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### FCC SAR EVALUATION REPORT FOR VERIFICATION

**Project No :** NK-23-R-438**Dates of receipt :** December 08, 2023**Applicant :** LG Electronics USA., Inc.**Dates of Issue :** January 2, 2024

111 Sylvan Avenue North Building, Englewood  
Cliffs, New Jersey State, 07632, USA  
Attn. : David Kim

**Test Site :**  
Nemko Korea Co., Ltd.

**FCC ID:**

BEJF1DA2835P

**Applicant :**

LG Electronics USA., Inc

**Brand Name :****Model:**

F1DA2835P

**Host Model Name:**

XG2T

**Additional****Host Model(s):**

\*XG2T\*\*

**EUT Type:**

PORTABLE BLUETOOTH SPEAKER

**Classification:**

FCC Part 15 Spread Spectrum Transmitter (DSS)  
Digital Transmission System(DTS)

**Date of Test:**

December 08, 2023 ~ December 16, 2023

**Applied Standard:**

FCC 47 CFR Part 2.1093

The device bearing the brand name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in IEEE 1528-2013. The client should not use it to claim product endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.



Tested By : Wonhee Lee  
Test Engineer



Reviewed By : Wonjae Song  
Technical Manager

**Revision History**

| Rev. | Issue Date      | Revisions     | Revised By |
|------|-----------------|---------------|------------|
| 00   | January 2, 2024 | Initial issue | Wonhee Lee |
|      |                 |               |            |
|      |                 |               |            |
|      |                 |               |            |

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## 1. INTRODUCTION

### 1.1 Test facility

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2014), the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013) was used in determining radiated and conducted emissions emanating.

These measurement tests were conducted at **Nemko Korea Co., Ltd..**

The site address 165-51, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 17042 Republic of Korea.

### 1.2 Accreditation and listing

| Accreditation type                                                                  |                                                                  | Accreditation number    |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------|
|   | CAB Accreditation for DOC                                        | Designation No. KR0026  |
|  | KOLAS Accredited Lab.<br>(Korea Laboratory Accreditation Scheme) | Registration No. KT155  |
|  | Canada IC Registered site                                        | Site No. 2040E          |
|  | VCCI registration site(RE/CE/Telecom CE)                         | Member No. 2118         |
|  | EMC CBTL                                                         | TL124                   |
|  | KCC(RRL)Designated Lab.                                          | Registration No. KR0026 |

## 2. EUT INFORMATION & TEST CONDITIONS

### 2.1 EUT Information

Specifications:

|                                          |                                                                                                                            |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| EUT Type                                 | PORTABLE BLUETOOTH SPEAKER                                                                                                 |
| Model Name                               | F1DA2835P                                                                                                                  |
| Host Model Name                          | XG2T                                                                                                                       |
| Variant Host Model Name                  | *XG2T**                                                                                                                    |
| Brand Name                               |  LG                                       |
| Frequency of Operation                   | (2 402 ~ 2 480) MHz                                                                                                        |
| Average Output Power (Conducted)         | GFSK : 6.67 dBm<br>$\pi$ /4DQPSK : 3.60 dBm<br>8DPSK : 3.62 dBm<br>LE 1 Mbps : 3.78 dBm<br>LE 2 Mbps : 3.53 dBm            |
| Modulations                              | GFSK, $\pi$ /4DQPSK, 8DPSK                                                                                                 |
| Highest SAR Value (Reported)             | 0.117 W/kg                                                                                                                 |
| Highest Simultaneous SAR Value(Reported) | N/A                                                                                                                        |
| FCC Classification                       | FCC Part 15 Spread Spectrum Transmitter (DSS)<br>Digital Transmission System (DTS)                                         |
| Channel Number                           | DSS : 79 ch<br>DTS : 40 ch                                                                                                 |
| Antenna Gain (peak)                      | 2.10 dBi                                                                                                                   |
| Antenna Setup                            | 1TX / 1RX                                                                                                                  |
| Remarks                                  | RF module FCC ID: BEJ-F1DA2835P<br>RF module(F1DA2835P) report No.:<br>REP015887-1(Bluetooth)<br>REP015887-2(Bluetooth LE) |

### 2.1.1 Variants Covered By This Report(Model Distinction)

| Model Distinction                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>*XG2T**</b></p> <p>Note 1)Front * : Code by region or customer -ex) D: Germany, U: UK, M: North America Walmart</p> <p>Note 2)Back ** : Product color -ex) BK : Black / BE : Beige / RD : Red / GD : Green</p> <p>The symbol '*' in the model name can be alphanumeric characters or blank.</p> |

## 2.2 Operation During Test

The EUT contains FCC approved RF module.

The EUT is the transceiver which is Bluetooth v5.3 module supporting BDR/EDR/LE mode.

The Laptop was used to control the EUT to transmit the wanted TX channel continuously by the testing program (FCC Test Tools V2.25) supported by manufacturer.

The EUT was tested at the lowest channel, middle channel and the highest channel with the maximum output power in accordance with the manufacturer's specifications. The worst data were recorded in the report.

### 2.2.1 Operating Environment

| Parameters          | Recording during test | Accepted deviation |
|---------------------|-----------------------|--------------------|
| Ambient temperature | (21.5 ~ 22.4) °C      | (18.0 ~ 25.0) °C   |
| Relative Humidity   | (37.2 ~ 45.8) %       | (30.0 ~ 70.0) %    |

### 2.2.2 Table of test channels

| Frequency band      | Modulation                       | Test Channel (CH) | Frequency (MHz) |
|---------------------|----------------------------------|-------------------|-----------------|
| (2 402 ~ 2 480) MHz | GFSK,<br>$\pi/4$ DQPSK,<br>8DPSK | 0                 | 2 402           |
|                     |                                  | 39                | 2 441           |
|                     |                                  | 78                | 2 480           |
|                     | LE 1 Mbps,<br>LE 2 Mbps          | 0                 | 2 402           |
|                     |                                  | 19                | 2 440           |
|                     |                                  | 39                | 2 480           |

### 2.2.3 Table of test power setting

| Frequency           | Mode          | Power Setting Level   |
|---------------------|---------------|-----------------------|
| (2 402 ~ 2 480) MHz | GFSK          | DUT Mode & Max. Power |
|                     | $\pi/4$ DQPSK | DUT Mode & Max. Power |
|                     | 8DPSK         | DUT Mode & Max. Power |
|                     | LE 1 Mbps     | 10                    |
|                     | LE 2 Mbps     | 10                    |

### 2.2.4 Antenna Information

| Frequency           | Mode                       | Antenna TX mode | Support MIMO |
|---------------------|----------------------------|-----------------|--------------|
| (2 402 ~ 2 480) MHz | GFSK, $\pi/4$ DQPSK, 8DPSK | ■ 1TX, □ 2TX    | □ Yes, ■ No  |
| (2 402 ~ 2 480) MHz | LE 1 Mbps, 2 Mbps          | ■ 1TX, □ 2TX    | □ Yes, ■ No  |

### 2.2.5 Additional Information Related to Testing

RF module approved as below are installed in this device.

| Product Name     | Module Name | FCC ID        | Remark            |
|------------------|-------------|---------------|-------------------|
| Bluetooth Module | F1DA2835P   | BEJ-F1DA2835P | BDR/EDR/LE module |

SAR testing was performed with a device-to-phantom separation distance of 0 mm according to KDB 447498 requirements.

## 2.3 Support Equipment

|                 |                                                                |                                            |
|-----------------|----------------------------------------------------------------|--------------------------------------------|
| EUT             | LG Electronics USA., Inc<br>Model : XG2T                       | S/N: N/A                                   |
| Laptop Computer | SAMSUNG<br>Model : NT300E5Q                                    | FCC DOC<br>S/N : 0QR291IHC00394L           |
| AC/DC Adapter   | SAMSUNG<br>Model : A13-040N2A<br>0.75 m unshielded power cable | FCC DOC<br>S/N : CN60BA4400313ADON871C04L2 |

## 2.4 Maximum Target Power among production units

Tune up tolerance is specified in operational description.

SAR values were scaled to the maximum tune-up power to determine compliance per KDB Publication 447498 D04 Interim General RF Exposure Guidance v01.

| Mode          | Nominal Power (dB m) | Maximum Power (dB m) |
|---------------|----------------------|----------------------|
| GFSK          | 6.0                  | 7.0                  |
| $\pi/4$ DQPSK | 3.0                  | 4.0                  |
| 8DPSK         | 3.0                  | 4.0                  |
| LE 1 Mbps     | 3.5                  | 4.5                  |
| LE 2 Mbps     | 3.5                  | 4.5                  |

## 2.5 SAR Test Consideration

Per FCC KDB 447498 D04 Interim General RF Exposure Guidance v01, SAR-based exemption threshold for distance  $\leq 20$  cm is defined by the following equation.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

$f$  is in GHz.

$d$  is the separation distance (cm).

Because the minimum separation distance was assumed to be 5 mm, the equation is used  $ERP_{20 \text{ cm}} (d/20 \text{ cm})^x$ .

Table B.2—Example Power Thresholds (mW)

| Frequency (MHz) | Distance (mm) |    |    |     |     |     |     |     |     |     |
|-----------------|---------------|----|----|-----|-----|-----|-----|-----|-----|-----|
|                 | 5             | 10 | 15 | 20  | 25  | 30  | 35  | 40  | 45  | 50  |
| 300             | 39            | 65 | 88 | 110 | 129 | 148 | 166 | 184 | 201 | 217 |
| 450             | 22            | 44 | 67 | 89  | 112 | 135 | 158 | 180 | 203 | 226 |
| 835             | 9             | 25 | 44 | 66  | 90  | 116 | 145 | 175 | 207 | 240 |
| 1900            | 3             | 12 | 26 | 44  | 66  | 92  | 122 | 157 | 195 | 236 |
| 2450            | 3             | 10 | 22 | 38  | 59  | 83  | 111 | 143 | 179 | 219 |
| 3600            | 2             | 8  | 18 | 32  | 49  | 71  | 96  | 125 | 158 | 195 |
| 5800            | 1             | 6  | 14 | 25  | 40  | 58  | 80  | 106 | 136 | 169 |

According to the FCC KDB 447498 D04 Interim General RF Exposure Guidance v01 Appendix B.2 Table, BDR(GFSK) is required to SAR testing.

