

**MOTOROLA SOLUTIONS**

TESTING CERT # 2518.01

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

**Motorola Solutions Inc.**  
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**Date of Report:** 01/22/2015  
**Report Revision:** D

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**Report Author:** Stephen C. Whalen (Principal Staff Engineer/Manager)  
**Date/s Tested:** 02/19/14-03/16/14 & 04/24/2014-04/28/2014  
**Manufacturer/Location:** Motorola Solutions Inc., Schaumburg  
**Sector/Group/Div.:** AESS  
**Date submitted for test:** 01/31/2014  
**DUT Description:** Handheld Portable – Frequency bands; LMR 136-174MHz, 764-776MHz, 794-824MHz & 851-869MHz; LTE 777-787MHz (band 13) & 788-798MHz (band 14); Bluetooth 2.402-2.480GHz  
**Test TX mode(s):** CW (PTT) & LTE  
**Max. Power output:** 6.6W (VHF band), 2.99W (700MHz band), 3.6W (800MHz band), 320mW (LTE) & 12mW (Bluetooth)  
**Nominal Power:** 6.0W (VHF band), 2.65W (700MHz band), 3.0W (800MHz band), 200mW (LTE) & 12mW (Bluetooth)  
**Tx Frequency Bands:** LMR 136-174MHz, 764-776MHz, 794-824MHz & 851-869MHz; LTE 777-787MHz (band 13) & 788-798MHz (band 14); Bluetooth 2.402-2.480GHz  
**Signaling type:** FM, TDMA, LTE, FHSS (Bluetooth)  
**Model(s) Tested:** H97TGD9PW1AN (NUR1066A)  
**Model(s) Certified:** H97TGD9PW1AN (NUR1065A, NUR1066A)  
**Serial Number(s):** 655CPX0696 & 655CPX0694  
**Classification:** Occupational/Controlled  
**FCC ID:** AZ489FT7059; Rule Part 90 (150.8-173.4MHz, 764-775MHz, 788-798MHz (LTE), 794-824MHz & 851-869MHz); Rule Part 27 (777-787MHz); Rule Part 15 (2402-2480MHz)  
 This report contains results that are immaterial for FCC equipment approval, which are clearly identified.  
**IC:** 109U-89FT7059; This report contains results that are immaterial for IC equipment approval, which are identified as LTE band 14 (788-798MHz).

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 OET Bulletin 65. 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 4.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola Solutions Inc 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.

**Deanna Zakharia**  
**EMS EME Lab Senior Resource Manager,**  
**Laboratory Director**  
**Approval Date:** 1/22/2015

**Certification Date:** 6/27/2014

**Certification No.:** L1140630P &  
 L1140631P

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## Report Revision History

| Date       | Revision | Comments                                                                                                 |
|------------|----------|----------------------------------------------------------------------------------------------------------|
| 05/12/2014 | O        | Initial release                                                                                          |
| 05/29/2014 | A        | Included LTE band 13 for IC                                                                              |
| 06/27/2014 | B        | Updated antenna gain for each antenna in Table 4 and added “Yes” to tested audio accessories in Table 7. |
| 09/09/2014 | C        | Changed 4.0 W/kg to 0.8 W/kg for LTE B13 on pages 38, 39, 54, & 55.                                      |
| 01/22/2015 | D        | The report was separated into three parts because of file size limitations.                              |

## 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 Motorola Solutions Inc. EME Test Laboratory for handheld portable model number H97TGD9PW1AN (NUR1066A). This device is classified as Occupational/Controlled.

## 2.0 FCC SAR Summary

**Table 1**

| Equipment Class        | Frequency band (MHz) | Max Calc at Body (W/kg) |         | Max Calc at Face (W/kg) |         |
|------------------------|----------------------|-------------------------|---------|-------------------------|---------|
|                        |                      | 1g-SAR                  | 10g-SAR | 1g-SAR                  | 10g-SAR |
| TNF                    | 150.8-173.4MHz (LMR) | 2.32                    | 0.96    | 0.48                    | 0.37    |
|                        | 700MHz (LMR)         | 5.36                    | 3.05    | 1.40                    | 1.02    |
|                        | 800MHz (LMR)         | 4.50                    | 2.62    | 2.05                    | 1.51    |
|                        | LTE B13              | 0.21                    | 0.14    | 0.22                    | 0.16    |
|                        | LTE B14              | 0.18                    | 0.11    | 0.26                    | 0.19    |
| *DSS                   | 2402-2480MHz         | NA                      | NA      | NA                      | NA      |
| **Simultaneous Results |                      | 4.71                    | 2.76    | 2.31                    | 1.70    |

\*Results not required per KDB (refer to sections 13.8 and 14.0)

\*\*LMR 700MHz band cannot transmit simultaneously with LTE.

## 3.0 Abbreviations / Definitions

BT: Bluetooth  
 CNR: Calibration Not Required  
 CW: Continuous Wave  
 C4FM: Continuous 4 Level Frequency Modulation  
 CQPSK: Compatible Quadrature Phase Shift Keying  
 DPSK: Differential Phase-Shift Keying  
 DQPSK: Differential Quadrature Phase-Shift Keying  
 DSP: Digital Signal Processor  
 DSS: Direct Spread Spectrum  
 DUT: Device Under Test  
 EDR: Enhanced Data Rate  
 EME: Electromagnetic Energy  
 FHSS: Frequency Hopping Spread Spectrum  
 FM: Frequency Modulation  
 GFSK: Gaussian Frequency-Shift Keying  
 LMR: Land Mobile Radio  
 LTE: Long Term Evolution

NA: Not Applicable  
OFDM: Orthogonal Frequency Division Multiplexing  
PSM: Public Safety Microphone  
PTT: Push to Talk  
QPSK: Quadrature Pulse Shift Key  
RB: Resource Blocks  
RSM: Remote Speaker Microphone  
SAR: Specific Absorption Rate  
SC-FDMA: Single Carrier Frequency Division Multiple Access  
TDD: Time Division Duplex  
TDMA: Time Division Multiple Access  
TNF: Licensed Non-Broadcast Transmitter Held to Face  
VoLTE; Voice over LTE  
4FSK: 4 Level Frequency Shift Keying  
16QAM: 16 State Quadrature Amplitude Modulation

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.

#### 4.0 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)
- Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, FCC, Washington, D.C.: 1997.
- 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 (2009), 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 9 kHz and 300 GHz." and "Attachment to resolution # 303 from July 2, 2002"
- IEC62209-2 Edition 1.0 2010-03, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz).
- FCC KDB – 643646 D01 SAR Test for PTT Radios v01r01 (04/04/2011)
- FCC KDB – 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r02 (12/05/2013)  
D02 RF Exposure Reporting v01r01 (05/28/2013)
- FCC KDB – 447498 D01 General RF Exposure Guidance v05r01 (05/28/2013)
- FCC KDB – 941225 D05 SAR for LTE Devices v02r03 (12/05/2013)

## 5.0 SAR Limits

**Table 2**

| 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                                             |

## 6.0 Description of Device Under Test (DUT)

This portable device operates in the LMR bands using frequency modulation (FM) and TDMA signals incorporating traditional simplex two-way radio transmission protocol. This device also contains LTE technology for data applications and Bluetooth technology for short range wireless devices.

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 at 12.5 kHz 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 1:2 is 50%.

The LMR bands in this device operate in a half duplex system. A half duplex system only allows the user to transmit or receive. This device cannot transmit and receive simultaneously. The user must stop transmitting in order to receive a signal or listen for a response, regardless of PTT button or use of voice activated audio accessories. This type of operation, along with the RF safety booklet, which instructs the user to transmit no more than 50% of the time, justifies the use of 50% duty factor for this device.

This device also incorporates an LTE device, which is capable of OFDM (Orthogonal Frequency Division Multiplexing) on the downlink and SC-FDMA (Single Carrier Frequency Division Multiple Access) on the uplink. Depending upon the packet size of the data being sent the uplink Bandwidth can vary from 1MHz to 10MHz. In the downlink, the subcarriers are split into resource blocks. This enables the system to be able to compartmentalize the data across standard numbers of subcarriers. Resource blocks comprise of 12 subcarriers, regardless of the overall LTE signal bandwidth. They also cover one slot in the time frame. This means that different LTE signal bandwidths will have different numbers of resource blocks in which the maximum of 10 MHz frequency correlates to 50 resource blocks or (50RB x 12) 600 subcarriers.

LTE bands 13 and 14 are for data applications only. The architecture and chip set do not support voice operations (VoLTE) and therefore voice configurations were not tested. Band 13 supports QPSK, 16QAM and the following channel bandwidths; 1.4MHz, 3MHz, 5MHz and 10MHz. Band 14 supports QPSK, 16QAM and the following channel bandwidths; 5MHz and 10MHz. TDD is not supported by either LTE band. Simultaneous transmission exists between the BT, LTE and LMR (VHF and 800MHz bands).

This device also incorporates a Class 1 Bluetooth device which is a Frequency Hopping Spread Spectrum (FHSS) technology. The Bluetooth radio modem is used to wireless link audio accessories. The maximum actual transmission duty cycle is imposed by the Bluetooth standard. The maximum duty cycle for BT is 76.1%. Refer to section 14.0 Simultaneous Transmission Exclusion.

Table 3 below summarizes the technologies, bands, maximum duty cycles and maximum output powers. Maximum output powers are defined as upper limit of the production line final test station.

**Table 3**

| <b>Radio Type</b> | <b>Band (MHz)</b> | <b>Transmission</b> | <b>Duty Cycle (%)</b> | <b>Max Power (W)</b> |
|-------------------|-------------------|---------------------|-----------------------|----------------------|
| LMR               | 136-174           | FM or TDMA          | *50 / *25             | 6.60                 |
| LMR               | 700               | FM or TDMA          | *50 / *25             | 2.99                 |
| LMR               | 800               | FM or TDMA          | *50 / *25             | 3.60                 |
| LTE               | B13               | SC-FDMA             | 100                   | 0.32                 |
| LTE               | B14               | SC-FDMA             | 100                   | 0.32                 |
| BT                | 2400              | FHSS                | 76                    | 0.012                |

Note - \* includes 50% PTT operation

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. Operation at the body without an audio accessory attached is possible by means of BT accessories.

## 7.0 Optional Accessories and Test Criteria

This device is offered with optional accessories. All accessories were individually evaluated during the test plan creation to determine if testing was required per the guidelines outlined in “SAR Test Reduction Considerations for Occupational PTT Radios” FCC KDB 643646 to assess compliance of this device. The following sections identify the test criteria and details for each accessory category. Refer to Exhibit 7B for antenna separation distances.

### 7.1 Antennas

There are optional removable antennas and one internal LTE/BT antenna offered for this product. The Table below lists their descriptions.

**Table 4**

| Antenna Models | Description                                                                                       | Selected for test | Tested |
|----------------|---------------------------------------------------------------------------------------------------|-------------------|--------|
| NAR6594A       | VHF/700/800 MHz + GPS(1575MHz)<br>136-174MHz, 764-870MHz, ¼ wave, -2.0dBi                         | Yes               | Yes    |
| NAF5085A       | 700/800MHz + GPS (1575MHz),<br>764-870MHz, ½wave, -5.85dBi                                        | Yes               | Yes    |
| *85009332001   | Internal FICA LTE + BT<br>746-798MHz and 2402-2481MHz,<br>-5.0dBi(B13), -4.8dBi(B14), -1.1dBi(BT) | Yes               | Yes    |
| NAR6593A       | VHF/GPS (1575MHz)<br>136-174MHz, ¼ wave, -6.35dBi                                                 | Yes               | Yes    |
| NAR6595A       | 700/800MHz + GPS (1575MHz),<br>764-870MHz, ¼wave, -7.85dBi                                        | Yes               | Yes    |
| PMAF4002A      | 7/800MHz PSM Stubby<br>764-870MHz, ¼ wave, -7.85dBi                                               | Yes               | Yes    |

\* Refer to sections 13.14 and 14.0 for BT low power exclusion and simultaneous TX for antenna not tested.

### 7.2 Battery

There are five batteries offered for this product. The Table below lists their descriptions.

**Table 5**

| Battery Models | Description                   | Selected for test | Tested | Comments                         |
|----------------|-------------------------------|-------------------|--------|----------------------------------|
| NNTN7038B      | Impres LiIon 2900mAh          | Yes               | Yes    |                                  |
| PMNN4403B      | Impres Li-ion 2150mAh slim    | Yes               | Yes    | Default battery for body testing |
| NNTN7034B      | Hi Cap Impress Li-ion 4200mAh | Yes               | Yes    | Default battery for face testing |
| NNTN7037A      | Impres 2100mAh                | Yes               | Yes    |                                  |
| NNTN7573A      | Rugged Impres 2100mAh         | Yes               | Yes    |                                  |

### 7.3 Body worn Accessories

All body worn accessories were considered. The Table below lists the body worn accessories, and body worn accessory descriptions.



**Table 6**

| Body worn Models | Description        | Selected for test | Tested | Comments                                                                                  |
|------------------|--------------------|-------------------|--------|-------------------------------------------------------------------------------------------|
| NTN8266B         | Belt Clip 2.5 in.  | Yes               | Yes    |                                                                                           |
| HLN6875A         | Belt Clip 3 in.    | Yes               | Yes    |                                                                                           |
| PMLN5331A        | Carry Holder-Basic | No                | No     | No metallic content and increases separation distance, only fits tested belt clips above. |

#### 7.4 Audio Accessories

All audio accessories were considered. The Table below lists the offered audio accessories and their descriptions. Exhibit 7B illustrates photos of the tested audio accessories.

**Table 7**

| Audio Acc. Models | Description                                                 | Selected for test | Tested | Comments                        |
|-------------------|-------------------------------------------------------------|-------------------|--------|---------------------------------|
| PMMN4050A         | IMPRES REMOTE SPEAKER MIC, NC                               | Yes               | Yes    | Default Audio                   |
| HMN4104B          | IMPRES Display Submersible RSM w/ jack & Ch. Selector       | Yes               | Yes    |                                 |
| PMMN4040A         | IMPRES IP57 Submersible Remote Speaker Microphone           | Yes               | Yes    |                                 |
| PMLN5275C         | Core H/D Headset                                            | Yes               | Yes    |                                 |
| PMLN5653A         | IMPRES Ear Microphone System                                | Yes               | Yes    |                                 |
| PMLN5102A         | CORE ULTRA-LITE HEADSET                                     | Yes               | Yes    |                                 |
| RMN5058A          | Core Lightweight Headset w/PTT & VOX                        | Yes               | Yes    |                                 |
| PMLN5101A         | Impress Temple Transducer                                   | Yes               | Yes    |                                 |
| RMN5116A          | Temple Transducer Headset                                   | Yes               | Yes    | Tested with HMN4104B            |
| PMLN5097A         | IMPRES 3 WIRE SURVEILLANCE-BLACK                            | Yes               | Yes    |                                 |
| RLN5882A          | Smart 2 Wire surveillance w/ acoustic tube black            | Yes               | Yes    |                                 |
| PMLN5096B         | CORE EARSET - D-SHELL                                       | Yes               | Yes    |                                 |
| BDN6783A          | 3.5 mm Audio Adapter                                        | Yes               | Yes    | Tested with BDN6729A            |
| BDN6729A          | Earpiece with Microphone and Push-to-Talk Combined (2-Wire) | Yes               | Yes    | Tested with BDN6783A            |
| NNTN7869A         | APX Surveillance Keyload Adapter                            | Yes               | Yes    | Tested with ZMN6031A & ZMN6032A |
| ZMN6031A          | 3 wire Surveillance beige Hirose                            | Yes               | Yes    | Tested with NNTN7869A           |
| ZMN6032A          | 2 wire Surveillance beige Hirose                            | Yes               | Yes    | Tested with NNTN7869A           |
| PMMN4065A         | Standard Large IP57 RSM                                     | No                | No     | By similarity to PMMN4050A      |
| PMMN4062A         | PLUS RSM NC IP54 3.5MM JACK RX                              | No                | No     | By similarity to PMMN4050A      |
| PMMN4024A         | Core RSM                                                    | No                | No     | By similarity to PMMN4050A      |
| PMMN4025A         | Smart RSM                                                   | No                | No     | By similarity to PMMN4050A      |
| PMMN4046A         | IMPRES SPEAKER MIC W/VOL, IP57                              | No                | No     | By similarity to PMMN4050A      |
| PMMN4069A         | APX Basic Smart RSM, IP55                                   | No                | No     | By similarity to PMMN4050A      |
| HMN4101B          | Display RSM w/o Display and w/o Channel Knob                | No                | No     | By similarity to HMN4104B       |
| HMN4103B          | Display RSM w/o Channel Knob                                | No                | No     | By similarity to HMN4104B       |
| PMLN5111A         | Plus 3 wire - Black- one programmable button                | No                | No     | By similarity to PMLN5097A      |
| PMLN5112A         | Plus 3 wire - Beige-one programmable button                 | No                | No     | By similarity to PMLN5097A      |
| PMLN5106A         | IMPRES 3 WIRE SURVEILLANCE-BEIGE                            | No                | No     | By similarity to PMLN5097A      |

Table 7 continued

| Audio Acc. Models | Description                                                             | Selected for test | Tested | Comments                                |
|-------------------|-------------------------------------------------------------------------|-------------------|--------|-----------------------------------------|
| RLN5881A          | Smart 2 wire surveillance - beige                                       | No                | No     | By similarity to RLN5882A               |
| RLN5880A          | Smart 2 wire surveillance - black                                       | No                | No     | By similarity to RLN5882A               |
| RLN5883A          | Smart 2 Wire surveillance w/ acoustic tube beige                        | No                | No     | By similarity to RLN5882A               |
| BDN6667A          | Earpiece with Microphone and Push-to-Talk Combined (2-Wire)             | No                | No     | By similarity to BDN6783A/BDN6729A      |
| BDN6669A          | Extra Loud Earpiece with Microphone and Push-to-Talk Combined (2-Wire), | No                | No     | By similarity to BDN6783A/BDN6729A      |
| BDN6731A          | Extra Loud Earpiece with Microphone and Push-to-Talk Combined (2-Wire)  | No                | No     | By similarity to BDN6783A/BDN6729A      |
| BDN6668A          | Earpiece with Microphone and Push-to-Talk Separate (3-Wire),            | No                | No     | By similarity to BDN6783A/BDN6729A      |
| BDN6730A          | Earpiece with Microphone and Push-to-Talk Separate (3-Wire)             | No                | No     | By similarity to BDN6783A/BDN6729A      |
| ZMN6039A          | 3 wire Surveillance beige Hirose, extra loud                            | No                | No     | By similarity to NNTN7869A/<br>ZMN6031A |
| ZMN6038A          | 2 wire Surveillance beige Hirose, extra loud                            | No                | No     | By similarity to NNTN7869A/<br>ZMN6032A |
| PMMN4059B         | PSM IP54 WITH 3.5MM JACK RX 18 in. (w/ 4205823V01 beltclip)             | Yes               | Yes    |                                         |
| PMMN4060B         | PSM IP54 WITH 3.5MM JACK RX 24 in. (w/ 4205823V01 beltclip)             | Yes               | Yes    |                                         |
| PMMN4061B         | PSM IP54 WITH 3.5MM JACK RX 30 in.(w/ 4205823V01 beltclip)              | Yes               | Yes    |                                         |

## 8.0 Description of Test System



## 8.1 Descriptions of Robotics/Probes/Readout Electronics

**Table 8**

| Dosimetric System type                             | System version | DAE type | Probe Type          |
|----------------------------------------------------|----------------|----------|---------------------|
| Schmid & Partner<br>Engineering AG<br>SPEAG DASY 5 | 52.8.2.969     | DAE3     | ES3DV3<br>(E-Field) |

The DASY5™ system is operated per the instructions in the DASY5™ Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess 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)

**Table 9**

| Phantom Type | Phantom(s) Used | Material Parameters                                   | Phantom Dimensions LxWxD (mm) | Material Thickness (mm) | Support Structure Material | Loss Tangent (wood) |
|--------------|-----------------|-------------------------------------------------------|-------------------------------|-------------------------|----------------------------|---------------------|
| Dual Flat    | NA              | 300MHz -6GHz;<br>Er = 4+/- 1,<br>Loss Tangent = ≤0.05 | 600x400x190                   | 2mm<br>+/- 0.2mm        | Wood                       | < 0.05              |
| SAM          | NA              |                                                       |                               |                         |                            |                     |
| Elliptical   | √               |                                                       |                               |                         |                            |                     |

## 8.3 Description of Simulated Tissue

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.

The simulated tissue mixture was mixed based on the Simulated Tissue Composition indicated in Table 10. During the daily testing of this product, the applicable mixture was used to measure the Di-electric parameters at each of the tested frequencies to verify that the Di-electric parameters were within the tolerance of the tissue specifications.

**Simulated Tissue Composition (percent by mass)****Table 10**

| Ingredients        | 835MHz |       | 300MHz |       |
|--------------------|--------|-------|--------|-------|
|                    | Head   | Body  | Head   | Body  |
| Sugar              | 57.0   | 44.9  | 56.0   | 47.1  |
| Diacetin           | 0      | 0     | 0      | 0     |
| De ionized – Water | 40.45  | 53.06 | 37.5   | 49.48 |
| Salt               | 1.45   | 0.94  | 5.4    | 2.32  |
| HEC                | 1.0    | 1.0   | 1.0    | 1.0   |
| Bact.              | 0.1    | 0.1   | 0.1    | 0.1   |

**9.0 Additional Test Equipment**

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

**Table 11**

| Equipment Type                                    | Model Number       | Serial Number | Calibration Date | Calibration Due Date |
|---------------------------------------------------|--------------------|---------------|------------------|----------------------|
| Speag Probe                                       | ES3DV3             | 3301          | 8/27/2013        | 8/27/2014            |
| Speag DAE                                         | DAE3               | 363           | 1/13/2014        | 1/13/2015            |
| Power Meter (Agilent)                             | N1912A             | GB45100294    | 9/10/2012        | 9/10/2014            |
| Power Meter (HP)                                  | E4418B             | US39251267    | 1/27/2014        | 1/27/2015            |
| E-Series Avg. Power Sensor (Agilent)              | E9301B             | MY50290001    | 9/4/2013         | 9/4/2014             |
| HP Power Meter                                    | E4418B             | US39251150    | 2/19/2014        | 2/19/2015            |
| HP Power Sensor                                   | 8481H              | 2703A09635    | 2/27/2014        | 2/27/2015            |
| Wideband Power Sensor (Agilent)                   | N1921A             | MY45240137    | 9/12/2013        | 9/12/2014            |
| Wideband Power Sensor (Agilent)                   | N1921A             | MY45240136    | 1/16/2014        | 1/16/2015            |
| Attenuator Weinschel Corp.                        | 33-30-34           | BG9479        | 5/1/2012         | 5/1/2014             |
| Attenuator Weinschel Corp.                        | 33-30-34           | BG8265        | 3/2/2012         | 3/2/2014             |
| NARDA                                             | 768-20             | 8088          | 5/1/2012         | 5/1/2014             |
| Bi-Directional Coupler (NARDA)                    | 3020A              | 31744         | 9/17/2013        | 9/17/2015            |
| Signal Generator (Agilent)                        | E4438C             | MY42081753    | 1/17/2014        | 1/17/2016            |
| AMP (PST)<br>AR Series                            | AR2729-<br>10/5506 | M2K2A00-001   | CNR              | CNR                  |
| PXT Wireless Comm. Test Set                       | E6621A             | MY51102130    | 9/17/2013        | 9/17/2015            |
| Dickson Temperature Recorder                      | TM325              | 12121144      | 5/8/2013         | 5/8/2014             |
| Omega Digital Thermometer with J<br>Type TC Probe | HH200A             | 20857         | 10/23/2013       | 10/23/2014           |
| Omega Digital Thermometer with J<br>Type TC Probe | HH200A             | 48870         | 5/14/2013        | 5/14/2014            |
| Omega Digital Thermometer with J<br>Type TC Probe | HH202A             | 18800         | 2/21/2013        | 2/21/2014            |
| Omega Digital Thermometer with J<br>Type TC Probe | HH202A             | 18801         | 5/14/2013        | 5/14/2014            |
| Omega Digital Thermometer with J<br>Type TC Probe | HH202A             | 18812         | 6/10/2013        | 6/10/2014            |

**Table 11 continued**

| Equipment Type                 | Model Number | Serial Number | Calibration Date | Calibration Due Date |
|--------------------------------|--------------|---------------|------------------|----------------------|
| Agilent PNA-L Network Analyzer | N5230C       | MY49002155    | 8/1/2013         | 8/1/2014             |
| Dielectric Probe Kit (DAK)     | DAK-3.5      | 1059          | 5/28/2013        | 5/28/2014            |
| Dielectric Probe Kit (DAK)     | DAK-12       | 1013          | 5/28/2013        | 5/28/2014            |
| Speag Dipole                   | D750V3       | 1098          | 10/15/2013       | 10/15/2015           |
| Speag Dipole                   | D300V3       | 1014          | 5/6/2013         | 5/6/2015             |
| Speag Dipole                   | D900V2       | 84            | 8/14/2013        | 8/14/2015            |

## 10.0 SAR Measurement System Validation and Verification

DASY output files of the probe/dipole calibration certificates and system verification test results are included in appendices B, C & D respectively.

