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Accreditation No.: **SCS 0108**

Client **UL-CN (Auden)**

Certificate No: **DAE4-1739\_Jul22**

## CALIBRATION CERTIFICATE

Object **DAE4 - SD 000 D04 BO - SN: 1739**

Calibration procedure(s) **QA CAL-06.v30  
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **July 29, 2022**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards             | ID #               | Cal Date (Certificate No.) | Scheduled Calibration  |
|-------------------------------|--------------------|----------------------------|------------------------|
| Keithley Multimeter Type 2001 | SN: 0810278        | 31-Aug-21 (No:31368)       | Aug-22                 |
| Secondary Standards           | ID #               | Check Date (in house)      | Scheduled Check        |
| Auto DAE Calibration Unit     | SE UWS 053 AA 1001 | 24-Jan-22 (in house check) | In house check: Jan-23 |
| Calibrator Box V2.1           | SE UMS 006 AA 1002 | 24-Jan-22 (in house check) | In house check: Jan-23 |

|                |                               |                                   |               |
|----------------|-------------------------------|-----------------------------------|---------------|
| Calibrated by: | Name<br><b>Adrian Gehring</b> | Function<br>Laboratory Technician | Signature<br> |
| Approved by:   | Name<br><b>Sven Kühn</b>      | Technical Manager                 |               |

Issued: July 29, 2022

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## Glossary

|                 |   |
|-----------------|---|
| DAE             | data acquisition electronics  |
| Connector angle | information used in DASY system to align probe sensor X to the robot coordinate system. |

## Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement:* Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 $\mu$ V, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X                         | Y                         | Z                         |
|---------------------|---------------------------|---------------------------|---------------------------|
| High Range          | 404.231 $\pm$ 0.02% (k=2) | 404.212 $\pm$ 0.02% (k=2) | 404.328 $\pm$ 0.02% (k=2) |
| Low Range           | 3.97945 $\pm$ 1.50% (k=2) | 3.97602 $\pm$ 1.50% (k=2) | 3.97468 $\pm$ 1.50% (k=2) |

## Connector Angle

|   |                                     |
|---|-------------------------------------|
| Connector Angle to be used in DASY system | 251.0 $^{\circ}$ $\pm$ 1 $^{\circ}$ |
|---|-------------------------------------|

## Appendix (Additional assessments outside the scope of SCS0108)

### 1. DC Voltage Linearity

| High Range        | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 200035.80                 | 0.15                         | 0.00      |
| Channel X + Input | 20005.88                  | -0.19                        | -0.00     |
| Channel X - Input | -20004.47                 | 1.62                         | -0.01     |
| Channel Y + Input | 200036.26                 | 0.29                         | 0.00      |
| Channel Y + Input | 20003.29                  | -2.59                        | -0.01     |
| Channel Y - Input | -20007.02                 | -0.88                        | 0.00      |
| Channel Z + Input | 200036.31                 | 0.23                         | 0.00      |
| Channel Z + Input | 20000.86                  | -5.04                        | -0.03     |
| Channel Z - Input | -20007.33                 | -1.15                        | 0.01      |

| Low Range         | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 2001.07                   | -0.30                        | -0.02     |
| Channel X + Input | 201.28                    | -0.02                        | -0.01     |
| Channel X - Input | -198.89                   | -0.22                        | 0.11      |
| Channel Y + Input | 2001.10                   | -0.04                        | -0.00     |
| Channel Y + Input | 200.05                    | -1.06                        | -0.53     |
| Channel Y - Input | -199.64                   | -0.80                        | 0.40      |
| Channel Z + Input | 2001.10                   | -0.12                        | -0.01     |
| Channel Z + Input | 200.76                    | -0.38                        | -0.19     |
| Channel Z - Input | -199.34                   | -0.50                        | 0.25      |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Common mode Input Voltage (mV) | High Range Average Reading ( $\mu\text{V}$ ) | Low Range Average Reading ( $\mu\text{V}$ ) |
|-----------|--------------------------------|--|---|
| Channel X | 200                            | -18.45                                       | -20.59                                      |
|           | - 200                          | 21.84  | 19.91                                       |
| Channel Y | 200                            | 7.50   | 7.49  |
|           | - 200                          | -9.71  | -9.92                                       |
| Channel Z | 200                            | 6.63   | 6.96  |
|           | - 200                          | -8.20  | -8.18                                       |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Input Voltage (mV) | Channel X ( $\mu\text{V}$ ) | Channel Y ( $\mu\text{V}$ ) | Channel Z ( $\mu\text{V}$ ) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200                | -                           | 1.15                        | -2.58                       |
| Channel Y | 200                | 6.40                        | -                           | 3.31                        |
| Channel Z | 200                | 8.01                        | 4.08                        | -                           |

#### 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 16168            | 14574           |
| Channel Y | 15948            | 13355           |
| Channel Z | 16227            | 13176           |

#### 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M $\Omega$

|           | Average ( $\mu$ V) | min. Offset ( $\mu$ V) | max. Offset ( $\mu$ V) | Std. Deviation ( $\mu$ V) |
|-----------|--------------------|------------------------|------------------------|---------------------------|
| Channel X | 0.24               | -1.26                  | 1.83                   | 0.40                      |
| Channel Y | -0.77              | -2.52                  | 0.61                   | 0.39                      |
| Channel Z | 0.01               | -1.43                  | 1.67                   | 0.45                      |

#### 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

#### 7. Input Resistance (Typical values for information)

|           | Zeroing (kOhm) | Measuring (MOhm) |
|-----------|----------------|------------------|
| Channel X | 200            | 200              |
| Channel Y | 200            | 200              |
| Channel Z | 200            | 200              |

#### 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|----------------|-------------------|
| Supply (+ Vcc) | +7.9              |
| Supply (- Vcc) | -7.6              |

#### 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|----------------|-------------------|---------------|-------------------|
| Supply (+ Vcc) | +0.01             | +6            | +14               |
| Supply (- Vcc) | -0.01             | -8            | -9                |