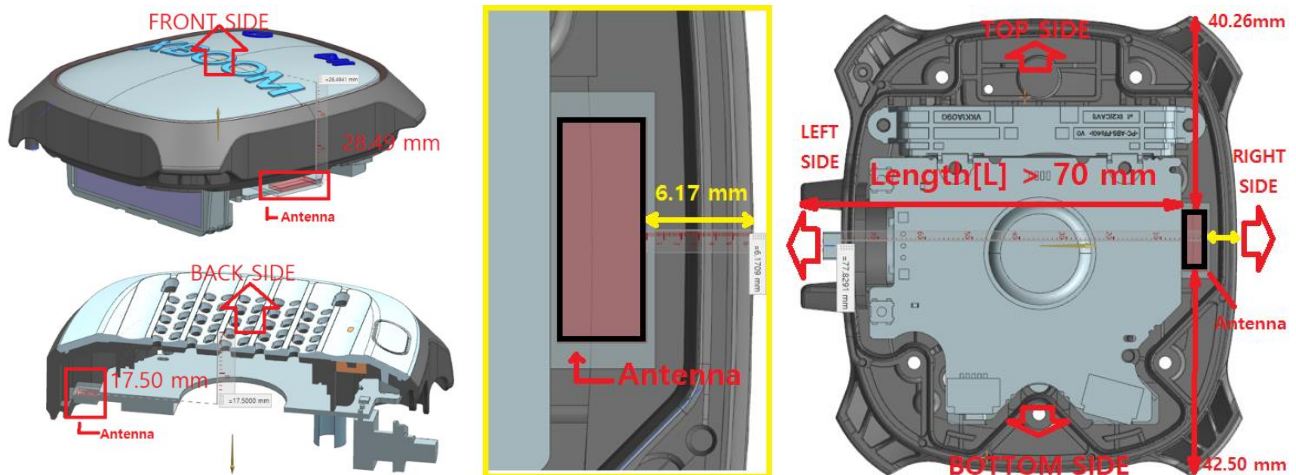
Refer to the following table.

| Mode          | Max. Average Output Power (dB m) | Max. Average Output Power (mW) | Required to SAR test |
|---------------|----------------------------------|--------------------------------|----------------------|
| GFSK          | 6.67                             | 4.65                           | <b>Yes</b>           |
| $\pi/4$ DQPSK | 3.60                             | 2.29                           | No                   |
| 8DPSK         | 3.62                             | 2.30                           | No                   |
| LE 1 Mbps     | 3.78                             | 2.39                           | No                   |
| LE 2 Mbps     | 3.53                             | 2.25                           | No                   |

## 2.6 SAR testing EUT configuration

| Device Type       | Band/Mode | Device edge for SAR Testing |      |           |            |     |        |
|-------------------|-----------|-----------------------------|------|-----------|------------|-----|--------|
|                   |           | Front                       | Back | Left edge | Right edge | Top | Bottom |
| Bluetooth Speaker | BT/GFSK   | N/A                         | Yes  | N/A       | Yes        | N/A | N/A    |

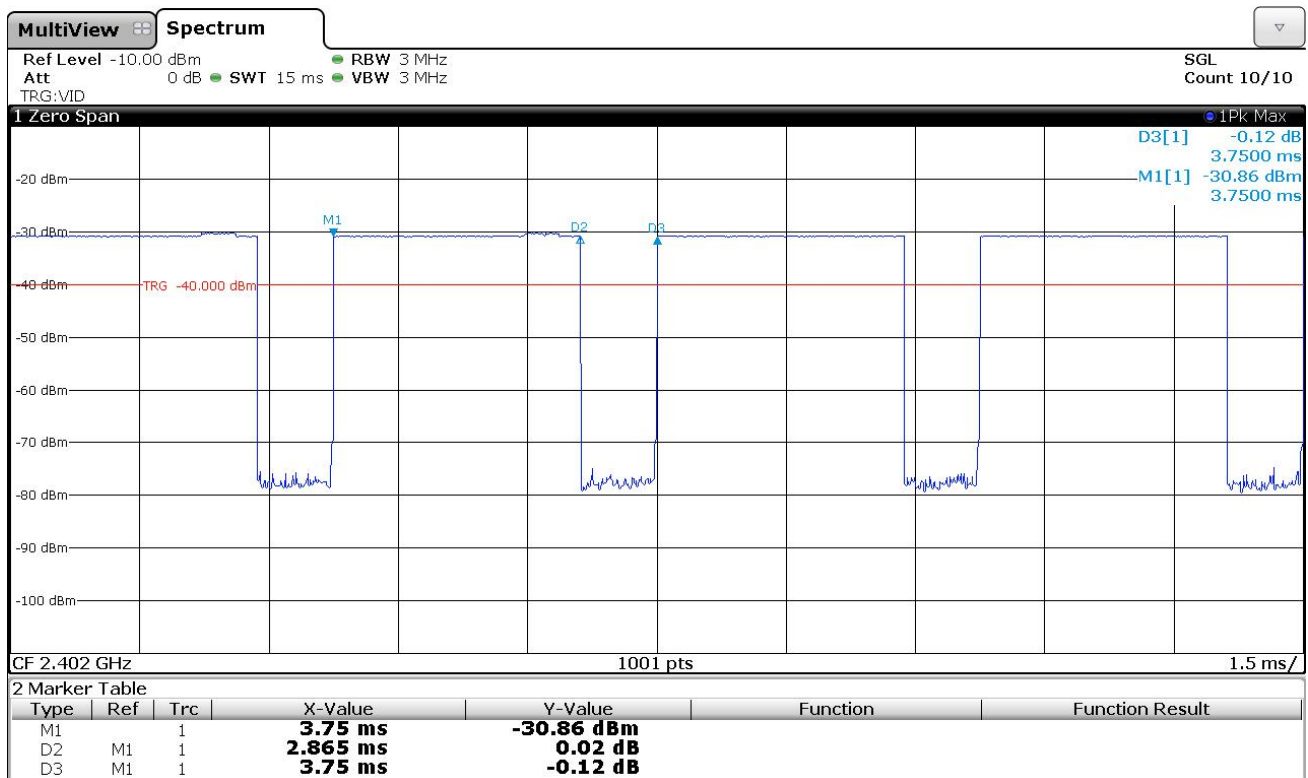
## 2.7 Antenna Location



## 2.8 Bluetooth Duty Cycle plot

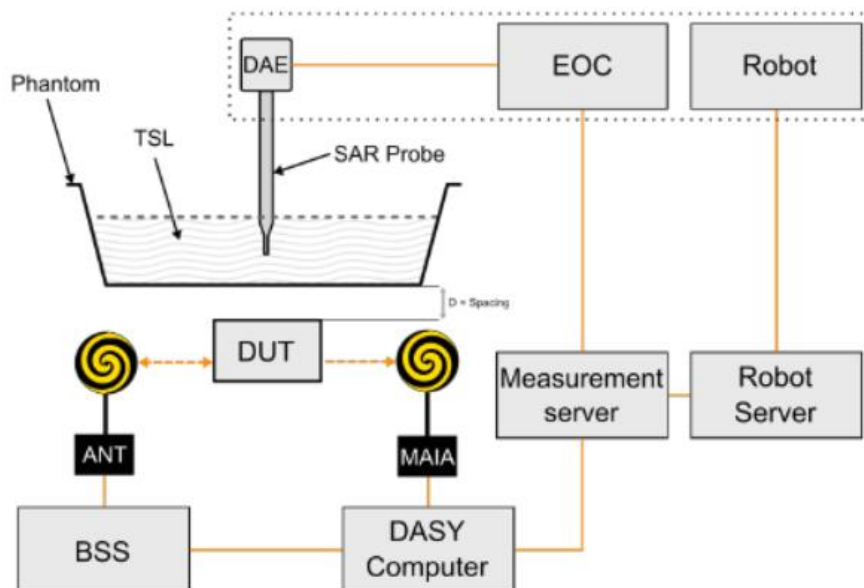
Per October 2016 TCB Workshop Notes, When call box and Bluetooth protocol are used, time-domain plots are required to identify duty factor supporting the test setup and results.

| Mode      | Packet | On time (ms) | On-Off time (ms) | Duty cycle (%) |
|-----------|--------|--------------|------------------|----------------|
| BDR(GFSK) | DH5    | 2.865        | 3.750            | 76.40          |



### **3. TEST METHODOLOGY**

1. FCC 47 CFR Part 2 (2.1093)
2. IEEE 1528-2013
3. FCC KDB Publication 447498 D04v01(Interim General RF Exposure)
4. FCC KDB Publication 865664 D01v01r04 (SAR Measurements up to 6 GHz)
5. 2016 October TCB Workshop Notes (RF Exposure Procedures)
6. 2019 April TCB Workshop Notes (Tissue Simulating Liquids)
7. SPEAG DASY8 System Handbook



### 5.2.2 SAR Probe

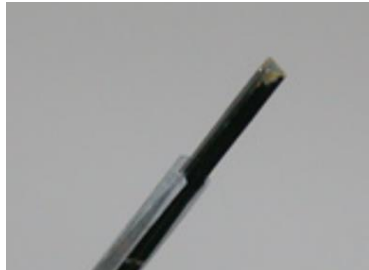
The SAR measurement were conducted with dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates.

The probe is equipped with ant optical multi-fiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface.

Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches a System maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero.

The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY8 software reads the reflection during a software approach and looks for the maximum using a 2<sup>nd</sup> order fitting.

The approach is stopped at reaching the maximum.

|                               |                                                                                                                                              |                                                                                       |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Model</b>                  | EX3DV4 (Refer to Appendix)                                                                                                                   |  |
| <b>Frequency</b>              | 4 MHz to 10 GHz                                                                                                                              |                                                                                       |
| <b>Dynamic Range</b>          | 10 $\mu$ W/g $\rightarrow$ 100 mW/g                                                                                                          |                                                                                       |
| <b>Linearity</b>              | $< \pm 0.2$ dB                                                                                                                               |                                                                                       |
| <b>Hemispherical Isotropy</b> | $< 0.5$ dB                                                                                                                                   |                                                                                       |
| <b>Position Precision</b>     | $< 0.2$ mm                                                                                                                                   |                                                                                       |
| <b>Dimensions</b>             | Overall length : 337 mm (tip : 20 mm)<br>Tip diameter : 2.5 mm (body : 12 mm)<br>Typical distance from probe tip to dipole centers :<br>1 mm |                                                                                       |

### 5.2.3 SAM Phantom

The shells have a very tight tolerance of less than 0.2 mm, and they are fully compliant with the SAR standards and national regulations in the frequency range of 4 MHz ~ 10 GHz. Full computer-aided design (CAD) information have been predefined in the DASY8 software, enabling fast and easy usage.

In DASY8, phantoms are placed in a platform slot. The position of the slot relative to the robot is taught using the three reference points (P1, P2, P3) located on top of the phantom table.



Figure 5.2.3 SAM Twin Phantom

#### 5.2.4 ELI Phantom

The ELI phantom is optimized for compliance testing of large handheld and body-mounted wireless devices (tablets, laptops) or for evaluating transmitters operating at low frequencies.

The size of the phantom, including top plate is 1.0 x 0.5 m (1 full DASY8 platform slot). The filling volume is approximately 25 L.

