-------|
| NormX                                  | 1.74 ± 10.1% | μV/(V/m) <sup>2</sup> | DCP X                          | 91 mV |
| NormY                                  | 1.81 ± 10.1% | μV/(V/m) <sup>2</sup> | DCP Y                          | 92 mV |
| NormZ                                  | 1.25 ± 10.1% | μV/(V/m) <sup>2</sup> | DCP Z                          | 94 mV |

### Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

### Boundary Effect

| TSL | 900 MHz  | Typical SAR gradient: 5 % per mm |        |
|-----|--|----------------------------------|--------|
|     | Sensor Center to Phantom Surface Distance          | 3.0 mm                           | 4.0 mm |
|     | SAR <sub>be</sub> [%] Without Correction Algorithm | 7.5                              | 4.6    |
|     | SAR <sub>be</sub> [%] With Correction Algorithm    | 0.8                              | 0.3    |

| TSL | 1810 MHz   | Typical SAR gradient: 10 % per mm |        |
|-----|--|-----------------------------------|--------|
|     | Sensor Center to Phantom Surface Distance          | 3.0 mm                            | 4.0 mm |
|     | SAR <sub>be</sub> [%] Without Correction Algorithm | 9.7                               | 7.1    |
|     | SAR <sub>be</sub> [%] With Correction Algorithm    | 0.9                               | 0.5    |

### Sensor Offset

Probe Tip to Sensor Center **2.7 mm**

**The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.**

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

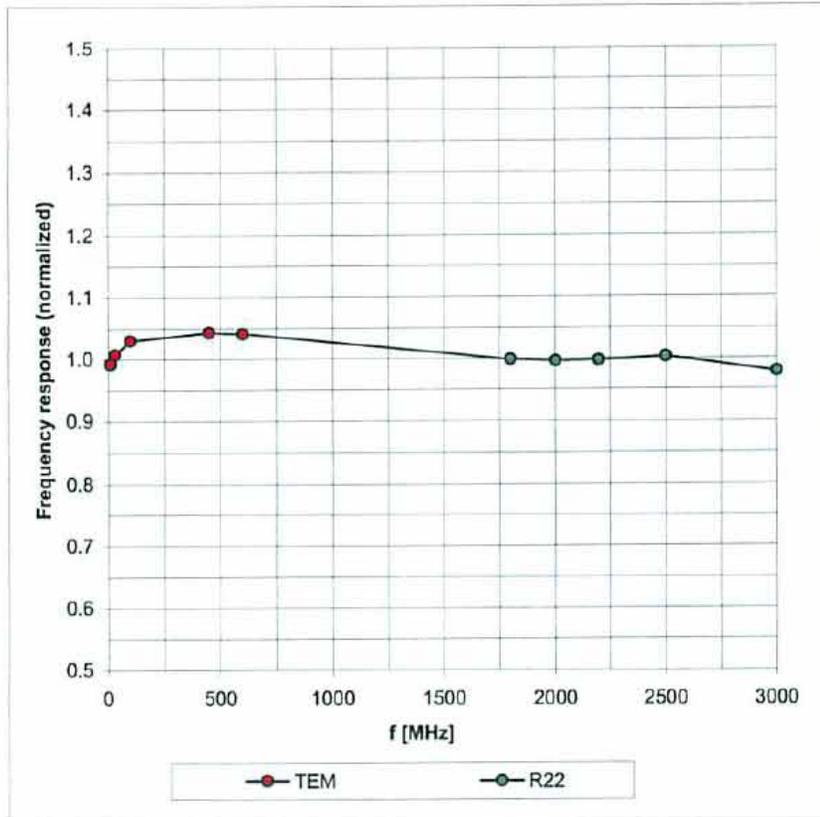
<sup>B</sup> Numerical linearization parameter: uncertainty not required.

ES3DV2 SN:3007

March 12, 2009

### Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)

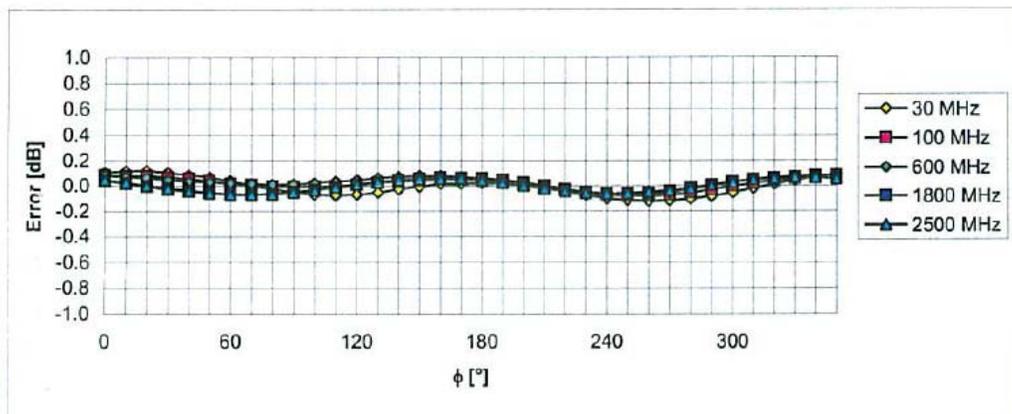
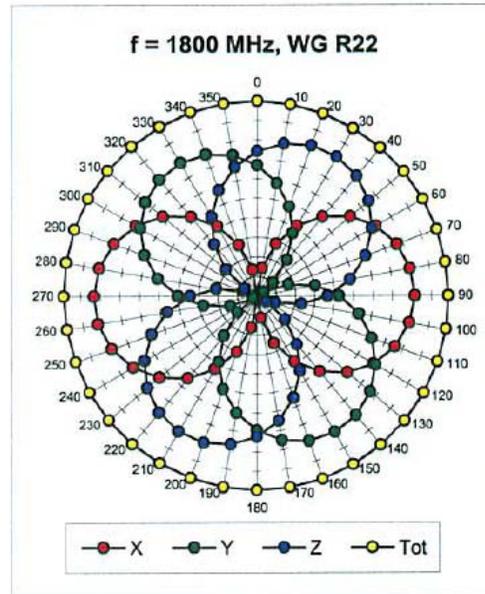
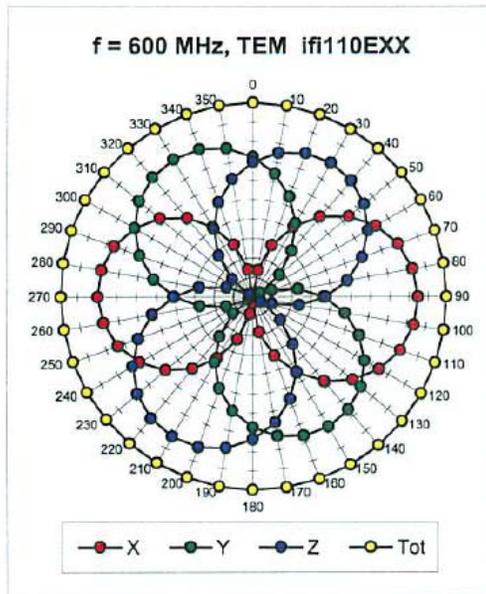


Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  (k=2)