### 10.1 System Validation

The SAR measurement system was validated according to procedures in KDB 865664. The validation status summary Table is below.

**Table 12**

| Table 12   |                         |     |          |                            |              |             |           |          |
|------------|-------------------------|-----|----------|----------------------------|--------------|-------------|-----------|----------|
| Dates      | Probe Calibration Point |     | Probe SN | Measured Tissue Parameters |              | Validation  |           |          |
|            |                         |     |          | $\sigma$                   | $\epsilon_r$ | Sensitivity | Linearity | Isotropy |
| CW         |                         |     |          |                            |              |             |           |          |
| 10/08/2013 | Body                    | 150 | 3301     | 0.77                       | 60.8         | Pass        | Pass      | Pass     |
| 10/08/2013 | Head                    | 150 |          | 0.73                       | 51.6         | Pass        | Pass      | Pass     |
| 10/08/2013 | Body                    | 300 |          | 0.87                       | 57.1         | Pass        | Pass      | Pass     |
| 10/08/2013 | Head                    | 300 |          | 0.86                       | 45.1         | Pass        | Pass      | Pass     |
| 10/03/2013 | Body                    | 750 |          | 0.97                       | 54.2         | Pass        | Pass      | Pass     |
| 10/04/2013 | Head                    | 750 |          | 0.89                       | 42.8         | Pass        | Pass      | Pass     |
| 09/25/2013 | Body                    | 900 |          | 1.06                       | 54.8         | Pass        | Pass      | Pass     |
| 09/26/2013 | Head                    | 900 |          | 0.97                       | 41.1         | Pass        | Pass      | Pass     |
| LTE        |                         |     |          |                            |              |             |           |          |
| 12/17/2013 | Body                    | 750 | 3301     | 0.92                       | 53.8         | Pass        | Pass      | Pass     |
| 12/17/2013 | Head                    | 750 |          | 0.88                       | 42.4         | Pass        | Pass      | Pass     |

### 10.2 System Verification

System verification checks were conducted each day during the SAR assessment. The results are normalized to 1W. Appendix D 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 13**

| Probe Serial # | Tissue Type   | Dipole Kit / Serial # | Ref SAR @ 1W (W/kg) | System Check Results Measured (W/kg) | System Check Test Results when normalized to 1W (W/kg) | Tested Date |
|----------------|---------------|-----------------------|---------------------|--------------------------------------|--------------------------------------------------------|-------------|
| 3301           | FCC Body      | SPEAG D300V3 / 1014   | *2.20 +/- 10%       | 0.566                                | 2.26                                                   | 2/19/2014   |
|                |               |                       |                     | 0.571                                | 2.28                                                   | 2/20/2014   |
|                |               |                       |                     | 0.549                                | 2.20                                                   | 3/12/2014   |
|                | IEEE/IEC Head |                       | *2.13 +/- 10%       | 0.554                                | 2.22                                                   | 3/11/2014   |
|                |               |                       |                     | 0.518                                | 2.07                                                   | 3/12/2014   |
|                |               |                       |                     | 0.519                                | 2.08                                                   | 4/28/2014   |
|                | FCC Body      | SPEAG D750V3 / 1098   | 8.67 +/- 10%        | 2.22                                 | 8.88                                                   | 2/21/2014   |
|                |               |                       |                     | 2.28                                 | 9.12                                                   | 2/22/2014   |
|                |               |                       |                     | 2.26                                 | 9.04                                                   | 2/23/2014   |
|                |               |                       |                     | 2.21                                 | 8.84                                                   | 2/24/2014   |
|                |               |                       |                     | 2.15                                 | 8.60                                                   | 2/25/2014   |
|                |               |                       |                     | 2.23                                 | 8.92                                                   | 3/05/2014   |
|                |               |                       |                     | 2.19                                 | 8.76                                                   | 3/06/2014   |
|                |               |                       |                     | 2.16                                 | 8.64                                                   | 3/13/2014   |
|                |               |                       |                     | 2.18                                 | 8.72                                                   | 3/15/2014   |
|                |               |                       |                     | 2.19                                 | 8.76                                                   | 4/24/2014   |
|                |               |                       |                     | 2.11                                 | 8.44                                                   | 4/25/2014   |
|                | IEEE/IEC Head |                       | 8.16 +/- 10%        | 2.07                                 | 8.28                                                   | 2/28/2014   |
|                |               |                       |                     | 2.05                                 | 8.20                                                   | 3/03/2014   |
|                |               |                       |                     | 2.10                                 | 8.40                                                   | 3/08/2014   |
|                |               |                       |                     | 2.00                                 | 8.00                                                   | 3/10/2014   |
|                |               |                       |                     | 2.03                                 | 8.12                                                   | 3/16/2014   |
|                |               |                       |                     | 1.96                                 | 7.84                                                   | 4/26/2014   |
|                |               |                       |                     | 2.82                                 | 11.28                                                  | 2/26/2014   |
|                |               |                       |                     | 2.82                                 | 11.28                                                  | 2/27/2014   |
|                |               |                       |                     | 2.83                                 | 11.32                                                  | 3/07/2014   |
|                |               |                       |                     | 2.81                                 | 11.24                                                  | 3/4/2014    |
|                | FCC Body      | SPEAG D900V2 / 84     | 10.7 +/- 10%        | 2.70                                 | 10.80                                                  | 3/5/2014    |
|                |               |                       |                     |                                      |                                                        |             |
| IEEE/IEC Head  | 10.8 +/- 10%  |                       |                     |                                      |                                                        |             |
|                |               |                       |                     |                                      |                                                        |             |

Note – \* Targets were set for 150MHz per the guidance in KDB8865664 System verification options. Detailed results are available in Appendix J

### 10.3 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 14

| Frequency (MHz) | Tissue Type       | Conductivity Target (S/m) | Dielectric Constant Target | Conductivity Meas. (S/m) | Dielectric Constant Meas. | Tested Date |
|-----------------|-------------------|---------------------------|----------------------------|--------------------------|---------------------------|-------------|
| 138             | FCC Body          | 0.79<br>(0.75-0.83)       | 62.2<br>(59.1-65.3)        | 0.81                     | 61.7                      | 3/12/2014   |
| 138             | IEEE/<br>IEC Head | 0.75<br>(0.71-0.79)       | 52.9<br>(50.2-55.5)        | 0.75                     | 53.7                      | 4/28/2014   |
| 145             | FCC Body          | 0.80<br>(0.76-0.84)       | 62.0<br>(58.9-65.1)        | 0.81                     | 61.4                      | 3/12/2014   |
| 145             | IEEE/<br>IEC Head | 0.76<br>(0.72-0.79)       | 52.5<br>(49.9-55.2)        | 0.76                     | 53.4                      | 4/28/2014   |
| 150             | FCC Body          | 0.80<br>(0.76-0.84)       | 61.9<br>(58.8-65.0)        | 0.79                     | 61.6                      | 2/19/2014   |
|                 |                   |                           |                            | 0.79                     | 61.3                      | 2/20/2014   |
|                 |                   |                           |                            | 0.81                     | 61.2                      | 3/12/2014   |
| 150             | IEEE/<br>IEC Head | 0.76<br>(0.72-0.80)       | 52.3<br>(49.7-54.9)        | 0.77                     | 53.1                      | 3/11/2014   |
|                 |                   |                           |                            | 0.74                     | 52.4                      | 3/12/2014   |
|                 |                   |                           |                            | 0.76                     | 53.1                      | 4/28/2014   |
| 151             | IEEE/<br>IEC Head | 0.76<br>(0.72-0.80)       | 52.3<br>(49.6-54.9)        | 0.77                     | 53.1                      | 3/11/2014   |
|                 |                   |                           |                            | 0.74                     | 52.4                      | 3/12/2014   |
| 173             | FCC Body          | 0.82<br>(0.78-0.86)       | 61.3<br>(58.3-64.4)        | 0.81                     | 60.9                      | 2/19/2014   |
|                 |                   |                           |                            | 0.80                     | 60.7                      | 2/20/2014   |
| 750             | FCC Body          | 0.96<br>(0.92-1.01)       | 55.5<br>(52.8-58.3)        | 0.93                     | 53.2                      | 2/21/2014   |
|                 |                   |                           |                            | 0.94                     | 53.7                      | 2/22/2014   |
|                 |                   |                           |                            | 0.94                     | 53.8                      | 2/23/2014   |
|                 |                   |                           |                            | 0.94                     | 54.3                      | 2/24/2014   |
|                 |                   |                           |                            | 0.93                     | 54.0                      | 2/25/2014   |
|                 |                   |                           |                            | 0.93                     | 53.9                      | 3/05/2014   |
|                 |                   |                           |                            | 0.94                     | 53.8                      | 3/06/2014   |
|                 |                   |                           |                            | 0.92                     | 53.8                      | 3/13/2014   |
|                 |                   |                           |                            | 0.94                     | 53.7                      | 3/15/2014   |
|                 |                   |                           |                            | 0.97                     | 55.7                      | 4/24/2014   |
|                 |                   |                           |                            | 1.00                     | 55.6                      | 4/25/2014   |
| 750             | IEEE/<br>IEC Head | 0.89<br>(0.85-0.93)       | 41.9<br>(39.8-44.0)        | 0.85                     | 42.9                      | 2/28/2014   |
|                 |                   |                           |                            | 0.87                     | 42.6                      | 3/03/2014   |
|                 |                   |                           |                            | 0.85                     | 42.5                      | 3/08/2014   |
|                 |                   |                           |                            | 0.85                     | 42.8                      | 3/10/2014   |
|                 |                   |                           |                            | 0.86                     | 43.2                      | 3/16/2014   |
|                 |                   |                           |                            | 0.88                     | 43.1                      | 4/26/2014   |
| 764             | FCC Body          | 0.96<br>(0.92-1.01)       | 55.5<br>(52.7-58.3)        | 0.94                     | 53.1                      | 2/21/2014   |
|                 |                   |                           |                            | 0.95                     | 53.5                      | 2/22/2014   |
|                 |                   |                           |                            | 0.95                     | 53.7                      | 2/23/2014   |
|                 |                   |                           |                            | 0.95                     | 53.7                      | 3/06/2014   |
|                 |                   |                           |                            | 0.94                     | 53.7                      | 3/13/2014   |

Table 14 continued

| Frequency (MHz) | Tissue Type    | Conductivity Target (S/m) | Dielectric Constant Target | Conductivity Meas. (S/m) | Dielectric Constant Meas. | Tested Date |
|-----------------|----------------|---------------------------|----------------------------|--------------------------|---------------------------|-------------|
| 764             | IEEE/ IEC Head | 0.89<br>(0.85-0.94)       | 41.8<br>(39.7-43.9)        | 0.86                     | 42.7                      | 2/28/2014   |
|                 |                |                           |                            | 0.89                     | 42.4                      | 3/03/2014   |
| 770             | FCC Body       | 0.96<br>(0.92-1.01)       | 55.5<br>(52.7-58.2)        | 0.95                     | 53.1                      | 2/21/2014   |
| 775             | FCC Body       | 0.97<br>(0.92-1.01)       | 55.4<br>(52.7-58.2)        | 0.95                     | 53.1                      | 2/21/2014   |
| 782             | FCC Body       | 0.97<br>(0.92-1.01)       | 55.4<br>(52.6-58.2)        | 0.97                     | 53.4                      | 3/15/2014   |
|                 |                |                           |                            | 1.00                     | 55.4                      | 4/24/2014   |
|                 |                |                           |                            | 1.00                     | 55.6                      | 4/25/2014   |
| 782             | IEEE/ IEC Head | 0.89<br>(0.85-0.94)       | 41.7<br>(39.7-43.8)        | 0.89                     | 42.8                      | 3/16/2014   |
|                 |                |                           |                            | 0.91                     | 42.7                      | 4/26/2014   |
| 793             | FCC Body       | 0.97<br>(0.92-1.02)       | 55.4<br>(52.6-58.1)        | 0.98                     | 53.3                      | 3/15/2014   |
|                 |                |                           |                            | 1.01                     | 55.4                      | 4/24/2014   |
| 793             | IEEE/ IEC Head | 0.90<br>(0.85-0.94)       | 41.7<br>(39.6-43.8)        | 0.90                     | 42.7                      | 3/16/2014   |
|                 |                |                           |                            | 0.92                     | 42.6                      | 4/26/2014   |
| 794             | FCC Body       | 0.97<br>(0.92-1.02)       | 55.4<br>(52.6-58.1)        | 0.98                     | 53.5                      | 3/05/2014   |
| 809             | FCC Body       | 0.97<br>(0.92-1.02)       | 55.3<br>(52.5-58.1)        | 0.99                     | 53.3                      | 2/23/2014   |
|                 |                |                           |                            | 0.99                     | 53.8                      | 2/24/2014   |
|                 |                |                           |                            | 0.98                     | 53.5                      | 2/25/2014   |
|                 |                |                           |                            | 0.99                     | 53.3                      | 3/05/2014   |
|                 |                |                           |                            | 0.99                     | 53.3                      | 3/06/2014   |
| 809             | IEEE/ IEC Head | 0.90<br>(0.85-0.94)       | 41.6<br>(39.5-43.7)        | 0.90                     | 41.8                      | 3/08/2014   |
|                 |                |                           |                            | 0.90                     | 42.1                      | 3/10/2014   |
| 824             | FCC Body       | 0.97<br>(0.92-1.02)       | 55.2<br>(52.5-58.0)        | 1.01                     | 53.2                      | 3/05/2014   |
| 851             | FCC Body       | 0.99<br>(0.94-1.04)       | 55.2<br>(52.4-57.9)        | 1.03                     | 53.7                      | 2/26/2014   |
|                 |                |                           |                            | 1.02                     | 53.1                      | 2/27/2014   |
|                 |                |                           |                            | 1.03                     | 52.8                      | 3/07/2014   |
| 851             | IEEE/ IEC Head | 0.92<br>(0.87-0.96)       | 41.5<br>(39.4-43.6)        | 0.95                     | 41.2                      | 3/04/2014   |
|                 |                |                           |                            | 0.93                     | 40.0                      | 3/05/2014   |
| 900             | FCC Body       | 1.05<br>(1.00-1.10)       | 55.0<br>(52.3-57.8)        | 1.08                     | 53.4                      | 2/26/2014   |
|                 |                |                           |                            | 1.06                     | 52.7                      | 2/27/2014   |
|                 |                |                           |                            | 1.07                     | 52.4                      | 3/07/2014   |
| 900             | IEEE/ IEC Head | 0.97<br>(0.92-1.02)       | 41.6<br>(39.5-43.7)        | 1.00                     | 40.7                      | 3/04/2014   |
|                 |                |                           |                            | 0.98                     | 39.5                      | 3/05/2014   |



## 11.0 Environmental Test Conditions

The EME Laboratory's 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  $\pm 2^{\circ}\text{C}$  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 15**

|                     | Target     | Measured                             |
|---------------------|------------|--------------------------------------|
| Ambient Temperature | 18 – 25 °C | Range: 21.3 – 23.4°C<br>Avg. 22.0 °C |
| Relative Humidity   | 30 – 70 %  | Range: 41.8 – 58.8 %<br>Avg. 51.0 %  |
| Tissue Temperature  | NA         | Range: 20.7-22.6°C<br>Avg. 21.6°C    |

Relative humidity target range is a recommended target

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 Setup and Methodology

### 12.1 Measurements

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

The Table below includes the step sizes and resolution of area and zoom scans per KDB 865664 requirements.

Table 16

| Description                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                    | $\leq 3$ GHz                                                                                                                                                                                                                                                           | $> 3$ GHz                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface                                                                                                                                                                                                                                                                                                                                             |                                    | $5 \pm 1$ mm                                                                                                                                                                                                                                                           | $\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm                         |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location                                                                                                                                                                                                                                                                                                                                                          |                                    | $30^\circ \pm 1^\circ$                                                                                                                                                                                                                                                 | $20^\circ \pm 1^\circ$                                                     |
| Maximum area scan spatial resolution: $\Delta x_{Area}$ , $\Delta y_{Area}$                                                                                                                                                                                                                                                                                                                                                                        |                                    | $\leq 2$ GHz: $\leq 15$ mm<br>2 – 3 GHz: $\leq 12$ mm                                                                                                                                                                                                                  | 3 – 4 GHz: $\leq 12$ mm<br>4 – 6 GHz: $\leq 10$ mm                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                    | When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device. |                                                                            |
| Maximum zoom scan spatial resolution: $\Delta x_{Zoom}$ , $\Delta y_{Zoom}$                                                                                                                                                                                                                                                                                                                                                                        |                                    | $\leq 2$ GHz: $\leq 8$ mm<br>2 – 3 GHz: $\leq 5$ mm*                                                                                                                                                                                                                   | 3 – 4 GHz: $\leq 5$ mm*<br>4 – 6 GHz: $\leq 4$ mm*                         |
| Maximum zoom scan spatial resolution, normal to phantom surface                                                                                                                                                                                                                                                                                                                                                                                    | uniform grid: $\Delta z_{Zoom}(n)$ | $\leq 5$ mm                                                                                                                                                                                                                                                            | 3 – 4 GHz: $\leq 4$ mm<br>4 – 5 GHz: $\leq 3$ mm<br>5 – 6 GHz: $\leq 2$ mm |
| Note: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.<br>* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz. |                                    |                                                                                                                                                                                                                                                                        |                                                                            |

## 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 considered when implementing the guidelines specified in KDB 643646. KDB 941225 was applied to LTE test configurations. Agilent's PXT Wireless Communication Test Set was used for LTE testing with the TTI (Transmit Time Interval) set to maximum.

## 12.3 DUT Positioning Procedures

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

### 12.3.1 Body

The DUT was positioned in normal use configuration against the phantom with the offered body worn accessory as well as with and without the offered audio accessories as applicable.

### 12.3.2 Head

Not applicable.

### 12.3.3 Face

The DUT was positioned with its' front and back sides separated 2.5cm from the phantom.

## 12.4 DUT Test Channels

The number of test channels was determined by using the following IEEE 1528 equation. The use of this equation produces the same or more test channels compared to the FCC KDB 447498 number of test channels formula.

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

Where

$N_c$  = Number of channels

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

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

$F_c$  = Center channel

## 12.5 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 F. For this device the “Max Calc. 1g-SAR” and “Max Calc.10g-SAR” are scaled using the following formula:

$$\text{Max\_Calc} = \text{SAR\_meas} \cdot 10^{\frac{-\text{Drift}}{10}} \cdot \frac{P_{\text{max}}}{P_{\text{int}}} \cdot \text{DC}$$

$P_{\text{max}}$  = Maximum Power (W)

$P_{\text{int}}$  = Initial Power (W)

Drift = DASY drift results (dB)

$\text{SAR\_meas}$  = 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  $P_{\text{int}} > P_{\text{max}}$ , then  $P_{\text{max}}/P_{\text{int}} = 1$ .

Drift = 1 for positive drift

Additional SAR scaling was applied using the methodologies outlined in FCC KDB 865664 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. Negative or reduced SAR scaling is not permitted.

## 12.6 DUT Test Plan

The guidelines and requirements outlined in section 4.0 were used to assess compliance of this device. All modes of operation identified in section 6.0 were considered during the development of the test plan. All tests were performed in CW and LTE modes and 50% duty cycle was applied to PTT configurations in the final results.

Standalone and simultaneous BT testing were assessed in sections 13.14 and 14.0 per the guidelines of KDB 447498.

### 13.0 DUT Test Data

#### 13.1 LMR assessments at the Body for 150.8-173.4MHz band

Battery PMNN4403B was selected as the default battery for assessments at the Body because it is the thinnest battery (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (150.8-173.4MHz) which are listed in Table 17. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 17**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 150.8000        | 6.34      |
| 158.0125        | 6.38      |
| 165.5000        | 6.35      |
| 173.4000        | 6.39      |

#### Assessments at the Body with Body worn NTN8266B

DUT assessment with offered antennas, default battery and, default body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 18**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |  |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|--|
| NAR6593A                           | PMNN4403B | NTN8266B        | PMMN4050A       | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.39         | -0.51          | 1.09                | 0.68                 | 0.63                    | 0.40                     | HvH-Ab-140219-04 |  |
| NAR6594A                           |           |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.48         | -0.50          | 1.21                | 0.76                 | <b>0.69</b>             | 0.43                     | HvH-Ab-140219-05 |  |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |  |
| NAR6594A                           | NNTN7038B | NTN8266B        | PMMN4050A       | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.50         | -0.36          | 1.23                | 0.78                 | 0.68                    | 0.43                     | HvH-Ab-140219-06 |  |

**Table 18 Continued**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |  |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|--|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |  |
| NAR6594A                           | NNTN7034B | NTN8266B        | PMMN4050A       | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.62         | -0.29          | 1.25                | 0.87                 | 0.67                    | 0.47                     | HvH-Ab-140219-07 |  |
|                                    | NNTN7037A |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.50         | -0.88          | 1.08                | 0.79                 | 0.67                    | 0.49                     | HvH-Ab-140219-08 |  |
|                                    | NNTN7573A |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.54         | -0.68          | 1.10                | 0.78                 | 0.65                    | 0.46                     | HvH-Ab-140219-09 |  |

**Assessments at the Body with Body worn HLN6875A**

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 19**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |  |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|--|
| NAR6593A                           | PMNN4403B | HLN6875A        | PMMN4050A       | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.54         | -0.59          | 0.96                | 0.44                 | 0.56                    | 0.25                     | HvH-Ab-140219-10 |  |
| NAR6594A                           |           |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.54         | -0.50          | 1.03                | 0.45                 | 0.58                    | 0.25                     | HvH-Ab-140219-11 |  |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |  |
| NAR6594A                           | NNTN7038B | HLN6875A        | PMMN4050A       | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.50         | -0.42          | 1.19                | 0.53                 | 0.67                    | 0.29                     | HvH-Ab-140220-02 |  |

**Table 19 Continued**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |  |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|--|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |  |
| NAR6594A                           | NNTN7034B | HLN6875A        | PMMN4050A       | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.51         | -0.34          | 2.81                | 1.17                 | 1.54                    | 0.64                     | HvH-Ab-140220-03 |  |
|                                    | NNTN7037A |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.51         | -0.66          | 2.73                | 1.18                 | <b>1.61</b>             | 0.70                     | HvH-Ab-140220-04 |  |
|                                    | NNTN7573A |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 173.4000        | 6.52         | -0.62          | 2.17                | 0.94                 | 1.27                    | 0.55                     | HvH-Ab-140220-05 |  |

**Assessment at the Body with other audio accessories**

Assessment per “KDB 643646 Body SAR Test Consideration for Audio Accessories without Built-in Antenna; Sec 1, A. when overall < 4.0 W/kg, SAR tested for that audio accessory is not necessary.” This was applicable to all remaining accessories.