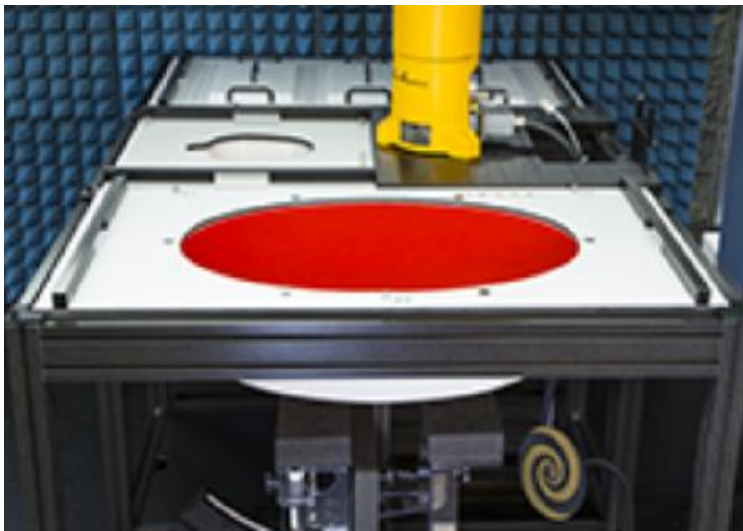


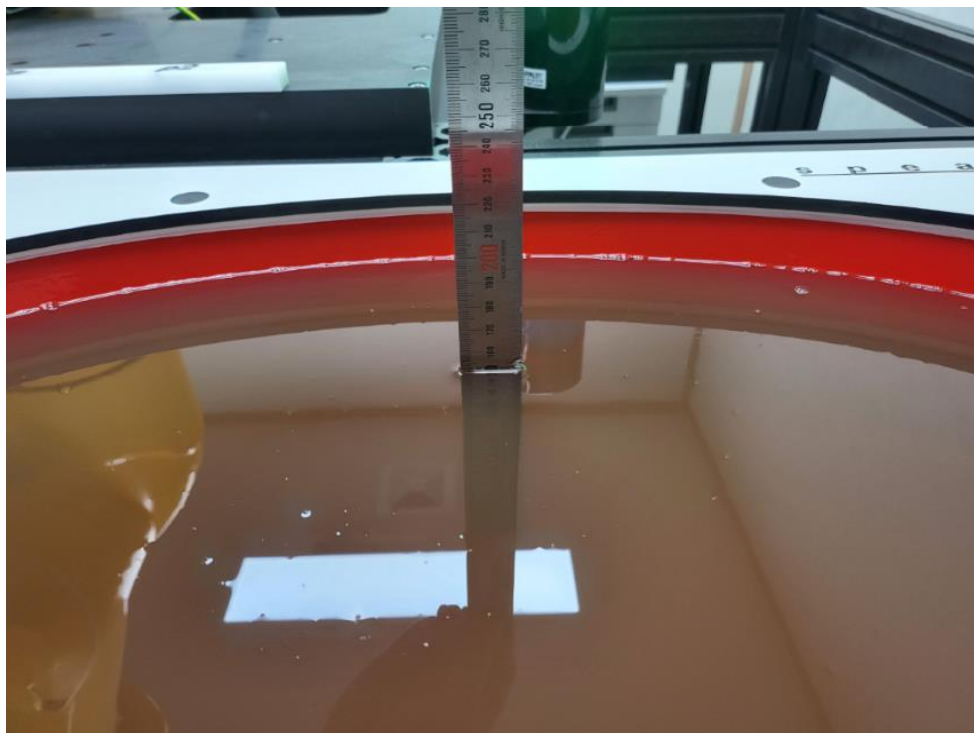
Figure 5.2.4 ELI Phantom

### 5.3 Simulating Mixture Characterization

The dielectric properties of the liquid material used in the phantom shall be those listed in Table 5.4. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 have been incorporated in the following table.

Table 5.4 Composition of the Head Tissue Equivalent Matter

| INGREDIENTS                        | SIMULATING TISSUE |
|------------------------------------|-------------------|
|                                    | 2450 MHz Head     |
| De-ionised water                   | 56.23 %           |
| Oxyethylated Sorbitan Mono Laurate | 43.67 %           |
| Ethylidihydro                      | 0.1 %             |
| Sum                                | 100 %             |



600 MHz ~ 10 GHz Head Broad band Tissue Simulating Liquid, Depth: 150 mm

## 5.4 Device Holder for Transmitters

Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions at which the devices must be measured are defined by the standards. The DASY8 device holder along with the associated adaptors / options is designed to accommodate different types and sizes of test devices and yet provide accurate and repeatable positioning as described in the test standards.



Figure 5.5 Mounting Device for Hand-held Devices and Laptop / Body-Worn Devices

## **6. Limits For Specific Absorption Rate (SAR)**

| HUMAN EXPOSURE                                           | SAR (W/kg)                                                   |                                                   |
|----------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------|
|                                                          | General Population /<br>Uncontrolled Exposure<br>Environment | Occupational / Controlled<br>Exposure Environment |
| Spatial Peak SAR<br>(Brain)                              | 1.6                                                          | 8.0                                               |
| Spatial Average SAR<br>(Whole Body)                      | 0.08                                                         | 0.4                                               |
| Spatial Peak SAR<br>(Hands, Wrists, Feet and<br>Ankles ) | 4.0                                                          | 20.0                                              |

1. This limits accord to SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6.
2. The Spatial Peak value of the SAR averaged over any 1g of tissue and over the appropriate averaging time.
3. The Spatial average value of the SAR averaged over the whole body.
4. The Spatial Peak value of the SAR averaged over any 10g of tissue and over appropriate averaging time.

## **7. Measurement Uncertainty & Decision Rule**

### **7.1 Measurement Uncertainty**

Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz clause 2.8.2, SAR measurement uncertainty analysis is required in SAR report only when the highest measured SAR in a frequency band is  $\geq 1.5$  W/kg for 1-g SAR and  $\geq 3.75$  W/kg for 10-g SAR. The expanded SAR measurement uncertainty must be  $\leq 30\%$ , for confidence interval of  $k = 2$ .

For this device, the highest measured 1-g SAR is less 1.5 W/kg and 10-g SAR is less 3.75 W/kg. Therefore, the measurement uncertainty table is not required in this report.

### **7.2 Decision Rule**

The choice of whether or not to include the measurement uncertainty of the measuring system used in the test in the conformance determination.:

- ☐ Application of internal procedures used in type testing where traceability of measurement uncertainty is established.
- ☒ Applying the decision that the standard used for type testing does not require it.

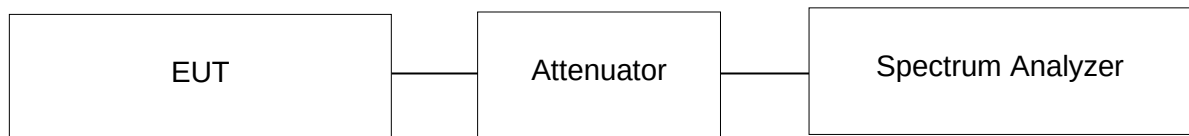
## 8. Test Equipments

| No. | Instrument                          | Manufacturer    | Model         | Serial No.         | Calibration Data | Calibration Due date |
|-----|-------------------------------------|-----------------|---------------|--------------------|------------------|----------------------|
| 1   | DASY8 System Robot                  | SPEAG           | TX2-90XL      | F/22/0036542/A/001 | N/A              | N/A                  |
| 2   | Shield Room                         | SY Corporation  | NKRFS2        | 20220619           | N/A              | N/A                  |
| 3   | DASY8 Robot Controller              | SPEAG           | CS9spe-TX2-90 | F/22/0036542/c/001 | N/A              | N/A                  |
| 4   | E-Field probe                       | SPEAG           | EX3DV4        | 7731               | 2023-05-22       | 2024-05-22           |
| 5   | Device Holder                       | SPEAG           | DH2005        | SD HAC H01 CA      | N/A              | N/A                  |
| 6   | Dipole Antenna                      | SPEAG           | D2450V2       | 774                | 2022-04-25       | 2024-04-25           |
| 7   | Power Meter                         | R&S             | NRVS          | 835360/002         | 2023-01-09       | 2024-01-09           |
| 8   | Power Sensor                        | R&S             | NRV-Z5        | 833722/006         | 2023-01-09       | 2024-01-09           |
| 9   | Power Meter                         | H.P             | 437B          | 2912U01687         | 2023-10-10       | 2024-10-10           |
| 10  | Power Sensor                        | H.P             | 8481A         | 3318A83210         | 2023-10-10       | 2024-10-10           |
| 11  | Power Meter                         | Anritsu         | ML2437A       | 97310060           | 2023-07-03       | 2024-07-03           |
| 12  | Power Sensor                        | Anritsu         | MA2474A       | 181289             | 2023-07-03       | 2024-07-03           |
| 13  | Low Pass Filter                     | Mini-Circuit    | VLF-3000+     | 3 2044             | 2023-12-12       | 2024-12-12           |
| 14  | 3 dB Attenuator                     | Mini-Circuit    | BW-S3W20+     | 2224               | 2023-10-10       | 2024-10-10           |
| 15  | RF Power Amplifier                  | EXODUS ADVANCED | AMP2027AD B   | 10004              | 2023-10-11       | 2024-10-11           |
| 16  | Vector Reflectometer                | SPEAG           | R140          | 21460035           | 2023-08-29       | 2024-08-29           |
| 17  | Oval Flat phantom ELI v8            | SPEAG           | QD OVA 004 A  | 2170               | N/A              | N/A                  |
| 18  | Signal & Spectrum Analyzer          | R&S             | FSW43         | 100732             | 2023-03-30       | 2024-03-30           |
| 19  | DIGITAL MULTIMETER                  | EZ DIGITAL      | DM-334        | 2111395            | 2023-10-11       | 2024-10-11           |
| 20  | Data Acquisition Electronics        | SPEAG           | DAE4          | 1726               | 2023-05-23       | 2024-05-23           |
| 21  | Humidity Temperature                | Lutron          | MHB-382SD     | 65456              | 2023-10-17       | 2024-10-17           |
| 22  | DUAL DIRECTIONAL COUPLER            | KEYSIGHT        | 772D          | MY52180366         | 2023-03-30       | 2024-03-30           |
| 23  | 10 dB Attenuator                    | H.P             | 8491B         | 57773              | 2023-10-10       | 2024-10-10           |
| 24  | WIDEBAND RADIO COMMUNICATION TESTER | R&S             | CMW500        | 145181             | 2023-04-13       | 2024-04-13           |

## **9. Output Power Measurement**

### **9.1 Measurement procedures for Output Power**

EUTs average output power was measured at low, middle, high channels with a spectrum analyzer connected to the antenna terminal while the EUTs operating at its maximum power control level.