ES3DV2 SN:3007

March 12, 2009

### Receiving Pattern ( $\phi$ ), $\vartheta = 0^\circ$

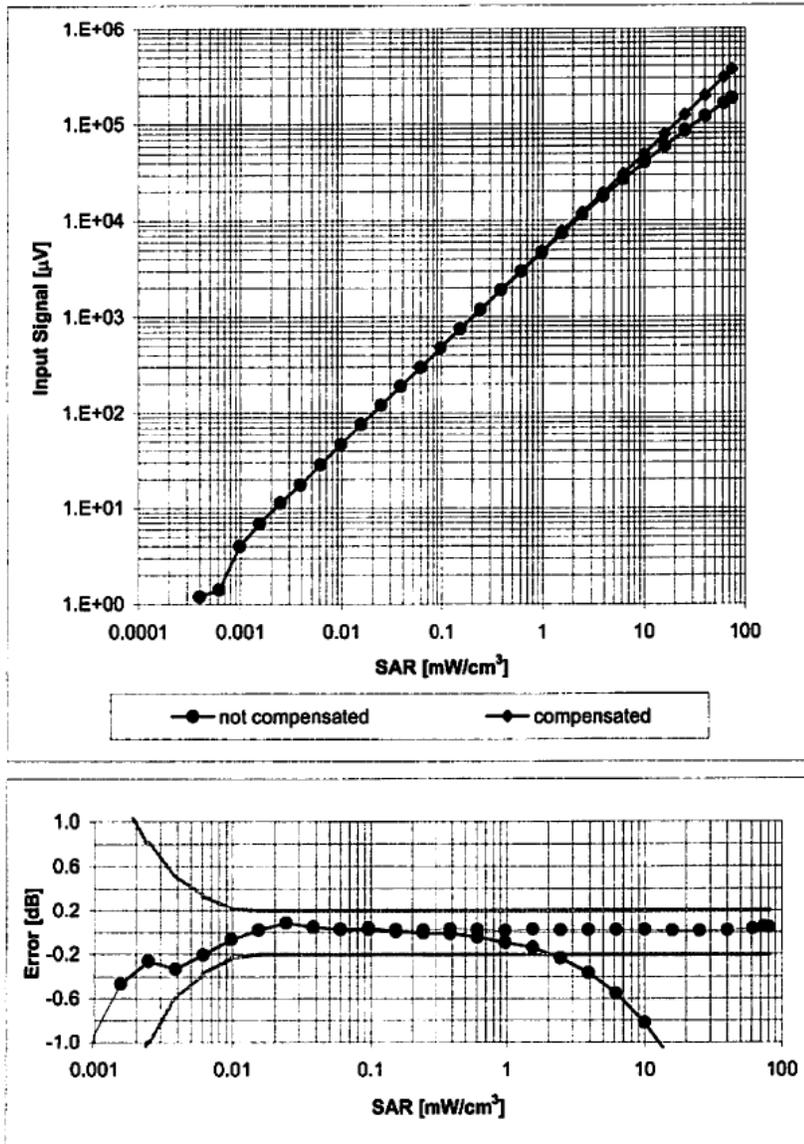


Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

ES3DV2 SN:3007

March 12, 2009

### Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800 \text{ MHz}$ )



Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

ES3DV2 SN:3007

March 12, 2009

### Conversion Factor Assessment

| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 450     | ± 50 / ± 100                | Head | 43.5 ± 5%    | 0.87 ± 5%    | 0.31  | 1.61  | 6.76 ± 13.3% (k=2) |
| 750     | ± 50 / ± 100                | Head | 41.9 ± 5%    | 0.89 ± 5%    | 0.97  | 1.23  | 6.29 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 5%    | 0.57  | 1.49  | 6.04 ± 11.0% (k=2) |
| 1810    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.26  | 2.57  | 5.13 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 102                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.40  | 1.95  | 4.93 ± 11.0% (k=2) |
| 2300    | ± 50 / ± 105                | Head | 39.4 ± 5%    | 1.71 ± 5%    | 0.36  | 2.14  | 4.80 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 106                | Head | 39.2 ± 5%    | 1.80 ± 5%    | 0.36  | 2.15  | 4.52 ± 11.0% (k=2) |
| 2600    | ± 50 / ± 107                | Head | 39.0 ± 5%    | 1.96 ± 5%    | 0.50  | 1.88  | 4.43 ± 11.0% (k=2) |
| 3500    | ± 50 / ± 108                | Head | 37.9 ± 5%    | 2.91 ± 5%    | 0.80  | 1.40  | 3.88 ± 13.1% (k=2) |
| 3700    | ± 50 / ± 109                | Head | 37.7 ± 5%    | 3.12 ± 5%    | 0.80  | 1.40  | 3.53 ± 13.1% (k=2) |
|         |                             |      |              |              |       |       |                    |
| 450     | ± 50 / ± 100                | Body | 56.7 ± 5%    | 0.94 ± 5%    | 0.22  | 1.53  | 7.19 ± 13.3% (k=2) |
| 750     | ± 50 / ± 100                | Body | 55.5 ± 5%    | 0.96 ± 5%    | 0.87  | 1.26  | 6.10 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Body | 55.0 ± 5%    | 1.05 ± 5%    | 0.95  | 1.27  | 6.02 ± 11.0% (k=2) |
| 1810    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.92  | 1.28  | 4.82 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.70  | 1.48  | 4.73 ± 11.0% (k=2) |
| 2300    | ± 50 / ± 100                | Body | 52.8 ± 5%    | 1.85 ± 5%    | 0.99  | 1.35  | 4.22 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Body | 52.7 ± 5%    | 1.95 ± 5%    | 0.99  | 1.22  | 4.02 ± 11.0% (k=2) |
| 2600    | ± 50 / ± 100                | Body | 52.5 ± 5%    | 2.16 ± 5%    | 0.99  | 1.27  | 3.90 ± 11.0% (k=2) |
| 3500    | ± 50 / ± 100                | Body | 51.3 ± 5%    | 3.31 ± 5%    | 0.80  | 1.50  | 3.37 ± 13.1% (k=2) |
| 3700    | ± 50 / ± 100                | Body | 51.0 ± 5%    | 3.55 ± 5%    | 0.80  | 1.60  | 3.10 ± 13.1% (k=2) |