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Accreditation No.: **SCS 0108**

Client **UL-CN (Auden)**

Certificate No **EX-7733\_Aug22**

**CALIBRATION CERTIFICATE**

Object **EX3DV4 - SN:7733**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v6, QA CAL-23.v5,  
QA CAL-25.v7  
Calibration procedure for dosimetric E-field probes**

Calibration date **August 02, 2022**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID               | Cal Date (Certificate No.)        | Scheduled Calibration |
|----------------------------|------------------|-----------------------------------|-----------------------|
| Power meter NRP            | SN: 104778       | 04-Apr-22 (No. 217-03525/03524)   | Apr-23                |
| Power sensor NRP-Z91       | SN: 103244       | 04-Apr-22 (No. 217-03524)         | Apr-23                |
| OCP DAK-3.5 (weighted)     | SN: 1249         | 20-Oct-21 (OCP-DAK3.5-1249_Oct21) | Oct-22                |
| OCP DAK-12                 | SN: 1016         | 20-Oct-21 (OCP-DAK12-1016_Oct21)  | Oct-22                |
| Reference 20 dB Attenuator | SN: CC2552 (20x) | 04-Apr-22 (No. 217-03527)         | Apr-23                |
| DAE4                       | SN: 660          | 13-Oct-21 (No. DAE4-660_Oct21)    | Oct-22                |
| Reference Probe ES3DV2     | SN: 3013         | 27-Dec-21 (No. ES3-3013_Dec21)    | Dec-22                |

| 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-20) | In house check: Oct-22 |

|               |              |                       |           |
|---------------|--------------|-----------------------|-----------|
|               | Name         | Function              | Signature |
| Calibrated by | Leif Klysner | Laboratory Technician |           |
| Approved by   | Sven Kühn    | Technical Manager     |           |

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**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 $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis |
| 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:**

- a) 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.
- b) 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  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not 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).

## Parameters of Probe: EX3DV4 - SN:7733

### Basic Calibration Parameters

|   | Sensor X | Sensor Y | Sensor Z | Unc (k = 2) |
|---|----------|----------|----------|-------------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 0.67     | 0.49     | 0.41     | ±10.1%      |
| DCP (mV) <sup>B</sup>                                     | 104.6    | 103.8    | 100.9    | ±4.7%       |

### Calibration Results for Modulation Response

| UID   | Communication System Name   |   | A<br>dB | B<br>dB $\sqrt{\mu\text{V}}$ | 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    | 161.2    | ±3.0%       | ±4.7%                            |
|       |                             | Y | 0.00    | 0.00                         | 1.00  |         | 168.4    |             |                                  |
|       |                             | Z | 0.00    | 0.00                         | 1.00  |         | 164.6    |             |                                  |
| 10352 | Pulse Waveform (200Hz, 10%) | X | 1.36    | 60.00                        | 5.87  | 10.00   | 60.0     | ±3.0%       | ±9.6%                            |
|       |                             | Y | 1.58    | 60.94                        | 6.41  |         | 60.0     |             |                                  |
|       |                             | Z | 1.51    | 60.81                        | 6.60  |         | 60.0     |             |                                  |
| 10353 | Pulse Waveform (200Hz, 20%) | X | 0.84    | 60.00                        | 4.71  | 6.99    | 80.0     | ±2.5%       | ±9.6%                            |
|       |                             | Y | 0.80    | 60.00                        | 4.83  |         | 80.0     |             |                                  |
|       |                             | Z | 0.77    | 60.00                        | 4.97  |         | 80.0     |             |                                  |
| 10354 | Pulse Waveform (200Hz, 40%) | X | 0.01    | 126.23                       | 0.08  | 3.98    | 95.0     | ±2.7%       | ±9.6%                            |
|       |                             | Y | 0.25    | 150.87                       | 2.01  |         | 95.0     |             |                                  |
|       |                             | Z | 1.02    | 116.60                       | 0.94  |         | 95.0     |             |                                  |
| 10355 | Pulse Waveform (200Hz, 60%) | X | 3.86    | 160.00                       | 0.94  | 2.22    | 120.0    | ±1.7%       | ±9.6%                            |
|       |                             | Y | 7.09    | 79.72                        | 0.26  |         | 120.0    |             |                                  |
|       |                             | Z | 2.85    | 159.95                       | 2.53  |         | 120.0    |             |                                  |
| 10387 | QPSK Waveform, 1 MHz        | X | 0.55    | 63.89                        | 11.81 | 1.00    | 150.0    | ±4.0%       | ±9.6%                            |
|       |                             | Y | 0.71    | 68.58                        | 15.54 |         | 150.0    |             |                                  |
|       |                             | Z | 0.38    | 61.37                        | 10.73 |         | 150.0    |             |                                  |
| 10388 | QPSK Waveform, 10 MHz       | X | 1.32    | 65.64                        | 13.61 | 0.00    | 150.0    | ±0.8%       | ±9.6%                            |
|       |                             | Y | 1.56    | 68.68                        | 15.60 |         | 150.0    |             |                                  |
|       |                             | Z | 1.11    | 64.39                        | 12.67 |         | 150.0    |             |                                  |
| 10396 | 64-QAM Waveform, 100 kHz    | X | 1.61    | 63.95                        | 15.56 | 3.01    | 150.0    | ±1.6%       | ±9.6%                            |
|       |                             | Y | 1.55    | 63.76                        | 16.12 |         | 150.0    |             |                                  |
|       |                             | Z | 1.51    | 62.92                        | 15.21 |         | 150.0    |             |                                  |
| 10399 | 64-QAM Waveform, 40 MHz     | X | 2.82    | 66.19                        | 14.98 | 0.00    | 150.0    | ±2.7%       | ±9.6%                            |
|       |                             | Y | 2.91    | 66.99                        | 15.69 |         | 150.0    |             |                                  |
|       |                             | Z | 2.74    | 66.24                        | 15.03 |         | 150.0    |             |                                  |
| 10414 | WLAN CCDF, 64-QAM, 40 MHz   | X | 3.82    | 65.86                        | 15.18 | 0.00    | 150.0    | ±4.1%       | ±9.6%                            |
|       |                             | Y | 4.00    | 66.98                        | 15.93 |         | 150.0    |             |                                  |
|       |                             | Z | 3.67    | 66.02                        | 15.21 |         | 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.