**Assessment of wireless BT configuration**

Assessment using the overall highest SAR configuration at the body from above without an audio accessory attached. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 20**

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6594A | NNTN7037A | HLN6875A        | None            | 150.8000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 158.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 173.4000        | 6.52         | -0.67          | 3.92                | 1.63                 | <b>2.32</b>             | 0.96                     | HvH-Ab-140220-06 |

### 13.2 LMR assessments at the Body for 764-775MHz band

Battery PMNN4403B was selected as the default battery for assessments at the Body because it is the thinnest battery (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (764-775MHz) which are listed in Table 21. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 21**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 764.0125        | 2.89      |
| 770.000         | 2.88      |
| 774.9875        | 2.88      |

#### Assessments at the Body with Body worn NTN8266B

DUT assessment with offered antennas, default battery and, default body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 21 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 22**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6594A                           | PMNN4403B | NTN8266B        | PMMN4050A       | 764.0125        | 2.92         | -0.21          | 4.56                | 2.69                 | 2.45                    | 1.45                     | HvH-Ab-140221-02 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
| 764.0125                           |           |                 |                 | 2.92            | -0.25        | 2.26           | 1.68                | 1.23                 | 0.91                    | HvH-Ab-140221-03         |                  |
| 770.0000                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 774.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 764.0125                           |           |                 |                 | 2.93            | -0.25        | 7.62           | 4.43                | 4.12                 | 2.39                    | HvH-Ab-140221-04         |                  |
| 770.0000                           |           |                 |                 | 2.92            | -0.46        | 7.17           | 4.15                | 4.08                 | 2.36                    | HvH-Ab-140221-05         |                  |
| 774.9875                           |           |                 |                 | 2.93            | -0.52        | 6.92           | 4.02                | 3.98                 | 2.31                    | HvH-Ab-140221-06         |                  |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| NAR6595A                           | NNTN7038B | NTN8266B        | PMMN4050A       | 764.0125        | 2.93         | -0.01          | 7.47                | 4.40                 | 3.82                    | 2.25                     | HvH-Ab-140221-07 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |

**Table 22 Continued**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| NAR6595A                           | NNTN7034B | NTN8266B        | PMMN4050A       | 764.0125        | 2.92         | -0.31          | 6.88                | 4.52                 | 3.78                    | 2.49                     | HvH-Ab-140222-02 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|                                    | NNTN7037A |                 |                 | 764.0125        | 2.92         | -0.67          | 6.11                | 4.30                 | 3.65                    | 2.57                     | HvH-Ab-140222-03 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|                                    | NNTN7573A |                 |                 | 764.0125        | 2.93         | -0.62          | 6.25                | 4.39                 | 3.68                    | 2.58                     | HvH-Ab-140222-04 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |

**Assessments at the Body with Body worn HLN6875A**

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 21 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 23**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6594A                           | PMNN4403B | HLN6875A        | PMMN4050A       | 764.0125        | 2.93         | -0.24          | 2.53                | 1.87                 | 1.36                    | 1.01                     | HvH-Ab-140222-05 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
| 764.0125                           |           |                 |                 | 2.93            | -0.18        | 0.97           | 0.72                | 0.52                 | 0.39                    | HvH-Ab-140222-06         |                  |
| 770.0000                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 774.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 764.0125                           |           |                 |                 | 2.93            | -0.95        | 5.33           | 3.96                | 3.38                 | 2.51                    | HvH-Ab-140222-07         |                  |
| 770.0000                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 774.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| NAR6595A                           | NNTN7038B | HLN6875A        | PMMN4050A       | 764.0125        | 2.93         | -0.27          | 5.31                | 3.94                 | 2.88                    | 2.14                     | HvH-Ab-140222-08 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |



**Table 23 Continued**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| NAR6595A                           | NNTN7034B | HLN6875A        | PMMN4050A       | 764.0125        | 2.93         | -0.19          | 1.93                | 1.44                 | 1.03                    | 0.77                     | HvH-Ab-140222-09 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|                                    | NNTN7037A |                 |                 | 764.0125        | 2.93         | -0.47          | 2.91                | 2.07                 | 1.65                    | 1.18                     | HvH-Ab-140222-10 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|                                    | NNTN7573A |                 |                 | 764.0125        | 2.94         | -0.49          | 2.85                | 2.03                 | 1.62                    | 1.16                     | HvH-Ab-140222-11 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |

**Assessment at the Body with other audio accessories**

Assessment of additional audio accessories per “KDB 643646 Body SAR Test Consideration for Audio Accessories without Built-in Antenna” Section 1, A. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 24**

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6595A | PMNN4403B | NTN8266B        | HMN4104B        | 764.0125        | 2.94         | -0.32          | 7.46                | 4.39                 | 4.08                    | 2.40                     | HvH-Ab-140222-12 |
|          |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMMN4040A       | 764.0125        | 2.93         | -0.30          | 7.97                | 4.61                 | <b>4.36</b>             | 2.52                     | HvH-Ab-140222-13 |
|          |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMLN5275C       | 764.0125        | 2.93         | -0.28          | 7.16                | 4.24                 | 3.90                    | 2.31                     | HvH-Ab-140222-14 |
|          |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMLN5653A       | 764.0125        | 2.93         | -0.35          | 7.78                | 4.47                 | 4.30                    | 2.47                     | HvH-Ab-140222-15 |
|          |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMLN5102A       | 764.0125        | 2.92         | -0.29          | 7.33                | 4.26                 | 4.01                    | 2.33                     | HvH-Ab-140223-02 |
|          |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | RMN5058A        | 764.0125        | 2.93         | -0.28          | 7.25                | 4.20                 | 3.95                    | 2.29                     | HvH-Ab-140223-03 |
|          |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |

**Table 24 Continued**

| Antenna  | Battery   | Carry Accessory | Cable Accessory      | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------|-----------|-----------------|----------------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6595A | PMNN4403B | NTN8266B        | PMLN5101A            | 764.0125        | 2.93         | -0.34          | 7.49                | 4.32                 | 4.13                    | 2.38                     | HvH-Ab-140223-05 |
|          |           |                 |                      | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | RMN5116A w/HMN4104B  | 764.0125        | 2.93         | -0.32          | 7.54                | 4.37                 | 4.14                    | 2.40                     | HvH-Ab-140223-06 |
|          |           |                 |                      | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMLN5097A            | 764.0125        | 2.93         | -0.13          | 7.32                | 4.38                 | 3.85                    | 2.30                     | HvH-Ab-140223-07 |
|          |           |                 |                      | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | RLN5882A             | 764.0125        | 2.93         | -0.27          | 7.98                | 4.65                 | 4.33                    | 2.52                     | HvH-Ab-140223-08 |
|          |           |                 |                      | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMLN5096B            | 764.0125        | 2.93         | -0.31          | 7.64                | 4.46                 | 4.19                    | 2.44                     | HvH-Ab-140223-09 |
|          |           |                 |                      | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | BDN6783B / BDN6729A  | 764.0125        | 2.93         | 0.07           | 8.10                | 4.80                 | 4.13                    | 2.45                     | HvH-Ab-140223-10 |
|          |           |                 |                      | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | NNTN7869A / ZMN6031A | 764.0125        | 2.93         | -0.23          | 7.43                | 4.38                 | 4.00                    | 2.36                     | HvH-Ab-140223-11 |
|          |           |                 |                      | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 774.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | NNTN7869A / ZMN6032A | 764.0125        | 2.92         | -0.20          | 6.83                | 4.17                 | 3.66                    | 2.24                     | HvH-Ab-140223-12 |
|          |           |                 |                      | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 774.9875        |              |                |                     |                      |                         |                          |                  |

**Assessment of wireless BT configuration**

Assessment using the overall highest SAR configuration at the body from above without an audio accessory attached. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 25**

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6595A | PMNN4403B | NTN8266B        | None            | 764.0125        | 2.90         | -0.62          | 8.60                | 4.93                 | <b>5.11</b>             | 2.93                     | HvH-Ab-140313-08 |
|          |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |

**Assessment of PSM configuration**

Battery NNTN7034B was selected as the default battery for assessments at the Body with Public Safety Microphone (PSM) because it has the highest capacity (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (764-775MHz) which are listed in Table 26. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 26**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 764.0125        | 2.89      |
| 770.000         | 2.88      |
| 774.9875        | 2.88      |

Assessment of offered PSM audio accessories per KDB 643646. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 27**

| Antenna   | Battery   | Carry Accessory   | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|-----------|-----------|-------------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| PMAF4002A | NNTN7034B | 4205823V08 REV. L | PMMN4059B       | 764.0125        | 2.87         | -0.11          | 4.60                | 3.05                 | 2.46                    | 1.63                     | HvH-Ab-140306-04 |
|           |           |                   |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|           |           |                   |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|           |           |                   | PMMN4060B       | 764.0125        | 2.87         | -0.12          | 4.24                | 2.86                 | 2.27                    | 1.53                     | HvH-Ab-140306-05 |
|           |           |                   |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|           |           |                   |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |
|           |           |                   | PMMN4061B       | 764.0125        | 2.88         | -0.11          | 5.66                | 3.81                 | <b>3.01</b>             | 2.03                     | HvH-Ab-140306-06 |
|           |           |                   |                 | 770.0000        |              |                |                     |                      |                         |                          |                  |
|           |           |                   |                 | 774.9875        |              |                |                     |                      |                         |                          |                  |

### 13.3 LMR assessments at the Body for 794-824MHz band

Battery PMNN4403B was selected as the default battery for assessments at the Body because it is the thinnest battery (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (794-824MHz) which are listed in Table 28. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 28**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 794.0125        | 2.89      |
| 808.5000        | 3.49      |
| 823.9875        | 3.49      |

#### Assessments at the Body with Body worn NTN8266B

DUT assessment with offered antennas, default battery and, default body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 28 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 29**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6594A                           | PMNN4403B | NTN8266B        | PMMN4050A       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 808.5000        | 3.58         | -0.18          | 2.07                | 1.24                 | 1.08                    | 0.65                     | HvH-Ab-140223-14 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |
| 794.0125                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 808.5000                           |           |                 |                 | 3.58            | -0.23        | 2.23           | 1.63                | 1.18                 | 0.86                    | HvH-Ab-140223-15         |                  |
| 823.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 794.0125                           |           |                 |                 | 2.90            | -0.38        | 6.72           | 3.89                | 3.78                 | 2.19                    | HvH-Ab-140305-08         |                  |
| 808.5000                           |           |                 |                 | 3.58            | -0.51        | 7.21           | 4.24                | 4.08                 | 2.40                    | HvH-Ab-140223-16         |                  |
| 823.9875                           |           |                 |                 | 3.53            | -0.41        | 6.55           | 3.88                | 3.67                 | 2.17                    | HvH-Ab-140305-09         |                  |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| NAR6595A                           | NNTN7038B | NTN8266B        | PMMN4050A       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 808.5000        | 3.57         | -0.49          | 7.36                | 4.33                 | 4.15                    | 2.44                     | HvH-Ab-140224-02 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |

**Table 29 Continued**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |  |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|--|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |  |
| NAR6595A                           | NNTN7034B | NTN8266B        | PMMN4050A       | 794.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 808.5000        | 3.57         | -0.50          | 6.38                | 4.12                 | 3.61                    | 2.33                     | HvH-Ab-140224-03 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |  |
|                                    | NNTN7037A |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 808.5000        | 3.57         | -0.45          | 6.15                | 4.05                 | 3.44                    | 2.26                     | HvH-Ab-140224-04 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |  |
|                                    | NNTN7573A |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 808.5000        | 3.51         | -0.55          | 6.02                | 3.99                 | 3.50                    | 2.32                     | HvH-Ab-140305-10 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |  |

**Assessments at the Body with Body worn HLN6875A**

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 28 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 30**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6594A                           | PMNN4403B | HLN6875A        | PMMN4050A       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 808.5000        | 3.58         | -0.19          | 1.39                | 1.02                 | 0.73                    | 0.54                     | HvH-Ab-140224-06 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |
| 794.0125                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 808.5000                           |           |                 |                 | 3.58            | -0.18        | 1.15           | 0.84                | 0.60                 | 0.44                    | HvH-Ab-140224-07         |                  |
| 823.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 794.0125                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 808.5000                           |           |                 |                 | 3.58            | -0.42        | 5.41           | 3.98                | 3.00                 | 2.20                    | HvH-Ab-140224-08         |                  |
| 823.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| NAR6595A                           | NNTN7038B | HLN6875A        | PMMN4050A       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 808.5000        | 3.58         | -0.35          | 5.65                | 4.13                 | 3.08                    | 2.25                     | HvH-Ab-140224-09 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |

**Table 30 Continued**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |  |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|--|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |  |
| NAR6595A                           | NNTN7034B | HLN6875A        | PMMN4050A       | 794.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 808.5000        | 3.58         | -0.50          | 2.36                | 1.61                 | 1.33                    | 0.91                     | HvH-Ab-140224-10 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |  |
|                                    | NNTN7037A |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 808.5000        | 3.58         | -0.42          | 3.61                | 2.55                 | 2.00                    | 1.41                     | HvH-Ab-140224-11 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |  |
|                                    | NNTN7573A |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                  |  |
|                                    |           |                 |                 | 808.5000        | 3.58         | -0.39          | 3.66                | 2.57                 | 2.01                    | 1.41                     | HvH-Ab-140224-12 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |  |

**Assessment at the Body with other audio accessories**

Assessment of additional audio accessories per “KDB 643646 Body SAR Test Consideration for Audio Accessories without Built-in Antenna” Section 1, A. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 31**

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6595A | NNTN7038B | NTN8266B        | HMN4104B        | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 808.5000        | 3.59         | -0.41          | 7.03                | 4.16                 | 3.87                    | 2.29                     | HvH-Ab-140224-13 |
|          |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMMN4040A       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 808.5000        | 3.58         | -0.46          | 7.36                | 4.25                 | 4.11                    | 2.38                     | HvH-Ab-140224-14 |
|          |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMLN5275C       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 808.5000        | 3.58         | -0.46          | 7.42                | 4.29                 | 4.15                    | 2.40                     | HvH-Ab-140225-02 |
|          |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMLN5653A       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 808.5000        | 3.58         | -0.46          | 7.28                | 4.24                 | 4.07                    | 2.37                     | HvH-Ab-140225-03 |
|          |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMLN5102A       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 808.5000        | 3.58         | -0.37          | 6.73                | 3.91                 | 3.68                    | 2.14                     | HvH-Ab-140225-04 |
|          |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | RMN5058A        | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 808.5000        | 3.58         | -0.39          | 6.91                | 4.05                 | 3.80                    | 2.23                     | HvH-Ab-140225-05 |
|          |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |

Table 31 Continued

| Antenna  | Battery   | Carry Accessory | Cable Accessory      | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------|-----------|-----------------|----------------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6595A | NNTN7038B | NTN8266B        | PMLN5101A            | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 808.5000        | 3.58         | -0.44          | 6.68                | 3.87                 | 3.72                    | 2.15                     | HvH-Ab-140225-06 |
|          |           |                 |                      | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | RMN5116A w/HMN4104B  | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 808.5000        | 3.58         | -0.41          | 7.12                | 4.17                 | 3.93                    | 2.30                     | HvH-Ab-140225-07 |
|          |           |                 |                      | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMLN5097A            | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 808.5000        | 3.58         | -0.34          | 7.10                | 4.13                 | 3.86                    | 2.25                     | HvH-Ab-140225-08 |
|          |           |                 |                      | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | RLN5882A             | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 808.5000        | 3.59         | -0.53          | 7.51                | 4.31                 | 4.25                    | 2.44                     | HvH-Ab-140225-09 |
|          |           |                 |                      | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | PMLN5096B            | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 808.5000        | 3.58         | -0.47          | 7.76                | 4.54                 | 4.35                    | 2.54                     | HvH-Ab-140225-10 |
|          |           |                 |                      | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | BDN6783B / BDN6729A  | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 808.5000        | 3.59         | -0.48          | 8.03                | 4.68                 | <b>4.50</b>             | 2.62                     | HvH-Ab-140225-11 |
|          |           |                 |                      | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | NNTN7869A / ZMN6031A | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 808.5000        | 3.59         | -0.49          | 6.85                | 4.03                 | 3.84                    | 2.26                     | HvH-Ab-140225-12 |
|          |           |                 |                      | 823.9875        |              |                |                     |                      |                         |                          |                  |
|          |           |                 | NNTN7869A / ZMN6032A | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                      | 808.5000        | 3.59         | -0.38          | 7.58                | 4.43                 | 4.15                    | 2.42                     | HvH-Ab-140225-13 |
|          |           |                 |                      | 823.9875        |              |                |                     |                      |                         |                          |                  |

**Assessment of wireless BT configuration**

Assessment using the overall highest SAR configuration at the body from above without an audio accessory attached. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 32

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6595A | NNTN7038B | NTN8266B        | None            | 794.0125        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 808.5000        | 3.59         | -0.41          | 7.55                | 4.28                 | <b>4.16</b>             | 2.36                     | HvH-Ab-140225-14 |
|          |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |

**Assessment of PSM configuration**

Battery NNTN7034B was selected as the default battery for assessments at the Body with Public Safety Microphone (PSM) because it has the highest capacity (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (794-824MHz) which are listed in Table 33. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 33**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 794.0125        | 2.89      |
| 808.5000        | 3.50      |
| 823.9875        | 3.49      |

Assessment of offered PSM audio accessories per KDB 643646. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 34**

| Antenna   | Battery   | Carry Accessory   | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|-----------|-----------|-------------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| PMAF4002A | NNTN7034B | 4205823V08 REV. L | PMMN4059B       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|           |           |                   |                 | 808.5000        | 3.51         | -0.66          | 3.84                | 2.51                 | <b>2.29</b>             | 1.50                     | HvH-Ab-140306-07 |
|           |           |                   |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |
|           |           |                   | PMMN4060B       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|           |           |                   |                 | 808.5000        | 3.51         | -0.72          | 2.31                | 1.56                 | 1.40                    | 0.94                     | HvH-Ab-140306-08 |
|           |           |                   |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |
|           |           |                   | PMMN4061B       | 794.0125        |              |                |                     |                      |                         |                          |                  |
|           |           |                   |                 | 808.5000        | 3.51         | -0.41          | 3.90                | 2.64                 | 2.20                    | 1.49                     | HvH-Ab-140306-09 |
|           |           |                   |                 | 823.9875        |              |                |                     |                      |                         |                          |                  |



### 13.4 LMR assessments at the Body for 851-869MHz band

Battery PMNN4403B was selected as the default battery for assessments at the Body because it is the thinnest battery (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (851-869MHz) which are listed in Table 35. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 35**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 851.0125        | 3.52      |
| 860.0000        | 3.49      |
| 868.9875        | 3.49      |

### Assessments at the Body with Body worn NTN8266B

DUT assessment with offered antennas, default battery and, default body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 35 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 36**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6594A                           | PMNN4403B | NTN8266B        | PMMN4050A       | 851.0125        | 3.56         | -0.32          | 5.39                | 3.41                 | 2.93                    | 1.86                     | HvH-Ab-140226-02 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |
| 851.0125                           |           |                 |                 | 3.58            | -0.16        | 3.02           | 1.89                | 1.58                 | 0.99                    | HvH-Ab-140226-05         |                  |
| 860.0000                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 868.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 851.0125                           |           |                 |                 | 3.58            | -0.31        | 5.38           | 3.24                | 2.91                 | 1.75                    | HvH-Ab-140226-06         |                  |
| 860.0000                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 868.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| NAR6594A                           | NNTN7038B | NTN8266B        | PMMN4050A       | 851.0125        | 3.58         | -0.43          | 5.42                | 3.42                 | 3.01                    | 1.90                     | HvH-Ab-140226-07 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |

**Table 36 Continued**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| NAR6594A                           | NNTN7034B | NTN8266B        | PMMN4050A       | 851.0125        | 3.58         | 0.11           | 5.93                | 3.82                 | 2.98                    | 1.92                     | HvH-Ab-140226-08 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |
|                                    | NNTN7037A |                 |                 | 851.0125        | 3.59         | 0.05           | 5.71                | 3.75                 | 2.86                    | 1.88                     | HvH-Ab-140227-02 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |
|                                    | NNTN7573A |                 |                 | 851.0125        | 3.57         | 0.06           | 5.76                | 3.73                 | 2.90                    | 1.88                     | HvH-Ab-140227-03 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |

**Assessments at the Body with Body worn HLN6875A**

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 35 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 37**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6594A                           | PMNN4403B | HLN6875A        | PMMN4050A       | 851.0125        | 3.58         | 0.23           | 2.34                | 1.70                 | 1.18                    | 0.85                     | HvH-Ab-140227-04 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |
| 851.0125                           |           |                 |                 | 3.58            | -0.08        | 1.46           | 1.06                | 0.75                 | 0.54                    | HvH-Ab-140227-05         |                  |
| 860.0000                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 868.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 851.0125                           |           |                 |                 | 3.57            | -0.28        | 4.22           | 3.05                | 2.27                 | 1.64                    | HvH-Ab-140227-06         |                  |
| 860.0000                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 868.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| NAR6595A                           | NNTN7038B | HLN6875A        | PMMN4050A       | 851.0125        | 3.58         | -0.24          | 4.15                | 3.00                 | 2.21                    | 1.59                     | HvH-Ab-140227-07 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |

**Table 37 Continued**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| NAR6595A                           | NNTN7034B | HLN6875A        | PMMN4050A       | 851.0125        | 3.58         | -0.24          | 3.75                | 1.69                 | 1.99                    | 0.90                     | HvH-Ab-140227-08 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |
|                                    | NNTN7037A |                 |                 | 851.0125        | 3.57         | -0.24          | 3.88                | 2.71                 | 2.07                    | 1.44                     | HvH-Ab-140227-09 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |
|                                    | NNTN7573A |                 |                 | 851.0125        | 3.58         | -0.23          | 4.07                | 2.75                 | 2.16                    | 1.46                     | HvH-Ab-140227-10 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |

**Assessment at the Body with other audio accessories**

Assessment per “KDB 643646 Body SAR Test Consideration for Audio Accessories without Built-in Antenna; Sec 1, A. when overall < 4.0 W/kg, SAR tested for that audio accessory is not necessary.” This was applicable to all remaining accessories.

**Assessment of wireless BT configuration**

Assessment using the overall highest SAR configuration at the body from above without an audio accessory attached. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 38**

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6594A | NNTN7038B | NTN8266B        | None            | 851.0125        | 3.58         | -0.48          | 5.45                | 3.33                 | <b>3.06</b>             | 1.87                     | HvH-Ab-140227-11 |
|          |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|          |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |

**Assessment of PSM configuration**

Battery NNTN7034B was selected as the default battery for assessments at the Body with Public Safety Microphone (PSM) because it has the highest capacity (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (851-869MHz) which are listed in Table 39. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 39**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 851.0125        | 3.52      |
| 860.0000        | 3.49      |
| 868.9875        | 3.49      |

Assessment of offered PSM audio accessories per KDB 643646. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 40**

| Antenna   | Battery   | Carry Accessory   | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|-----------|-----------|-------------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| PMAF4002A | NNTN7034B | 4205823V08 REV. L | PMMN4059B       | 851.0125        | 3.56         | -0.65          | 3.89                | 2.52                 | <b>2.28</b>             | 1.48                     | HvH-Ab-140307-02 |
|           |           |                   |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|           |           |                   |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |
|           |           |                   | PMMN4060B       | 851.0125        | 3.57         | -0.16          | 1.28                | 0.833                | 0.67                    | 0.44                     | HvH-Ab-140307-03 |
|           |           |                   |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|           |           |                   |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |
|           |           |                   | PMMN4061B       | 851.0125        | 3.56         | -0.56          | 2.48                | 1.59                 | 1.43                    | 0.91                     | HvH-Ab-140307-04 |
|           |           |                   |                 | 860.0000        |              |                |                     |                      |                         |                          |                  |
|           |           |                   |                 | 868.9875        |              |                |                     |                      |                         |                          |                  |

### 13.5 LTE assessments at the Body for 777-787MHz band (B13)

Battery PMNN4403B was selected as the default battery for assessments at the Body because it is the thinnest (refer to Exhibit 7B for battery illustration) per KDB 643646 (SAR Test for PTT Radios). The default battery was used during conducted power measurements for all test configurations within Part 27 frequency range (777-787MHz). Table 41 below includes the output powers for the largest channel bandwidth (10MHz), QPSK and 1 RB allocation and location (low, mid, high). The highest RB configuration was used to start the LTE testing per KDB 941225 (SAR for LTE Devices). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 41**

| QPSK, 10MHz BW Power (dBm) |       |        |       |
|----------------------------|-------|--------|-------|
| RB Allocation              | Lower | Middle | Upper |
| <b>1 RB</b>                | 22.15 | 23.37  | 22.28 |

### Assessments at the Body with Body worn NTN8266B

DUT assessment with LTE internal antenna, default battery and, default body worn accessory per KDB 643646 using the highest output power configuration from Table 41 per KDB 941225. Optional batteries were tested per the requirements of KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 42**

| Antenna                                         | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|-------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Band 13 (777-787MHz), 10MHz BW, QPSK 1RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 85009332001                                     | PMNN4403B | NTN8266B        | PMMN4050A       | 782             | 0.22         | 0.42           | 0.11                | 0.07                 | 0.17                    | 0.10                     | HvH-Ab-140315-04 |
|                                                 | NNTN7038B |                 |                 |                 | 0.22         | 0.00           | 0.11                | 0.07                 | <b>0.17</b>             | 0.10                     | HvH-Ab-140315-05 |
|                                                 | NNTN7034B |                 |                 |                 | 0.22         | 0.21           | 0.07                | 0.04                 | 0.10                    | 0.06                     | HvH-Ab-140315-06 |
|                                                 | NNTN7037A |                 |                 |                 | 0.22         | 0.34           | 0.08                | 0.05                 | 0.12                    | 0.07                     | HvH-Ab-140315-07 |
|                                                 | NNTN7573A |                 |                 |                 | 0.22         | 0.24           | 0.08                | 0.05                 | 0.12                    | 0.07                     | HvH-Ab-140315-08 |

**Assessments at the Body with Body worn HLN6875A**

DUT assessment with LTE internal antenna, default battery and, optional body worn accessory per KDB 643646 using the highest output power configuration from Table 41 per KDB 941225. Optional batteries were tested per the requirements of KDB 643646. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 43**

| Antenna                                         | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|-------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Band 13 (777-787MHz), 10MHz BW, QPSK 1RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 85009332001                                     | PMNN4403B | HLN6875A        | PMMN4050A       | 782             | 0.22         | -0.51          | 0.06                | 0.04                 | <b>0.10</b>             | 0.07                     | HvH-Ab-140315-09 |
|                                                 | NNTN7038B |                 |                 |                 | 0.22         | -0.32          | 0.06                | 0.04                 | 0.09                    | 0.07                     | HvH-Ab-140315-10 |
|                                                 | NNTN7034B |                 |                 |                 | 0.22         | 0.21           | 0.03                | 0.02                 | 0.04                    | 0.03                     | HvH-Ab-140315-11 |
|                                                 | NNTN7037A |                 |                 |                 | 0.22         | 0.22           | 0.03                | 0.02                 | 0.05                    | 0.03                     | HvH-Ab-140315-12 |
|                                                 | NNTN7573A |                 |                 |                 | 0.22         | 0.48           | 0.04                | 0.02                 | 0.05                    | 0.03                     | HvH-Ab-140315-13 |

**Assessment at the Body with other audio accessories**

Assessment per “KDB 643646 Body SAR Test Consideration for Audio Accessories without Built-in Antenna; Sec 1, A. when overall < 0.8 W/kg, SAR tested for that audio accessory is not necessary.” This was applicable to all remaining accessories.