**Power measurement Test Setup**

## 9.2 Conducted RF Output Power

| Mode                | Measured Frequency (MHz) | Measured Output Power (dB m) |                            |
|---------------------|--------------------------|------------------------------|----------------------------|
|                     |                          | Measured Output Power (dB m) | Measured Output Power (mW) |
| BDR(GFSK)           | 2 402                    | 6.35                         | 4.32                       |
|                     | 2 441                    | 6.37                         | 4.34                       |
|                     | 2 480                    | 6.67                         | 4.65                       |
| EDR( $\pi$ /4DQPSK) | 2 402                    | 3.60                         | 2.29                       |
|                     | 2 441                    | 3.51                         | 2.24                       |
|                     | 2 480                    | 3.51                         | 2.24                       |
| EDR(8DPSK)          | 2 402                    | 3.62                         | 2.30                       |
|                     | 2 441                    | 3.59                         | 2.29                       |
|                     | 2 480                    | 3.43                         | 2.20                       |
| LE 1 Mbps           | 2 402                    | 3.77                         | 2.38                       |
|                     | 2 440                    | 3.68                         | 2.33                       |
|                     | 2 480                    | 3.78                         | 2.19                       |
| LE 2 Mbps           | 2 402                    | 3.48                         | 2.23                       |
|                     | 2 440                    | 3.40                         | 2.19                       |
|                     | 2 480                    | 3.53                         | 2.25                       |

## 10. System Verification

### 10.1 Tissue verification results

For the measurement of the following parameters the DAKS-3.5 was used, representing the open-ended slim form probe measurement procedure. The measured values should be within  $\pm 5\%$  of the recommended values given by IEEE 1528-2013.

**Table 10.1 Measured Tissue Parameters**

| Date        | Liquid Type | Liquid Temp. (°C) | Frequency (MHz) | Measured relative Permittivity ( $\epsilon$ ) | Measured Conductivity (S/m) | Target relative Permittivity ( $\epsilon$ ) | Target Conductivity (S/m) | Permittivity Error (%) | Conductivity Error (%) |
|-------------|-------------|-------------------|-----------------|-----------------------------------------------|-----------------------------|---------------------------------------------|---------------------------|------------------------|------------------------|
| Dec 08.2023 | 2G /Head    | 22.30             | 2 402           | 38.318                                        | 1.815                       | 39.285                                      | 1.757                     | -2.461                 | 3.256                  |
|             |             |                   | 2 441           | 38.256                                        | 1.844                       | 39.216                                      | 1.792                     | -2.448                 | 2.922                  |
|             |             |                   | 2 450           | 38.247                                        | 1.852                       | 39.200                                      | 1.800                     | -2.432                 | 2.862                  |
|             |             |                   | 2 480           | 38.198                                        | 1.877                       | 39.162                                      | 1.833                     | -2.460                 | 2.411                  |



### 10.3 System Verification Results

A complete 1 g and/or 10 g averaged SAR measurement is performed using a standard source. The input power of the standard source is adjusted to produce a 1 g and/or 10 g averaged SAR value falling in the range of 0.4 W/kg to 10 W/kg. The 1 g and/or 10g averaged SAR is measured at frequencies in Table 10.2 within the range to be used in compliance tests. The results are normalized to 1 W forward input power and compared with the reference SAR value.

**Table 10.2 System Verification Results**

| Date        | Liquid Temperature (°C) | Measured Frequency (MHz) | Targeted 1 g SAR (W/kg) | Measured 1 g SAR (W/kg) | Normalized 1 g SAR (W/kg) | Deviation (%) | Verification Kit   | Plot No. |
|-------------|-------------------------|--------------------------|-------------------------|-------------------------|---------------------------|---------------|--------------------|----------|
| Dec 08.2023 | 22.3                    | 2 450                    | 52.80                   | 13.70                   | 54.80                     | 3.79          | D2450V2<br>SN: 774 | #V01     |

## 11. SAR Measurement Results

1. Per KDB 447498 D04v01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.

Scaling Factor = Maximum Tune-up limit power(mW) / EUT RF Power(mW),

Where tune-up limit is the maximum rated power among all production units.

Reported SAR(W/kg) = Scaling Factor \* Measured SAR (W/kg)

2. Tune-up Limit power is refer to clause 2.4.

| Measured Frequency |    | Mode | Test distance | Average Power (mW) | Maximum Tune-Up Limit pwr (mW) | Scaling Factor | Duty Factor | EUT Configuration | Measured SAR 1g (W/kg) | Reported SAR 1g (W/kg) | Plot No. |
|--------------------|----|------|---------------|--------------------|--------------------------------|----------------|-------------|-------------------|------------------------|------------------------|----------|
| MHz                | CH |      |               |                    |                                |                |             |                   |                        |                        |          |
| 2480               | 78 | GFSK | 0 mm          | 4.65               | 5.01                           | 1.08           | 1.31        | Back              | 0.024                  | 0.034                  | #S01     |
|                    |    |      |               |                    |                                |                |             | Right             | 0.060                  | 0.085                  | #S02     |
| 2402               | 0  |      |               | 4.32               |                                | 1.16           | 1.31        | Right             | 0.077                  | 0.117                  | #S03     |
| 2441               | 39 |      |               | 4.34               |                                | 1.16           | 1.31        | Right             | 0.073                  | 0.110                  | #S04     |

## **11. Conclusion**

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. The results and statements relate only to the item(s) tested.

## **APPENDIX A. PLOTS OF SAR RESULTS**

## Measurement PLOT #S01

### Measurement Report for F1DA2835P, BACK, ISM 2.4 GHz Band, UID 10032 CAA, Channel 78 (2480.000MHz)

#### Device under Test Properties

| Model, Manufacturer | Dimensions [mm]     | IMEI | DUT Type |
|---------------------|---------------------|------|----------|
| XG2T,               | 100.0 x 91.0 x 50.0 |      | Phone    |

#### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band             | Group, UID           | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|------------------------------|------------------|----------------------|---------------------------------|-------------------|------------------------|------------------|
| Flat, HSL            | BACK, 0.00                   | ISM 2.4 GHz Band | Bluetooth, 10032-CAA | 2480.000, 78                    | 7.86              | 1.88                   | 38.2             |

#### Hardware Setup

| Phantom                            | TSL, Measured Date                     | Probe, Calibration Date     | DAE, Calibration Date   |
|------------------------------------|----------------------------------------|-----------------------------|-------------------------|
| ELI V8.0 (20deg probe tilt) - 2170 | HBBL-600-10000 Chargexxxx, 2023-Dec-08 | EX3DV4 - SN3947, 2023-03-24 | DAE4 Sn1726, 2023-05-23 |

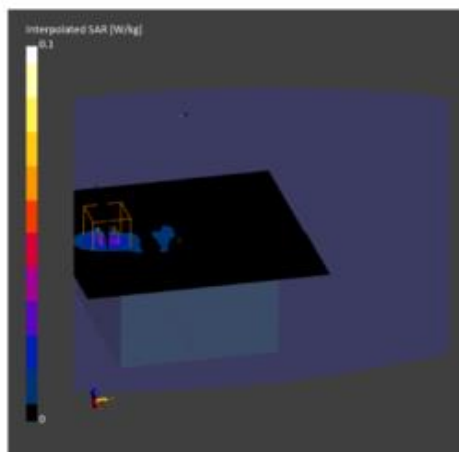
#### Scan Setup

|                     | Area Scan     | Zoom Scan          |                     | Area Scan         | Zoom Scan         |
|---------------------|---------------|--------------------|---------------------|-------------------|-------------------|
| Grid Extents [mm]   | 140.0 x 140.0 | 30.0 x 30.0 x 30.0 | Date                | 2023-12-08, 16:03 | 2023-12-08, 16:17 |
| Grid Steps [mm]     | 10.0 x 10.0   | 5.0 x 5.0 x 1.5    | psSAR1g [W/kg]      | 0.024             | 0.024             |
| Sensor Surface [mm] | 3.0           | 1.4                | psSAR10g [W/kg]     | 0.011             | 0.010             |
| Graded Grid         | N/A           | Yes                | Power Drift [dB]    | -0.16             | 0.09              |
| Grading Ratio       | N/A           | 1.5                | Power Scaling       | Disabled          | Disabled          |
| MAIA                | Y             | Y                  | Scaling Factor [dB] |                   |                   |
| Surface Detection   | VMS + 6p      | VMS + 6p           | TSL Correction      | No correction     | No correction     |
| Scan Method         | Measured      | Measured           | M2/M1 [%]           |                   | 77.7              |
|                     |               |                    | Dist 3dB Peak [mm]  |                   | 9.5               |

#### Measurement Results

#### Warning(s) / Error(s)

| Details    | Area Scan | Zoom Scan |
|------------|-----------|-----------|
| Warning(s) |           |           |
| Error(s)   |           |           |



## Measurement PLOT #S02

### Measurement Report for F1DA2835P, EDGE RIGHT, ISM 2.4 GHz Band, UID 10032 CAA, Channel 78 (2480.000MHz)

#### Device under Test Properties

| Model, Manufacturer | Dimensions [mm]     | IMEI | DUT Type |
|---------------------|---------------------|------|----------|
| XG2T,               | 100.0 x 91.0 x 50.0 |      | Phone    |

#### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band             | Group, UID           | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|------------------------------|------------------|----------------------|---------------------------------|-------------------|------------------------|------------------|
| Flat, HSL            | EDGE RIGHT, 0.00             | ISM 2.4 GHz Band | Bluetooth, 10032-CAA | 2480.000, 78                    | 7.86              | 1.88                   | 38.2             |

#### Hardware Setup

| Phantom                            | TSL, Measured Date                      | Probe, Calibration Date     | DAE, Calibration Date   |
|------------------------------------|-----------------------------------------|-----------------------------|-------------------------|
| ELI V8.0 (20deg probe tilt) - 2170 | HBBL-600-10000 Charge:xxxx, 2023-Dec-08 | EX3DV4 - SN3947, 2023-03-24 | DAE4 Sn1726, 2023-05-23 |

#### Scan Setup

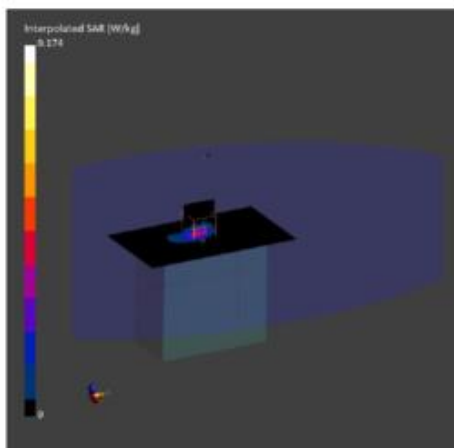
|                     | Area Scan    | Zoom Scan          |
|---------------------|--------------|--------------------|
| Grid Extents [mm]   | 80.0 x 140.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm]     | 10.0 x 10.0  | 5.0 x 5.0 x 1.5    |
| Sensor Surface [mm] | 3.0          | 1.4                |
| Graded Grid         | N/A          | Yes                |
| Grading Ratio       | N/A          | 1.5                |
| MAIA                | Y            | Y                  |
| Surface Detection   | VMS + 6p     | VMS + 6p           |
| Scan Method         | Measured     | Measured           |

#### Measurement Results

|                     | Area Scan         | Zoom Scan         |
|---------------------|-------------------|-------------------|
| Date                | 2023-12-08, 19:23 | 2023-12-08, 19:36 |
| psSAR1g [W/kg]      | 0.059             | 0.060             |
| psSAR10g [W/kg]     | 0.023             | 0.021             |
| Power Drift [dB]    | 0.16              | -0.16             |
| Power Scaling       | Disabled          | Disabled          |
| Scaling Factor [dB] |                   |                   |
| TSL Correction      | No correction     | No correction     |
| M2/M1 [%]           |                   | 70.4              |
| Dist 3dB Peak [mm]  |                   | 5.7               |