**Parameters of Probe: EX3DV4 - SN:7733**

**Sensor Model Parameters**

|   | C1<br>fF | C2<br>fF | $\alpha$<br>V <sup>-1</sup> | T1<br>msV <sup>-2</sup> | T2<br>msV <sup>-1</sup> | T3<br>ms | T4<br>V <sup>-2</sup> | T5<br>V <sup>-1</sup> | T6   |
|---|----------|----------|-----------------------------|-------------------------|-------------------------|----------|-----------------------|-----------------------|------|
| x | 10.2     | 74.70    | 33.99                       | 4.75                    | 0.00                    | 4.91     | 0.51                  | 0.00                  | 1.00 |
| y | 9.5      | 69.37    | 34.25                       | 3.34                    | 0.00                    | 4.90     | 0.00                  | 0.00                  | 1.00 |
| z | 8.3      | 62.41    | 35.70                       | 2.31                    | 0.00                    | 4.96     | 0.00                  | 0.04                  | 1.00 |

**Other Probe Parameters**

|   |            |
|---|------------|
| Sensor Arrangement                            | Triangular |
| Connector Angle                               | -112.9°    |
| 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.

| UID   | Rev | Communication System Name                                  | Group    | PAR (dB) | Unc <sup>E</sup> k = 2 |
|-------|-----|--|----------|----------|------------------------|
| 10307 | AAB | IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, QPSK, PUSC)      | WiMAX    | 14.49    | ±9.6                   |
| 10308 | AAB | IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, 16QAM, PUSC)     | WiMAX    | 14.46    | ±9.6                   |
| 10309 | AAB | IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, 16QAM, AMC 2x3)  | WiMAX    | 14.58    | ±9.6                   |
| 10310 | AAB | IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, QPSK, AMC 2x3)   | WiMAX    | 14.57    | ±9.6                   |
| 10311 | AAB | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)                   | LTE-FDD  | 6.06     | ±9.6                   |
| 10313 | AAD | iDEN 1:3   | iDEN     | 10.51    | ±9.6                   |
| 10314 | AAD | iDEN 1:6   | iDEN     | 13.48    | ±9.6                   |
| 10315 | AAD | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc dc)          | WLAN     | 1.71     | ±9.6                   |
| 10316 | AAD | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc dc)      | WLAN     | 8.36     | ±9.6                   |
| 10317 | AAA | IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc dc)            | WLAN     | 8.36     | ±9.6                   |
| 10352 | AAA | Pulse Waveform (200 Hz, 10%)                               | Generic  | 10.00    | ±9.6                   |
| 10353 | AAA | Pulse Waveform (200 Hz, 20%)                               | Generic  | 6.99     | ±9.6                   |
| 10354 | AAA | Pulse Waveform (200 Hz, 40%)                               | Generic  | 3.98     | ±9.6                   |
| 10355 | AAA | Pulse Waveform (200 Hz, 60%)                               | Generic  | 2.22     | ±9.6                   |
| 10356 | AAA | Pulse Waveform (200 Hz, 80%)                               | Generic  | 0.97     | ±9.6                   |
| 10387 | AAA | QPSK Waveform, 1 MHz                                       | Generic  | 5.10     | ±9.6                   |
| 10388 | AAA | QPSK Waveform, 10 MHz                                      | Generic  | 5.22     | ±9.6                   |
| 10396 | AAA | 64-QAM Waveform, 100 kHz                                   | Generic  | 6.27     | ±9.6                   |
| 10399 | AAA | 64-QAM Waveform, 40 MHz                                    | Generic  | 6.27     | ±9.6                   |
| 10400 | AAD | IEEE 802.11ac WiFi (20 MHz, 64-QAM, 99pc dc)               | WLAN     | 8.37     | ±9.6                   |
| 10401 | AAA | IEEE 802.11ac WiFi (40 MHz, 64-QAM, 99pc dc)               | WLAN     | 8.60     | ±9.6                   |
| 10402 | AAA | IEEE 802.11ac WiFi (80 MHz, 64-QAM, 99pc dc)               | WLAN     | 8.53     | ±9.6                   |
| 10403 | AAB | CDMA2000 (1xEV-DO, Rev. 0)                                 | CDMA2000 | 3.76     | ±9.6                   |
| 10404 | AAB | CDMA2000 (1xEV-DO, Rev. A)                                 | CDMA2000 | 3.77     | ±9.6                   |
| 10406 | AAD | CDMA2000, RC3, SQ32, SCH0, Full Rate                       | CDMA2000 | 5.22     | ±9.6                   |
| 10410 | AAA | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub=2,3,4,7,8,9)  | LTE-TDD  | 7.82     | ±9.6                   |
| 10414 | AAA | WLAN CCDF, 64-QAM, 40 MHz                                  | Generic  | 8.54     | ±9.6                   |
| 10415 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc dc)          | WLAN     | 1.54     | ±9.6                   |
| 10416 | AAA | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc dc)      | WLAN     | 8.23     | ±9.6                   |
| 10417 | AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc dc)          | WLAN     | 8.23     | ±9.6                   |
| 10418 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Long)  | WLAN     | 8.14     | ±9.6                   |
| 10419 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Short) | WLAN     | 8.19     | ±9.6                   |
| 10422 | AAA | IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)               | WLAN     | 8.32     | ±9.6                   |
| 10423 | AAA | IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)            | WLAN     | 8.47     | ±9.6                   |
| 10424 | AAE | IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)            | WLAN     | 8.40     | ±9.6                   |
| 10425 | AAE | IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)                | WLAN     | 8.41     | ±9.6                   |
| 10426 | AAE | IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)              | WLAN     | 8.45     | ±9.6                   |
| 10427 | AAB | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)             | WLAN     | 8.41     | ±9.6                   |
| 10430 | AAB | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)                           | LTE-FDD  | 8.28     | ±9.6                   |
| 10431 | AAC | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)                          | LTE-FDD  | 8.38     | ±9.6                   |
| 10432 | AAB | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)                          | LTE-FDD  | 8.34     | ±9.6                   |
| 10433 | AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)                          | LTE-FDD  | 8.34     | ±9.6                   |
| 10434 | AAG | W-CDMA (BS Test Model 1, 64 DPCH)                          | WCDMA    | 8.60     | ±9.6                   |
| 10435 | AAA | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub)              | LTE-TDD  | 7.82     | ±9.6                   |
| 10447 | AAA | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)             | LTE-FDD  | 7.56     | ±9.6                   |
| 10448 | AAA | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)            | LTE-FDD  | 7.53     | ±9.6                   |
| 10449 | AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)            | LTE-FDD  | 7.51     | ±9.6                   |
| 10450 | AAA | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)            | LTE-FDD  | 7.48     | ±9.6                   |
| 10451 | AAA | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)            | WCDMA    | 7.59     | ±9.6                   |
| 10453 | AAC | Validation (Square, 10 ms, 1 ms)                           | Test     | 10.00    | ±9.6                   |
| 10456 | AAC | IEEE 802.11ac WiFi (160 MHz, 64-QAM, 99pc dc)              | WLAN     | 8.63     | ±9.6                   |
| 10457 | AAC | UMTS-FDD (DC-HSDPA)  | WCDMA    | 6.62     | ±9.6                   |
| 10458 | AAC | CDMA2000 (1xEV-DO, Rev. B, 2 carriers)                     | CDMA2000 | 6.55     | ±9.6                   |
| 10459 | AAC | CDMA2000 (1xEV-DO, Rev. B, 3 carriers)                     | CDMA2000 | 8.25     | ±9.6                   |
| 10460 | AAC | UMTS-FDD (WCDMA, AMR)                                      | WCDMA    | 2.39     | ±9.6                   |
| 10461 | AAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Sub)             | LTE-TDD  | 7.82     | ±9.6                   |
| 10462 | AAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Sub)           | LTE-TDD  | 8.30     | ±9.6                   |
| 10463 | AAD | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Sub)           | LTE-TDD  | 8.56     | ±9.6                   |
| 10464 | AAD | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Sub)               | LTE-TDD  | 7.82     | ±9.6                   |
| 10465 | AAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Sub)             | LTE-TDD  | 8.32     | ±9.6                   |
| 10466 | AAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Sub)             | LTE-TDD  | 8.57     | ±9.6                   |
| 10467 | AAA | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Sub)               | LTE-TDD  | 7.82     | ±9.6                   |
| 10468 | AAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Sub)             | LTE-TDD  | 8.32     | ±9.6                   |
| 10469 | AAD | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Sub)             | LTE-TDD  | 8.56     | ±9.6                   |
| 10470 | AAD | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub)              | LTE-TDD  | 7.82     | ±9.6                   |
| 10471 | AAC | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Sub)            | LTE-TDD  | 8.32     | ±9.6                   |