**Assessment at the Body with other 1 RB allocations**

Assessments for additional 1RB configurations are not required per KDB 941225 when the reported SAR is less than or equal to half the SAR limit i.e. 0.8 W/kg.

**Assessment at the Body with 50% RB allocations**

Assessment at the body with 50% RB allocation based on the output power in Table 44.

**Table 44**

| QPSK, 10MHz BW Power (dBm) |       |        |       |
|----------------------------|-------|--------|-------|
| RB Allocation              | Lower | Middle | Upper |
| <b>50% RB</b>              | 22.70 | 22.94  | 22.63 |

Assessment at the body with 50% RB allocation was conducted using highest configuration from 1RB data. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 45**

| Antenna                                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Band 13 (777-787MHz), 10MHz BW, QPSK 50% RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 85009332001                                        | NNTN7038B | NTN8266B        | PMMN4050A       | 782             | 0.20         | 0.33           | 0.13                | 0.09                 | <b>0.21</b>             | 0.14                     | HvH-Ab-140424-02 |

**Assessment at the Body with 100% RB allocations**

Assessment at the body with 100% RB allocation is not required when the highest maximum output power for 100% RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1RB and 50% RB allocation from above are less than or equal to half the SAR limit i.e. 0.8 W/kg. Table 46 below indicates no testing is required.

**Table 46**

| <b>QPSK, 10MHz BW Power (dBm)</b> |              |               |              |
|-----------------------------------|--------------|---------------|--------------|
| <b>RB Allocation</b>              | <b>Lower</b> | <b>Middle</b> | <b>Upper</b> |
| <b>1 RB</b>                       | 22.15        | 23.37         | 22.28        |
| <b>50% RB</b>                     | 22.70        | 22.94         | 22.63        |
| <b>100% RB</b>                    | 22.74        |               |              |

**Assessment at the Body with 16QAM RB allocations**

Assessment at the body with 16QAM RB allocation is required only when the highest maximum output power for the configuration in the higher order modulation (bold in table below) is  $> \frac{1}{2}$  dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is  $> 90\%$  of the SAR limit. Data in Table 47 below indicates one test is required.

**Table 47**

| <b>RB allocation</b> | <b>RB location</b> | <b>QPSK</b> | <b>16QAM</b> | <b>dB delta</b> |
|----------------------|--------------------|-------------|--------------|-----------------|
| 1 RB                 | Lower              | 22.15       | 22.60        | 0.45            |
|                      | Middle             | 23.37       | <b>23.99</b> | <b>0.62</b>     |
|                      | Upper              | 22.28       | 22.91        | 0.63            |
| 50% RB               | Lower              | 22.70       | 22.75        | 0.05            |
|                      | Middle             | 22.94       | <b>22.95</b> | 0.01            |
|                      | Upper              | 22.63       | 22.74        | 0.11            |
| 100% RB              | All                | 22.74       | <b>22.95</b> | 0.21            |

Assessment at the body with 16QAM RB allocation was conducted using highest configuration from 1RB data. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 48**

| <b>Antenna</b>                                    | <b>Battery</b> | <b>Carry Accessory</b> | <b>Cable Accessory</b> | <b>Test Freq (MHz)</b> | <b>Init Pwr (W)</b> | <b>SAR Drift (dB)</b> | <b>Meas. 1g-SAR (W/kg)</b> | <b>Meas. 10g-SAR (W/kg)</b> | <b>Max Calc. 1g-SAR (W/kg)</b> | <b>Max Calc. 10g-SAR (W/kg)</b> | <b>Run#</b>      |
|---------------------------------------------------|----------------|------------------------|------------------------|------------------------|---------------------|-----------------------|----------------------------|-----------------------------|--------------------------------|---------------------------------|------------------|
| Band 13 (777-787MHz), 10MHz BW, 16QAM 1 RB middle |                |                        |                        |                        |                     |                       |                            |                             |                                |                                 |                  |
| 85009332001                                       | NNTN7038B      | NTN8266B               | PMMN4050A              | 782                    | 0.25                | -0.18                 | 0.10                       | 0.04                        | <b>0.13</b>                    | 0.05                            | HvH-Ab-140424-03 |

**Assessment at the Body with 5MHz bandwidth channel**

Assessment at the body with 5MHz bandwidth channel is required when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is  $> \frac{1}{2}$  dB higher than the equivalent channel configurations in the largest channel bandwidth configuration. Table 49 below indicates no testing is required.

**Table 49**

| RB allocation | RB location | 10MHz BW Ch. | 5MHz BW Ch.  | dB delta |
|---------------|-------------|--------------|--------------|----------|
| <b>QPSK</b>   |             |              |              |          |
| 1RB           | Lower       | 22.15        | 22.36        | 0.21     |
|               | Middle      | 23.37        | <b>22.93</b> | -0.44    |
|               | Upper       | 22.28        | 22.33        | 0.05     |
| 50% RB        | Lower       | 22.70        | 22.34        | -0.36    |
|               | Middle      | 22.94        | <b>22.64</b> | -0.30    |
|               | Upper       | 22.63        | 22.41        | -0.22    |
| 100% RB       | All         | 22.74        | <b>22.49</b> | -0.25    |
| <b>16 QAM</b> |             |              |              |          |
| 1RB           | Lower       | 22.60        | 22.54        | -0.06    |
|               | Middle      | 23.99        | <b>23.15</b> | -0.84    |
|               | Upper       | 22.91        | 22.63        | -0.28    |
| 50% RB        | Lower       | 22.75        | 22.30        | -0.45    |
|               | Middle      | 22.95        | <b>22.53</b> | -0.42    |
|               | Upper       | 22.74        | 22.33        | -0.41    |
| 100% RB       | All         | 22.95        | <b>22.44</b> | -0.51    |

**Assessment at the Body with 3MHz bandwidth channel**

Assessment at the body with 3MHz bandwidth channel is required when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration. Table 50 below indicates no testing is required.

**Table 50**

| RB allocation | RB location | 10MHz BW Ch. | 3MHz BW Ch.  | dB delta |
|---------------|-------------|--------------|--------------|----------|
| <b>QPSK</b>   |             |              |              |          |
| 1RB           | Lower       | 22.15        | 22.46        | 0.31     |
|               | Middle      | 23.37        | <b>22.91</b> | -0.46    |
|               | Upper       | 22.28        | 22.67        | 0.39     |
| 50% RB        | Lower       | 22.70        | 22.95        | 0.25     |
|               | Middle      | 22.94        | <b>23.14</b> | 0.20     |
|               | Upper       | 22.63        | 22.97        | 0.34     |
| 100% RB       | All         | 22.74        | <b>22.38</b> | -0.36    |
| <b>16 QAM</b> |             |              |              |          |
| 1RB           | Lower       | 22.60        | 23.44        | 0.84     |
|               | Middle      | 23.99        | <b>23.88</b> | -0.11    |
|               | Upper       | 22.91        | 23.54        | 0.63     |
| 50% RB        | Lower       | 22.75        | 22.88        | 0.13     |
|               | Middle      | 22.95        | <b>23.09</b> | 0.14     |
|               | Upper       | 22.74        | 22.82        | 0.08     |
| 100% RB       | All         | 22.95        | <b>22.51</b> | -0.44    |



**Assessment at the Body with 1.4MHz bandwidth channel**

Assessment at the body with 1.4MHz bandwidth channel is required when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is  $> \frac{1}{2}$  dB higher than the equivalent channel configurations in the largest channel bandwidth configuration. Table 51 below indicates two tests are required.

**Table 51**

| RB allocation | RB location | 10MHz BW Ch. | 1.4MHz BW Ch. | dB delta    |
|---------------|-------------|--------------|---------------|-------------|
| <b>QPSK</b>   |             |              |               |             |
| 1RB           | Lower       | 22.15        | 22.82         | 0.67        |
|               | Middle      | 23.37        | <b>22.88</b>  | -0.49       |
|               | Upper       | 22.28        | 22.73         | 0.45        |
| 50% RB        | Lower       | 22.70        | 22.61         | -0.09       |
|               | Middle      | 22.94        | <b>22.96</b>  | 0.02        |
|               | Upper       | 22.63        | 22.89         | 0.26        |
| 100% RB       | All         | 22.74        | <b>22.66</b>  | -0.08       |
| <b>16 QAM</b> |             |              |               |             |
| 1RB           | Lower       | 23.30        | <b>23.93</b>  | <b>0.63</b> |
|               | Middle      | 23.55        | 23.84         | 0.29        |
|               | Upper       | 22.95        | 23.69         | 0.74        |
| 50% RB        | Lower       | 22.54        | 23.47         | 0.93        |
|               | Middle      | 22.27        | <b>23.49</b>  | <b>1.22</b> |
|               | Upper       | 22.18        | 23.44         | 1.26        |
| 100% RB       | All         | 22.58        | <b>22.66</b>  | 0.08        |

Assessment at the body with 1.4MHz band width channel as indicated in Table 51 above was conducted using highest configuration from 1RB data. This data is in Table 52 below. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 52**

| Antenna                                              | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|------------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Band 13 (777-787MHz), 1.4MHz BW, 16QAM 1 RB lower    |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 85009332001                                          | NNTN7038B | NTN8266B        | PMMN4050A       | 782             | 0.23         | -0.02          | 0.12                | 0.08                 | <b>0.17</b>             | 0.10                     | HvH-Ab-140425-04 |
| Band 13 (777-787MHz), 1.4MHz BW, 16QAM 50% RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 85009332001                                          | NNTN7038B | NTN8266B        | PMMN4050A       | 782             | 0.22         | 0.13           | 0.10                | 0.06                 | 0.15                    | 0.09                     | HvH-Ab-140425-05 |

**13.6 LTE assessment at the Body for 788-798MHz band (B14)**

Battery PMNN4403B was selected as the default battery for assessments at the Body because it is the thinnest (refer to Exhibit 7B for battery illustration) per KDB 643646 (SAR Test for PTT Radios). The default battery was used during conducted power measurements for all test configurations within Part 90 frequency range (788-798MHz). Table 53 below includes the output powers for the largest channel bandwidth (10MHz), QPSK and 1 RB allocation and location (low, mid, high). The highest RB configuration was used to start the LTE testing per KDB 941225 (SAR for LTE Devices). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 53**

| QPSK, 10MHz BW Power (dBm) |       |        |       |
|----------------------------|-------|--------|-------|
| RB Allocation              | Lower | Middle | Upper |
| 1 RB                       | 22.88 | 23.14  | 22.77 |

**Assessments at the Body with Body worn NTN8266B**

DUT assessment with LTE internal antenna, default battery and, default body worn accessory per KDB 643646 using the highest output power configuration from Table 53 per KDB 941225. Optional batteries were tested per the requirements of KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 54**

| Antenna                                         | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|-------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Band 14 (788-798MHz), 10MHz BW, QPSK 1RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 85009332001                                     | PMNN4403B | NTN8266B        | PMMN4050A       | 793.000         | 0.21         | 0.06           | 0.12                | 0.07                 | <b>0.18</b>             | 0.11                     | HvH-Ab-140315-14 |
|                                                 | NNTN7038B |                 |                 |                 | 0.21         | 0.23           | 0.12                | 0.07                 | 0.18                    | 0.11                     | HvH-Ab-140315-15 |
|                                                 | NNTN7034B |                 |                 |                 | 0.21         | 0.21           | 0.07                | 0.04                 | 0.11                    | 0.07                     | HvH-Ab-140315-16 |
|                                                 | NNTN7037A |                 |                 |                 | 0.21         | 0.32           | 0.07                | 0.04                 | 0.11                    | 0.06                     | HvH-Ab-140315-17 |
|                                                 | NNTN7573A |                 |                 |                 | 0.21         | 0.11           | 0.07                | 0.04                 | 0.11                    | 0.07                     | HvH-Ab-140315-18 |

**Assessments at the Body with Body worn HLN6875A**

DUT assessment with LTE internal antenna, default battery and, optional body worn accessory per KDB 643646 using the highest output power configuration from Table 53 per KDB 941225. Optional batteries were tested per the requirements of KDB 643646. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 55**

| Antenna                                         | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|-------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Band 14 (788-798MHz), 10MHz BW, QPSK 1RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 85009332001                                     | PMNN4403B | HLN6875A        | PMMN4050A       | 793.000         | 0.21         | 0.13           | 0.09                | 0.07                 | 0.14                    | 0.10                     | HvH-Ab-140315-19 |
|                                                 | NNTN7038B |                 |                 |                 | 0.21         | -0.58          | 0.09                | 0.07                 | <b>0.16</b>             | 0.12                     | HvH-Ab-140315-20 |
|                                                 | NNTN7034B |                 |                 |                 | 0.21         | 0.19           | 0.03                | 0.02                 | 0.05                    | 0.04                     | HvH-Ab-140315-21 |
|                                                 | NNTN7037A |                 |                 |                 | 0.21         | 0.29           | 0.08                | 0.04                 | 0.12                    | 0.07                     | HvH-Ab-140315-22 |
|                                                 | NNTN7573A |                 |                 |                 | 0.21         | 0.42           | 0.07                | 0.04                 | 0.11                    | 0.06                     | HvH-Ab-140315-23 |

**Assessment at the Body with other audio accessories**

Assessment per “KDB 643646 Body SAR Test Consideration for Audio Accessories without Built-in Antenna; Sec 1, A. when overall < 4.0 W/kg, SAR tested for that audio accessory is not necessary.” This was applicable to all remaining accessories.

**Assessment at the Body with other 1 RB allocations**

Assessments for additional 1RB configurations are not required per KDB 941225 when the reported SAR is less than or equal to half the SAR limit i.e. 4.0 W/kg.

**Assessment at the Body with 50% RB allocations**

Assessment at the body with 50% RB allocation based on the output power in Table 56.

**Table 56**

| QPSK, 10MHz BW Power (dBm) |       |        |       |
|----------------------------|-------|--------|-------|
| RB Allocation              | Lower | Middle | Upper |
| 50% RB                     | 22.72 | 22.94  | 22.65 |

Assessment at the body with 50% RB allocation was conducted using highest configuration from 1RB results. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 57**

| Antenna                                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| Band 14 (788-798MHz), 10MHz BW, QPSK 50% RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                  |
| 85009332001                                        | PMNN4403B | NTN8266B        | PMMN4050A       | 793.000         | 0.20         | 0.16           | 0.11                | 0.06                 | <b>0.18</b>             | 0.10                     | HvH-Ab-140424-04 |

**Assessment at the Body with 100% RB allocations**

Assessment at the body with 100% RB allocation is not required when the highest maximum output power for 100% RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1RB and 50% RB allocation from above are less than or equal to half the SAR limit i.e. 4.0 W/kg. Table 58 below indicates no testing is required.

**Table 58**

| <b>QPSK, 10MHz BW Power (dBm)</b> |              |               |              |
|-----------------------------------|--------------|---------------|--------------|
| <b>RB Allocation</b>              | <b>Lower</b> | <b>Middle</b> | <b>Upper</b> |
| <b>1 RB</b>                       | 22.88        | 23.14         | 22.77        |
| <b>50% RB</b>                     | 22.72        | 22.94         | 22.65        |
| <b>100% RB</b>                    | 22.56        |               |              |

**Assessment at the Body with 16QAM RB allocations**

Assessment at the body with 16QAM RB allocation is required only when the highest maximum output power for the configuration in the higher order modulation (bold in table below) is  $> \frac{1}{2}$  dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is  $> 90\%$  of the SAR limit. Data in Table 59 below indicates no testing is required.

**Table 59**

| <b>RB allocation</b> | <b>RB location</b> | <b>QPSK</b> | <b>16QAM</b> | <b>dB delta</b> |
|----------------------|--------------------|-------------|--------------|-----------------|
| 1 RB                 | Lower              | 22.88       | 23.30        | 0.42            |
|                      | Middle             | 23.14       | <b>23.55</b> | <b>0.41</b>     |
|                      | Upper              | 22.77       | 22.95        | 0.18            |
| 50% RB               | Lower              | 22.72       | <b>22.54</b> | <b>-0.18</b>    |
|                      | Middle             | 22.94       | 22.27        | -0.67           |
|                      | Upper              | 22.65       | 22.18        | -0.47           |
| 100% RB              | All                | 22.56       | <b>22.58</b> | <b>0.02</b>     |

**Assessment at the Body with 5MHz bandwidth channel**

Assessment at the body with 5MHz bandwidth channel is required when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is  $> \frac{1}{2}$  dB higher than the equivalent channel configurations in the largest channel bandwidth configuration. Table 60 below indicates no testing is required.

**Table 60**

| <b>RB allocation</b> | <b>RB location</b> | <b>10MHz BW Ch.</b> | <b>5MHz BW Ch.</b> | <b>dB delta</b> |
|----------------------|--------------------|---------------------|--------------------|-----------------|
| <b>QPSK</b>          |                    |                     |                    |                 |
| 1RB                  | Lower              | 22.88               | 22.80              | -0.08           |
|                      | Middle             | 23.14               | <b>23.21</b>       | 0.07            |
|                      | Upper              | 22.77               | 22.95              | 0.18            |
| 50% RB               | Lower              | 22.72               | 22.87              | 0.15            |
|                      | Middle             | 22.94               | <b>23.02</b>       | 0.08            |
|                      | Upper              | 22.65               | 22.57              | -0.08           |
| 100% RB              | All                | 22.56               | <b>22.37</b>       | -0.19           |

**Table 60 continued**

| RB allocation | RB location | 10MHz BW Ch. | 5MHz BW Ch.  | dB delta |
|---------------|-------------|--------------|--------------|----------|
| <b>16QAM</b>  |             |              |              |          |
| 1RB           | Lower       | 23.30        | <b>23.26</b> | -0.04    |
|               | Middle      | 23.55        | 23.23        | -0.32    |
|               | Upper       | 22.95        | 22.89        | -0.06    |
| 50% RB        | Lower       | 22.54        | 22.22        | -0.32    |
|               | Middle      | 22.27        | 22.40        | 0.13     |
|               | Upper       | 22.18        | <b>22.57</b> | 0.39     |
| 100% RB       | All         | 22.58        | <b>21.78</b> | -0.80    |

**13.7 LMR assessments at the Face for 150.8-173.4MHz band**

Battery NNTN7034B was selected as the default battery for assessments at the Face because it has the highest capacity (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (150.8-173.4MHz) which are listed in Table 61. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 61**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 150.8000        | 6.36      |
| 158.0125        | 6.39      |
| 165.5000        | 6.36      |
| 173.4000        | 6.39      |

DUT assessment with offered antennas, default battery with front of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 61 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 62**

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |  |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|--|
| NAR6593A | NNTN7034B | None (front)    | None            | 150.8000        |              |                |                     |                      |                         |                          |                    |  |
|          |           |                 |                 | 158.0125        | 6.40         | -0.40          | 0.75                | 0.58                 | 0.42                    | 0.33                     | HvH-Face-140311-02 |  |
|          |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |  |
|          |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |  |
| NAR6594A |           |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                    |  |
|          |           |                 |                 | 158.0125        | 6.40         | -0.44          | 0.82                | 0.64                 | 0.47                    | 0.36                     | HvH-Face-140311-03 |  |
|          |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |  |
|          |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |  |

Table 62 continued

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |  |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|--|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |  |
| NAR6594A                           | NNTN7037A | None (front)    | None            | 150.8000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 158.0125        | 6.45         | -0.36          | 0.82                | 0.63                 | 0.45                    | 0.35                     | HvH-Face-140311-04 |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |  |
|                                    | NNTN7573A |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 158.0125        | 6.46         | -0.38          | 0.82                | 0.64                 | 0.46                    | 0.35                     | HvH-Face-140311-05 |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |  |
|                                    | PMNN4403B |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 158.0125        | 6.42         | -0.44          | 0.85                | 0.66                 | 0.48                    | 0.37                     | HvH-Face-140311-06 |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |  |
|                                    | NNTN7038B |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 158.0125        | 6.45         | -0.40          | 0.86                | 0.67                 | <b>0.48</b>             | 0.37                     | HvH-Face-140311-07 |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |  |

DUT assessment with offered antennas, default battery with back of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 61 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 63

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| NAR6593A | NNTN7034B | None (back)     | None            | 150.8000        |              |                |                     |                      |                         |                          |                    |
|          |           |                 |                 | 158.0125        | 6.48         | -0.38          | 0.77                | 0.60                 | 0.43                    | 0.33                     | HvH-Face-140311-08 |
|          |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |
|          |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |
| NAR6594A |           |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                    |
|          |           |                 |                 | 158.0125        | 6.44         | -0.40          | 0.85                | 0.66                 | <b>0.48</b>             | 0.37                     | HvH-Face-140311-09 |
|          |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |
|          |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |

**Table 63 continued**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |  |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|--|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |  |
| NAR6594A                           | NNTN7037A | None (back)     | None            | 150.8000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 158.0125        | 6.39         | -0.28          | 0.83                | 0.64                 | 0.46                    | 0.35                     | HvH-Face-140312-02 |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |  |
|                                    | NNTN7573A |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 158.0125        | 6.38         | -0.31          | 0.83                | 0.64                 | 0.46                    | 0.36                     | HvH-Face-140312-03 |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |  |
|                                    | PMNN4403B |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 158.0125        | 6.39         | -0.34          | 0.84                | 0.65                 | 0.47                    | 0.36                     | HvH-Face-140312-04 |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |  |
|                                    | NNTN7038B |                 |                 | 150.8000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 158.0125        | 6.38         | -0.38          | 0.84                | 0.65                 | 0.47                    | 0.37                     | HvH-Face-140312-05 |  |
|                                    |           |                 |                 | 165.5000        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 173.4000        |              |                |                     |                      |                         |                          |                    |  |

### 13.8 LMR assessment at the Face for 764-775MHz band

Battery NNTN7034B was selected as the default battery for assessments at the Face because it has the highest capacity (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (764-775MHz) which are listed in Table 64. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 64**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 764.0125        | 2.89      |
| 770.0000        | 2.88      |
| 774.9875        | 2.88      |

DUT assessment with offered antennas, default battery with front of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 64 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 65**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| NAR6594A                           | NNTN7034B | None (front)    | None            | 764.0125        | 2.89         | -0.18          | 1.47                | 1.08                 | 0.79                    | 0.58                     | HvH-Face-140228-09 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |
| 764.0125                           |           |                 |                 | 2.89            | -0.07        | 0.91           | 0.67                | 0.48                 | 0.35                    | HvH-Face-140228-07       |                    |
| 770.0000                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 774.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 764.0125                           |           |                 |                 | 2.89            | -0.35        | 2.34           | 1.71                | 1.31                 | 0.96                    | HvH-Face-140228-08       |                    |
| 770.0000                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 774.9875                           |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| NAR6595A                           | NNTN7037A | None (front)    | None            | 764.0125        | 2.88         | -0.47          | 2.42                | 1.77                 | 1.40                    | 1.02                     | HvH-Face-140228-10 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | NNTN7573A |                 |                 | 764.0125        | 2.88         | -0.43          | 2.41                | 1.76                 | 1.38                    | 1.01                     | HvH-Face-140228-11 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | PMNN4403B |                 |                 | 764.0125        | 2.87         | 1.17           | 2.00                | 1.47                 | 1.04                    | 0.77                     | HvH-Face-140303-02 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | NNTN7038B |                 |                 | 764.0125        | 2.87         | 0.22           | 1.98                | 1.45                 | 1.03                    | 0.76                     | HvH-Face-140303-03 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |

DUT assessment with offered antennas, default battery with back of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 64 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 66**

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| NAR6594A | NNTN7034B | None (back)     | None            | 764.0125        | 2.87         | -0.18          | 1.05                | 0.77                 | 0.57                    | 0.42                     | HvH-Face-140303-04 |
|          |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|          |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |
| NAF5085A |           |                 |                 | 764.0125        | 2.87         | -0.20          | 0.96                | 0.72                 | 0.53                    | 0.39                     | HvH-Face-140303-05 |
|          |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|          |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |
| NAR6595A |           |                 |                 | 764.0125        | 2.87         | -0.25          | 1.89                | 1.39                 | 1.04                    | 0.77                     | HvH-Face-140303-06 |
|          |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|          |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |



**Table 66 Continued**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| NAR6595A                           | NNTN7037A | None (back)     | None            | 764.0125        | 2.87         | -0.51          | 2.21                | 1.63                 | 1.29                    | 0.95                     | HvH-Face-140303-07 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | NNTN7573A |                 |                 | 764.0125        | 2.88         | -0.46          | 2.24                | 1.65                 | 1.29                    | 0.95                     | HvH-Face-140303-08 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | PMNN4403B |                 |                 | 764.0125        | 2.88         | -0.22          | 2.50                | 1.87                 | <b>1.37</b>             | 1.02                     | HvH-Face-140303-09 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | NNTN7038B |                 |                 | 764.0125        | 2.88         | -0.14          | 2.23                | 1.67                 | 1.20                    | 0.90                     | HvH-Face-140303-10 |
|                                    |           |                 |                 | 770.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 774.9875        |              |                |                     |                      |                         |                          |                    |