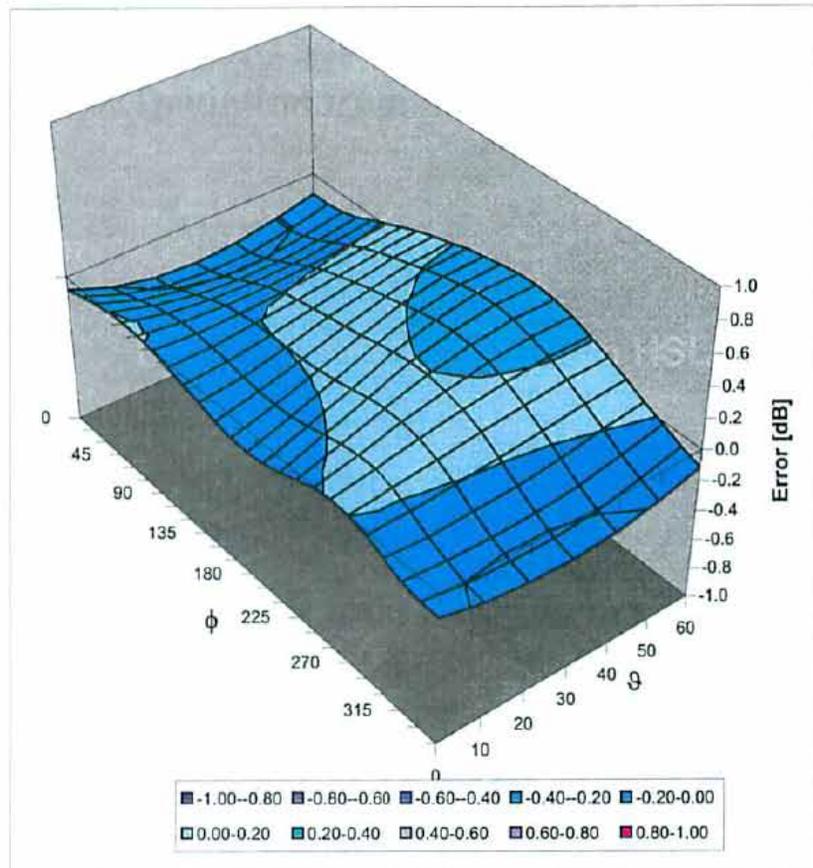
<sup>c</sup> The validity of ± 100 MHz only applies for DASYS v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ES3DV2 SN:3007

March 12, 2009

### Deviation from Isotropy in HSL

Error ( $\phi, \theta$ ),  $f = 900$  MHz



Uncertainty of Spherical Isotropy Assessment:  $\pm 2.6\%$  ( $k=2$ )

Schmid & Partner Engineering AG

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Phone +41 44 245 9700, Fax +41 44 245 9779  
info@speag.com, http://www.speag.com

### **Additional Conversion Factors for Dosimetric E-Field Probe**

Type:

**ES3DV2**

Serial Number:

**3007**

Place of Assessment:

**Zurich**

Date of Assessment:

**March 16, 2009**

Probe Calibration Date:

**March 12, 2009**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1810 MHz.

Assessed by:



Schmid & Partner Engineering AG

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 Phone +41 44 245 9700, Fax +41 44 245 9779  
 info@speag.com, http://www.speag.com

**Dosimetric E-Field Probe ES3DV2 SN:3007**

Conversion factor ( $\pm$  standard deviation)

|         |              |               |   |
|---------|--------------|---------------|---|
| 150 MHz | <i>ConvF</i> | 8.2 $\pm$ 10% | $\epsilon_r = 52.3$<br>$\sigma = 0.76$ mho/m<br>(head tissue) |
| 250 MHz | <i>ConvF</i> | 7.5 $\pm$ 10% | $\epsilon_r = 47.6$<br>$\sigma = 0.83$ mho/m<br>(head tissue) |
| 300 MHz | <i>ConvF</i> | 7.4 $\pm$ 9%  | $\epsilon_r = 45.3$<br>$\sigma = 0.87$ mho/m<br>(head tissue) |
| 150 MHz | <i>ConvF</i> | 7.9 $\pm$ 10% | $\epsilon_r = 61.9$<br>$\sigma = 0.80$ mho/m<br>(body tissue) |
| 250 MHz | <i>ConvF</i> | 7.5 $\pm$ 10% | $\epsilon_r = 59.4$<br>$\sigma = 0.88$ mho/m<br>(body tissue) |
| 300 MHz | <i>ConvF</i> | 7.4 $\pm$ 9%  | $\epsilon_r = 58.2$<br>$\sigma = 0.92$ mho/m<br>(body tissue) |

**Important Note:**

**For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.**

**Please see also Section 4.7 of the DASY4 Manual.**

**Calibration Laboratory of  
Schmid & Partner  
Engineering AG**  
Zeughausstrasse 43, 8004 Zurich, Switzerland



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**S** Servizio svizzero di taratura  
**S** Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola Plantation EME Lab**

Certificate No: **ES3-3006\_May09**

**CALIBRATION CERTIFICATE**

Object **ES3DV2 - SN:3006**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-12.v5, QA CAL-14.v3 and QA CAL-23.v3  
Calibration procedure for dosimetric E-field probes**

Calibration date: **May 19, 2009**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #            | Cal Date (Certificate No.)        | Scheduled Calibration  |
|----------------------------|-----------------|-----------------------------------|------------------------|
| Power meter E4419B         | GB41293874      | 1-Apr-09 (No. 217-01030)          | Apr-10                 |
| Power sensor E4412A        | MY41495277      | 1-Apr-09 (No. 217-01030)          | Apr-10                 |
| Power sensor E4412A        | MY41498087      | 1-Apr-09 (No. 217-01030)          | Apr-10                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 31-Mar-09 (No. 217-01026)         | Mar-10                 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 31-Mar-09 (No. 217-01028)         | Mar-10                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 31-Mar-09 (No. 217-01027)         | Mar-10                 |
| Reference Probe ES3DV2     | SN: 3013        | 2-Jan-09 (No. ES3-3013_Jan09)     | Jan-10                 |
| DAE4                       | SN: 660         | 9-Sep-08 (No. DAE4-660_Sep08)     | Sep-09                 |
| Secondary Standards        | ID #            | Check Date (in house)             | Scheduled Check        |
| Rf generator HP 8648C      | US3642U01700    | 4-Aug-99 (in house check Oct-07)  | In house check: Oct-09 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (in house check Oct-08) | In house check: Oct-09 |

|                |               |                   |                  |
|----------------|---------------|-------------------|------------------|
|                | <b>Name</b>   | <b>Function</b>   | <b>Signature</b> |
| Calibrated by: | Katja Pokovic | Technical Manager |                  |
| Approved by:   | Niels Kuster  | Quality Manager   |                  |

Issued: May 20, 2009

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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**S** Service suisse d'étalonnage  
**C** Servizio svizzero di taratura  
**S** Swiss Calibration Service

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The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

**Glossary:**

|                       |  |
|-----------------------|--|
| TSL                   | tissue simulating liquid   |
| NORM <sub>x,y,z</sub> | sensitivity in free space  |
| ConvF                 | sensitivity in TSL / NORM <sub>x,y,z</sub>   |
| DCP                   | diode compression point  |
| Polarization φ        | φ rotation around probe axis   |
| Polarization ϑ        | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis |

**Calibration is Performed According to the Following Standards:**

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

**Methods Applied and Interpretation of Parameters:**

- **NORM<sub>x,y,z</sub>**: Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not effect the E<sup>2</sup>-field uncertainty inside TSL (see below *ConvF*).
- **NORM(f)<sub>x,y,z</sub> = NORM<sub>x,y,z</sub> \* frequency\_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- **DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- **ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- **Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- **Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

**ES3DV2 SN:3006**

**May 19, 2009**

# Probe ES3DV2

## SN:3006

|                  |                  |
|------------------|------------------|
| Manufactured:    | October 22, 1999 |
| Last calibrated: | May 15, 2008     |
| Recalibrated:    | May 19, 2009     |

**Calibrated for DASY Systems**

(Note: non-compatible with DASY2 system!)