| UID              | Rev            | Communication System Name                                | Group              | PAR (dB)        | Unc <sup>E</sup> k = 2 |
|------------------|----------------|--|--------------------|-----------------|------------------------|
| 10472            | AAC            | LTE-TDD (SC-FDMA, 1 RB, 10MHz, 64-QAM, UL Sub)           | LTE-TDD            | 8.57            | ±9.6                   |
| 10473            | AAA            | LTE-TDD (SC-FDMA, 1 RB, 15MHz, QPSK, UL Sub)             | LTE-TDD            | 7.82            | ±9.6                   |
| 10474            | AAC            | LTE-TDD (SC-FDMA, 1 RB, 15MHz, 16-QAM, UL Sub)           | LTE-TDD            | 8.32            | ±9.6                   |
| 10475            | AAD            | LTE-TDD (SC-FDMA, 1 RB, 15MHz, 64-QAM, UL Sub)           | LTE-TDD            | 8.57            | ±9.6                   |
| 10477            | AAC            | LTE-TDD (SC-FDMA, 1 RB, 20MHz, 16-QAM, UL Sub)           | LTE-TDD            | 8.32            | ±9.6                   |
| 10478            | AAC            | LTE-TDD (SC-FDMA, 1 RB, 20MHz, 64-QAM, UL Sub)           | LTE-TDD            | 8.57            | ±9.6                   |
| 10479            | AAC            | LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, QPSK, UL Sub)          | LTE-TDD            | 7.74            | ±9.6                   |
| 10480            | AAA            | LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, 16-QAM, UL Sub)        | LTE-TDD            | 8.18            | ±9.6                   |
| 10481            | AAA            | LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, 64-QAM, UL Sub)        | LTE-TDD            | 8.45            | ±9.6                   |
| <del>10482</del> | <del>AAA</del> | <del>LTE-TDD (SC-FDMA, 50% RB, 3MHz, QPSK, UL Sub)</del> | <del>LTE-TDD</del> | <del>7.71</del> | <del>±9.6</del>        |
| 10483            | AAA            | LTE-TDD (SC-FDMA, 50% RB, 3MHz, 16-QAM, Sub)             | LTE-TDD            | 8.39            | ±9.6                   |
| 10484            | AAB            | LTE-TDD (SC-FDMA, 50% RB, 3MHz, 64-QAM, UL Sub)          | LTE-TDD            | 8.47            | ±9.6                   |
| 10485            | AAB            | LTE-TDD (SC-FDMA, 50% RB, 5MHz, QPSK, UL Sub)            | LTE-TDD            | 7.59            | ±9.6                   |
| 10486            | AAB            | LTE-TDD (SC-FDMA, 50% RB, 5MHz, 16-QAM, UL Sub)          | LTE-TDD            | 8.38            | ±9.6                   |
| 10487            | AAC            | LTE-TDD (SC-FDMA, 50% RB, 5MHz, 64-QAM, UL Sub)          | LTE-TDD            | 8.60            | ±9.6                   |
| 10488            | AAC            | LTE-TDD (SC-FDMA, 50% RB, 10MHz, QPSK, UL Sub)           | LTE-TDD            | 7.70            | ±9.6                   |
| 10489            | AAC            | LTE-TDD (SC-FDMA, 50% RB, 10MHz, 16-QAM, UL Sub)         | LTE-TDD            | 8.31            | ±9.6                   |
| 10490            | AAF            | LTE-TDD (SC-FDMA, 50% RB, 10MHz, 64-QAM, UL Sub)         | LTE-TDD            | 8.54            | ±9.6                   |
| 10491            | AAF            | LTE-TDD (SC-FDMA, 50% RB, 15MHz, QPSK, UL Sub)           | LTE-TDD            | 7.74            | ±9.6                   |
| 10492            | AAF            | LTE-TDD (SC-FDMA, 50% RB, 15MHz, 16-QAM, UL Sub)         | LTE-TDD            | 8.41            | ±9.6                   |
| 10493            | AAF            | LTE-TDD (SC-FDMA, 50% RB, 15MHz, 64-QAM, UL Sub)         | LTE-TDD            | 8.55            | ±9.6                   |
| 10494            | AAF            | LTE-TDD (SC-FDMA, 50% RB, 20MHz, QPSK, UL Sub)           | LTE-TDD            | 7.74            | ±9.6                   |
| 10495            | AAF            | LTE-TDD (SC-FDMA, 50% RB, 20MHz, 16-QAM, UL Sub)         | LTE-TDD            | 8.37            | ±9.6                   |
| 10496            | AAE            | LTE-TDD (SC-FDMA, 50% RB, 20MHz, 64-QAM, UL Sub)         | LTE-TDD            | 8.54            | ±9.6                   |
| 10497            | AAE            | LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, QPSK, UL Sub)         | LTE-TDD            | 7.67            | ±9.6                   |
| 10498            | AAE            | LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, 16-QAM, UL Sub)       | LTE-TDD            | 8.40            | ±9.6                   |
| 10499            | AAC            | LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, 64-QAM, UL Sub)       | LTE-TDD            | 8.68            | ±9.6                   |
| 10500            | AAF            | LTE-TDD (SC-FDMA, 100% RB, 3MHz, QPSK, UL Sub)           | LTE-TDD            | 7.67            | ±9.6                   |
| 10501            | AAF            | LTE-TDD (SC-FDMA, 100% RB, 3MHz, 16-QAM, UL Sub)         | LTE-TDD            | 8.44            | ±9.6                   |
| 10502            | AAB            | LTE-TDD (SC-FDMA, 100% RB, 3MHz, 64-QAM, UL Sub)         | LTE-TDD            | 8.52            | ±9.6                   |
| 10503            | AAB            | LTE-TDD (SC-FDMA, 100% RB, 5MHz, QPSK, UL Sub)           | LTE-TDD            | 7.72            | ±9.6                   |
| 10504            | AAB            | LTE-TDD (SC-FDMA, 100% RB, 5MHz, 16-QAM, UL Sub)         | LTE-TDD            | 8.31            | ±9.6                   |