#### Warning(s) / Error(s)

| Details    | Area Scan | Zoom Scan |
|------------|-----------|-----------|
| Warning(s) |           |           |
| Error(s)   |           |           |



## Measurement PLOT #S03

### Measurement Report for F1DA2835P, EDGE RIGHT, ISM 2.4 GHz Band, UID 10032 CAA, Channel 0 (2402.000MHz)

#### Device under Test Properties

| Model, Manufacturer | Dimensions [mm]     | IMEI | DUT Type |
|---------------------|---------------------|------|----------|
| XG2T,               | 100.0 x 91.0 x 50.0 |      | Phone    |

#### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band             | Group, UID           | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|------------------------------|------------------|----------------------|---------------------------------|-------------------|------------------------|------------------|
| Flat, HSL            | EDGE RIGHT, 0.00             | ISM 2.4 GHz Band | Bluetooth, 10032-CAA | 2402.000, 0                     | 7.86              | 1.81                   | 38.3             |

#### Hardware Setup

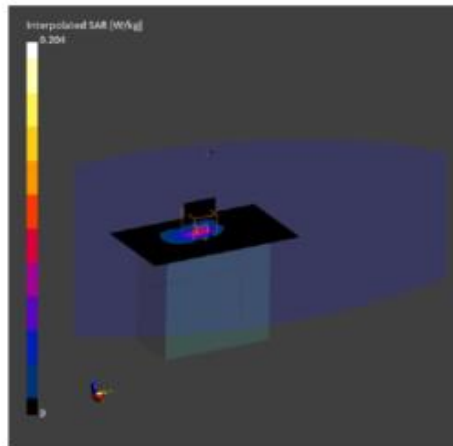
| Phantom                            | TSL, Measured Date                     | Probe, Calibration Date     | DAE, Calibration Date   |
|------------------------------------|----------------------------------------|-----------------------------|-------------------------|
| ELI V8.0 (20deg probe tilt) - 2170 | HBBL-600-10000 Chargexxxx, 2023-Dec-08 | EX3DV4 - SN3947, 2023-03-24 | DAE4 Sn1726, 2023-05-23 |

#### Scan Setup

|                     | Area Scan    | Zoom Scan          |                     | Area Scan         | Zoom Scan         |
|---------------------|--------------|--------------------|---------------------|-------------------|-------------------|
| Grid Extents [mm]   | 80.0 x 140.0 | 30.0 x 30.0 x 30.0 | Date                | 2023-12-08, 19:02 | 2023-12-08, 19:16 |
| Grid Steps [mm]     | 10.0 x 10.0  | 5.0 x 5.0 x 1.5    | psSAR1g [W/kg]      | 0.077             | 0.077             |
| Sensor Surface [mm] | 3.0          | 1.4                | psSAR10g [W/kg]     | 0.033             | 0.030             |
| Graded Grid         | N/A          | Yes                | Power Drift [dB]    | 0.09              | -0.03             |
| Grading Ratio       | N/A          | 1.5                | Power Scaling       | Disabled          | Disabled          |
| MAIA                | Y            | Y                  | Scaling Factor [dB] |                   |                   |
| Surface Detection   | VMS + 6p     | VMS + 6p           | TSL Correction      | No correction     | No correction     |
| Scan Method         | Measured     | Measured           | M2/M1 [%]           |                   | 71.5              |
|                     |              |                    | Dist 3dB Peak [mm]  |                   | 7.3               |

#### Warning(s) / Error(s)

| Details    | Area Scan | Zoom Scan |
|------------|-----------|-----------|
| Warning(s) |           |           |
| Error(s)   |           |           |



## Measurement PLOT #S04

Measurement Report for F1DA2835P, EDGE RIGHT, ISM 2.4 GHz Band, UID 10032 CAA, Channel 39 (2441.000MHz)

### Device under Test Properties

| Model, Manufacturer | Dimensions [mm]     | IMEI | DUT Type |
|---------------------|---------------------|------|----------|
| XG2T,               | 100.0 x 91.0 x 50.0 |      | Phone    |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band             | Group, UID           | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|------------------------------|------------------|----------------------|---------------------------------|-------------------|------------------------|------------------|
| Flat, HSL            | EDGE RIGHT, 0.00             | ISM 2.4 GHz Band | Bluetooth, 10032-CAA | 2441.000, 39                    | 7.86              | 1.84                   | 38.3             |

### Hardware Setup

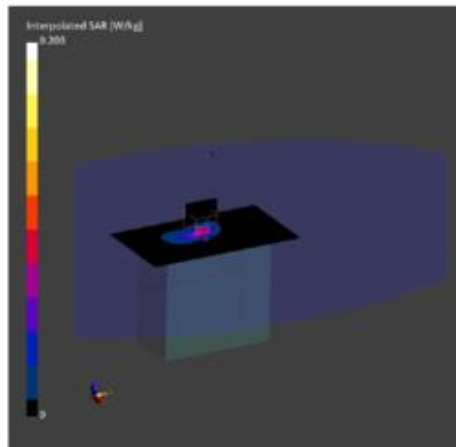
| Phantom                            | TSL, Measured Date                      | Probe, Calibration Date     | DAE, Calibration Date   |
|------------------------------------|-----------------------------------------|-----------------------------|-------------------------|
| ELI V8.0 (20deg probe tilt) - 2170 | HBBL-600-10000 Change:xxxx, 2023-Dec-08 | EX3DV4 - SN3947, 2023-03-24 | DAE4 Sn1726, 2023-05-23 |

### Scan Setup

|                     | Area Scan    | Zoom Scan          |                     | Area Scan         | Zoom Scan         |
|---------------------|--------------|--------------------|---------------------|-------------------|-------------------|
| Grid Extents [mm]   | 80.0 x 140.0 | 30.0 x 30.0 x 30.0 | Date                | 2023-12-08, 19:47 | 2023-12-08, 20:01 |
| Grid Steps [mm]     | 10.0 x 10.0  | 5.0 x 5.0 x 1.5    | psSAR1g [W/kg]      | 0.073             | 0.073             |
| Sensor Surface [mm] | 3.0          | 1.4                | psSAR10g [W/kg]     | 0.030             | 0.027             |
| Graded Grid         | N/A          | Yes                | Power Drift [dB]    | -0.04             | -0.07             |
| Grading Ratio       | N/A          | 1.5                | Power Scaling       | Disabled          | Disabled          |
| MAIA                | Y            | Y                  | Scaling Factor [dB] |                   |                   |
| Surface Detection   | VMS + 6p     | VMS + 6p           | TSL Correction      | No correction     | No correction     |
| Scan Method         | Measured     | Measured           | M2/M1 [%]           |                   | 70.8              |
|                     |              |                    | Dist 3dB Peak [mm]  |                   | 6.5               |

### Warning(s) / Error(s)

| Details    | Area Scan | Zoom Scan |
|------------|-----------|-----------|
| Warning(s) |           |           |
| Error(s)   |           |           |



## **APPENDIX B. PLOTS OF SYSTEM VERIFICATION**

## Measurement PLOT #V01 (System Verification Results)

### System Performance Check Report

#### Summary

| Dipole          | Frequency [MHz] | TSL | Power [dBm] | Dev. 1g [%] | Dev. 10g [%] | Dev. Peak [%] | Iso. Error [%] |
|-----------------|-----------------|-----|-------------|-------------|--------------|---------------|----------------|
| D2450V2 - SN774 | 2450.0          | HSL | 24.0        | 1.0         | 0.2          | 14.1          | -12.6          |

#### Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat, HSL            | 10                 |      | CW, 0--    | 2450.000, 0                     | 7.86              | 1.85                   | 38.2             |

#### Hardware Setup

| Phantom                            | TSL, Measured Date                      | Probe, Calibration Date     | DAE, Calibration Date   |
|------------------------------------|-----------------------------------------|-----------------------------|-------------------------|
| ELI V8.0 (20deg probe tilt) - 2170 | HBBL-600-10000 Charge:xxxx, 2023-Dec-08 | EX3DV4 - SN3947, 2023-03-24 | DAE4 Sn1726, 2023-05-23 |

#### Scan Setup

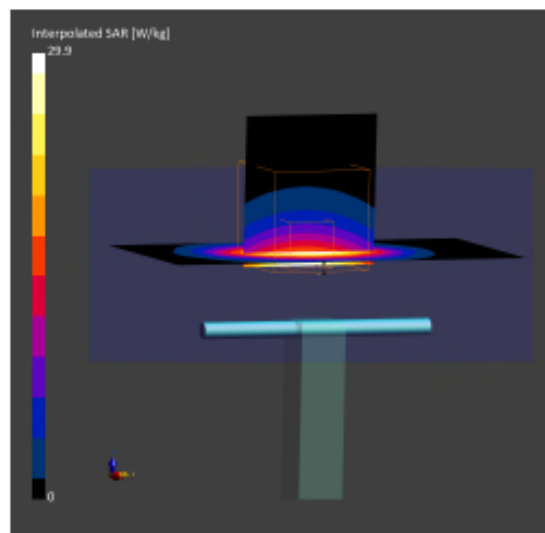
|                     | Area Scan   | Zoom Scan          |
|---------------------|-------------|--------------------|
| Grid Extents [mm]   | 40.0 x 80.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm]     | 10.0 x 10.0 | 5.0 x 5.0 x 1.5    |
| Sensor Surface [mm] | 3.0         | 1.4                |
| Graded Grid         | N/A         | Yes                |
| Grading Ratio       | N/A         | 1.5                |
| MAIA                | N/A         | N/A                |
| Surface Detection   | VMS + 6p    | VMS + 6p           |
| Scan Method         | Measured    | Measured           |

#### Measurement Results

|                     | Area Scan         | Zoom Scan         |
|---------------------|-------------------|-------------------|
| Date                | 2023-12-08, 13:38 | 2023-12-08, 13:51 |
| psSAR1g [W/Kg]      | 13.6              | 13.7              |
| psSAR10g [W/Kg]     | 6.44              | 6.34              |
| Power Drift [dB]    | 0.01              | -0.00             |
| Power Scaling       | Disabled          | Disabled          |
| Scaling Factor [dB] |                   |                   |
| TSL Correction      | No correction     | No correction     |

#### Warning(s) / Error(s)

| Details    | Area Scan | Zoom Scan |
|------------|-----------|-----------|
| Warning(s) |           |           |
| Error(s)   |           |           |



## **APPENDIX C. CALIBRATION REPORT OF THE PROBE**

**Calibration Laboratory of**

Schmid & Partner  
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland


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

Accredited by the Swiss Accreditation Service (SAS)

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

Accreditation No.: SCS 0108

Client

**Nemko**

Gyeonggi-do, Republic of Korea

Certificate No.