ES3DV2 SN:3006

May 19, 2009

### DASY - Parameters of Probe: ES3DV2 SN:3006

#### Sensitivity in Free Space<sup>A</sup>

#### Diode Compression<sup>B</sup>

|       |              |                 |       |       |
|-------|--------------|-----------------|-------|-------|
| NormX | 1.77 ± 10.1% | $\mu V/(V/m)^2$ | DCP X | 92 mV |
| NormY | 1.36 ± 10.1% | $\mu V/(V/m)^2$ | DCP Y | 90 mV |
| NormZ | 1.70 ± 10.1% | $\mu V/(V/m)^2$ | DCP Z | 92 mV |

#### Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

#### Boundary Effect

|            |  |  |               |  |
|------------|--|--|---------------|--|
| <b>TSL</b> | <b>900 MHz</b>                                     | <b>Typical SAR gradient: 5 % per mm</b>  |               |  |
|            | Sensor Center to Phantom Surface Distance          | <b>3.7 mm</b>                            | <b>4.7 mm</b> |  |
|            | SAR <sub>be</sub> [%] Without Correction Algorithm | 7.9                                      | 5.0           |  |
|            | SAR <sub>be</sub> [%] With Correction Algorithm    | 0.9                                      | 0.7           |  |
| <b>TSL</b> | <b>1810 MHz</b>                                    | <b>Typical SAR gradient: 10 % per mm</b> |               |  |
|            | Sensor Center to Phantom Surface Distance          | <b>3.7 mm</b>                            | <b>4.7 mm</b> |  |
|            | SAR <sub>be</sub> [%] Without Correction Algorithm | 8.9                                      | 5.9           |  |
|            | SAR <sub>be</sub> [%] With Correction Algorithm    | 0.7                                      | 0.2           |  |

#### Sensor Offset

Probe Tip to Sensor Center **2.7 mm**

**The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.**

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

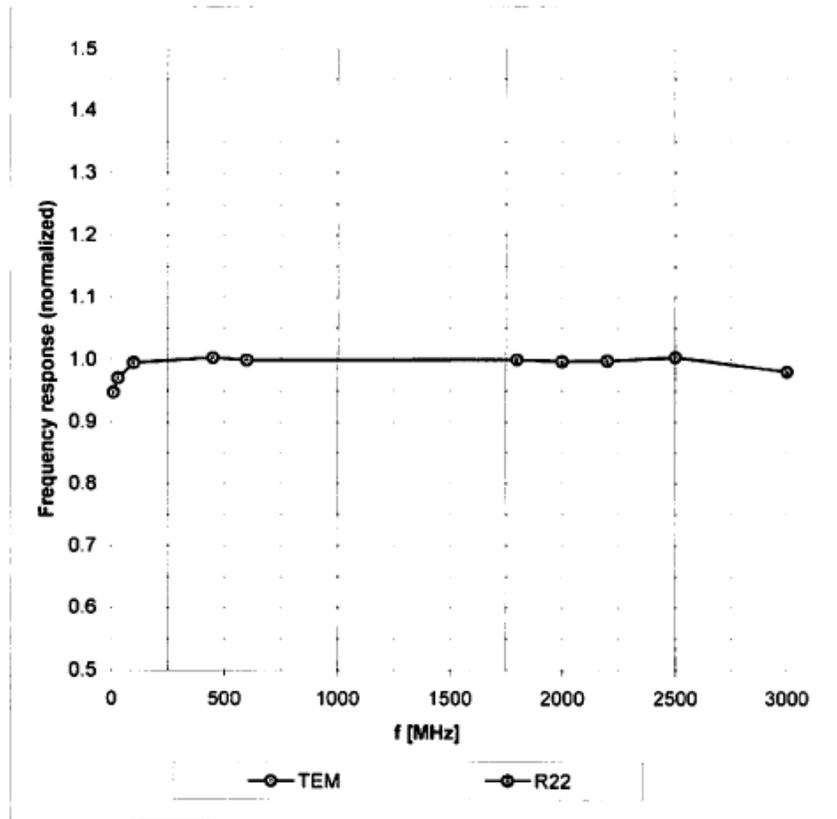
<sup>B</sup> Numerical linearization parameter: uncertainty not required.

ES3DV2 SN:3006

May 19, 2009

### Frequency Response of E-Field

(TEM-Cell: ifi110 EXX, Waveguide: R22)

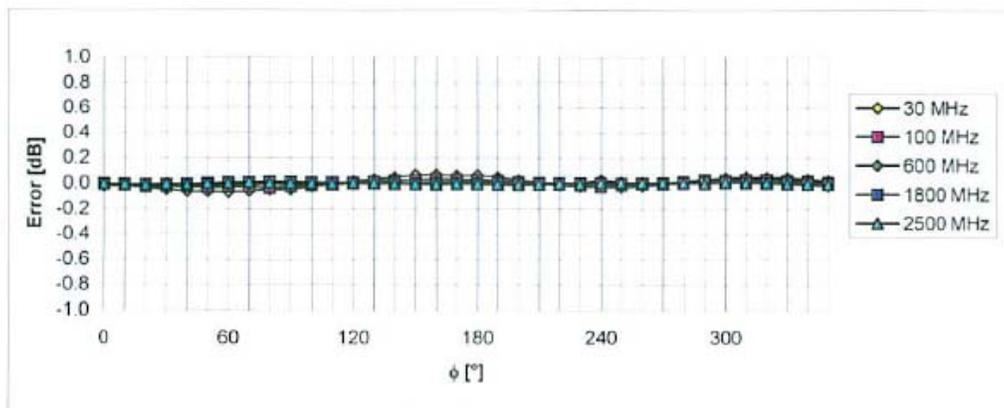
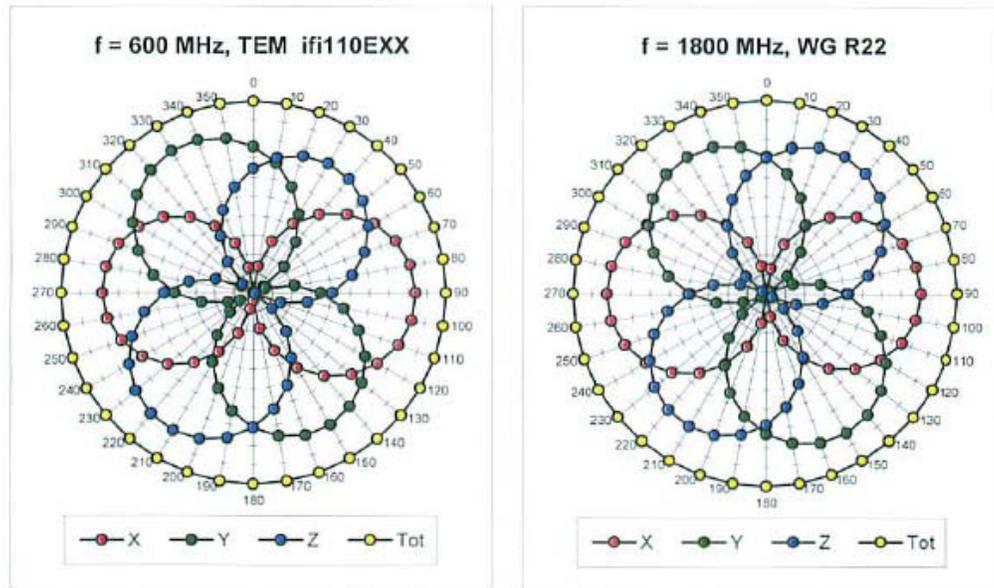


Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

ES3DV2 SN:3006

May 19, 2009

### Receiving Pattern ( $\phi$ ), $\vartheta = 0^\circ$

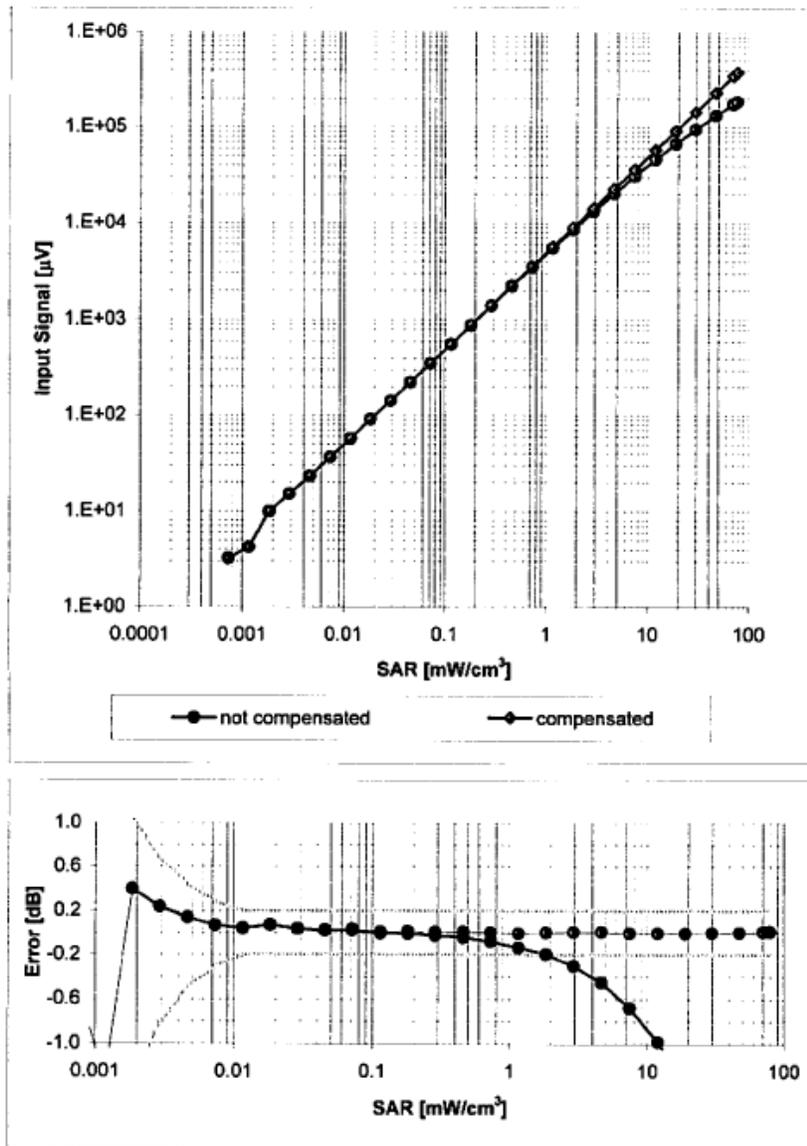


Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  (k=2)

ES3DV2 SN:3006

May 19, 2009

### Dynamic Range $f(SAR_{head})$ (Waveguide R22, $f = 1800$ MHz)

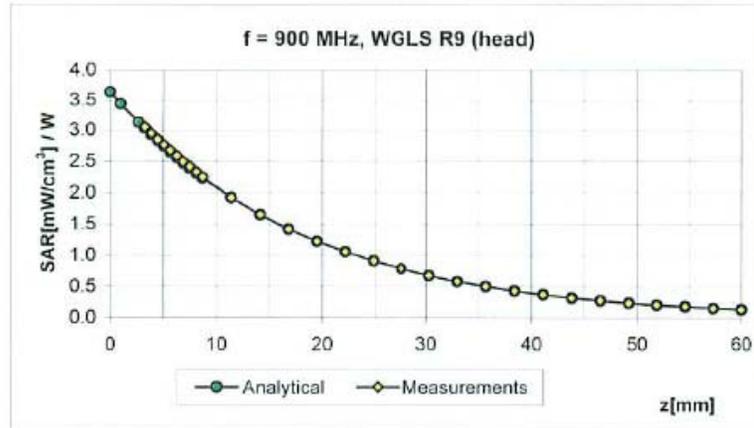


Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

ES3DV2 SN:3006

May 19, 2009

### Conversion Factor Assessment



| f [MHz] | Validity [MHz] <sup>C</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 450     | ± 50 / ± 100                | Head | 43.5 ± 5%    | 0.87 ± 5%    | 0.23  | 1.57  | 6.59 ± 13.3% (k=2) |
| 750     | ± 50 / ± 100                | Head | 41.9 ± 5%    | 0.89 ± 5%    | 0.80  | 1.30  | 6.20 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 5%    | 0.88  | 1.27  | 5.94 ± 11.0% (k=2) |
| 1810    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.42  | 1.96  | 5.13 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.43  | 1.86  | 4.96 ± 11.0% (k=2) |
| 2300    | ± 50 / ± 100                | Head | 39.5 ± 5%    | 1.67 ± 5%    | 0.51  | 1.77  | 4.80 ± 11.0% (k=2) |
| 2600    | ± 50 / ± 100                | Head | 39.0 ± 5%    | 1.96 ± 5%    | 0.57  | 1.72  | 4.47 ± 11.0% (k=2) |
| 3500    | ± 50 / ± 100                | Head | 37.9 ± 5%    | 2.91 ± 5%    | 0.80  | 1.35  | 4.04 ± 13.1% (k=2) |
| 3700    | ± 50 / ± 100                | Head | 37.7 ± 5%    | 3.12 ± 5%    | 0.80  | 1.45  | 3.55 ± 13.1% (k=2) |
| 450     | ± 50 / ± 100                | Body | 56.7 ± 5%    | 0.94 ± 5%    | 0.14  | 1.50  | 7.09 ± 13.3% (k=2) |
| 750     | ± 50 / ± 100                | Body | 55.5 ± 5%    | 0.96 ± 5%    | 0.47  | 1.66  | 6.06 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Body | 55.0 ± 5%    | 1.05 ± 5%    | 0.50  | 1.63  | 6.00 ± 11.0% (k=2) |
| 1810    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.33  | 2.63  | 4.81 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.35  | 2.75  | 4.73 ± 11.0% (k=2) |
| 2300    | ± 50 / ± 100                | Body | 52.8 ± 5%    | 1.85 ± 5%    | 0.65  | 1.67  | 4.36 ± 11.0% (k=2) |
| 2600    | ± 50 / ± 100                | Body | 52.5 ± 5%    | 2.16 ± 5%    | 0.99  | 1.20  | 4.00 ± 11.0% (k=2) |
| 3500    | ± 50 / ± 100                | Body | 51.3 ± 5%    | 3.31 ± 5%    | 0.90  | 1.55  | 3.23 ± 13.1% (k=2) |
| 3700    | ± 50 / ± 100                | Body | 51.0 ± 5%    | 3.55 ± 5%    | 0.95  | 1.60  | 3.09 ± 13.1% (k=2) |