### 13.9 LMR assessments at the Face for 794-824MHz band

Battery PMNN4448AR was selected as the default battery for assessments at the Body because it has the highest capacity (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (794-824MHz) which are listed in Table 67. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 67**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 794.0125        | 2.89      |
| 808.5000        | 3.50      |
| 823.9875        | 3.49      |

DUT assessment with offered antennas, default battery with front of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 67 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 68

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| NAR6594A                           | NNTN7034B | None (front)    | None            | 794.0125        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 808.5000        | 3.51         | -0.24          | 0.94                | 0.69                 | 0.51                    | 0.37                     | HvH-Face-140308-06 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |
| NAF5085A                           |           |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 808.5000        | 3.51         | -0.27          | 1.10                | 0.81                 | 0.60                    | 0.44                     | HvH-Face-140308-07 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |
| NAR6595A                           |           |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 808.5000        | 3.51         | -0.45          | 1.57                | 1.15                 | 0.89                    | 0.65                     | HvH-Face-140308-08 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| NAR6595A                           | NNTN7037A | None (front)    | None            | 794.0125        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 808.5000        | 3.51         | -0.59          | 1.50                | 1.09                 | 0.88                    | 0.64                     | HvH-Face-140308-09 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | NNTN7573A |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 808.5000        | 3.52         | -0.58          | 1.52                | 1.11                 | 0.89                    | 0.65                     | HvH-Face-140308-10 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | PMNN4403B |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 808.5000        | 3.52         | -0.31          | 2.04                | 1.52                 | 1.12                    | 0.83                     | HvH-Face-140308-11 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | NNTN7038B |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 808.5000        | 3.52         | -0.29          | 2.29                | 1.70                 | 1.25                    | 0.93                     | HvH-Face-140308-12 |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |

DUT assessment with offered antennas, default battery with back of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 67 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 69**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |  |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|--|
| NAR6594A                           | NNTN7034B | None (back)     | None            | 794.0125        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 808.5000        | 3.52         | -0.36          | 1.10                | 0.82                 | 0.61                    | 0.45                     | HvH-Face-140308-13 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |  |
| NAF5085A                           |           |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 808.5000        | 3.52         | -0.27          | 1.23                | 0.91                 | 0.67                    | 0.49                     | HvH-Face-140308-14 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |  |
| NAR6595A                           |           |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 808.5000        | 3.52         | -0.52          | 2.00                | 1.46                 | 1.15                    | 0.84                     | HvH-Face-140308-15 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |  |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |  |
| NAR6595A                           | NNTN7037A | None (back)     | None            | 794.0125        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 808.5000        | 3.52         | -0.51          | 1.94                | 1.41                 | 1.12                    | 0.81                     | HvH-Face-140308-16 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |  |
|                                    | NNTN7573A |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 808.5000        | 3.52         | -0.83          | 2.00                | 1.46                 | 1.24                    | 0.90                     | HvH-Face-140308-17 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |  |
|                                    | PMNN4403B |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 808.5000        | 3.51         | -0.38          | 3.61                | 2.66                 | 2.02                    | 1.49                     | HvH-Face-140310-02 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |  |
|                                    | NNTN7038B |                 |                 | 794.0125        |              |                |                     |                      |                         |                          |                    |  |
|                                    |           |                 |                 | 808.5000        | 3.51         | -0.34          | 3.69                | 2.72                 | <b>2.05</b>             | 1.51                     | HvH-Face-140310-03 |  |
|                                    |           |                 |                 | 823.9875        |              |                |                     |                      |                         |                          |                    |  |

**13.10 LMR assessments at the Face for 851-869MHz band**

Battery NNTN7034B was selected as the default battery for assessments at the Face because it has the highest capacity (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within Part 90 frequency range (851-869MHz) which are listed in Table 70. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 70**

| Test Freq (MHz) | Power (W) |
|-----------------|-----------|
| 851.0125        | 3.52      |
| 860.0000        | 3.49      |
| 868.9875        | 3.49      |

DUT assessment with offered antennas, default battery with front of DUT positioned 2.5cm facing phantom per KDB 643646 SAR. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 70 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 71**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| NAR6594A                           | NNTN7034B | None (front)    | None            | 851.0125        | 3.57         | -0.41          | 1.33                | 0.96                 | 0.74                    | 0.53                     | HvH-Face-140304-02 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
| NAF5085A                           |           |                 |                 | 851.0125        | 3.56         | -0.17          | 1.64                | 1.19                 | 0.86                    | 0.63                     | HvH-Face-140304-03 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
| NAR6595A                           |           |                 |                 | 851.0125        | 3.57         | -0.33          | 1.26                | 0.91                 | 0.69                    | 0.49                     | HvH-Face-140304-04 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| NAR6595A                           | NNTN7037A | None (front)    | None            | 851.0125        | 3.56         | -0.30          | 1.77                | 1.28                 | <b>0.96</b>             | 0.69                     | HvH-Face-140304-05 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | NNTN7573A |                 |                 | 851.0125        | 3.57         | -0.10          | 1.77                | 1.28                 | 0.91                    | 0.66                     | HvH-Face-140304-06 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | PMNN4403B |                 |                 | 851.0125        | 3.56         | -0.17          | 1.50                | 1.08                 | 0.79                    | 0.57                     | HvH-Face-140304-07 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | NNTN7038B |                 |                 | 851.0125        | 3.58         | -0.12          | 1.50                | 1.09                 | 0.78                    | 0.56                     | HvH-Face-140304-08 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |

DUT assessment with offered antennas, default battery with back of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 70 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 72**

| Antenna                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| NAR6594A                           | NNTN7034B | None (back)     | None            | 851.0125        | 3.58         | -0.41          | 1.39                | 1.01                 | 0.77                    | 0.56                     | HvH-Face-140304-09 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
| NAF5085A                           |           |                 |                 | 851.0125        | 3.57         | -0.14          | 1.59                | 1.15                 | 0.83                    | 0.60                     | HvH-Face-140304-10 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
| NAR6595A                           |           |                 |                 | 851.0125        | 3.58         | -0.34          | 1.38                | 1.00                 | 0.75                    | 0.54                     | HvH-Face-140305-02 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
| Assessment of Additional Batteries |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| NAR6595A                           | NNTN7037A | None (back)     | None            | 851.0125        | 3.56         | -0.15          | 1.59                | 1.15                 | 0.83                    | 0.60                     | HvH-Face-140305-03 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | NNTN7573A |                 |                 | 851.0125        | 3.56         | -0.17          | 1.59                | 1.15                 | <b>0.84</b>             | 0.60                     | HvH-Face-140305-04 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | PMNN4403B |                 |                 | 851.0125        | 3.57         | -0.08          | 1.52                | 1.10                 | 0.78                    | 0.56                     | HvH-Face-140305-05 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |
|                                    | NNTN7038B |                 |                 | 851.0125        | 3.57         | -0.11          | 1.48                | 1.07                 | 0.77                    | 0.55                     | HvH-Face-140305-06 |
|                                    |           |                 |                 | 860.0000        |              |                |                     |                      |                         |                          |                    |
|                                    |           |                 |                 | 868.9875        |              |                |                     |                      |                         |                          |                    |

### 13.11 LTE assessments at the Face for 777-787MHz band (B13)

#### Assessment of front side of DUT

Battery NNTN7034B was selected as the default battery for assessments at the Face because it has the highest capacity (refer to Exhibit 7B for battery illustration) per KDB 643646 (SAR Test for PTT Radios). The default battery was used during conducted power measurements for all test configurations within Part 27 frequency range (777-787MHz). Table 73 below includes the output powers for the largest channel bandwidth (10MHz), QPSK and 1 RB allocation and location (low, mid, high). The highest RB configuration was used to start the LTE testing per KDB 941225 (SAR for LTE Devices). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 73**

| QPSK, 10MHz BW Power (dBm) |       |        |       |
|----------------------------|-------|--------|-------|
| RB Allocation              | Lower | Middle | Upper |
| 1 RB                       | 22.08 | 23.92  | 22.89 |

DUT assessment with offered antenna, default battery with front of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 73 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 74**

| Antenna                                         | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|-------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| Band 13 (777-787MHz), 10MHz BW, QPSK 1RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 85009332001                                     | NNTN7034B | None (front)    | None            | 782             | 0.25         | 0.34           | 0.10                | 0.07                 | 0.13                    | 0.09                     | HvH-Face-140316-03 |
|                                                 | PMNN4403B |                 |                 |                 | 0.25         | -0.13          | 0.13                | 0.09                 | <b>0.17</b>             | 0.11                     | HvH-Face-140316-04 |
|                                                 | NNTN7038B |                 |                 |                 | 0.25         | -0.19          | 0.13                | 0.09                 | 0.17                    | 0.12                     | HvH-Face-140316-05 |
|                                                 | NNTN7037A |                 |                 |                 | 0.25         | 0.03           | 0.10                | 0.07                 | 0.13                    | 0.09                     | HvH-Face-140316-17 |
|                                                 | NNTN7573A |                 |                 |                 | 0.25         | 0.60           | 0.10                | 0.06                 | 0.12                    | 0.08                     | HvH-Face-140316-18 |
|                                                 |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |

DUT assessment with offered antennas, default battery with back of DUT positioned 2.5cm facing phantom per KDB 643646 SAR. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 73 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 75**

| Antenna                                         | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|-------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| Band 13 (777-787MHz), 10MHz BW, QPSK 1RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 85009332001                                     | NNTN7034B | None (back)     | None            | 782             | 0.25         | 0.51           | 0.01                | 0.01                 | 0.02                    | 0.01                     | HvH-Face-140316-19 |
|                                                 | PMNN4403B |                 |                 |                 | 0.25         | 0.84           | 0.05                | 0.04                 | <b>0.06</b>             | 0.05                     | HvH-Face-140316-20 |
|                                                 | NNTN7038B |                 |                 |                 | 0.25         | 0.75           | 0.04                | 0.03                 | 0.06                    | 0.04                     | HvH-Face-140316-21 |
|                                                 | NNTN7037A |                 |                 |                 | 0.25         | 0.27           | 0.01                | 0.01                 | 0.02                    | 0.01                     | HvH-Face-140316-22 |
|                                                 | NNTN7573A |                 |                 |                 | 0.25         | -0.06          | 0.01                | 0.01                 | 0.02                    | 0.01                     | HvH-Face-140316-23 |
|                                                 |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |

### Assessment at the Face with other 1 RB allocations

Assessments for additional 1RB configurations are not required per KDB 941225 when the reported SAR is less than or equal to half the SAR limit i.e. 0.8 W/kg.

**Assessment at the Face with 50% RB allocations**

Assessment at the face with 50% RB allocation based on the output power in Table 76 was conducted using highest configuration from 1RB data.

**Table 76**

| <b>QPSK, 10MHz BW Power (dBm)</b> |              |               |              |
|-----------------------------------|--------------|---------------|--------------|
| <b>RB Allocation</b>              | <b>Lower</b> | <b>Middle</b> | <b>Upper</b> |
| <b>50% RB</b>                     | 22.75        | 22.98         | 22.86        |

Assessment at the face with 50% RB allocation was conducted using the highest configuration from 1RB results. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 77**

| <b>Antenna</b>                                     | <b>Battery</b> | <b>Carry Accessory</b> | <b>Cable Accessory</b> | <b>Test Freq (MHz)</b> | <b>Init Pwr (W)</b> | <b>SAR Drift (dB)</b> | <b>Meas. 1g-SAR (W/kg)</b> | <b>Meas. 10g-SAR (W/kg)</b> | <b>Max Calc. 1g-SAR (W/kg)</b> | <b>Max Calc. 10g-SAR (W/kg)</b> | <b>Run#</b>        |
|----------------------------------------------------|----------------|------------------------|------------------------|------------------------|---------------------|-----------------------|----------------------------|-----------------------------|--------------------------------|---------------------------------|--------------------|
| Band 13 (777-787MHz), 10MHz BW, QPSK 50% RB middle |                |                        |                        |                        |                     |                       |                            |                             |                                |                                 |                    |
| 85009332001                                        | PMNN4403B      | None (front)           | None                   | 782                    | 0.20                | -0.05                 | 0.13                       | 0.10                        | <b>0.22</b>                    | 0.16                            | HvH-Face-140426-02 |

**Assessment at the Face with 100% RB allocations**

Assessment at the face with 100% RB allocation is not required when the highest maximum output power for 100% RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1RB and 50% RB allocation from above are less than or equal to half the SAR limit i.e. 0.8 W/kg. Table 78 below indicates no testing is required.

**Table 78**

| <b>QPSK, 10MHz BW Power (dBm)</b> |              |               |              |
|-----------------------------------|--------------|---------------|--------------|
| <b>RB Allocation</b>              | <b>Lower</b> | <b>Middle</b> | <b>Upper</b> |
| <b>1 RB</b>                       | 22.08        | 23.92         | 22.89        |
| <b>50% RB</b>                     | 22.75        | 22.98         | 22.86        |
| <b>100% RB</b>                    | 22.75        |               |              |

**Assessment at the Face with 16QAM RB allocations**

Assessment at the face with 16QAM RB allocation is required only when the highest maximum output power for the configuration in the higher order modulation (bold in table below) is  $> \frac{1}{2}$  dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is  $> 90\%$  of the SAR limit. Data in Table 79 below indicates one test is required.

**Table 79**

| RB allocation | RB location | QPSK  | 16QAM        | dB delta    |
|---------------|-------------|-------|--------------|-------------|
| 1 RB          | Lower       | 22.08 | 23.22        | 1.14        |
|               | Middle      | 23.92 | <b>24.55</b> | <b>0.63</b> |
|               | Upper       | 22.89 | 23.37        | 0.48        |
| 50% RB        | Lower       | 22.75 | 23.08        | 0.33        |
|               | Middle      | 22.98 | <b>23.42</b> | 0.44        |
|               | Upper       | 22.86 | 23.26        | 0.40        |
| 100% RB       | All         | 22.75 | <b>23.20</b> | 0.45        |

Assessment at the face with 16QAM RB allocation was conducted using highest configuration from 1RB data. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 80**

| Antenna                                           | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|---------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| Band 13 (777-787MHz), 10MHz BW, 16QAM 1 RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 85009332001                                       | PMNN4403B | None (front)    | None            | 782             | 0.29         | 0.45           | 0.13                | 0.10                 | <b>0.15</b>             | 0.11                     | HvH-Face-140426-03 |

### Assessment at the Face with 5MHz bandwidth channel

Assessment at the face with 5MHz bandwidth channel is required when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is  $> \frac{1}{2}$  dB higher than the equivalent channel configurations in the largest channel bandwidth configuration. Table 81 below indicates no testing is required.

**Table 81**

| RB allocation | RB location | 10MHz BW Ch. | 5MHz BW Ch.  | dB delta |
|---------------|-------------|--------------|--------------|----------|
| <b>QPSK</b>   |             |              |              |          |
| 1RB           | Lower       | 22.08        | 22.34        | 0.26     |
|               | Middle      | 23.92        | <b>22.82</b> | -1.10    |
|               | Upper       | 22.89        | 22.22        | -0.67    |
| 50% RB        | Lower       | 22.75        | 22.23        | -0.52    |
|               | Middle      | 22.98        | <b>22.50</b> | -0.48    |
|               | Upper       | 22.86        | 22.37        | -0.49    |
| 100% RB       | All         | 22.75        | <b>22.27</b> | -0.48    |
| <b>16 QAM</b> |             |              |              |          |
| 1RB           | Lower       | 23.22        | 22.42        | -0.80    |
|               | Middle      | 24.55        | <b>23.08</b> | -1.47    |
|               | Upper       | 23.37        | 22.52        | -0.85    |
| 50% RB        | Lower       | 23.08        | 22.27        | -0.81    |
|               | Middle      | 23.42        | <b>22.63</b> | -0.79    |
|               | Upper       | 23.26        | 22.30        | -0.96    |
| 100% RB       | All         | 23.20        | <b>22.48</b> | -0.72    |



**Assessment at the Face with 3MHz bandwidth channel**

Assessment at the face with 3MHz bandwidth channel is required when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is  $> \frac{1}{2}$  dB higher than the equivalent channel configurations in the largest channel bandwidth configuration. Table 82 below indicates no testing is required.

**Table 82**

| RB allocation | RB location | 10MHz BW Ch. | 3MHz BW Ch.  | dB delta |
|---------------|-------------|--------------|--------------|----------|
| <b>QPSK</b>   |             |              |              |          |
| 1RB           | Lower       | 22.08        | 22.56        | 0.48     |
|               | Middle      | 23.92        | <b>23.02</b> | -0.90    |
|               | Upper       | 22.89        | 22.63        | -0.26    |
| 50% RB        | Lower       | 22.75        | 22.46        | -0.29    |
|               | Middle      | 22.98        | <b>22.65</b> | -0.33    |
|               | Upper       | 22.86        | 22.51        | -0.35    |
| 100% RB       | All         | 22.75        | 22.55        | -0.20    |
| <b>16 QAM</b> |             |              |              |          |
| 1RB           | Lower       | 23.22        | 23.02        | -0.20    |
|               | Middle      | 24.55        | <b>23.47</b> | -1.08    |
|               | Upper       | 23.37        | 23.12        | -0.25    |
| 50% RB        | Lower       | 23.08        | 22.43        | -0.65    |
|               | Middle      | 23.42        | <b>22.65</b> | -0.77    |
|               | Upper       | 23.26        | 22.36        | -0.90    |
| 100% RB       | All         | 23.20        | <b>22.55</b> | -0.65    |

**Assessment at the Face with 1.4MHz bandwidth channel**

Assessment at the face with 1.4MHz bandwidth channel is required when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is  $> \frac{1}{2}$  dB higher than the equivalent channel configurations in the largest channel bandwidth configuration. Table 83 below indicates one test is required.

**Table 83**

| RB allocation | RB location | 10MHz BW Ch. | 1.4MHz BW Ch. | dB delta |
|---------------|-------------|--------------|---------------|----------|
| <b>QPSK</b>   |             |              |               |          |
| 1RB           | Lower       | 22.08        | 22.89         | 0.81     |
|               | Middle      | 23.92        | <b>23.01</b>  | -0.91    |
|               | Upper       | 22.89        | 22.85         | -0.04    |
| 50% RB        | Lower       | 22.75        | <b>22.74</b>  | -0.01    |
|               | Middle      | 22.98        | 22.57         | -0.41    |
|               | Upper       | 22.86        | 22.50         | -0.36    |
| 100% RB       | All         | 22.75        | <b>22.62</b>  | -0.13    |

**Table 83 continued**

| RB allocation | RB location | 10MHz BW Ch. | 1.4MHz BW Ch. | dB delta    |
|---------------|-------------|--------------|---------------|-------------|
| <b>16 QAM</b> |             |              |               |             |
| 1RB           | Lower       | 23.22        | 23.40         | 0.18        |
|               | Middle      | 23.66        | <b>23.54</b>  | -0.12       |
|               | Upper       | 23.27        | 23.39         | 0.12        |
| 50% RB        | Lower       | 22.22        | 23.13         | 0.91        |
|               | Middle      | 22.20        | <b>23.15</b>  | <b>0.95</b> |
|               | Upper       | 22.09        | 23.09         | 1.00        |
| 100% RB       | All         | 22.21        | <b>22.55</b>  | 0.34        |

Assessment at the face with 1.4MHz bandwidth channel was conducted using highest configuration from 1RB data. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 84**

| Antenna                                              | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|------------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| Band 13 (777-787MHz), 1.4MHz BW, 16QAM 50% RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 85009332001                                          | PMNN4403B | None (front)    | None            | 782             | 0.27         | 0.52           | 0.12                | 0.09                 | <b>0.19</b>             | 0.13                     | HvH-Face-140426-04 |

### 13.12 LTE assessment at the Face for 788-798MHz band (B14)

#### Assessment of front side of DUT

Battery NNTN7034B was selected as the default battery for assessments at the Face because it has the highest capacity (refer to Exhibit 7B for battery illustration) per KDB 643646 (SAR Test for PTT Radios). The default battery was used during conducted power measurements for all test configurations within Part 90 frequency range (788-798MHz). Table 85 below includes the output powers for the largest channel bandwidth (10MHz), QPSK and 1 RB allocation and location (low, mid, high). The highest RB configuration was used to start the LTE testing per KDB 941225 (SAR for LTE Devices). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 85**

| <b>QPSK, 10MHz BW Power (dBm)</b> |              |               |              |
|-----------------------------------|--------------|---------------|--------------|
| <b>RB Allocation</b>              | <b>Lower</b> | <b>Middle</b> | <b>Upper</b> |
| <b>1 RB</b>                       | 22.89        | 22.79         | 22.72        |

DUT assessment with offered antenna, default battery with front of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 85 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 86**

| Antenna                                        | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| Band 14 (788-798MHz), 10MHz BW, QPSK 1RB lower |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 85009332001                                    | NNTN7034B | None (front)    | None            | 793             | 0.19         | -0.03          | 0.08                | 0.06                 | 0.13                    | 0.09                     | HvH-Face-140316-07 |
|                                                | PMNN4403B |                 |                 |                 | 0.19         | 0.45           | 0.13                | 0.09                 | 0.21                    | 0.15                     | HvH-Face-140316-08 |
|                                                | NNTN7038B |                 |                 |                 | 0.19         | 0.45           | 0.13                | 0.09                 | <b>0.21</b>             | 0.15                     | HvH-Face-140316-09 |
|                                                | NNTN7037A |                 |                 |                 | 0.19         | 0.40           | 0.07                | 0.05                 | 0.12                    | 0.09                     | HvH-Face-140316-10 |
|                                                | NNTN7573A |                 |                 |                 | 0.19         | 0.72           | 0.07                | 0.05                 | 0.12                    | 0.09                     | HvH-Face-140316-11 |
|                                                |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |

DUT assessment with offered antennas, default battery with back of DUT positioned 2.5cm facing phantom per KDB 643646 SAR. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 85 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 87**

| Antenna                                        | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| Band 14 (788-798MHz), 10MHz BW, QPSK 1RB lower |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 85009332001                                    | NNTN7034B | None (back)     | None            | 793             | 0.19         | 0.11           | 0.02                | 0.02                 | 0.03                    | 0.02                     | HvH-Face-140316-12 |
|                                                | PMNN4403B |                 |                 |                 | 0.19         | 0.97           | 0.04                | 0.03                 | 0.07                    | 0.05                     | HvH-Face-140316-13 |
|                                                | NNTN7038B |                 |                 |                 | 0.19         | -0.16          | 0.04                | 0.03                 | <b>0.07</b>             | 0.05                     | HvH-Face-140316-14 |
|                                                | NNTN7037A |                 |                 |                 | 0.19         | 0.35           | 0.03                | 0.02                 | 0.04                    | 0.03                     | HvH-Face-140316-15 |
|                                                | NNTN7573A |                 |                 |                 | 0.19         | -0.12          | 0.03                | 0.02                 | 0.04                    | 0.03                     | HvH-Face-140316-16 |
|                                                |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |

#### Assessment at the Face with other 1 RB allocations

Assessments for additional 1RB configurations are not required per KDB 941225 when the reported SAR is less than or equal to half the SAR limit i.e. 4.0 W/kg.

#### Assessment at the Face with 50% RB allocations

Assessment at the face with 50% RB allocation based on the output power in Table 88 was conducted using highest configuration from 1RB data.

**Table 88**

| QPSK, 10MHz BW Power (dBm) |       |        |       |
|----------------------------|-------|--------|-------|
| RB Allocation              | Lower | Middle | Upper |
| 50% RB                     | 22.80 | 23.07  | 22.85 |

Assessment at the face with 50% RB allocation was conducted using the highest configuration from 1RB results. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 89**

| Antenna                                            | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|----------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| Band 14 (788-798MHz), 10MHz BW, QPSK 50% RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 85009332001                                        | NNTN7038B | None (front)    | None            | 793             | .020         | 0.42           | 0.16                | 0.12                 | <b>0.26</b>             | 0.19                     | HvH-Face-140426-12 |

### Assessment at the Face with 100% RB allocations

Assessment at the face with 100% RB allocation is not required when the highest maximum output power for 100% RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1RB and 50% RB allocation from above are less than or equal to half the SAR limit i.e. 4.0 W/kg. Table 90 below indicates no testing is required.

**Table 90**

| QPSK, 10MHz BW Power (dBm) |       |        |       |
|----------------------------|-------|--------|-------|
| RB Allocation              | Lower | Middle | Upper |
| <b>1 RB</b>                | 22.89 | 22.79  | 22.72 |
| <b>50% RB</b>              | 22.80 | 23.07  | 22.85 |
| <b>100% RB</b>             | 22.69 |        |       |

### Assessment at the Face with 16QAM RB allocations

Assessment at the face with 16QAM RB allocation is required only when the highest maximum output power for the configuration in the higher order modulation (bold in table below) is  $> \frac{1}{2}$  dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is  $> 90\%$  of the SAR limit. Data in Table 91 below indicates one test is required.