**EX-7731\_May23**
**CALIBRATION CERTIFICATE**

Object EX3DV4 - SN:7731

Calibration procedure(s) QA CAL-01.v10, QA CAL-12.v10, QA CAL-14.v7, QA CAL-23.v6,  
QA CAL-25.v8  
Calibration procedure for dosimetric E-field probes

Calibration date May 22, 2023

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

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

Calibration Equipment used (M&amp;TE critical for calibration)

| Primary Standards          | ID               | Cal Date (Certificate No.)        | Scheduled Calibration |
|----------------------------|------------------|-----------------------------------|-----------------------|
| Power meter NRP2           | SN: 104778       | 30-Mar-23 (No. 217-03804/03805)   | Mar-24                |
| Power sensor NRP-Z91       | SN: 103244       | 30-Mar-23 (No. 217-03804)         | Mar-24                |
| OCP DAK-3.5 (weighted)     | SN: 1249         | 20-Oct-22 (OCP-DAK3.5-1249_Oct22) | Oct-23                |
| OCP DAK-12                 | SN: 1016         | 20-Oct-22 (OCP-DAK12-1016_Oct22)  | Oct-23                |
| Reference 20 dB Attenuator | SN: CC2552 (20x) | 30-Mar-23 (No. 217-03809)         | Mar-24                |
| DAE4                       | SN: 660          | 16-Mar-23 (No. DAE4-660_Mar23)    | Mar-24                |
| Reference Probe ES3DV2     | SN: 3013         | 06-Jan-23 (No. ES3-3013_Jan23)    | Jan-24                |

| Secondary Standards     | ID               | Check Date (in house)             | Scheduled Check        |
|-------------------------|------------------|-----------------------------------|------------------------|
| Power meter E4419B      | SN: GB41293874   | 06-Apr-16 (in house check Jun-22) | In house check: Jun-24 |
| Power sensor E4412A     | SN: MY41498087   | 06-Apr-16 (in house check Jun-22) | In house check: Jun-24 |
| Power sensor E4412A     | SN: 000110210    | 06-Apr-16 (in house check Jun-22) | In house check: Jun-24 |
| RF generator HP 8648C   | SN: US3642U01700 | 04-Aug-99 (in house check Jun-22) | In house check: Jun-24 |
| Network Analyzer E8358A | SN: US41080477   | 31-Mar-14 (in house check Oct-22) | In house check: Oct-24 |

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

Issued: May 23, 2023

Certificate No: EX-7731\_May23

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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  
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 0108

**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 $\varphi$ | $\varphi$ rotation around probe axis                                                                                                           |
| Polarization $\theta$  | $\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ is normal to probe axis |
| Connector Angle        | information used in DASY system to align probe sensor X to the robot coordinate system                                                         |

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

- IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices – Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**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. 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.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM<sub>x</sub> (no uncertainty required).

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### Parameters of Probe: EX3DV4 - SN:7731

#### Basic Calibration Parameters

|                                                           | Sensor X | Sensor Y | Sensor Z | Unc (k = 2) |
|-----------------------------------------------------------|----------|----------|----------|-------------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 0.47     | 0.49     | 0.51     | ±10.1%      |
| DCP (mV) <sup>B</sup>                                     | 101.2    | 101.5    | 101.3    | ±4.7%       |

#### Calibration Results for Modulation Response

| UID   | Communication System Name   |   | A<br>dB | B<br>dB/μV | C     | D<br>dB | VR<br>mV | Max<br>dev. | Max<br>Unc <sup>E</sup><br>k = 2 |
|-------|-----------------------------|---|---------|------------|-------|---------|----------|-------------|----------------------------------|
| 0     | CW                          | X | 0.00    | 0.00       | 1.00  | 0.00    | 141.1    | ±3.3%       | ±4.7%                            |
|       |                             | Y | 0.00    | 0.00       | 1.00  |         | 134.7    |             |                                  |
|       |                             | Z | 0.00    | 0.00       | 1.00  |         | 128.6    |             |                                  |
| 10352 | Pulse Waveform (200Hz, 10%) | X | 1.51    | 60.74      | 6.58  | 10.00   | 60.0     | ±2.9%       | ±9.6%                            |
|       |                             | Y | 1.35    | 60.00      | 5.93  |         | 60.0     |             |                                  |
|       |                             | Z | 1.67    | 61.47      | 6.88  |         | 60.0     |             |                                  |
| 10353 | Pulse Waveform (200Hz, 20%) | X | 0.76    | 60.00      | 4.93  | 6.99    | 80.0     | ±2.5%       | ±9.6%                            |
|       |                             | Y | 0.83    | 60.00      | 4.79  |         | 80.0     |             |                                  |
|       |                             | Z | 0.80    | 60.00      | 4.96  |         | 80.0     |             |                                  |
| 10354 | Pulse Waveform (200Hz, 40%) | X | 0.51    | 114.83     | 1.75  | 3.98    | 95.0     | ±2.4%       | ±9.6%                            |
|       |                             | Y | 0.44    | 60.00      | 3.63  |         | 95.0     |             |                                  |
|       |                             | Z | 0.02    | 128.53     | 0.01  |         | 95.0     |             |                                  |
| 10355 | Pulse Waveform (200Hz, 60%) | X | 0.00    | 153.82     | 53.88 | 2.22    | 120.0    | ±1.6%       | ±9.6%                            |
|       |                             | Y | 11.19   | 133.36     | 1.89  |         | 120.0    |             |                                  |
|       |                             | Z | 1.91    | 156.86     | 11.63 |         | 120.0    |             |                                  |
| 10387 | QPSK Waveform, 1 MHz        | X | 0.44    | 62.09      | 10.99 | 1.00    | 150.0    | ±4.6%       | ±9.6%                            |
|       |                             | Y | 0.56    | 65.06      | 13.23 |         | 150.0    |             |                                  |
|       |                             | Z | 0.43    | 63.20      | 11.45 |         | 150.0    |             |                                  |
| 10388 | QPSK Waveform, 10 MHz       | X | 1.32    | 65.87      | 13.70 | 0.00    | 150.0    | ±0.8%       | ±9.6%                            |
|       |                             | Y | 1.37    | 66.87      | 14.27 |         | 150.0    |             |                                  |
|       |                             | Z | 1.22    | 65.74      | 13.50 |         | 150.0    |             |                                  |
| 10396 | 64-QAM Waveform, 100 kHz    | X | 1.60    | 63.63      | 15.66 | 3.01    | 150.0    | ±1.6%       | ±9.6%                            |
|       |                             | Y | 1.76    | 65.36      | 16.35 |         | 150.0    |             |                                  |
|       |                             | Z | 1.57    | 64.07      | 16.07 |         | 150.0    |             |                                  |
| 10399 | 64-QAM Waveform, 40 MHz     | X | 2.81    | 66.22      | 15.08 | 0.00    | 150.0    | ±3.1%       | ±9.6%                            |
|       |                             | Y | 2.84    | 66.69      | 15.35 |         | 150.0    |             |                                  |
|       |                             | Z | 2.71    | 66.12      | 15.01 |         | 150.0    |             |                                  |
| 10414 | WLAN CCDF, 64-QAM, 40 MHz   | X | 3.81    | 65.93      | 15.29 | 0.00    | 150.0    | ±4.7%       | ±9.6%                            |
|       |                             | Y | 3.78    | 66.27      | 15.41 |         | 150.0    |             |                                  |
|       |                             | Z | 3.82    | 66.48      | 15.50 |         | 150.0    |             |                                  |

Note: For details on UID parameters see Appendix

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 Norm X,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Linearization parameter uncertainty for maximum specified field strength.

<sup>E</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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### Parameters of Probe: EX3DV4 - SN:7731

#### Sensor Model Parameters

|   | C1<br>fF | C2<br>fF | $\alpha$<br>$V^{-1}$ | T1<br>$ms V^{-2}$ | T2<br>$ms V^{-1}$ | T3<br>ms | T4<br>$V^{-2}$ | T5<br>$V^{-1}$ | T6   |
|---|----------|----------|----------------------|-------------------|-------------------|----------|----------------|----------------|------|
| x | 10.0     | 74.69    | 35.66                | 1.55              | 0.00              | 4.96     | 0.00           | 0.08           | 1.00 |
| y | 8.8      | 64.17    | 34.24                | 4.46              | 0.00              | 4.90     | 0.55           | 0.00           | 1.00 |
| z | 9.0      | 67.16    | 35.05                | 3.28              | 0.00              | 4.98     | 0.00           | 0.04           | 1.01 |

#### Other Probe Parameters

|                                               |            |
|-----------------------------------------------|------------|
| Sensor Arrangement                            | Triangular |
| Connector Angle                               | -71.8°     |
| Mechanical Surface Detection Mode             | enabled    |
| Optical Surface Detection Mode                | disabled   |
| Probe Overall Length                          | 337 mm     |
| Probe Body Diameter                           | 10 mm      |
| Tip Length                                    | 9 mm       |
| Tip Diameter                                  | 2.5 mm     |
| Probe Tip to Sensor X Calibration Point       | 1 mm       |
| Probe Tip to Sensor Y Calibration Point       | 1 mm       |
| Probe Tip to Sensor Z Calibration Point       | 1 mm       |
| Recommended Measurement Distance from Surface | 1.4 mm     |

**Note:** Measurement distance from surface can be increased to 3–4 mm for an *Area Scan* job.

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### Parameters of Probe: EX3DV4 - SN:7731

#### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity <sup>F</sup> (S/m) | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unc (k = 2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 835                  | 41.5                               | 0.90                            | 10.68   | 10.68   | 10.68   | 0.34               | 1.07                    | ±12.0%      |
| 900                  | 41.5                               | 0.97                            | 10.39   | 10.39   | 10.39   | 0.48               | 0.80                    | ±12.0%      |
| 1810                 | 40.0                               | 1.40                            | 9.11    | 9.11    | 9.11    | 0.35               | 0.86                    | ±12.0%      |
| 1950                 | 40.0                               | 1.40                            | 8.87    | 8.87    | 8.87    | 0.31               | 0.86                    | ±12.0%      |
| 2450                 | 39.2                               | 1.80                            | 8.49    | 8.49    | 8.49    | 0.28               | 0.90                    | ±12.0%      |
| 3500                 | 37.9                               | 2.91                            | 7.45    | 7.45    | 7.45    | 0.30               | 1.35                    | ±14.0%      |
| 3700                 | 37.7                               | 3.12                            | 7.20    | 7.20    | 7.20    | 0.30               | 1.35                    | ±14.0%      |
| 5200                 | 36.0                               | 4.66                            | 6.14    | 6.14    | 6.14    | 0.40               | 1.80                    | ±14.0%      |
| 5300                 | 35.9                               | 4.76                            | 5.89    | 5.89    | 5.89    | 0.40               | 1.80                    | ±14.0%      |
| 5500                 | 35.6                               | 4.96                            | 5.54    | 5.54    | 5.54    | 0.40               | 1.80                    | ±14.0%      |
| 5600                 | 35.5                               | 5.07                            | 5.37    | 5.37    | 5.37    | 0.40               | 1.80                    | ±14.0%      |
| 5800                 | 35.3                               | 5.27                            | 5.45    | 5.45    | 5.45    | 0.40               | 1.80                    | ±14.0%      |

<sup>C</sup> Frequency validity above 300 MHz of ±100 MHz only applies for DASV 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. Frequency validity below 300 MHz is ±10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4–9 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

<sup>F</sup> The probes are calibrated using tissue simulating liquids (TSL) that deviate for  $\epsilon$  and  $\sigma$  by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10%. If TSL with deviations from the target of less than ±5% are used, the calibration uncertainties are 11.1% for 0.7 - 3 GHz and 13.1% for 3 - 6 GHz.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3–6 GHz at any distance larger than half the probe tip diameter from the boundary.