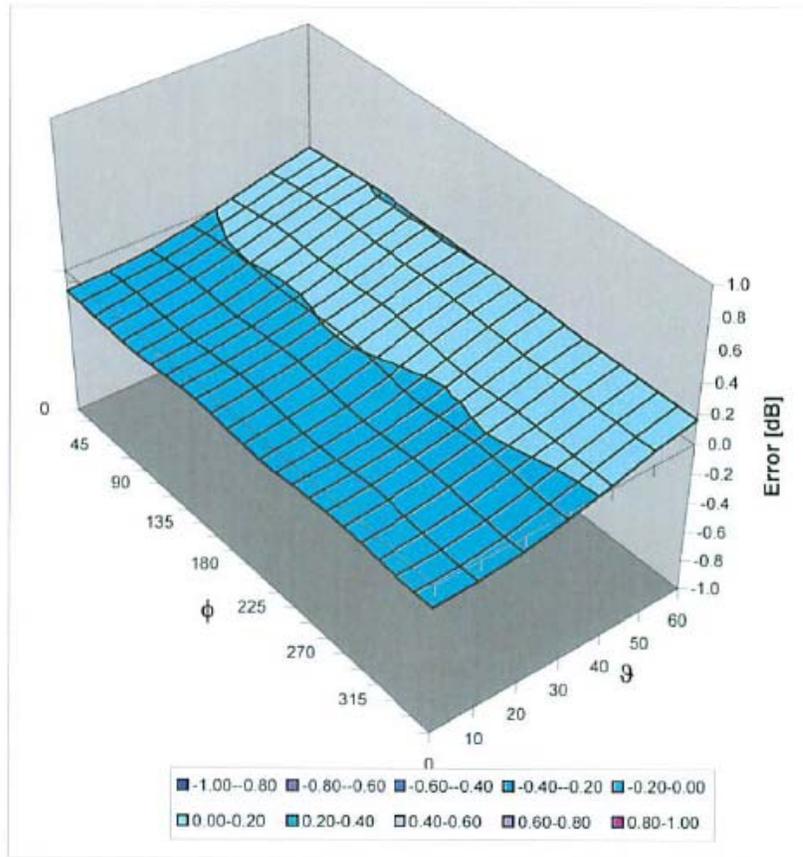
<sup>C</sup> The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ES3DV2 SN:3006

May 19, 2009

### Deviation from Isotropy in HSL

Error ( $\phi, \theta$ ),  $f = 900$  MHz



Uncertainty of Spherical Isotropy Assessment:  $\pm 2.6\%$  ( $k=2$ )

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### Additional Conversion Factors for Dosimetric E-Field Probe

Type:

**ES3DV2**

Serial Number:

**3006**

Place of Assessment:

**Zurich**

Date of Assessment:

**May 19, 2009**

Probe Calibration Date:

**May 21, 2009**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1810 MHz.

Assessed by:



Schmid & Partner Engineering AG

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 Phone +41 44 245 9700, Fax +41 44 245 9779  
 info@speag.com, http://www.speag.com

**Dosimetric E-Field Probe ES3DV2 SN:3006**

Conversion factor ( $\pm$  standard deviation)

|         |              |               |   |
|---------|--------------|---------------|---|
| 150 MHz | <i>ConvF</i> | 8.1 $\pm$ 10% | $\epsilon_r = 52.3$<br>$\sigma = 0.76$ mho/m<br>(head tissue) |
| 250 MHz | <i>ConvF</i> | 7.3 $\pm$ 10% | $\epsilon_r = 47.6$<br>$\sigma = 0.83$ mho/m<br>(head tissue) |
| 300 MHz | <i>ConvF</i> | 7.2 $\pm$ 9%  | $\epsilon_r = 45.3$<br>$\sigma = 0.87$ mho/m<br>(head tissue) |
| 150 MHz | <i>ConvF</i> | 7.8 $\pm$ 10% | $\epsilon_r = 61.9$<br>$\sigma = 0.80$ mho/m<br>(body tissue) |
| 250 MHz | <i>ConvF</i> | 7.4 $\pm$ 10% | $\epsilon_r = 59.4$<br>$\sigma = 0.88$ mho/m<br>(body tissue) |
| 300 MHz | <i>ConvF</i> | 7.3 $\pm$ 9%  | $\epsilon_r = 58.2$<br>$\sigma = 0.92$ mho/m<br>(body tissue) |

**Important Note:**

**For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.**

**Please see also Section 4.7 of the DASY4 Manual.**

**APPENDIX C**  
**Dipole Calibration Certificates**

**Calibration Laboratory of  
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Accreditation No.: **SCS 108**

Client **Motorola CGISS**

Certificate No: **D450V2-1002\_Sep08**

**CALIBRATION CERTIFICATE**

Object **D450V2 - SN: 1002**

Calibration procedure(s) **QA CAL-15.v5  
Calibration Procedure for dipole validation kits below 800 MHz**

Calibration date: **September 26, 2008**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|-----------------------------|--------------------|---|------------------------|
| Power meter E4419B          | GB41293874         | 01-Apr-08 (No. 217-00788)                 | Apr-09                 |
| Power sensor E4412A         | MY41495277         | 01-Apr-08 (No. 217-00788)                 | Apr-09                 |
| Power sensor E4412A         | MY41498087         | 01-Apr-08 (No. 217-00788)                 | Apr-09                 |
| Reference 3 dB Attenuator   | SN: S5054 (3c)     | 01-Jul-08 (No. 217-00865)                 | Jul-09                 |
| Reference 20 dB Attenuator  | SN: S5086 (20b)    | 31-Mar-08 (No. 217-00787)                 | Mar-09                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 01-Jul-08 (No. 217-00867)                 | Jul-09                 |
| Reference Probe ET3DV6 (LF) | SN: 1507           | 27-Jun-08 (No. ET3-1507_Jun08)            | Jun-09                 |
| DAE4                        | SN: 601            | 14-Mar-08 (No. DAE4-601_Mar08)            | Mar-09                 |
| Secondary Standards         | ID #               | Check Date (in house)                     | Scheduled Check        |
| RF generator HP 8648C       | US3642U01700       | 04-Aug-99 (in house check Oct-07)         | In house check: Oct-09 |
| Network Analyzer HP 8753E   | US37390585         | 19-Oct-01 (in house check Oct-07)         | In house check: Oct-08 |

|                | Name           | Function              | Signature |
|----------------|----------------|-----------------------|-----------|
| Calibrated by: | Jeton Kastrati | Laboratory Technician |           |
| Approved by:   | Katja Pokovic  | Technical Manager     |           |

Issued: September 29, 2008

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The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

#### Glossary:

|      |                                 |
|------|---------------------------------|
| TSL  | tissue simulating liquid        |
| ConF | sensitivity in TSL / NORM x,y,z |
| N/A  | not applicable or not measured  |

#### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

#### Additional Documentation:

- DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

**Measurement Conditions**

DASY system configuration, as far as not given on page 1.