| 10505            | AAC            | LTE-TDD (SC-FDMA, 100% RB, 5MHz, 64-QAM, UL Sub)         | LTE-TDD            | 8.54            | ±9.6                   |
| 10506            | AAC            | LTE-TDD (SC-FDMA, 100% RB, 10MHz, QPSK, UL Sub)          | LTE-TDD            | 7.74            | ±9.6                   |
| 10507            | AAC            | LTE-TDD (SC-FDMA, 100% RB, 10MHz, 16-QAM, UL Sub)        | LTE-TDD            | 8.36            | ±9.6                   |
| 10508            | AAF            | LTE-TDD (SC-FDMA, 100% RB, 10MHz, 64-QAM, UL Sub)        | LTE-TDD            | 8.55            | ±9.6                   |
| 10509            | AAF            | LTE-TDD (SC-FDMA, 100% RB, 15MHz, QPSK, UL Sub)          | LTE-TDD            | 7.99            | ±9.6                   |
| 10510            | AAF            | LTE-TDD (SC-FDMA, 100% RB, 15MHz, 16-QAM, UL Sub)        | LTE-TDD            | 8.49            | ±9.6                   |
| 10511            | AAF            | LTE-TDD (SC-FDMA, 100% RB, 15MHz, 64-QAM, UL Sub)        | LTE-TDD            | 8.51            | ±9.6                   |
| 10512            | AAF            | LTE-TDD (SC-FDMA, 100% RB, 20MHz, QPSK, UL Sub)          | LTE-TDD            | 7.74            | ±9.6                   |
| 10513            | AAF            | LTE-TDD (SC-FDMA, 100% RB, 20MHz, 16-QAM, UL Sub)        | LTE-TDD            | 8.42            | ±9.6                   |
| 10514            | AAE            | LTE-TDD (SC-FDMA, 100% RB, 20MHz, 64-QAM, UL Sub)        | LTE-TDD            | 8.45            | ±9.6                   |
| 10515            | AAE            | IEEE 802.11b WiFi 2.4GHz (DSSS, 2Mbps, 99pc dc)          | WLAN               | 1.58            | ±9.6                   |
| 10516            | AAE            | IEEE 802.11b WiFi 2.4GHz (DSSS, 5.5Mbps, 99pc dc)        | WLAN               | 1.57            | ±9.6                   |
| 10517            | AAF            | IEEE 802.11b WiFi 2.4GHz (DSSS, 11Mbps, 99pc dc)         | WLAN               | 1.58            | ±9.6                   |
| 10518            | AAF            | IEEE 802.11a/h WiFi 5GHz (OFDM, 9Mbps, 99pc dc)          | WLAN               | 8.23            | ±9.6                   |
| 10519            | AAF            | IEEE 802.11a/h WiFi 5GHz (OFDM, 12Mbps, 99pc dc)         | WLAN               | 8.39            | ±9.6                   |
| 10520            | AAB            | IEEE 802.11a/h WiFi 5GHz (OFDM, 18Mbps, 99pc dc)         | WLAN               | 8.12            | ±9.6                   |
| 10521            | AAB            | IEEE 802.11a/h WiFi 5GHz (OFDM, 24Mbps, 99pc dc)         | WLAN               | 7.97            | ±9.6                   |
| 10522            | AAB            | IEEE 802.11a/h WiFi 5GHz (OFDM, 36Mbps, 99pc dc)         | WLAN               | 8.45            | ±9.6                   |
| 10523            | AAC            | IEEE 802.11a/h WiFi 5GHz (OFDM, 48Mbps, 99pc dc)         | WLAN               | 8.08            | ±9.6                   |
| 10524            | AAC            | IEEE 802.11a/h WiFi 5GHz (OFDM, 54Mbps, 99pc dc)         | WLAN               | 8.27            | ±9.6                   |
| 10525            | AAC            | IEEE 802.11ac WiFi (20MHz, MCS0, 99pc dc)                | WLAN               | 8.36            | ±9.6                   |
| 10526            | AAF            | IEEE 802.11ac WiFi (20MHz, MCS1, 99pc dc)                | WLAN               | 8.42            | ±9.6                   |
| 10527            | AAF            | IEEE 802.11ac WiFi (20MHz, MCS2, 99pc dc)                | WLAN               | 8.21            | ±9.6                   |
| 10528            | AAF            | IEEE 802.11ac WiFi (20MHz, MCS3, 99pc dc)                | WLAN               | 8.36            | ±9.6                   |
| 10529            | AAF            | IEEE 802.11ac WiFi (20MHz, MCS4, 99pc dc)                | WLAN               | 8.36            | ±9.6                   |
| 10531            | AAF            | IEEE 802.11ac WiFi (20MHz, MCS6, 99pc dc)                | WLAN               | 8.43            | ±9.6                   |
| 10532            | AAF            | IEEE 802.11ac WiFi (20MHz, MCS7, 99pc dc)                | WLAN               | 8.29            | ±9.6                   |
| 10533            | AAE            | IEEE 802.11ac WiFi (20MHz, MCS8, 99pc dc)                | WLAN               | 8.38            | ±9.6                   |
| 10534            | AAE            | IEEE 802.11ac WiFi (40MHz, MCS0, 99pc dc)                | WLAN               | 8.45            | ±9.6                   |
| 10535            | AAE            | IEEE 802.11ac WiFi (40MHz, MCS1, 99pc dc)                | WLAN               | 8.45            | ±9.6                   |
| 10536            | AAF            | IEEE 802.11ac WiFi (40MHz, MCS2, 99pc dc)                | WLAN               | 8.32            | ±9.6                   |
| 10537            | AAF            | IEEE 802.11ac WiFi (40MHz, MCS3, 99pc dc)                | WLAN               | 8.44            | ±9.6                   |
| 10538            | AAF            | IEEE 802.11ac WiFi (40MHz, MCS4, 99pc dc)                | WLAN               | 8.54            | ±9.6                   |
| 10540            | AAA            | IEEE 802.11ac WiFi (40MHz, MCS6, 99pc dc)                | WLAN               | 8.39            | ±9.6                   |