**Table 91**

| RB allocation | RB location | QPSK  | 16QAM        | dB delta    |
|---------------|-------------|-------|--------------|-------------|
| 1 RB          | Lower       | 22.89 | 23.22        | 0.33        |
|               | Middle      | 22.79 | <b>23.66</b> | <b>0.87</b> |
|               | Upper       | 22.72 | 23.27        | 0.55        |
| 50% RB        | Lower       | 22.80 | <b>22.22</b> | -0.58       |
|               | Middle      | 23.07 | 22.20        | -0.87       |
|               | Upper       | 22.85 | 22.09        | -0.76       |
| 100% RB       | All         | 22.69 | <b>22.21</b> | -0.48       |

Assessment at the face with 16QAM RB allocation was conducted using highest configuration from 1RB data. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 92**

| Antenna                                           | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|---------------------------------------------------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| Band 14 (788-798MHz), 10MHz BW, 16QAM 1 RB middle |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| 85009332001                                       | NNTN7038B | None (front)    | None            | 793             | 0.23         | 0.04           | 0.13                | 0.09                 | <b>0.17</b>             | 0.12                     | HvH-Face-140426-10 |

**Assessment at the Face with 5MHz bandwidth channel**

Assessment at the face with 5MHz bandwidth channel is required when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is  $> \frac{1}{2}$  dB higher than the equivalent channel configuration s in the largest channel bandwidth configuration. Table 93 below indicates no testing is required.

**Table 93**

| RB allocation | RB location | 10MHz BW Ch. | 5MHz BW Ch. | dB delta |
|---------------|-------------|--------------|-------------|----------|
| <b>QPSK</b>   |             |              |             |          |
| 1RB           | Lower       | 22.89        | 22.20       | -0.69    |
|               | Middle      | 22.79        | 22.56       | -0.23    |
|               | Upper       | 22.72        | 22.48       | -0.24    |
| 50% RB        | Lower       | 22.80        | 22.40       | -0.40    |
|               | Middle      | 23.07        | 22.31       | -0.76    |
|               | Upper       | 22.85        | 22.47       | -0.38    |
| 100% RB       | All         | 22.69        | 22.59       | -0.10    |
| <b>16 QAM</b> |             |              |             |          |
| 1RB           | Lower       | 23.22        | 22.67       | -0.55    |
|               | Middle      | 23.66        | 22.77       | -0.89    |
|               | Upper       | 23.27        | 22.67       | -0.60    |
| 50% RB        | Lower       | 22.22        | 21.69       | -0.53    |
|               | Middle      | 22.20        | 22.08       | -0.12    |
|               | Upper       | 22.09        | 22.26       | 0.17     |
| 100% RB       | All         | 22.21        | 22.56       | 0.35     |

**13.13 Assessment for Industry Canada**

Based on the assessment results for body and face per KDB643646, additional tests were required for Industry Canada frequency range (138-74MHz). The overall highest test configuration from 150.8-173.4MHz band was repeated with test frequencies 138.0125 and 144.5000MHz. The SAR results are in Table 94 below. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

**Table 94**

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#               |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|--------------------|
| Body     |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| NAR6594A | NNTN7037A | HLN6875A        | None            | 138.0125        | 6.34         | -0.07          | 7.79                | 3.26                 | 4.12                    | 1.72                     | HvH-Ab-140312-07   |
|          |           |                 |                 | 144.5000        | 6.37         | -0.65          | 4.15                | 1.80                 | 2.50                    | 1.08                     | HvH-Ab-140312-08   |
| Face     |           |                 |                 |                 |              |                |                     |                      |                         |                          |                    |
| NAR6594A | PMNN4403B | None (front)    | None            | 138.0125        | 6.14         | -0.23          | 1.35                | 1.05                 | 0.77                    | 0.60                     | HvH-Face-140428-02 |
|          |           |                 |                 | 144.5000        | 6.19         | -0.40          | 0.97                | 0.75                 | 0.57                    | 0.44                     | HvH-Face-140428-03 |

**13.14 Assessment at the Bluetooth band**

Per guidelines in KDB 447498, the following formula was used to determine the test exclusion for standalone Bluetooth transmitter;

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{F_{(\text{GHz})}}] = 2.48$ , which is  $\leq 3$  for 1-g SAR

Where:

Max. power = 9.13mW (12mW\*76.1% duty cycle)

Min. test separation distance = 5mm for actual test separation < 5mm

F(GHz) = 2.48 GHz

Per the result from the calculation above, the standalone SAR assessment was not required for Bluetooth band. Therefore, SAR results for Bluetooth are not reported herein.

**13.15 Shortened Scan Assessment**

A “shortened” scan using the highest SAR configuration overall from above was performed to validate the SAR drift of the full DASY5™ coarse and 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 zoom scan only was performed. The results of the shortened cube scan presented in Appendix D demonstrate that the scaling methodology used to determine the calculated SAR results presented herein are valid. The SAR result from the Table below is provided in Appendix F.

**Table 95**

| Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq (MHz) | Init Pwr (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) | Run#             |
|----------|-----------|-----------------|-----------------|-----------------|--------------|----------------|---------------------|----------------------|-------------------------|--------------------------|------------------|
| NAR6595A | PMNN4403B | NTN8266B        | None            | 764.0125        | 2.90         | -0.75          | 8.75                | 4.98                 | 5.36                    | 3.05                     | HvH-Ab-140313-07 |

#### 14.0 Simultaneous Transmission Exclusion for BT

Per guidelines in KDB 447498, the following formula was used to determine the test exclusion to an antenna that transmits simultaneously with other antennas for test distances  $\leq 50\text{mm}$ :

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] * [\sqrt{F(\text{GHz})/X}] \leq 0.4 \text{ W/kg (1g)}$$

Where:

X = 7.5 for 1g-SAR; 18.75 for 10g

Max. power = 9.13mW (12mW\*76.1% duty cycle)

Min. test separation distance = 5mm for actual test separation < 5mm

F(GHz) = 2.48 GHz

#### 15.0 Simultaneous Transmission between LMR and LTE

The table below summarizes the simultaneous transmissions between LMR and LTE bands. Note that LMR band 700 cannot transmit simultaneously with either LTE band.

**Table 96**

|           |     | LMR Bands     |     |     |
|-----------|-----|---------------|-----|-----|
|           |     | VHF           | 700 | 800 |
| LTE Bands | MHz | 777-787 (B13) | NA  | √   |
|           |     | 788-798 (B14) | NA  | √   |

#### 16.0 Results Summary

Based on the test guidelines from section 4.0 and satisfying frequencies within FCC bands and Industry Canada Frequency bands, the highest Operational Maximum Calculated 1-gram and 10-gram average SAR values found for this filing:

**Table 97**

| Designator      | Frequency band (MHz) | Max Calc at Body (W/kg) |         | Max Calc at Face (W/kg) |         |
|-----------------|----------------------|-------------------------|---------|-------------------------|---------|
|                 |                      | 1g-SAR                  | 10g-SAR | 1g-SAR                  | 10g-SAR |
| FCC             |                      |                         |         |                         |         |
| LMR             | 150.8-173.4          | 2.32                    | 0.96    | 0.48                    | 0.37    |
| LMR             | 700                  | 5.36                    | 3.05    | 1.40                    | 1.02    |
| LMR             | 800                  | 4.50                    | 2.62    | 2.05                    | 1.51    |
| LTE (B13)       | 777-787              | 0.21                    | 0.14    | 0.22                    | 0.16    |
| LTE (B14)       | 788-798              | 0.18                    | 0.11    | 0.26                    | 0.19    |
| Industry Canada |                      |                         |         |                         |         |
| LMR             | 138-174              | 4.12                    | 1.72    | 0.77                    | 0.60    |
| LMR             | 700                  | 5.36                    | 3.05    | 1.40                    | 1.02    |
| LMR             | 800                  | 4.50                    | 2.62    | 2.05                    | 1.51    |
| LTE (B13)       | 777-787              | 0.21                    | 0.14    | 0.22                    | 0.16    |

All results are scaled to the maximum output power.

The highest combined 1g-SAR results for simultaneous is indicated in the following Table:

**Table 98**

| Regulator   | Frequency bands            | Combined 1g-SAR (W/kg) | Combined 10g-SAR (W/kg) |
|-------------|----------------------------|------------------------|-------------------------|
| <b>Body</b> |                            |                        |                         |
| FCC/IC      | LMR (VHF & 800MHz) and LTE | 4.71                   | 2.76                    |
| <b>Face</b> |                            |                        |                         |
| FCC         | LMR (VHF & 800MHz) and LTE | 2.31                   | 1.70                    |
| IC          | LMR (VHF & 800MHz) and LTE | 2.27                   | 1.67                    |

Note – 700MHz cannot simultaneous TX with LTE bands.

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 OET Bulletin 65. The 10 grams result is not applicable to FCC filing.

## 17.0 Variability Assessment

Per the guidelines in KDB 865664 SAR variability assessment is required because SAR results are above 4.0W/kg (Occupational).

The Table below includes test results of the original measurement(s), the repeated measurement(s), and the ratio ( $SAR_{high}/SAR_{low}$ ) for the applicable test configuration(s).

**Table 99**

| Run#             | Antenna  | Battery   | Carry Accessory | Cable Accessory | Test Freq. (MHz) | Adj Calc. 1g-SAR (W/kg) | Ratio | Comments                                                                                    |
|------------------|----------|-----------|-----------------|-----------------|------------------|-------------------------|-------|---------------------------------------------------------------------------------------------|
| HvH-Ab-140313-08 | NAR6595A | PMNN4403B | NTN8266B        | None            | 764.0125         | 5.11                    | 1.05  | No additional repeated scans is required due to the Ratio ( $SAR_{high}/SAR_{low}$ ) < 1.20 |
| HvH-Ab-140313-07 |          |           |                 |                 |                  | 5.36                    |       |                                                                                             |



## 18.0 System Uncertainty

A system uncertainty analysis is not required for this report per KDB 865664 because the highest report SAR value for Occupational exposure is less than 7.5W/kg.

Per the guidelines of ISO 17025 a reported system uncertainty is required and therefore measurement uncertainty budget is included in Appendix A.

## **Appendix A**

### **Measurement Uncertainty Budget**

**Uncertainty Budget for Device Under Test, for 750 MHz to 2.6 GHz**

| <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 =<br/>c x f / e</i>            | <i>i =<br/>c x g / e</i>             | <i>k</i>             |
|------------------------------------------------|-------------------------|---------------|--------------|-------------------|-------------------------------|--------------------------------|-------------------------------------|--------------------------------------|----------------------|
| Uncertainty Component                          | IEEE<br>1528<br>section | Tol.<br>(± %) | Prob<br>Dist | Div.              | <i>c<sub>i</sub></i><br>(1 g) | <i>c<sub>i</sub></i><br>(10 g) | 1 g<br><i>u<sub>i</sub></i><br>(±%) | 10 g<br><i>u<sub>i</sub></i><br>(±%) | <i>v<sub>i</sub></i> |
| <b>Measurement System</b>                      |                         |               |              |                   |                               |                                |                                     |                                      |                      |
| Probe Calibration                              | E.2.1                   | 6.0           | N            | 1.00              | 1                             | 1                              | 6.0                                 | 6.0                                  | ∞                    |
| 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                                  | ∞                    |
| Combined Standard Uncertainty                  |                         |               | RSS          |                   |                               |                                | 11                                  | 11                                   | 419                  |
| Expanded Uncertainty<br>(95% CONFIDENCE LEVEL) |                         |               | <i>k</i> =2  |                   |                               |                                | 22                                  | 22                                   |                      |

Notes for uncertainty budget Tables:

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

**Uncertainty Budget for Device Under Test, for 150 MHz**

| <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.<br>(± %) | Prob<br>Dist | Div.              | <i>c<sub>i</sub></i><br>(1 g) | <i>c<sub>i</sub></i><br>(10 g) | 1 g<br><i>u<sub>i</sub></i><br>(±%) | 10 g<br><i>u<sub>i</sub></i><br>(±%) | <i>v<sub>i</sub></i> |
| <b>Measurement System</b>                             |                   |               |              |                   |                               |                                |                                     |                                      |                      |
| Probe Calibration                                     | E.2.1             | 10.0          | N            | 1.00              | 1                             | 1                              | 10.0                                | 10.0                                 | ∞                    |
| Axial Isotropy                                        | E.2.2             | 4.7           | R            | 1.73              | 0.707                         | 0.707                          | 1.9                                 | 1.9                                  | ∞                    |
| Hemispherical Isotropy                                | E.2.2             | 9.6           | R            | 1.73              | 0.707                         | 0.707                          | 3.9                                 | 3.9                                  | ∞                    |
| Boundary Effect                                       | E.2.3             | 1.0           | R            | 1.73              | 1                             | 1                              | 0.6                                 | 0.6                                  | ∞                    |
| Linearity                                             | E.2.4             | 4.7           | R            | 1.73              | 1                             | 1                              | 2.7                                 | 2.7                                  | ∞                    |
| System Detection Limits                               | E.2.5             | 1.0           | R            | 1.73              | 1                             | 1                              | 0.6                                 | 0.6                                  | ∞                    |
| Readout Electronics                                   | E.2.6             | 0.3           | N            | 1.00              | 1                             | 1                              | 0.3                                 | 0.3                                  | ∞                    |
| Response Time                                         | E.2.7             | 1.1           | R            | 1.73              | 1                             | 1                              | 0.6                                 | 0.6                                  | ∞                    |
| Integration Time                                      | E.2.8             | 1.1           | R            | 1.73              | 1                             | 1                              | 0.6                                 | 0.6                                  | ∞                    |
| RF Ambient Conditions - Noise                         | E.6.1             | 3.0           | R            | 1.73              | 1                             | 1                              | 1.7                                 | 1.7                                  | ∞                    |
| RF Ambient Conditions - Reflections                   | E.6.1             | 0.0           | R            | 1.73              | 1                             | 1                              | 0.0                                 | 0.0                                  | ∞                    |
| Probe Positioner Mech. Tolerance                      | E.6.2             | 0.4           | R            | 1.73              | 1                             | 1                              | 0.2                                 | 0.2                                  | ∞                    |
| Probe Positioning w.r.t Phantom                       | E.6.3             | 1.4           | R            | 1.73              | 1                             | 1                              | 0.8                                 | 0.8                                  | ∞                    |
| Max. SAR Evaluation (ext., int., avg.)                | E.5               | 3.4           | R            | 1.73              | 1                             | 1                              | 2.0                                 | 2.0                                  | ∞                    |
| <b>Test sample Related</b>                            |                   |               |              |                   |                               |                                |                                     |                                      |                      |
| Test Sample Positioning                               | E.4.2             | 3.2           | N            | 1.00              | 1                             | 1                              | 3.2                                 | 3.2                                  | 29                   |
| Device Holder Uncertainty                             | E.4.1             | 4.0           | N            | 1.00              | 1                             | 1                              | 4.0                                 | 4.0                                  | 8                    |
| SAR drift                                             | 6.6.2             | 5.0           | R            | 1.73              | 1                             | 1                              | 2.9                                 | 2.9                                  | ∞                    |
| <b>Phantom and Tissue Parameters</b>                  |                   |               |              |                   |                               |                                |                                     |                                      |                      |
| Phantom Uncertainty                                   | E.3.1             | 4.0           | R            | 1.73              | 1                             | 1                              | 2.3                                 | 2.3                                  | ∞                    |
| Liquid Conductivity (target)                          | E.3.2             | 5.0           | R            | 1.73              | 0.64                          | 0.43                           | 1.8                                 | 1.2                                  | ∞                    |
| Liquid Conductivity (measurement)                     | E.3.3             | 3.3           | N            | 1.00              | 0.64                          | 0.43                           | 2.1                                 | 1.4                                  | ∞                    |
| Liquid Permittivity (target)                          | E.3.2             | 5.0           | R            | 1.73              | 0.6                           | 0.49                           | 1.7                                 | 1.4                                  | ∞                    |
| Liquid Permittivity (measurement)                     | E.3.3             | 1.9           | N            | 1.00              | 0.6                           | 0.49                           | 1.1                                 | 0.9                                  | ∞                    |
| <b>Combined Standard Uncertainty</b>                  |                   |               | RSS          |                   |                               |                                | 14                                  | 13                                   | 965                  |
| <b>Expanded Uncertainty</b><br>(95% CONFIDENCE LEVEL) |                   |               | <i>k</i> =2  |                   |                               |                                | 27                                  | 27                                   |                      |

Notes for uncertainty budget Tables:

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

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

Client **Motorola EME**

Certificate No: **ES3-3301\_Aug13**

## CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3301**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-12.v8, QA CAL-14.v4, QA CAL-23.v5,  
QA CAL-25.v6  
Calibration procedure for dosimetric E-field probes**

Calibration date: **August 27, 2013**

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 ( $22 \pm 3$ )°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      | 04-Apr-13 (No. 217-01733)         | Apr-14                 |
| Power sensor E4412A        | MY41498087      | 04-Apr-13 (No. 217-01733)         | Apr-14                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 04-Apr-13 (No. 217-01737)         | Apr-14                 |
| Reference 20 dB Attenuator | SN: S5277 (20x) | 04-Apr-13 (No. 217-01735)         | Apr-14                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 04-Apr-13 (No. 217-01738)         | Apr-14                 |
| Reference Probe ES3DV2     | SN: 3013        | 28-Dec-12 (No. ES3-3013_Dec12)    | Dec-13                 |
| DAE4                       | SN: 660         | 31-Jan-13 (No. DAE4-660_Jan13)    | Jan-14                 |
| Secondary Standards        | ID              | Check Date (in house)             | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (in house check Apr-13)  | In house check: Apr-15 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (in house check Oct-12) | In house check: Oct-13 |

|                                                                                                                 | Name           | Function              | Signature |
|-----------------------------------------------------------------------------------------------------------------|----------------|-----------------------|-----------|
| Calibrated by:                                                                                                  | Jeton Kastrati | Laboratory Technician |           |
| Approved by:                                                                                                    | Katja Pokovic  | Technical Manager     |           |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. |                |                       |           |

Issued: August 28, 2013

Certificate No: ES3-3301\_Aug13

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**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  
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

#### 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                                                                                                                           |
| CF                    | crest factor (1/duty_cycle) of the RF signal                                                                                                      |
| A, B, C, D            | modulation dependent linearization parameters                                                                                                     |
| Polarization $\phi$   | $\phi$ rotation around probe axis                                                                                                                 |
| Polarization $\theta$ | $\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center),<br>i.e., $\theta = 0$ 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  $\theta = 0$  ( $f \leq 900$  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 affect 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 with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- 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.

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# Probe ES3DV3

## SN:3301

Manufactured: August 27, 2010  
Calibrated: August 27, 2013

Calibrated for DASY/EASY Systems  
(Note: non-compatible with DASY2 system!)



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**DASY/EASY - Parameters of Probe: ES3DV3 - SN:3301****Basic Calibration Parameters**

|                                                           | Sensor X | Sensor Y | Sensor Z | Unc (k=2)    |
|-----------------------------------------------------------|----------|----------|----------|--------------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 1.48     | 1.02     | 1.24     | $\pm 10.1\%$ |
| DCP (mV) <sup>B</sup>                                     | 100.0    | 103.1    | 101.7    |              |

**Modulation Calibration Parameters**

| UID       | Communication System Name                   |   | A<br>dB | B<br>dB $\sqrt{\mu\text{V}}$ | C    | D<br>dB | VR<br>mV | Unc <sup>C</sup><br>(k=2) |
|-----------|---------------------------------------------|---|---------|------------------------------|------|---------|----------|---------------------------|
| 0         | CW                                          | X | 0.0     | 0.0                          | 1.0  | 0.00    | 172.9    | $\pm 3.0\%$               |
|           |                                             | Y | 0.0     | 0.0                          | 1.0  |         | 142.1    |                           |
|           |                                             | Z | 0.0     | 0.0                          | 1.0  |         | 157.6    |                           |
| 10108-CAB | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)    | X | 6.10    | 66.1                         | 19.2 | 5.80    | 108.6    | $\pm 1.2\%$               |
|           |                                             | Y | 6.21    | 66.9                         | 19.7 |         | 123.8    |                           |
|           |                                             | Z | 6.51    | 67.8                         | 20.2 |         | 137.5    |                           |
| 10109-CAB | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)  | X | 7.12    | 66.8                         | 19.8 | 6.43    | 116.7    | $\pm 1.4\%$               |
|           |                                             | Y | 7.21    | 67.6                         | 20.3 |         | 130.3    |                           |
|           |                                             | Z | 7.50    | 68.3                         | 20.6 |         | 146.1    |                           |
| 10110-CAB | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)     | X | 5.86    | 65.8                         | 19.1 | 5.75    | 107.0    | $\pm 1.2\%$               |
|           |                                             | Y | 5.90    | 66.4                         | 19.5 |         | 120.2    |                           |
|           |                                             | Z | 6.15    | 67.1                         | 19.8 |         | 134.4    |                           |
| 10111-CAB | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)   | X | 6.84    | 66.4                         | 19.7 | 6.44    | 111.7    | $\pm 1.2\%$               |
|           |                                             | Y | 6.89    | 67.1                         | 20.1 |         | 126.3    |                           |
|           |                                             | Z | 7.26    | 68.0                         | 20.5 |         | 142.9    |                           |
| 10112-CAB | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)  | X | 7.36    | 67.0                         | 20.0 | 6.59    | 116.8    | $\pm 1.7\%$               |
|           |                                             | Y | 7.47    | 67.9                         | 20.5 |         | 133.1    |                           |
|           |                                             | Z | 7.80    | 68.6                         | 20.8 |         | 149.5    |                           |
| 10113-CAB | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)   | X | 7.08    | 66.6                         | 19.9 | 6.62    | 113.1    | $\pm 1.4\%$               |
|           |                                             | Y | 7.16    | 67.5                         | 20.3 |         | 128.9    |                           |
|           |                                             | Z | 7.51    | 68.2                         | 20.7 |         | 144.8    |                           |
| 10142-CAB | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)     | X | 6.17    | 67.5                         | 20.1 | 5.73    | 148.0    | $\pm 1.2\%$               |
|           |                                             | Y | 5.75    | 66.4                         | 19.5 |         | 119.5    |                           |
|           |                                             | Z | 5.99    | 67.0                         | 19.8 |         | 132.7    |                           |
| 10143-CAB | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)   | X | 6.60    | 66.4                         | 19.6 | 6.35    | 109.0    | $\pm 1.4\%$               |
|           |                                             | Y | 6.66    | 67.2                         | 20.1 |         | 124.9    |                           |
|           |                                             | Z | 6.97    | 67.7                         | 20.3 |         | 139.8    |                           |
| 10145-CAB | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)   | X | 5.85    | 67.1                         | 19.9 | 5.76    | 142.6    | $\pm 1.2\%$               |
|           |                                             | Y | 5.50    | 66.3                         | 19.5 |         | 115.9    |                           |
|           |                                             | Z | 5.74    | 66.6                         | 19.6 |         | 129.0    |                           |
| 10146-CAB | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | X | 6.80    | 68.1                         | 20.6 | 6.41    | 147.0    | $\pm 1.4\%$               |
|           |                                             | Y | 6.32    | 67.1                         | 20.1 |         | 119.0    |                           |
|           |                                             | Z | 6.69    | 67.7                         | 20.4 |         | 133.0    |                           |