|                                     |                        |                             |
|-------------------------------------|------------------------|-----------------------------|
| <b>DASY Version</b>                 | DASY5                  | V5.0                        |
| <b>Extrapolation</b>                | Advanced Extrapolation |                             |
| <b>Phantom</b>                      | Flat Phantom V4.4      | Shell thickness: 6 ± 0.2 mm |
| <b>Distance Dipole Center - TSL</b> | 15 mm                  | with Spacer                 |
| <b>Area Scan Resolution</b>         | dx, dy = 15 mm         |                             |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm      |                             |
| <b>Frequency</b>                    | 450 MHz ± 1 MHz        |                             |

**Head TSL parameters**

The following parameters and calculations were applied.

|   | Temperature     | Permittivity | Conductivity     |
|---|-----------------|--------------|------------------|
| <b>Nominal Head TSL parameters</b>      | 22.0 °C         | 43.5         | 0.87 mho/m       |
| <b>Measured Head TSL parameters</b>     | (22.0 ± 0.2) °C | 43.1 ± 6 %   | 0.83 mho/m ± 6 % |
| <b>Head TSL temperature during test</b> | (21.8 ± 0.2) °C | ---          | —                |

**SAR result with Head TSL**

| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | condition          |                                   |
|---|--------------------|-----------------------------------|
| SAR measured  | 398 mW input power | 1.97 mW / g                       |
| SAR normalized  | normalized to 1W   | 4.95 mW / g                       |
| <b>SAR for nominal Head TSL parameters <sup>1</sup></b>     | normalized to 1W   | <b>5.03 mW / g ± 18.1 % (k=2)</b> |

| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                   |
|---|--------------------|-----------------------------------|
| SAR measured  | 398 mW input power | 1.33 mW / g                       |
| SAR normalized  | normalized to 1W   | 3.34 mW / g                       |
| <b>SAR for nominal Head TSL parameters <sup>1</sup></b>       | normalized to 1W   | <b>3.37 mW / g ± 17.6 % (k=2)</b> |

<sup>1</sup> Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

**Appendix**

**Antenna Parameters with Head TSL**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 56.3 $\Omega$ - 6.1 j $\Omega$ |
| Return Loss                          | - 21.7 dB                      |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.348 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

**Additional EUT Data**

|                 |                |
|-----------------|----------------|
| Manufactured by | SPEAG          |
| Manufactured on | March 22, 2002 |

**DASY5 Validation Report for Head TSL**

Date/Time: 26.09.2008 13:21:17

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2 - SN:1002**

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450

Medium parameters used:  $f = 450$  MHz;  $\sigma = 0.83$  mho/m;  $\epsilon_r = 43.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

**DASY5 Configuration:**

- Probe: ET3DV6 - SN1507 (LF); ConvF(6.66, 6.66, 6.66); Calibrated: 27.06.2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.4; Type: Flat Phantom 4.4
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

**d=15mm, Pin=398mW/Area Scan (41x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.09 mW/g

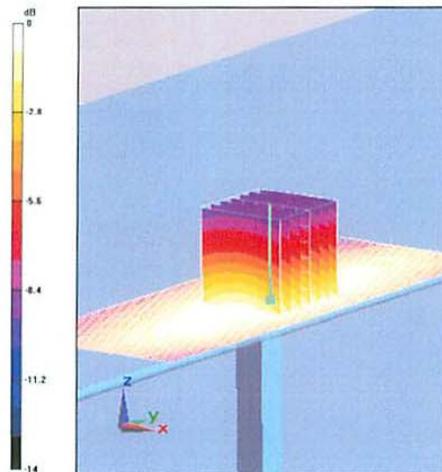
**d=15mm, Pin=398mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 51.7 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 2.92 W/kg

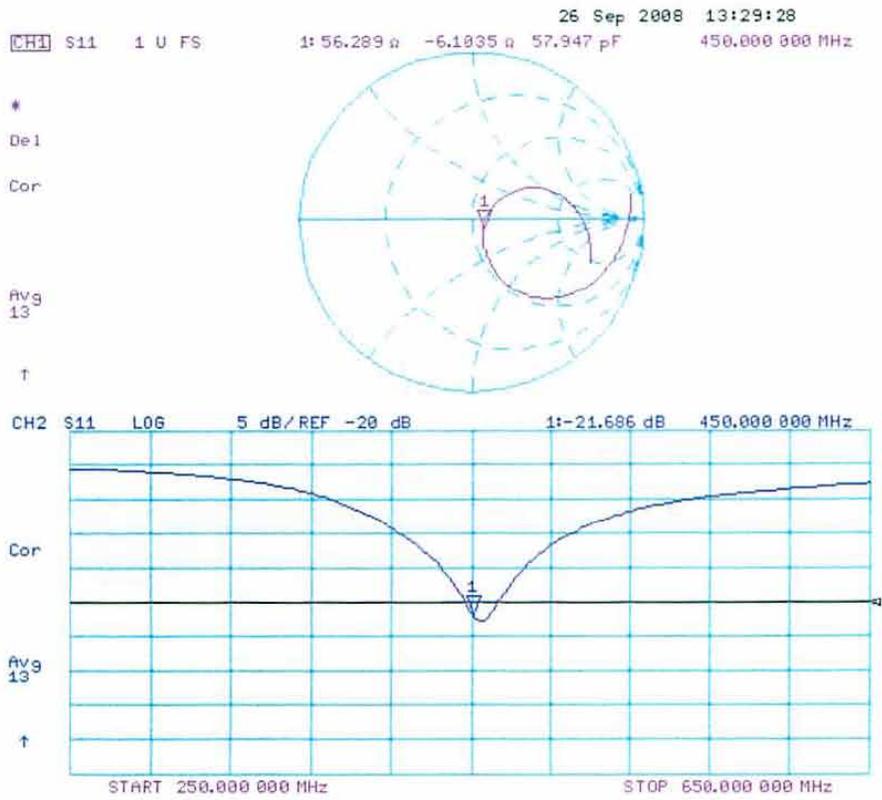
**SAR(1 g) = 1.97 mW/g; SAR(10 g) = 1.33 mW/g**

Maximum value of SAR (measured) = 2.12 mW/g



0 dB = 2.12mW/g

### Impedance Measurement Plot for Head TSL



**Calibration Laboratory of  
Schmid & Partner  
Engineering AG**  
Zeughausstrasse 43, 8004 Zurich, Switzerland



**S** Schweizerischer Kalibrierdienst  
**C** Service suisse c'etalonnage  
**S** Servizio svizzero di taratura  
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Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola CGISS**

Certificate No: **D300V2-1001\_Jul08**

**CALIBRATION CERTIFICATE**

Object **D300V2 - SN: 1001**

Calibration procedure(s) **QA CAL-15.v5  
Calibration Procedure for dipole validation kits below 800 MHz**