| UID              | Rev            | Communication System Name                               | Group           | PAR (dB)        | Unc <sup>F</sup> k = 2 |
|------------------|----------------|---|-----------------|-----------------|------------------------|
| 10541            | AAA            | IEEE 802.11ac WiFi (40 MHz, MCS7, 99pc dc)              | WLAN            | 8.46            | ±9.6                   |
| 10542            | AAA            | IEEE 802.11ac WiFi (40 MHz, MCS8, 99pc dc)              | WLAN            | 8.65            | ±9.6                   |
| 10543            | AAC            | IEEE 802.11ac WiFi (40 MHz, MCS9, 99pc dc)              | WLAN            | 8.65            | ±9.6                   |
| 10544            | AAC            | IEEE 802.11ac WiFi (80 MHz, MCS0, 99pc dc)              | WLAN            | 8.47            | ±9.6                   |
| 10545            | AAC            | IEEE 802.11ac WiFi (80 MHz, MCS1, 99pc dc)              | WLAN            | 8.55            | ±9.6                   |
| 10546            | AAC            | IEEE 802.11ac WiFi (80 MHz, MCS2, 99pc dc)              | WLAN            | 8.35            | ±9.6                   |
| 10547            | AAC            | IEEE 802.11ac WiFi (80 MHz, MCS3, 99pc dc)              | WLAN            | 8.49            | ±9.6                   |
| 10548            | AAC            | IEEE 802.11ac WiFi (80 MHz, MCS4, 99pc dc)              | WLAN            | 8.37            | ±9.6                   |
| 10550            | AAC            | IEEE 802.11ac WiFi (80 MHz, MCS6, 99pc dc)              | WLAN            | 8.38            | ±9.6                   |
| <del>10551</del> | <del>AAC</del> | <del>IEEE 802.11ac WiFi (80 MHz, MCS7, 99pc dc)</del>   | <del>WLAN</del> | <del>8.50</del> | <del>±9.6</del>        |
| 10552            | AAC            | IEEE 802.11ac WiFi (80 MHz, MCS8, 99pc dc)              | WLAN            | 8.42            | ±9.6                   |
| 10553            | AAC            | IEEE 802.11ac WiFi (80 MHz, MCS9, 99pc dc)              | WLAN            | 8.45            | ±9.6                   |
| 10554            | AAC            | IEEE 802.11ac WiFi (160 MHz, MCS0, 99pc dc)             | WLAN            | 8.48            | ±9.6                   |
| 10555            | AAC            | IEEE 802.11ac WiFi (160 MHz, MCS1, 99pc dc)             | WLAN            | 8.47            | ±9.6                   |
| 10556            | AAC            | IEEE 802.11ac WiFi (160 MHz, MCS2, 99pc dc)             | WLAN            | 8.50            | ±9.6                   |
| 10557            | AAC            | IEEE 802.11ac WiFi (160 MHz, MCS3, 99pc dc)             | WLAN            | 8.52            | ±9.6                   |
| 10558            | AAC            | IEEE 802.11ac WiFi (160 MHz, MCS4, 99pc dc)             | WLAN            | 8.61            | ±9.6                   |
| 10560            | AAC            | IEEE 802.11ac WiFi (160 MHz, MCS6, 99pc dc)             | WLAN            | 8.73            | ±9.6                   |
| 10561            | AAC            | IEEE 802.11ac WiFi (160 MHz, MCS7, 99pc dc)             | WLAN            | 8.56            | ±9.6                   |
| 10562            | AAC            | IEEE 802.11ac WiFi (160 MHz, MCS8, 99pc dc)             | WLAN            | 8.69            | ±9.6                   |
| 10563            | AAC            | IEEE 802.11ac WiFi (160 MHz, MCS9, 99pc dc)             | WLAN            | 8.77            | ±9.6                   |
| 10564            | AAC            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc dc)  | WLAN            | 8.25            | ±9.6                   |
| 10565            | AAC            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc dc) | WLAN            | 8.45            | ±9.6                   |
| 10566            | AAC            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc dc) | WLAN            | 8.13            | ±9.6                   |
| 10567            | AAC            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc dc) | WLAN            | 8.00            | ±9.6                   |
| 10568            | AAC            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc dc) | WLAN            | 8.37            | ±9.6                   |
| 10569            | AAC            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc dc) | WLAN            | 8.10            | ±9.6                   |
| 10570            | AAC            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc dc) | WLAN            | 8.30            | ±9.6                   |
| 10571            | AAC            | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc dc)       | WLAN            | 1.99            | ±9.6                   |
| 10572            | AAC            | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc dc)       | WLAN            | 1.99            | ±9.6                   |
| 10573            | AAC            | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc dc)     | WLAN            | 1.98            | ±9.6                   |
| 10574            | AAC            | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc dc)      | WLAN            | 1.98            | ±9.6                   |