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### Parameters of Probe: EX3DV4 - SN:7731

#### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity <sup>F</sup> (S/m) | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unc (k = 2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-------------|
| 6500                 | 34.5                               | 6.07                            | 5.75    | 5.75    | 5.75    | 0.20               | 2.50                    | ±18.6%      |

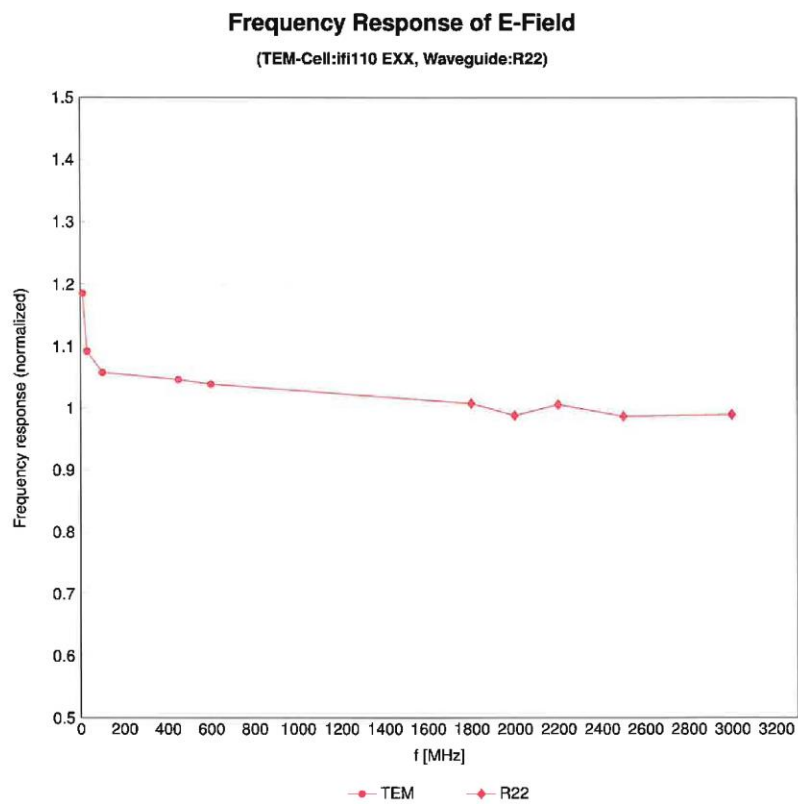
<sup>C</sup> Frequency validity at 6.5 GHz is -600/+700 MHz, and ±700 MHz at or above 7 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> The probes are calibrated using tissue simulating liquids (TSL) that deviate for  $\epsilon$  and  $\sigma$  by less than ±10% from the target values (typically better than ±6%) and are valid for TSL with deviations of up to ±10%.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3–6 GHz; and below ±4% for frequencies between 6–10 GHz at any distance larger than half the probe tip diameter from the boundary.

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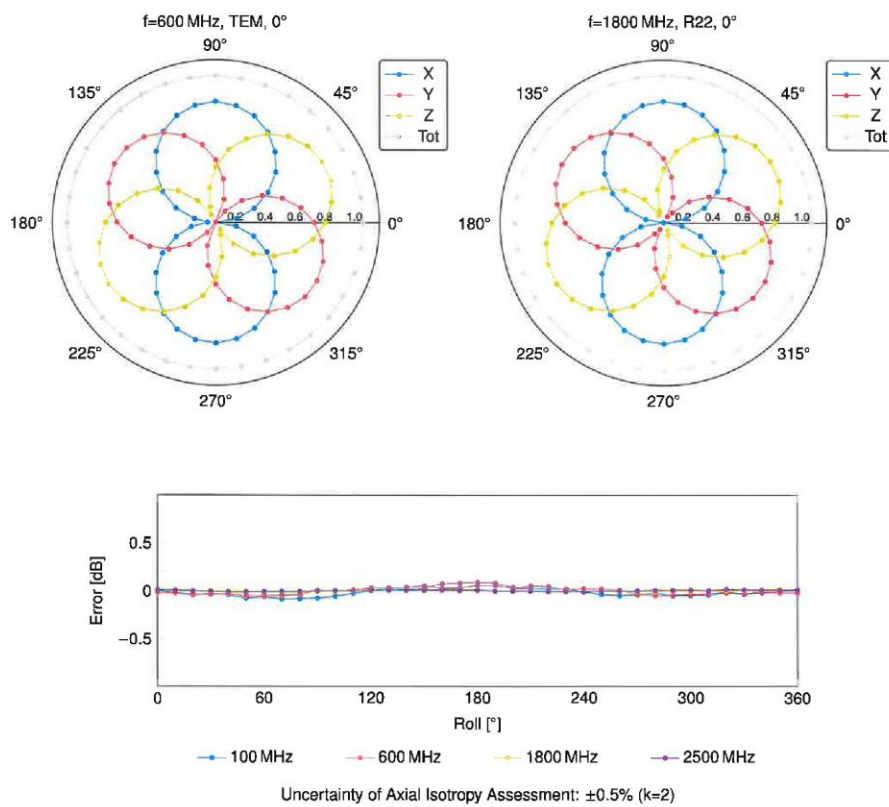


Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

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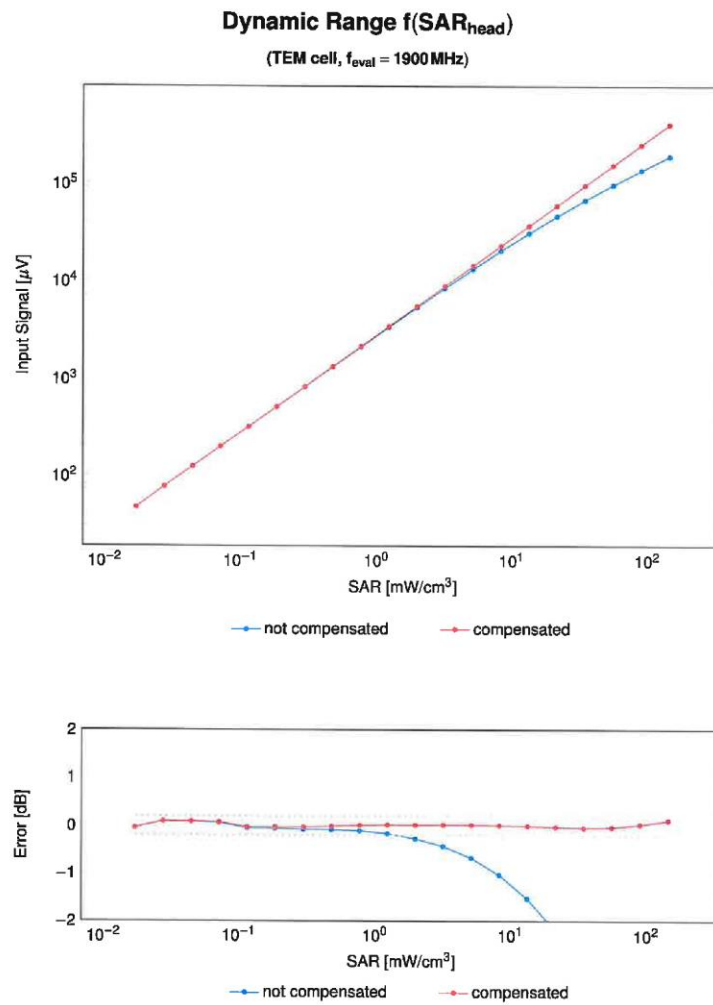
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### Receiving Pattern ( $\phi$ ), $\vartheta = 0^\circ$



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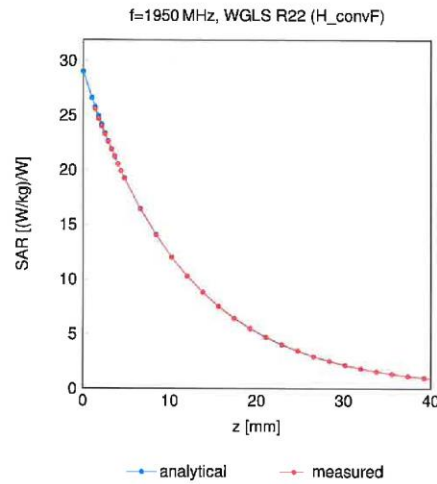


Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

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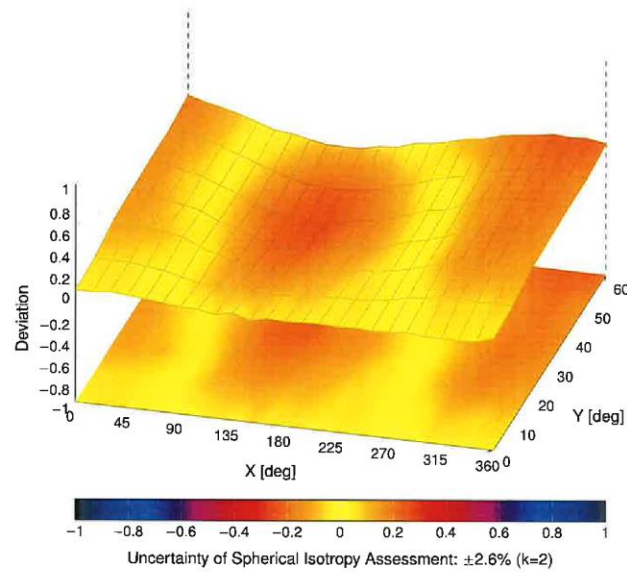
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### Conversion Factor Assessment