Calibration date: **July 23, 2008**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|-----------------------------|--------------------|---|------------------------|
| Power meter E4419B          | GB41293874         | 01-Apr-08 (No. 217-00788)                 | Apr-09                 |
| Power sensor E4412A         | MY41495277         | 01-Apr-08 (No. 217-00788)                 | Apr-09                 |
| Power sensor E4412A         | MY41498087         | 01-Apr-08 (No. 217-00788)                 | Apr-09                 |
| Reference 3 dB Attenuator   | SN: S5054 (3c)     | 01-Jul-08 (No. 217-00865)                 | Jul-09                 |
| Reference 20 dB Attenuator  | SN: S5086 (20b)    | 31-Mar-08 (No. 217-00787)                 | Mar-09                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 01-Jul-08 (No. 217-00867)                 | Jul-09                 |
| Reference Probe ET3DV6 (LF) | SN: 1507           | 27-Jun-08 (No. ET3-1507_Jun08)            | Jun-09                 |
| DAE4                        | SN: 601            | 14-Mar-08 (No. DAE4-601_Mar08)            | Mar-09                 |
| Secondary Standards         | ID #               | Check Date (in house)                     | Scheduled Check        |
| RF generator HP 8648C       | US3642U01700       | 04-Aug-99 (in house check Oct-07)         | In house check: Oct-09 |
| Network Analyzer HP 8753E   | US37390585         | 19-Oct-01 (in house check Oct-07)         | In house check: Oct-08 |

|                |                      |                          |                  |
|----------------|----------------------|--------------------------|------------------|
|                | <b>Name</b>          | <b>Function</b>          | <b>Signature</b> |
| Calibrated by: | <b>Katja Pokovic</b> | <b>Technical Manager</b> |                  |
| Approved by:   | <b>Niels Kuster</b>  | <b>Quality Manager</b>   |                  |

Issued: July 23, 2008

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

**Calibration Laboratory of  
Schmid & Partner  
Engineering AG**  
Zeughausstrasse 43, 8004 Zurich, Switzerland



**S** Schweizerischer Kalibrierdienst  
**C** Service suisse d'étalonnage  
**S** Servizio svizzero di taratura  
**S** Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

**Glossary:**

TSL tissue simulating liquid  
ConF sensitivity in TSL / NORM x,y,z  
N/A not applicable or not measured

**Calibration is Performed According to the Following Standards:**

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

**Additional Documentation:**

- d) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

**Measurement Conditions**

DASY system configuration, as far as not given on page 1.

|                                     |                        |                             |
|-------------------------------------|------------------------|-----------------------------|
| <b>DASY Version</b>                 | DASY4                  | V4.7                        |
| <b>Extrapolation</b>                | Advanced Extrapolation |                             |
| <b>Phantom</b>                      | Flat Phantom V4.4      | Shell thickness: 6 ± 0.2 mm |
| <b>Distance Dipole Center - TSL</b> | 15 mm                  | with Spacer                 |
| <b>Area Scan Resolution</b>         | dx, dy = 15 mm         |                             |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm      |                             |
| <b>Frequency</b>                    | 300 MHz ± 1 MHz        |                             |

**Head TSL parameters**

The following parameters and calculations were applied.

|   | Temperature     | Permittivity | Conductivity     |
|---|-----------------|--------------|------------------|
| <b>Nominal Head TSL parameters</b>      | 22.0 °C         | 45.3         | 0.87 mho/m       |
| <b>Measured Head TSL parameters</b>     | (22.0 ± 0.2) °C | 44.3 ± 6 %   | 0.84 mho/m ± 6 % |
| <b>Head TSL temperature during test</b> | (22.0 ± 0.2) °C | —            | —                |

**SAR result with Head TSL**

| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | condition          |                            |
|---|--------------------|----------------------------|
| SAR measured  | 398 mW input power | 1.17 mW / g                |
| SAR normalized  | normalized to 1W   | 2.94 mW / g                |
| SAR for nominal Head TSL parameters <sup>1</sup>            | normalized to 1W   | 2.95 mW / g ± 18.1 % (k=2) |

| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                            |
|---|--------------------|----------------------------|
| SAR measured  | 398 mW input power | 0.78 mW / g                |
| SAR normalized  | normalized to 1W   | 1.96 mW / g                |
| SAR for nominal Head TSL parameters <sup>1</sup>              | normalized to 1W   | 1.95 mW / g ± 17.6 % (k=2) |

<sup>1</sup> Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

**Appendix**

**Antenna Parameters with Head TSL**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 57.3 $\Omega$ - 8.3 j $\Omega$ |
| Return Loss                          | - 20.0 dB                      |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.749 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

**Additional EUT Data**

|                 |                 |
|-----------------|-----------------|
| Manufactured by | SPEAG           |
| Manufactured on | August 26, 2002 |

**DASY4 Validation Report for Head TSL**

Date/Time: 23.07.2008 11:28:09

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 300 MHz; Type: D300V2; Serial: D300V2 - SN:1001**

Communication System: CW; Frequency: 300 MHz; Duty Cycle: 1:1

Medium: HSL300;

Medium parameters used:  $f = 300$  MHz;  $\sigma = 0.84$  mho/m;  $\epsilon_r = 44.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

**DASY4 Configuration:**

- Probe: ET3DV6 - SN1507 (LF); ConvF(7.51, 7.51, 7.51); Calibrated: 27.06.2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.4; Type: Flat Phantom 4.4; ;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

**d=15mm, Pin=398mW/Area Scan (41x111x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.22 mW/g

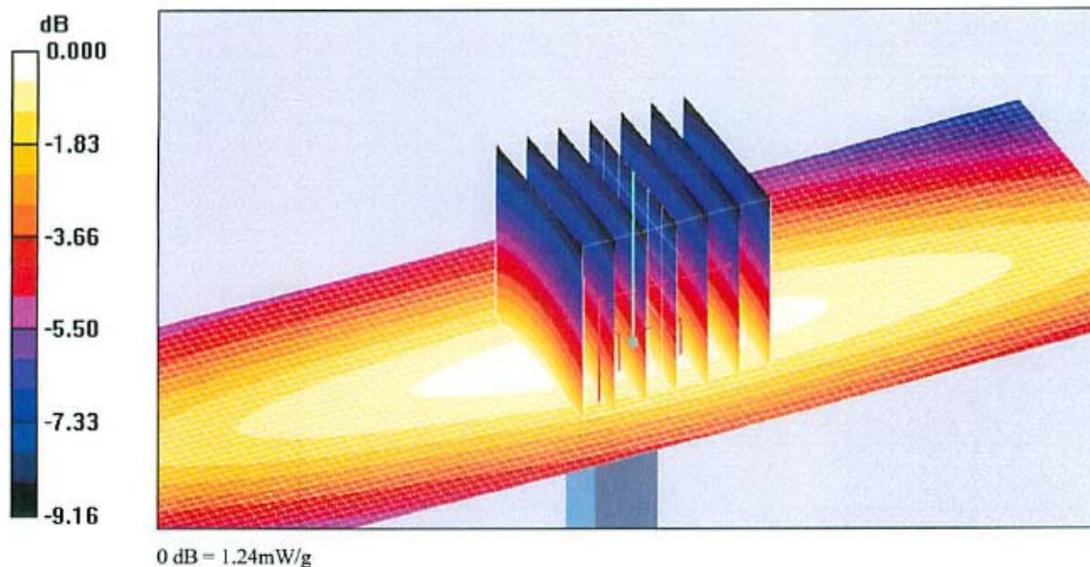
**d=15mm, Pin=398mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 39.0 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 1.84 W/kg

**SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.780 mW/g**

Maximum value of SAR (measured) = 1.24 mW/g



### Impedance Measurement Plot for Head TSL