| 10575            | AAC            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc dc)  | WLAN            | 8.59            | ±9.6                   |
| 10576            | AAC            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc dc)  | WLAN            | 8.60            | ±9.6                   |
| 10577            | AAC            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc dc) | WLAN            | 8.70            | ±9.6                   |
| 10578            | AAD            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc dc) | WLAN            | 8.49            | ±9.6                   |
| 10579            | AAD            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc dc) | WLAN            | 8.36            | ±9.6                   |
| 10580            | AAD            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc dc) | WLAN            | 8.76            | ±9.6                   |
| 10581            | AAD            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc dc) | WLAN            | 8.35            | ±9.6                   |
| 10582            | AAD            | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc dc) | WLAN            | 8.67            | ±9.6                   |
| 10583            | AAD            | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc dc)       | WLAN            | 8.59            | ±9.6                   |
| 10584            | AAD            | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc dc)       | WLAN            | 8.60            | ±9.6                   |
| 10585            | AAD            | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc dc)      | WLAN            | 8.70            | ±9.6                   |
| 10586            | AAD            | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc dc)      | WLAN            | 8.49            | ±9.6                   |
| 10587            | AAA            | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc dc)      | WLAN            | 8.36            | ±9.6                   |
| 10588            | AAA            | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc dc)      | WLAN            | 8.76            | ±9.6                   |
| 10589            | AAA            | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc dc)      | WLAN            | 8.35            | ±9.6                   |
| 10590            | AAA            | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc dc)      | WLAN            | 8.67            | ±9.6                   |
| 10591            | AAA            | IEEE 802.11n (HT Mixed, 20 MHz, MCS0, 90pc dc)          | WLAN            | 8.63            | ±9.6                   |
| 10592            | AAA            | IEEE 802.11n (HT Mixed, 20 MHz, MCS1, 90pc dc)          | WLAN            | 8.79            | ±9.6                   |
| 10593            | AAA            | IEEE 802.11n (HT Mixed, 20 MHz, MCS2, 90pc dc)          | WLAN            | 8.64            | ±9.6                   |
| 10594            | AAA            | IEEE 802.11n (HT Mixed, 20 MHz, MCS3, 90pc dc)          | WLAN            | 8.74            | ±9.6                   |
| 10595            | AAA            | IEEE 802.11n (HT Mixed, 20 MHz, MCS4, 90pc dc)          | WLAN            | 8.74            | ±9.6                   |
| 10596            | AAA            | IEEE 802.11n (HT Mixed, 20 MHz, MCS5, 90pc dc)          | WLAN            | 8.71            | ±9.6                   |
| 10597            | AAA            | IEEE 802.11n (HT Mixed, 20 MHz, MCS6, 90pc dc)          | WLAN            | 8.72            | ±9.6                   |
| 10598            | AAA            | IEEE 802.11n (HT Mixed, 20 MHz, MCS7, 90pc dc)          | WLAN            | 8.50            | ±9.6                   |
| 10599            | AAA            | IEEE 802.11n (HT Mixed, 40 MHz, MCS0, 90pc dc)          | WLAN            | 8.79            | ±9.6                   |
| 10600            | AAA            | IEEE 802.11n (HT Mixed, 40 MHz, MCS1, 90pc dc)          | WLAN            | 8.88            | ±9.6                   |
| 10601            | AAA            | IEEE 802.11n (HT Mixed, 40 MHz, MCS2, 90pc dc)          | WLAN            | 8.82            | ±9.6                   |
| 10602            | AAA            | IEEE 802.11n (HT Mixed, 40 MHz, MCS3, 90pc dc)          | WLAN            | 8.94            | ±9.6                   |
| 10603            | AAA            | IEEE 802.11n (HT Mixed, 40 MHz, MCS4, 90pc dc)          | WLAN            | 9.03            | ±9.6                   |
| 10604            | AAA            | IEEE 802.11n (HT Mixed, 40 MHz, MCS5, 90pc dc)          | WLAN            | 8.76            | ±9.6                   |
| 10605            | AAA            | IEEE 802.11n (HT Mixed, 40 MHz, MCS6, 90pc dc)          | WLAN            | 8.97            | ±9.6                   |
| 10606            | AAC            | IEEE 802.11n (HT Mixed, 40 MHz, MCS7, 90pc dc)          | WLAN            | 8.82            | ±9.6                   |
| 10607            | AAC            | IEEE 802.11ac WiFi (20 MHz, MCS0, 90pc dc)              | WLAN            | 8.64            | ±9.6                   |
| 10608            | AAC            | IEEE 802.11ac WiFi (20 MHz, MCS1, 90pc dc)              | WLAN            | 8.77            | ±9.6                   |