### Deviation from Isotropy in Liquid

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



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### Appendix: Modulation Calibration Parameters

| UID   | Rev | Communication System Name                           | Group     | PAR (dB) | Unc <sup>±</sup> k = 2 |
|-------|-----|-----------------------------------------------------|-----------|----------|------------------------|
| 0     |     | CW                                                  | CW        | 0.00     | ±4.7                   |
| 10010 | CAB | SAR Validation (Square, 100 ms, 10 ms)              | Test      | 10.00    | ±9.6                   |
| 10011 | CAC | UMTS-FDD (WCDMA)                                    | WCDMA     | 2.91     | ±9.6                   |
| 10012 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)            | WLAN      | 1.87     | ±9.6                   |
| 10013 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)       | WLAN      | 9.46     | ±9.6                   |
| 10021 | DAC | GSM-FDD (TDMA, GMSK)                                | GSM       | 9.39     | ±9.6                   |
| 10023 | DAC | GPRS-FDD (TDMA, GMSK, TN 0)                         | GSM       | 9.57     | ±9.6                   |
| 10024 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1)                       | GSM       | 6.56     | ±9.6                   |
| 10025 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0)                         | GSM       | 12.62    | ±9.6                   |
| 10026 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1)                       | GSM       | 9.55     | ±9.6                   |
| 10027 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2)                     | GSM       | 4.80     | ±9.6                   |
| 10028 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)                   | GSM       | 3.55     | ±9.6                   |
| 10029 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2)                     | GSM       | 7.78     | ±9.6                   |
| 10030 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1)                 | Bluetooth | 5.30     | ±9.6                   |
| 10031 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3)                 | Bluetooth | 1.87     | ±9.6                   |
| 10032 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5)                 | Bluetooth | 1.16     | ±9.6                   |
| 10033 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)           | Bluetooth | 7.74     | ±9.6                   |
| 10034 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)           | Bluetooth | 4.53     | ±9.6                   |
| 10035 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)           | Bluetooth | 3.83     | ±9.6                   |
| 10036 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH1)               | Bluetooth | 8.01     | ±9.6                   |
| 10037 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3)               | Bluetooth | 4.77     | ±9.6                   |
| 10038 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH5)               | Bluetooth | 4.10     | ±9.6                   |
| 10039 | CAB | CDMA2000 (1xRTT, RC1)                               | CDMA2000  | 4.57     | ±9.6                   |
| 10042 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate) | AMPS      | 7.78     | ±9.6                   |
| 10044 | CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM)                    | AMPS      | 0.00     | ±9.6                   |
| 10048 | CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)           | DECT      | 13.80    | ±9.6                   |
| 10049 | CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)         | DECT      | 10.79    | ±9.6                   |
| 10056 | CAA | UMTS-TDD (TD-SCDMA, 1.28 Mbps)                      | TD-SCDMA  | 11.01    | ±9.6                   |
| 10058 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)                   | GSM       | 6.52     | ±9.6                   |
| 10059 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)            | WLAN      | 2.12     | ±9.6                   |
| 10060 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)          | WLAN      | 2.83     | ±9.6                   |
| 10061 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)           | WLAN      | 3.80     | ±9.6                   |
| 10062 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)            | WLAN      | 8.68     | ±9.6                   |
| 10063 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)            | WLAN      | 8.83     | ±9.6                   |
| 10064 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)           | WLAN      | 9.09     | ±9.6                   |
| 10065 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)           | WLAN      | 9.00     | ±9.6                   |
| 10066 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)           | WLAN      | 9.38     | ±9.6                   |
| 10067 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)           | WLAN      | 10.12    | ±9.6                   |
| 10068 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)           | WLAN      | 10.24    | ±9.6                   |
| 10069 | CAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)           | WLAN      | 10.56    | ±9.6                   |
| 10071 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)       | WLAN      | 9.83     | ±9.6                   |
| 10072 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)      | WLAN      | 9.82     | ±9.6                   |
| 10073 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)      | WLAN      | 9.94     | ±9.6                   |
| 10074 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)      | WLAN      | 10.30    | ±9.6                   |
| 10075 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)      | WLAN      | 10.77    | ±9.6                   |
| 10076 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)      | WLAN      | 10.94    | ±9.6                   |
| 10077 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)      | WLAN      | 11.00    | ±9.6                   |
| 10081 | CAB | CDMA2000 (1xRTT, RC3)                               | CDMA2000  | 3.97     | ±9.6                   |
| 10082 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | AMPS      | 4.77     | ±9.6                   |
| 10090 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-4)                       | GSM       | 6.56     | ±9.6                   |
| 10097 | CAC | UMTS-FDD (HSDPA)                                    | WCDMA     | 3.98     | ±9.6                   |
| 10098 | CAC | UMTS-FDD (HSUPA, Subtest 2)                         | WCDMA     | 3.98     | ±9.6                   |
| 10099 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-4)                       | GSM       | 9.55     | ±9.6                   |
| 10100 | CAF | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)            | LTE-FDD   | 5.67     | ±9.6                   |
| 10101 | CAF | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)          | LTE-FDD   | 6.42     | ±9.6                   |
| 10102 | CAF | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)          | LTE-FDD   | 6.60     | ±9.6                   |
| 10103 | CAH | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)            | LTE-TDD   | 9.29     | ±9.6                   |
| 10104 | CAH | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)          | LTE-TDD   | 9.97     | ±9.6                   |
| 10105 | CAH | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)          | LTE-TDD   | 10.01    | ±9.6                   |
| 10108 | CAH | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)            | LTE-FDD   | 5.80     | ±9.6                   |
| 10109 | CAH | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)          | LTE-FDD   | 6.43     | ±9.6                   |
| 10110 | CAH | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)             | LTE-FDD   | 5.75     | ±9.6                   |
| 10111 | CAH | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)           | LTE-FDD   | 6.44     | ±9.6                   |

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| UID   | Rev | Communication System Name                      | Group   | PAR (dB) | Unc <sup>F</sup> k = 2 |
|-------|-----|------------------------------------------------|---------|----------|------------------------|
| 10112 | CAH | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)     | LTE-FDD | 6.59     | ±9.6                   |
| 10113 | CAH | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)      | LTE-FDD | 6.62     | ±9.6                   |
| 10114 | CAD | IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)  | WLAN    | 8.10     | ±9.6                   |
| 10115 | CAD | IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)  | WLAN    | 8.46     | ±9.6                   |
| 10116 | CAD | IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM) | WLAN    | 8.15     | ±9.6                   |
| 10117 | CAD | IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)       | WLAN    | 8.07     | ±9.6                   |
| 10118 | CAD | IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)       | WLAN    | 8.59     | ±9.6                   |
| 10119 | CAD | IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)      | WLAN    | 8.13     | ±9.6                   |
| 10140 | CAF | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)     | LTE-FDD | 6.49     | ±9.6                   |
| 10141 | CAF | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)     | LTE-FDD | 6.53     | ±9.6                   |
| 10142 | CAF | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)        | LTE-FDD | 5.73     | ±9.6                   |
| 10143 | CAF | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)      | LTE-FDD | 6.35     | ±9.6                   |
| 10144 | CAF | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)      | LTE-FDD | 6.65     | ±9.6                   |
| 10145 | CAG | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)      | LTE-FDD | 5.76     | ±9.6                   |
| 10146 | CAG | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)    | LTE-FDD | 6.41     | ±9.6                   |
| 10147 | CAG | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)    | LTE-FDD | 6.72     | ±9.6                   |
| 10149 | CAF | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-FDD | 6.42     | ±9.6                   |
| 10150 | CAF | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-FDD | 6.60     | ±9.6                   |
| 10151 | CAH | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)        | LTE-TDD | 9.28     | ±9.6                   |
| 10152 | CAH | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-TDD | 9.92     | ±9.6                   |
| 10153 | CAH | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-TDD | 10.05    | ±9.6                   |
| 10154 | CAH | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)        | LTE-FDD | 5.75     | ±9.6                   |
| 10155 | CAH | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)      | LTE-FDD | 6.43     | ±9.6                   |
| 10156 | CAH | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)         | LTE-FDD | 5.79     | ±9.6                   |
| 10157 | CAH | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)       | LTE-FDD | 6.49     | ±9.6                   |
| 10158 | CAH | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)      | LTE-FDD | 6.62     | ±9.6                   |
| 10159 | CAH | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)       | LTE-FDD | 6.56     | ±9.6                   |
| 10160 | CAF | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)        | LTE-FDD | 5.82     | ±9.6                   |
| 10161 | CAF | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)      | LTE-FDD | 6.43     | ±9.6                   |
| 10162 | CAF | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)      | LTE-FDD | 6.58     | ±9.6                   |
| 10166 | CAG | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)       | LTE-FDD | 5.46     | ±9.6                   |
| 10167 | CAG | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)     | LTE-FDD | 6.21     | ±9.6                   |
| 10168 | CAG | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)     | LTE-FDD | 6.79     | ±9.6                   |
| 10169 | CAF | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-FDD | 5.73     | ±9.6                   |
| 10170 | CAF | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        | LTE-FDD | 6.52     | ±9.6                   |
| 10171 | AAF | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-FDD | 6.49     | ±9.6                   |
| 10172 | CAH | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-TDD | 9.21     | ±9.6                   |
| 10173 | CAH | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        | LTE-TDD | 9.48     | ±9.6                   |
| 10174 | CAH | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-TDD | 10.25    | ±9.6                   |
| 10175 | CAH | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)          | LTE-FDD | 5.72     | ±9.6                   |
| 10176 | CAH | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)        | LTE-FDD | 6.52     | ±9.6                   |
| 10177 | CAJ | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)           | LTE-FDD | 5.73     | ±9.6                   |
| 10178 | CAH | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)         | LTE-FDD | 6.52     | ±9.6                   |
| 10179 | CAH | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)        | LTE-FDD | 6.50     | ±9.6                   |
| 10180 | CAH | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)         | LTE-FDD | 6.50     | ±9.6                   |
| 10181 | CAF | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)          | LTE-FDD | 5.72     | ±9.6                   |
| 10182 | CAF | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)        | LTE-FDD | 6.52     | ±9.6                   |
| 10183 | AAE | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)        | LTE-FDD | 6.50     | ±9.6                   |
| 10184 | CAF | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)           | LTE-FDD | 5.73     | ±9.6                   |
| 10185 | CAF | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)         | LTE-FDD | 6.51     | ±9.6                   |
| 10186 | AAF | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)         | LTE-FDD | 6.50     | ±9.6                   |
| 10187 | CAG | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)         | LTE-FDD | 5.73     | ±9.6                   |
| 10188 | CAG | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)       | LTE-FDD | 6.52     | ±9.6                   |
| 10189 | AAG | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)       | LTE-FDD | 6.50     | ±9.6                   |
| 10193 | CAD | IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)   | WLAN    | 8.09     | ±9.6                   |
| 10194 | CAD | IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)  | WLAN    | 8.12     | ±9.6                   |
| 10195 | CAD | IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)  | WLAN    | 8.21     | ±9.6                   |
| 10196 | CAD | IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)        | WLAN    | 8.10     | ±9.6                   |
| 10197 | CAD | IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)       | WLAN    | 8.13     | ±9.6                   |
| 10198 | CAD | IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)       | WLAN    | 8.27     | ±9.6                   |
| 10219 | CAD | IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)        | WLAN    | 8.03     | ±9.6                   |
| 10220 | CAD | IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)     | WLAN    | 8.13     | ±9.6                   |
| 10221 | CAD | IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)     | WLAN    | 8.27     | ±9.6                   |
| 10222 | CAD | IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)         | WLAN    | 8.06     | ±9.6                   |
| 10223 | CAD | IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)       | WLAN    | 8.48     | ±9.6                   |
| 10224 | CAD | IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)      | WLAN    | 8.08     | ±9.6                   |

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