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|           |                                            |   |      |      |      |      |       |        |
|-----------|--------------------------------------------|---|------|------|------|------|-------|--------|
| 10154-CAB | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)    | X | 6.31 | 67.6 | 20.2 | 5.75 | 149.1 | ±1.2 % |
|           |                                            | Y | 5.93 | 66.6 | 19.6 |      | 122.0 |        |
|           |                                            | Z | 6.18 | 67.2 | 19.9 |      | 135.0 |        |
| 10155-CAB | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)  | X | 6.84 | 66.4 | 19.7 | 6.43 | 110.9 | ±1.2 % |
|           |                                            | Y | 6.88 | 67.1 | 20.0 |      | 129.0 |        |
|           |                                            | Z | 7.24 | 68.0 | 20.5 |      | 143.3 |        |
| 10156-CAB | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)     | X | 6.09 | 67.3 | 20.1 | 5.79 | 145.5 | ±1.2 % |
|           |                                            | Y | 5.68 | 66.2 | 19.5 |      | 119.4 |        |
|           |                                            | Z | 5.97 | 66.9 | 19.8 |      | 132.3 |        |
| 10157-CAB | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)   | X | 6.58 | 66.3 | 19.7 | 6.49 | 106.7 | ±1.2 % |
|           |                                            | Y | 6.59 | 66.9 | 20.0 |      | 123.8 |        |
|           |                                            | Z | 7.00 | 67.9 | 20.5 |      | 138.6 |        |
| 10158-CAB | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)  | X | 7.04 | 66.5 | 19.7 | 6.62 | 111.3 | ±1.4 % |
|           |                                            | Y | 7.09 | 67.2 | 20.1 |      | 130.3 |        |
|           |                                            | Z | 7.54 | 68.3 | 20.8 |      | 145.1 |        |
| 10159-CAB | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)   | X | 6.67 | 66.3 | 19.7 | 6.56 | 107.7 | ±1.2 % |
|           |                                            | Y | 6.69 | 67.0 | 20.1 |      | 124.5 |        |
|           |                                            | Z | 7.14 | 68.0 | 20.6 |      | 139.8 |        |
| 10166-CAB | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)   | X | 5.22 | 66.6 | 19.6 | 5.46 | 134.3 | ±0.9 % |
|           |                                            | Y | 4.89 | 65.9 | 19.2 |      | 112.2 |        |
|           |                                            | Z | 5.15 | 66.4 | 19.5 |      | 124.6 |        |
| 10167-CAB | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM) | X | 6.12 | 67.5 | 20.3 | 6.21 | 135.5 | ±1.2 % |
|           |                                            | Y | 5.71 | 66.9 | 20.0 |      | 112.6 |        |
|           |                                            | Z | 6.11 | 67.5 | 20.3 |      | 126.3 |        |
| 10175-CAB | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)      | X | 5.04 | 66.7 | 19.9 | 5.72 | 128.1 | ±0.9 % |
|           |                                            | Y | 4.99 | 67.3 | 20.3 |      | 146.6 |        |
|           |                                            | Z | 5.01 | 66.6 | 19.8 |      | 118.6 |        |
| 10176-CAB | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)    | X | 5.82 | 67.8 | 20.8 | 6.52 | 127.4 | ±1.2 % |
|           |                                            | Y | 5.74 | 68.6 | 21.4 |      | 144.6 |        |
|           |                                            | Z | 5.76 | 67.6 | 20.6 |      | 118.3 |        |
| 10177-CAC | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)       | X | 5.06 | 66.8 | 19.9 | 5.73 | 128.2 | ±0.9 % |
|           |                                            | Y | 5.09 | 67.9 | 20.7 |      | 146.2 |        |
|           |                                            | Z | 5.02 | 66.7 | 19.8 |      | 118.5 |        |
| 10178-CAB | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)     | X | 5.83 | 67.8 | 20.8 | 6.52 | 127.4 | ±1.2 % |
|           |                                            | Y | 5.80 | 68.9 | 21.6 |      | 146.0 |        |
|           |                                            | Z | 5.78 | 67.7 | 20.7 |      | 118.4 |        |
| 10179-CAB | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)    | X | 5.81 | 67.8 | 20.7 | 6.50 | 127.6 | ±1.2 % |
|           |                                            | Y | 5.76 | 68.8 | 21.4 |      | 144.7 |        |
|           |                                            | Z | 5.75 | 67.6 | 20.6 |      | 118.2 |        |
| 10180-CAB | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)     | X | 5.82 | 67.9 | 20.8 | 6.50 | 127.5 | ±1.2 % |
|           |                                            | Y | 5.74 | 68.7 | 21.4 |      | 144.5 |        |
|           |                                            | Z | 5.79 | 67.8 | 20.7 |      | 118.8 |        |

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|           |                                          |   |      |      |      |      |       |        |
|-----------|------------------------------------------|---|------|------|------|------|-------|--------|
| 10184-CAB | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)     | X | 5.03 | 66.6 | 19.8 | 5.73 | 127.1 | ±0.9 % |
|           |                                          | Y | 5.05 | 67.7 | 20.5 |      | 145.7 |        |
|           |                                          | Z | 5.02 | 66.6 | 19.8 |      | 119.3 |        |
| 10185-CAB | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)   | X | 5.79 | 67.6 | 20.7 | 6.51 | 127.2 | ±1.2 % |
|           |                                          | Y | 5.74 | 68.6 | 21.4 |      | 144.0 |        |
|           |                                          | Z | 5.81 | 67.8 | 20.7 |      | 118.5 |        |
| 10187-CAB | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)   | X | 5.05 | 66.7 | 19.9 | 5.73 | 128.0 | ±0.9 % |
|           |                                          | Y | 5.08 | 67.8 | 20.6 |      | 145.3 |        |
|           |                                          | Z | 5.02 | 66.6 | 19.8 |      | 119.3 |        |
| 10188-CAB | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM) | X | 5.81 | 67.7 | 20.7 | 6.52 | 127.6 | ±0.9 % |
|           |                                          | Y | 5.71 | 68.4 | 21.2 |      | 142.0 |        |
|           |                                          | Z | 5.80 | 67.7 | 20.7 |      | 119.2 |        |
| 10298-AAA | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)   | X | 5.93 | 67.2 | 19.9 | 5.72 | 142.2 | ±1.2 % |
|           |                                          | Y | 5.54 | 66.3 | 19.5 |      | 115.7 |        |
|           |                                          | Z | 5.85 | 66.9 | 19.8 |      | 132.3 |        |
| 10299-AAA | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | X | 6.95 | 68.3 | 20.7 | 6.39 | 149.5 | ±1.4 % |
|           |                                          | Y | 6.47 | 67.3 | 20.2 |      | 119.7 |        |
|           |                                          | Z | 6.86 | 68.0 | 20.5 |      | 137.0 |        |

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 Pages 7 and 8).

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

<sup>c</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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## DASY/EASY - Parameters of Probe: ES3DV3 - SN:3301

### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha | Depth (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|-------|------------|-------------|
| 300                  | 45.3                               | 0.87                            | 7.40    | 7.40    | 7.40    | 0.27  | 1.18       | ± 13.4 %    |
| 450                  | 43.5                               | 0.87                            | 6.85    | 6.85    | 6.85    | 0.20  | 2.30       | ± 13.4 %    |
| 750                  | 41.9                               | 0.89                            | 6.39    | 6.39    | 6.39    | 0.29  | 1.93       | ± 12.0 %    |
| 900                  | 41.5                               | 0.97                            | 6.06    | 6.06    | 6.06    | 0.34  | 1.77       | ± 12.0 %    |
| 1810                 | 40.0                               | 1.40                            | 5.17    | 5.17    | 5.17    | 0.67  | 1.27       | ± 12.0 %    |
| 1950                 | 40.0                               | 1.40                            | 5.00    | 5.00    | 5.00    | 0.49  | 1.54       | ± 12.0 %    |
| 2300                 | 39.5                               | 1.67                            | 4.83    | 4.83    | 4.83    | 0.67  | 1.33       | ± 12.0 %    |
| 2450                 | 39.2                               | 1.80                            | 4.55    | 4.55    | 4.55    | 0.66  | 1.43       | ± 12.0 %    |
| 2600                 | 39.0                               | 1.96                            | 4.38    | 4.38    | 4.38    | 0.80  | 1.32       | ± 12.0 %    |
| 3500                 | 37.9                               | 2.91                            | 4.22    | 4.22    | 4.22    | 1.00  | 1.18       | ± 13.1 %    |
| 3700                 | 37.7                               | 3.12                            | 3.98    | 3.98    | 3.98    | 1.00  | 1.12       | ± 13.1 %    |

<sup>C</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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## DASY/EASY - Parameters of Probe: ES3DV3 - SN:3301

### Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) <sup>c</sup> | Relative Permittivity <sup>f</sup> | Conductivity (S/m) <sup>f</sup> | ConvF X | ConvF Y | ConvF Z | Alpha | Depth (mm) | Unct. (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|-------|------------|-------------|
| 300                  | 58.2                               | 0.92                            | 7.07    | 7.07    | 7.07    | 0.22  | 1.61       | ± 13.4 %    |
| 450                  | 56.7                               | 0.94                            | 7.11    | 7.11    | 7.11    | 0.09  | 1.20       | ± 13.4 %    |
| 750                  | 55.5                               | 0.96                            | 6.01    | 6.01    | 6.01    | 0.38  | 1.77       | ± 12.0 %    |
| 900                  | 55.0                               | 1.05                            | 5.89    | 5.89    | 5.89    | 0.51  | 1.49       | ± 12.0 %    |
| 1810                 | 53.3                               | 1.52                            | 4.80    | 4.80    | 4.80    | 0.68  | 1.32       | ± 12.0 %    |
| 1950                 | 53.3                               | 1.52                            | 4.76    | 4.76    | 4.76    | 0.58  | 1.56       | ± 12.0 %    |
| 2300                 | 52.9                               | 1.81                            | 4.40    | 4.40    | 4.40    | 0.80  | 1.22       | ± 12.0 %    |
| 2450                 | 52.7                               | 1.95                            | 4.23    | 4.23    | 4.23    | 0.80  | 1.04       | ± 12.0 %    |
| 2600                 | 52.5                               | 2.16                            | 4.04    | 4.04    | 4.04    | 0.80  | 1.01       | ± 12.0 %    |
| 3500                 | 51.3                               | 3.31                            | 3.81    | 3.81    | 3.81    | 1.00  | 1.01       | ± 13.1 %    |
| 3700                 | 51.0                               | 3.55                            | 3.58    | 3.58    | 3.58    | 1.00  | 1.22       | ± 13.1 %    |

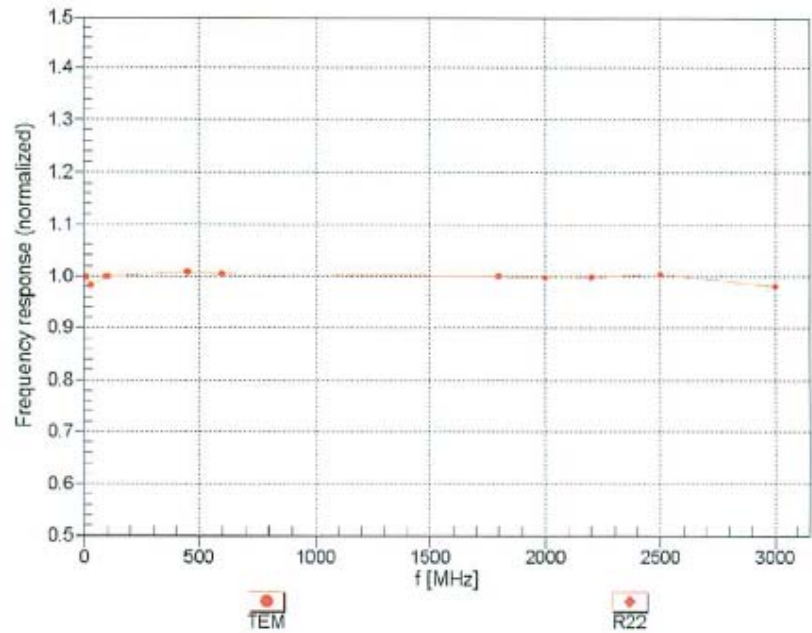
<sup>c</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>f</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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Frequency Response of E-Field  
(TEM-Cell:ifi110 EXX, Waveguide: R22)

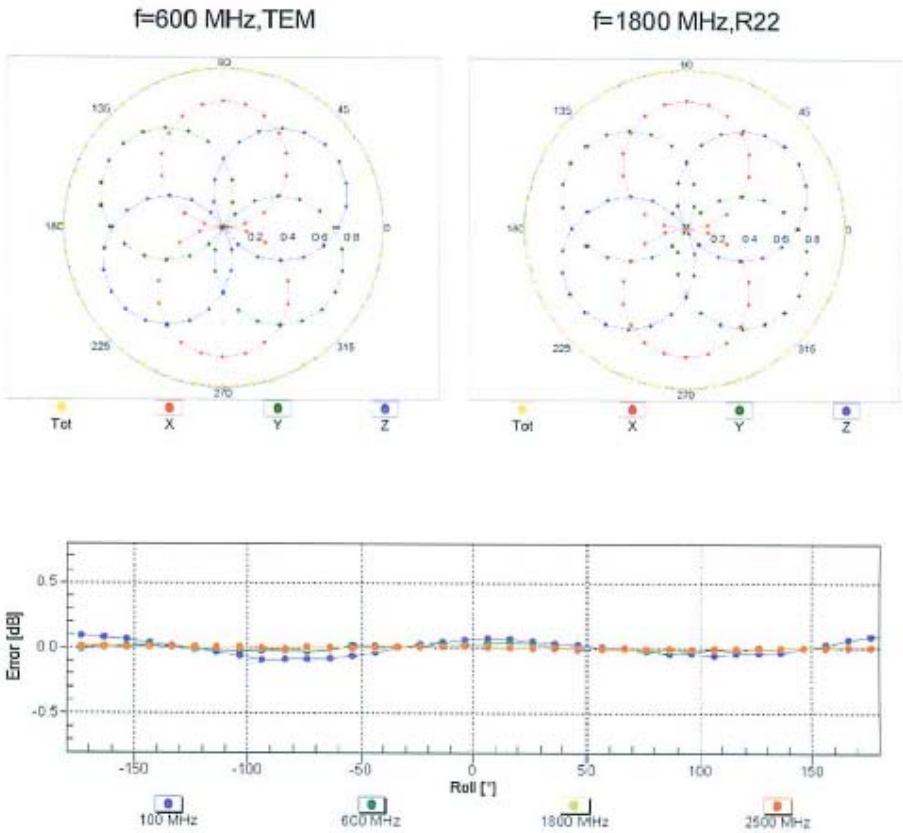


Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  (k=2)

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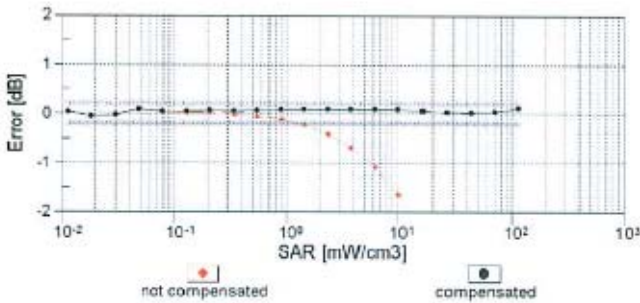
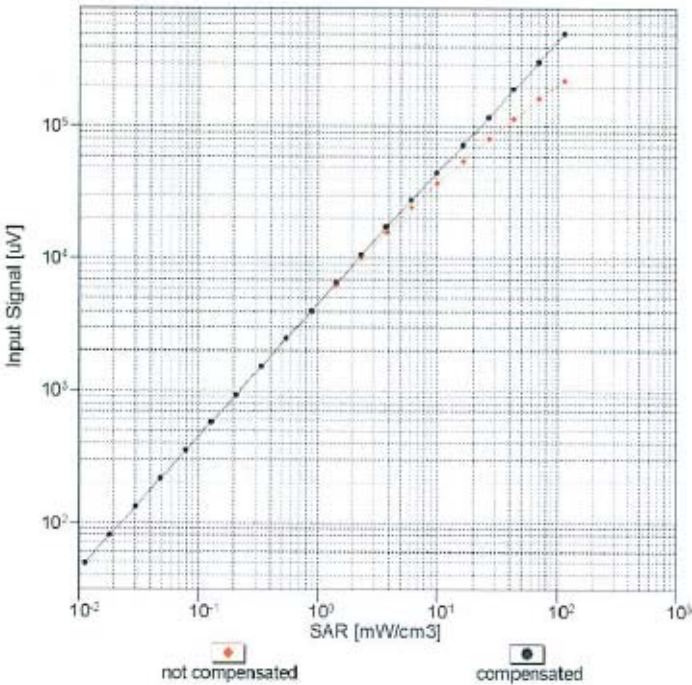
Receiving Pattern ( $\phi$ ),  $\theta = 0^\circ$



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August 27, 2013

Dynamic Range f(SAR<sub>head</sub>)  
(TEM cell , f = 900 MHz)



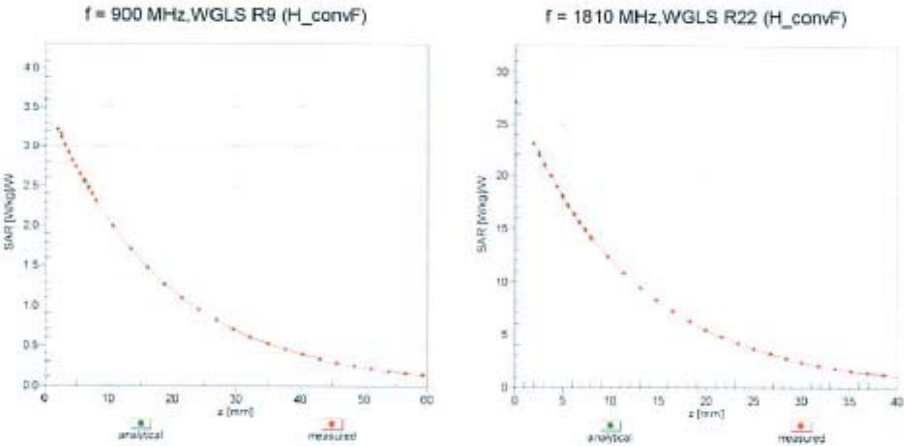
Uncertainty of Linearity Assessment: ± 0.6% (k=2)



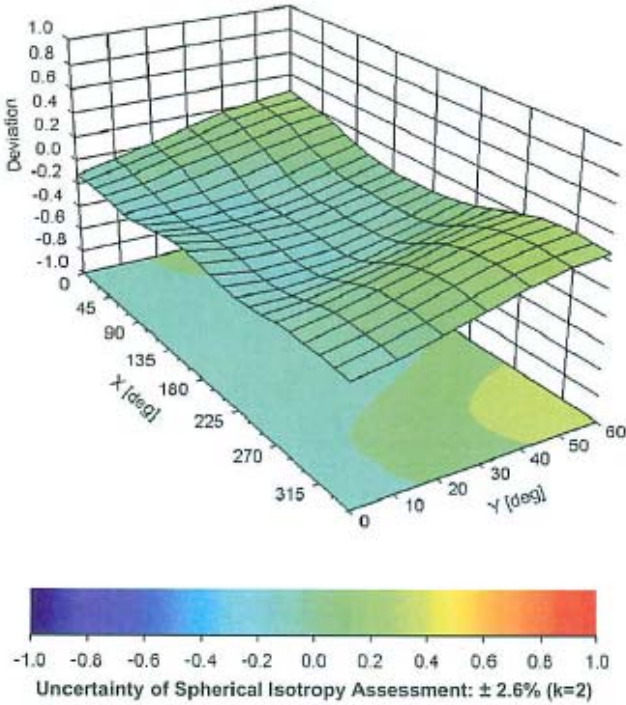
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Conversion Factor Assessment



Deviation from Isotropy in Liquid  
Error ( $\phi, \theta$ ), f = 900 MHz



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**DASY/EASY - Parameters of Probe: ES3DV3 - SN:3301****Other Probe Parameters**

|                                               |            |
|-----------------------------------------------|------------|
| Sensor Arrangement                            | Triangular |
| Connector Angle (°)                           | -73.6      |
| Mechanical Surface Detection Mode             | enabled    |
| Optical Surface Detection Mode                | disabled   |
| Probe Overall Length                          | 337 mm     |
| Probe Body Diameter                           | 10 mm      |
| Tip Length                                    | 10 mm      |
| Tip Diameter                                  | 4 mm       |
| Probe Tip to Sensor X Calibration Point       | 2 mm       |
| Probe Tip to Sensor Y Calibration Point       | 2 mm       |
| Probe Tip to Sensor Z Calibration Point       | 2 mm       |
| Recommended Measurement Distance from Surface | 3 mm       |

Schmid &amp; Partner Engineering AG

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info@speag.com, <http://www.speag.com>

### Additional Conversion Factors

for Dosimetric E-Field Probe

Type:

ES3DV3

Serial Number:

3301

Place of Assessment:

Zurich

Date of Assessment:

August 29, 2013

Probe Calibration Date:

August 27, 2013

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 450, 900 or at 1810 MHz.

Assessed by:



ES3DV3-SN:3301

Page 1 of 2

August 29, 2013

Schmid & Partner Engineering AG

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Zeughausstrasse 43, 8004 Zurich, Switzerland  
Phone +41 44 245 9700, Fax +41 44 245 9779  
info@speag.com, <http://www.speag.com>

Dosimetric E-Field Probe ES3DV3 SN:3291

Conversion factor (± standard deviation)

|              |       |             |                                                                                                                          |
|--------------|-------|-------------|--------------------------------------------------------------------------------------------------------------------------|
| 150 ± 50 MHz | ConvF | 8.24 ± 10 % | <div><math>\epsilon_r = 52.3 \pm 5\%</math><br/><math>\sigma = 0.76 \pm 5\% \text{ mho/m}</math><br/>(head tissue)</div> |
| 250 ± 50 MHz | ConvF | 7.67 ± 10 % | <div><math>\epsilon_r = 47.6 \pm 5\%</math><br/><math>\sigma = 0.83 \pm 5\% \text{ mho/m}</math><br/>(head tissue)</div> |
| 150 ± 50 MHz | ConvF | 7.85 ± 10 % | <div><math>\epsilon_r = 61.9 \pm 5\%</math><br/><math>\sigma = 0.80 \pm 5\% \text{ mho/m}</math><br/>(body tissue)</div> |
| 250 ± 50 MHz | ConvF | 7.57 ± 10 % | <div><math>\epsilon_r = 59.4 \pm 5\%</math><br/><math>\sigma = 0.88 \pm 5\% \text{ mho/m}</math><br/>(body tissue)</div> |

**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 DASY Manual.

## **Appendix C**

### **Dipole Calibration Certificates**

**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)

Accreditation No.: **SCS 108**

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

Cient **Motorola EME**

Certificate No: **D300V3-1014\_May13**

## CALIBRATION CERTIFICATE

Object **D300V3 - SN: 1014**

Calibration procedure(s) **QA CAL-15.v7**  
**Calibration procedure for dipole validation kits below 700 MHz**

Calibration date: **May 06, 2013**

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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter E4419B          | GB41293874         | 04-Apr-13 (No. 217-01733)         | Apr-14                 |
| Power sensor E4412A         | MY41498087         | 04-Apr-13 (No. 217-01733)         | Apr-14                 |
| Reference 3 dB Attenuator   | SN: S5054 (3c)     | 04-Apr-13 (No. 217-01737)         | Apr-14                 |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 04-Apr-13 (No. 217-01736)         | Apr-14                 |
| Type-N mismatch combination | SN: 5047.3 / 06327 | 04-Apr-13 (No. 217-01739)         | Apr-14                 |
| Reference Probe ET3DV6      | SN: 1507           | 28-Dec-12 (No. ET3-1507_Dec12)    | Dec-13                 |
| DAE4                        | SN: 654            | 10-Apr-13 (No. DAE4-654_Apr13)    | Apr-14                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-11) | In house check: Oct-13 |
| RF generator R&S SMT-06     | 100005             | 04-Aug-99 (in house check Oct-11) | In house check: Oct-13 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-12) | In house check: Oct-13 |

Calibrated by: **Name** **Function**  
**Claudio Leubler** **Laboratory Technician**

Signature

Approved by: **Katja Pokovic** **Technical Manager**

Issued: May 6, 2013

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

Certificate No: D300V3-1014\_May13

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**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        |
| ConvF | 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.

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%.

**Measurement Conditions**

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

|                              |                        |                                 |
|------------------------------|------------------------|---------------------------------|
| DASY Version                 | DASY5                  | V52.8.6                         |
| Extrapolation                | Advanced Extrapolation |                                 |
| Phantom                      | ELI4 Flat Phantom      | Shell thickness: $2 \pm 0.2$ mm |
| Distance Dipole Center - TSL | 15 mm                  | with Spacer                     |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm      |                                 |
| Frequency                    | 300 MHz $\pm$ 1 MHz    |                                 |

**Head TSL parameters**

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 45.3           | 0.37 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 44.6 $\pm$ 6 % | 0.87 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

**SAR result with Head TSL**

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 0.725 W/kg                   |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 2.89 W/kg $\pm$ 18.1 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 0.478 W/kg                   |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 1.91 W/kg $\pm$ 17.6 % (k=2) |

**Body TSL parameters**

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 58.2           | 0.92 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 57.4 $\pm$ 6 % | 0.93 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

**SAR result with Body TSL**

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 0.721 W/kg                   |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 2.85 W/kg $\pm$ 18.1 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 0.486 W/kg                   |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 1.92 W/kg $\pm$ 17.6 % (k=2) |



**Appendix****Antenna Parameters with Head TSL**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 57.5 $\Omega$ - 4.1 j $\Omega$ |
| Return Loss                          | - 22.0 dB                      |

**Antenna Parameters with Body TSL**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 57.4 $\Omega$ - 4.9 j $\Omega$ |
| Return Loss                          | - 21.7 dB                      |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.744 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

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 | November 30, 2010 |

**DASY5 Validation Report for Head TSL**

Date: 06.05.2013

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 300 MHz; Type: D300V3; Serial: D300V3 - SN: 1014**

Communication System: UID 0 - CW; Frequency: 300 MHz

Medium parameters used:  $f = 300$  MHz;  $\sigma = 0.87$  S/m;  $\epsilon_r = 44.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

**DASY52 Configuration:**

- Probe: ET3DV6 - SN1507; ConvF(7.32, 7.32, 7.32); Calibrated: 28.12.2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 10.04.2013
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1003
- DASY52 52.8.6(1115); SEMCAD X 14.6.9(7117)

**Dipole Calibration for Head Tissue/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:**

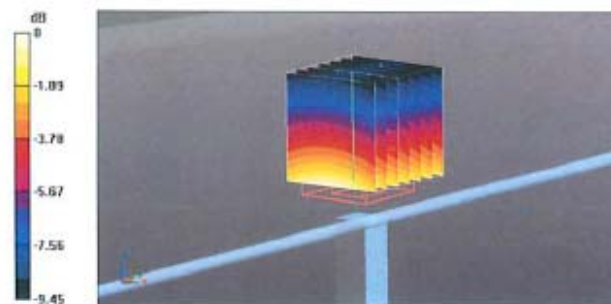
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 30.216 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.21 W/kg

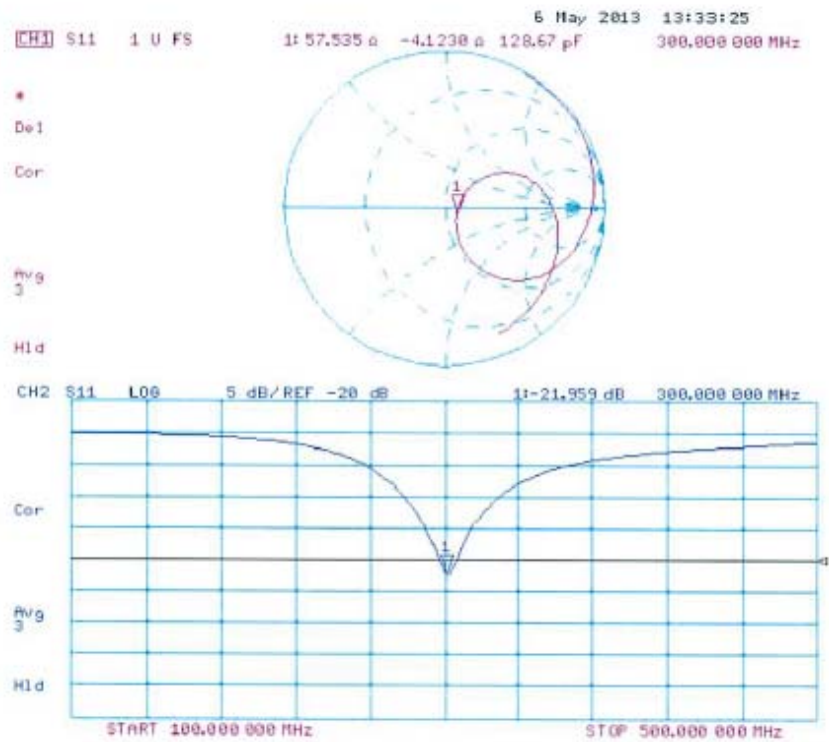
**SAR(1 g) = 0.725 W/kg; SAR(10 g) = 0.478 W/kg**

Maximum value of SAR (measured) = 0.766 W/kg



0 dB = 0.766 W/kg = -1.16 dBW/kg

Impedance Measurement Plot for Head TSL



**DASY5 Validation Report for Body TSL**

Date: 06.05.2013

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 300 MHz; Type: D300V3; Serial: D300V3 - SN: 1014**

Communication System: UID 0 - CW; Frequency: 300 MHz

Medium parameters used:  $f = 300$  MHz;  $\sigma = 0.93$  S/m;  $\epsilon_r = 57.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(7.08, 7.08, 7.08); Calibrated: 28.12.2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 10.04.2013
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1003
- DASY52 52.8.6(1115); SEMCAD X 14.6.9(7117)

**Dipole Calibration for Body Tissue/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:**

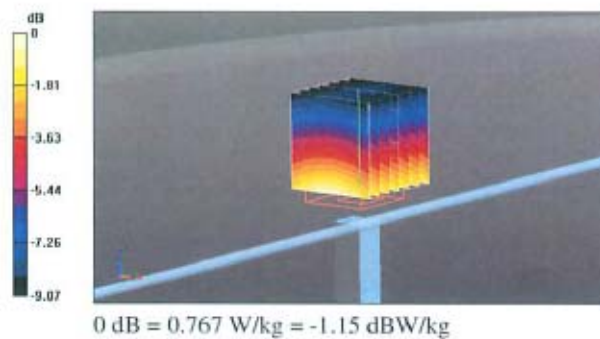
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 30.216 V/m; Power Drift = -0.05 dB

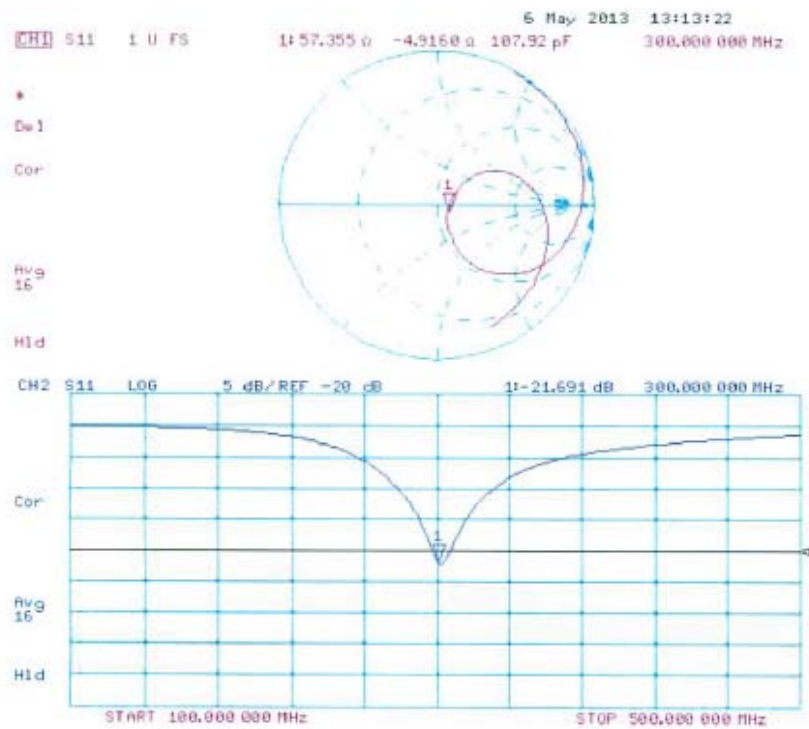
Peak SAR (extrapolated) = 1.12 W/kg

**SAR(1 g) = 0.721 W/kg; SAR(10 g) = 0.486 W/kg**

Maximum value of SAR (measured) = 0.767 W/kg



Impedance Measurement Plot for Body TSL



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Accreditation No.: **SCS 108**

Client **Motorola EME**

Certificate No: **D750V3-1098\_Oct13**

## CALIBRATION CERTIFICATE

Object **D750V3 - SN: 1098**

Calibration procedure(s) **QA CAL-05.v9**  
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **October 15, 2013**

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  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704         | 09-Oct-13 (No. 217-01827)         | Oct-14                 |
| Power sensor HP 8481A       | US37292783         | 09-Oct-13 (No. 217-01827)         | Oct-14                 |
| Power sensor HP 8481A       | MY41092317         | 09-Oct-13 (No. 217-01828)         | Oct-14                 |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 04-Apr-13 (No. 217-01736)         | Apr-14                 |
| Type-N mismatch combination | SN: 5047.3 / 06327 | 04-Apr-13 (No. 217-01739)         | Apr-14                 |
| Reference Probe ES3DV3      | SN: 3205           | 28-Dec-12 (No. ES3-3205_Dec12)    | Dec-13                 |
| DAE4                        | SN: 601            | 25-Apr-13 (No. DAE4-601_Apr13)    | Apr-14                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| RF generator R&S SMT-06     | 100005             | 04-Aug-99 (in house check Oct-13) | In house check: Oct-15 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-13) | In house check: Oct-14 |

|                |               |                       |           |
|----------------|---------------|-----------------------|-----------|
|                | Name          | Function              | Signature |
| Calibrated by: | Dimce Iliev   | Laboratory Technician |           |
| Approved by:   | Katja Pokovic | Technical Manager     |           |

Issued: October 15, 2013

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

Certificate No: D750V3-1098\_Oct13

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Accreditation No.: **SCS 108**

#### Glossary:

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

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

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### 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.

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%.

**Measurement Conditions**

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

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.8.7     |
| Extrapolation                | Advanced Extrapolation |             |
| Phantom                      | Modular Flat Phantom   |             |
| Distance Dipole Center - TSL | 15 mm                  | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm      |             |
| Frequency                    | 750 MHz $\pm$ 1 MHz    |             |

**Head TSL parameters**

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 41.9           | 0.89 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 41.4 $\pm$ 6 % | 0.91 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

**SAR result with Head TSL**

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 2.08 W/kg                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 8.16 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 1.36 W/kg                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 5.36 W/kg $\pm$ 16.5 % (k=2) |

**Body TSL parameters**

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 55.5           | 0.96 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 54.6 $\pm$ 6 % | 0.98 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

**SAR result with Body TSL**

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 2.21 W/kg                    |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 8.67 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 1.46 W/kg                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 5.75 W/kg $\pm$ 16.5 % (k=2) |



**Appendix****Antenna Parameters with Head TSL**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 54.7 $\Omega$ - 2.3 j $\Omega$ |
| Return Loss                          | - 26.0 dB                      |

**Antenna Parameters with Body TSL**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 49.3 $\Omega$ - 3.6 j $\Omega$ |
| Return Loss                          | - 28.7 dB                      |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.033 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

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 | July 05, 2013 |

DASY5 Validation Report for Head TSL

Date: 14.10.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1098

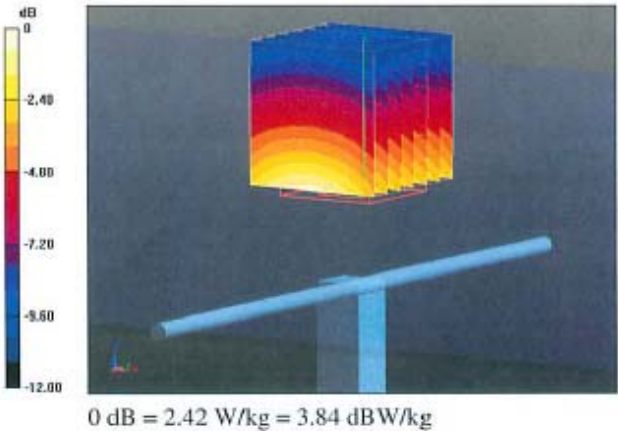
Communication System: UID 0 - CW ; Frequency: 750 MHz  
Medium parameters used:  $f = 750 \text{ MHz}$ ;  $\sigma = 0.91 \text{ S/m}$ ;  $\epsilon_r = 41.4$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

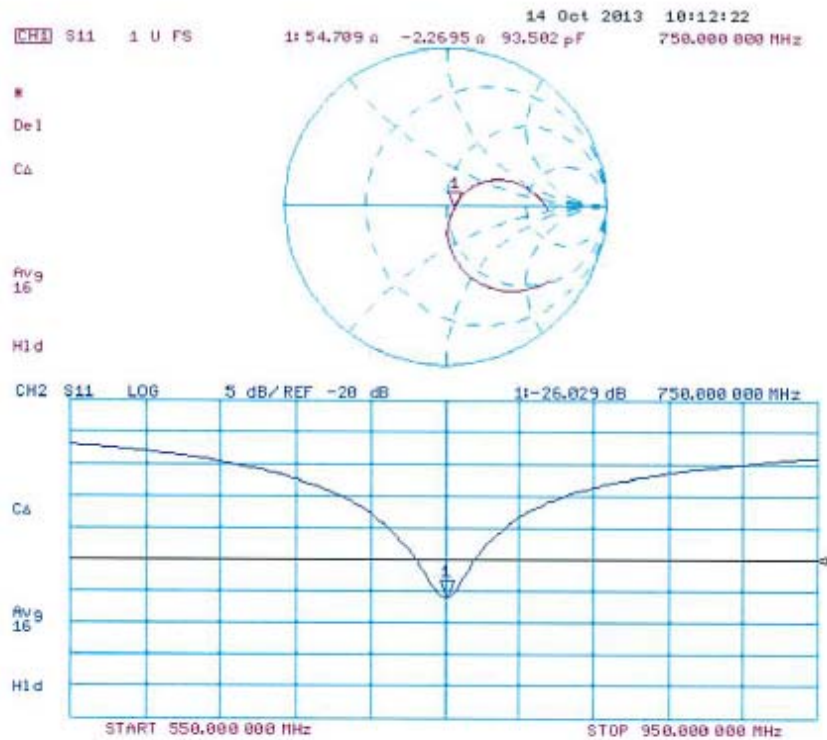
- Probe: ES3DV3 - SN3205; ConvF(6.28, 6.28, 6.28); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$   
Reference Value = 52.874 V/m; Power Drift = 0.03 dB  
Peak SAR (extrapolated) = 3.15 W/kg  
SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.36 W/kg  
Maximum value of SAR (measured) = 2.42 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 15.10.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1098

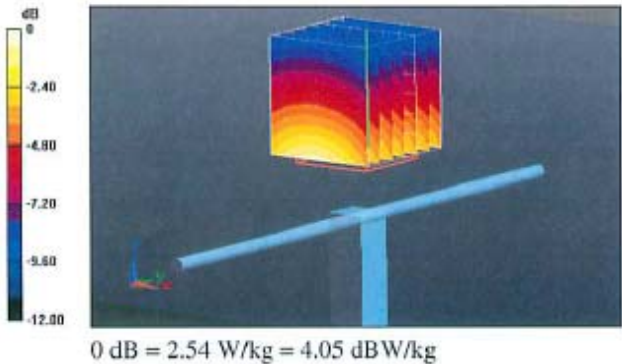
Communication System: UID 0 - CW ; Frequency: 750 MHz  
Medium parameters used:  $f = 750 \text{ MHz}$ ;  $\sigma = 0.98 \text{ S/m}$ ;  $\epsilon_r = 54.6$ ;  $\rho = 1000 \text{ kg/m}^3$   
Phantom section: Flat Section  
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

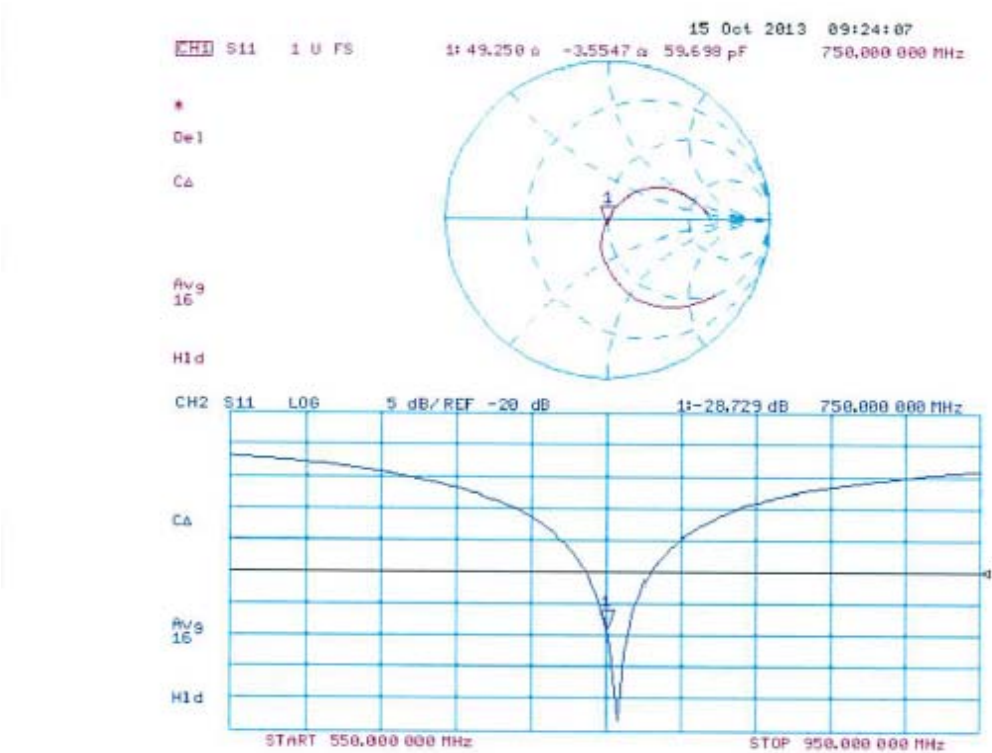
- Probe: ES3DV3 - SN3205; ConvF(6.11, 6.11, 6.11); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$   
Reference Value = 52.593 V/m; Power Drift = 0.02 dB  
Peak SAR (extrapolated) = 3.23 W/kg  
SAR(1 g) = 2.21 W/kg; SAR(10 g) = 1.46 W/kg  
Maximum value of SAR (measured) = 2.54 W/kg



Impedance Measurement Plot for Body TSL





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



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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 EME**

Certificate No: **D900V2-084\_Aug13**

## CALIBRATION CERTIFICATE

Object **D900V2 - SN: 084**

Calibration procedure(s) **QA CAL-05.v9**  
 Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **August 14, 2013**

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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704         | 01-Nov-12 (No. 217-01640)         | Oct-13                 |
| Power sensor HP 8481A       | US37292783         | 01-Nov-12 (No. 217-01640)         | Oct-13                 |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 04-Apr-13 (No. 217-01736)         | Apr-14                 |
| Type-N mismatch combination | SN: 5047.3 / 06327 | 04-Apr-13 (No. 217-01739)         | Apr-14                 |
| Reference Probe ES3DV3      | SN: 3205           | 28-Dec-12 (No. ES3-3205_Dec12)    | Dec-13                 |
| DAE4                        | SN: 601            | 25-Apr-13 (No. DAE4-601_Apr13)    | Apr-14                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317         | 18-Oct-02 (in house check Oct-11) | In house check: Oct-13 |
| RF generator R&S SMT-06     | 100005             | 04-Aug-99 (in house check Oct-11) | In house check: Oct-13 |
| Network Analyzer HP 8753E   | US37390585 S4206   | 18-Oct-01 (in house check Oct-12) | In house check: Oct-13 |

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

Issued: August 14, 2013

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

Certificate No: D900V2-084\_Aug13

Page 1 of 8

**Calibration Laboratory of  
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Zeughausstrasse 43, 8004 Zurich, Switzerland



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Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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#### Glossary:

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | 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
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### 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.

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%.

**Measurement Conditions**

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

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.8.7     |
| Extrapolation                | Advanced Extrapolation |             |
| Phantom                      | Modular Flat Phantom   |             |
| Distance Dipole Center - TSL | 15 mm                  | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm      |             |
| Frequency                    | 900 MHz $\pm$ 1 MHz    |             |

**Head TSL parameters**

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 41.5           | 0.97 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 41.4 $\pm$ 6 % | 0.95 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

**SAR result with Head TSL**

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 2.65 W/kg                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 10.8 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 1.71 W/kg                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 6.92 W/kg $\pm$ 16.5 % (k=2) |

**Body TSL parameters**

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 55.0           | 1.05 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 54.2 $\pm$ 6 % | 1.03 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

**SAR result with Body TSL**

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 2.64 W/kg                    |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 10.7 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 1.71 W/kg                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 6.90 W/kg $\pm$ 16.5 % (k=2) |



**Appendix****Antenna Parameters with Head TSL**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 49.4 $\Omega$ - 7.2 j $\Omega$ |
| Return Loss                          | - 22.8 dB                      |

**Antenna Parameters with Body TSL**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 45.3 $\Omega$ - 6.9 j $\Omega$ |
| Return Loss                          | - 21.2 dB                      |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.413 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

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 | September 20, 2000 |

**DASY5 Validation Report for Head TSL**

Date: 13.08.2013

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN: 084**

Communication System: UID 0 - CW ; Frequency: 900 MHz

Medium parameters used:  $f = 900$  MHz;  $\sigma = 0.95$  S/m;  $\epsilon_r = 41.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.95, 5.95, 5.95); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

**Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:**

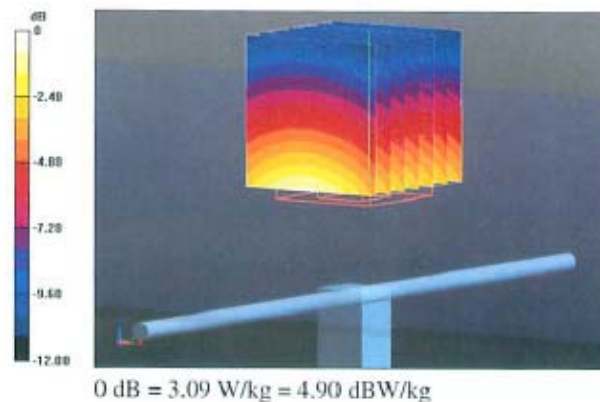
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 58.816 V/m; Power Drift = 0.03 dB

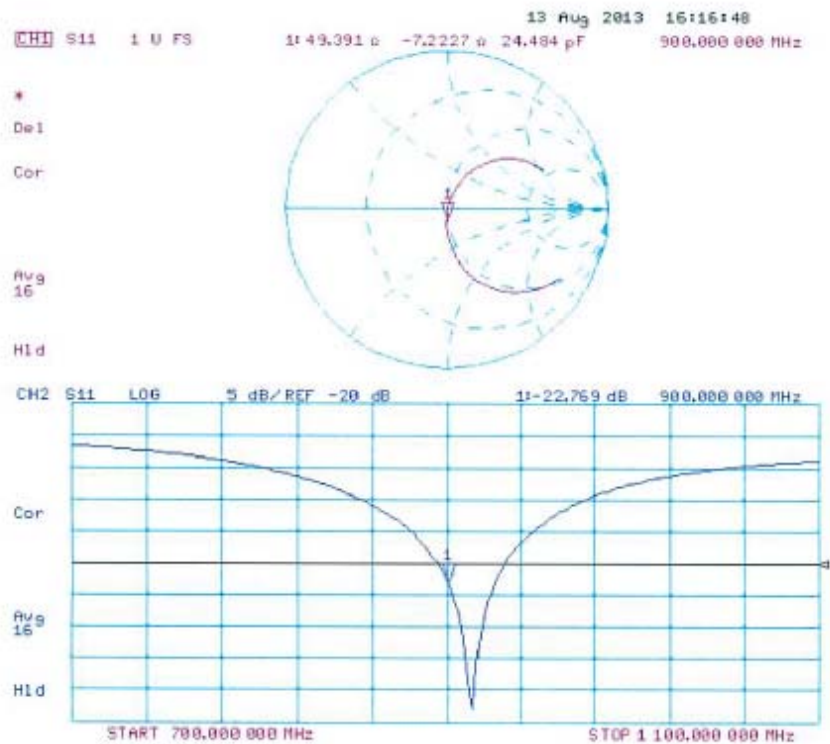
Peak SAR (extrapolated) = 4.00 W/kg

**SAR(1 g) = 2.65 W/kg; SAR(10 g) = 1.71 W/kg**

Maximum value of SAR (measured) = 3.09 W/kg



Impedance Measurement Plot for Head TSL



**DASY5 Validation Report for Body TSL**

Date: 14.08.2013

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN: 084**

Communication System: UID 0 - CW ; Frequency: 900 MHz

Medium parameters used:  $f = 900$  MHz;  $\sigma = 1.03$  S/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

**DASY52 Configuration:**

- Probe: ES3DV3 - SN3205; ConvF(5.95, 5.95, 5.95); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

**Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:**

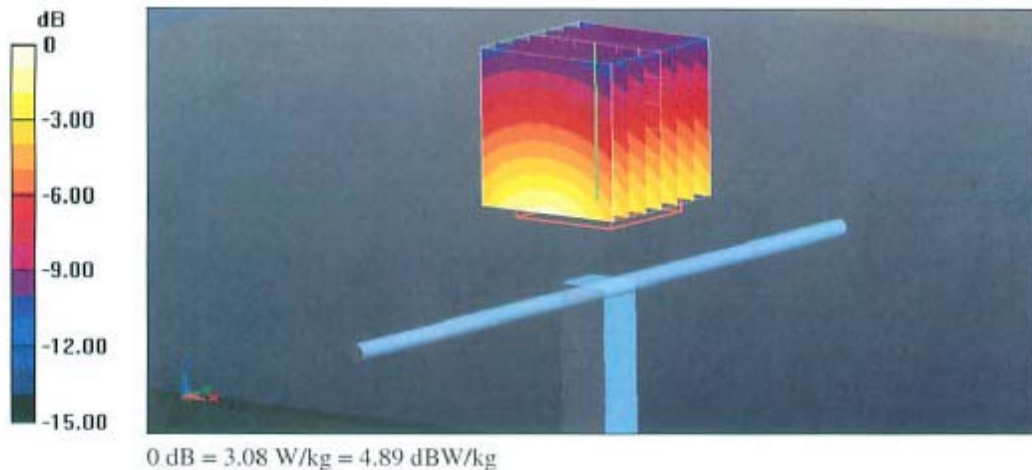
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 58.816 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 3.87 W/kg

**SAR(1 g) = 2.64 W/kg; SAR(10 g) = 1.71 W/kg**

Maximum value of SAR (measured) = 3.08 W/kg



Impedance Measurement Plot for Body TSL