| UID   | Rev | Communication System Name                         | Group     | PAR (dB) | Unc <sup>E</sup> k = 2 |
|-------|-----|---|-----------|----------|------------------------|
| 10609 | AAC | IEEE 802.11ac WiFi (20 MHz, MCS2, 90pc dc)        | WLAN      | 8.57     | ±9.6                   |
| 10610 | AAC | IEEE 802.11ac WiFi (20 MHz, MCS3, 90pc dc)        | WLAN      | 8.78     | ±9.6                   |
| 10611 | AAC | IEEE 802.11ac WiFi (20 MHz, MCS4, 90pc dc)        | WLAN      | 8.70     | ±9.6                   |
| 10612 | AAC | IEEE 802.11ac WiFi (20 MHz, MCS5, 90pc dc)        | WLAN      | 8.77     | ±9.6                   |
| 10613 | AAC | IEEE 802.11ac WiFi (20 MHz, MCS6, 90pc dc)        | WLAN      | 8.94     | ±9.6                   |
| 10614 | AAC | IEEE 802.11ac WiFi (20 MHz, MCS7, 90pc dc)        | WLAN      | 8.59     | ±9.6                   |
| 10615 | AAC | IEEE 802.11ac WiFi (20 MHz, MCS8, 90pc dc)        | WLAN      | 8.82     | ±9.6                   |
| 10616 | AAC | IEEE 802.11ac WiFi (40 MHz, MCS0, 90pc dc)        | WLAN      | 8.82     | ±9.6                   |
| 10617 | AAC | IEEE 802.11ac WiFi (40 MHz, MCS1, 90pc dc)        | WLAN      | 8.81     | ±9.6                   |
| 10618 | AAC | IEEE 802.11ac WiFi (40 MHz, MCS2, 90pc dc)        | WLAN      | 8.58     | ±9.6                   |
| 10619 | AAC | IEEE 802.11ac WiFi (40 MHz, MCS3, 90pc dc)        | WLAN      | 8.86     | ±9.6                   |
| 10620 | AAC | IEEE 802.11ac WiFi (40 MHz, MCS4, 90pc dc)        | WLAN      | 8.87     | ±9.6                   |
| 10621 | AAC | IEEE 802.11ac WiFi (40 MHz, MCS5, 90pc dc)        | WLAN      | 8.77     | ±9.6                   |
| 10622 | AAC | IEEE 802.11ac WiFi (40 MHz, MCS6, 90pc dc)        | WLAN      | 8.68     | ±9.6                   |
| 10623 | AAC | IEEE 802.11ac WiFi (40 MHz, MCS7, 90pc dc)        | WLAN      | 8.82     | ±9.6                   |
| 10624 | AAC | IEEE 802.11ac WiFi (40 MHz, MCS8, 90pc dc)        | WLAN      | 8.96     | ±9.6                   |
| 10625 | AAC | IEEE 802.11ac WiFi (40 MHz, MCS9, 90pc dc)        | WLAN      | 8.96     | ±9.6                   |
| 10626 | AAC | IEEE 802.11ac WiFi (80 MHz, MCS0, 90pc dc)        | WLAN      | 8.83     | ±9.6                   |
| 10627 | AAC | IEEE 802.11ac WiFi (80 MHz, MCS1, 90pc dc)        | WLAN      | 8.88     | ±9.6                   |
| 10628 | AAC | IEEE 802.11ac WiFi (80 MHz, MCS2, 90pc dc)        | WLAN      | 8.71     | ±9.6                   |
| 10629 | AAC | IEEE 802.11ac WiFi (80 MHz, MCS3, 90pc dc)        | WLAN      | 8.85     | ±9.6                   |
| 10630 | AAC | IEEE 802.11ac WiFi (80 MHz, MCS4, 90pc dc)        | WLAN      | 8.72     | ±9.6                   |
| 10631 | AAC | IEEE 802.11ac WiFi (80 MHz, MCS5, 90pc dc)        | WLAN      | 8.81     | ±9.6                   |
| 10632 | AAC | IEEE 802.11ac WiFi (80 MHz, MCS6, 90pc dc)        | WLAN      | 8.74     | ±9.6                   |
| 10633 | AAC | IEEE 802.11ac WiFi (80 MHz, MCS7, 90pc dc)        | WLAN      | 8.83     | ±9.6                   |
| 10634 | AAC | IEEE 802.11ac WiFi (80 MHz, MCS8, 90pc dc)        | WLAN      | 8.80     | ±9.6                   |
| 10635 | AAC | IEEE 802.11ac WiFi (80 MHz, MCS9, 90pc dc)        | WLAN      | 8.81     | ±9.6                   |
| 10636 | AAC | IEEE 802.11ac WiFi (160 MHz, MCS0, 90pc dc)       | WLAN      | 8.83     | ±9.6                   |
| 10637 | AAC | IEEE 802.11ac WiFi (160 MHz, MCS1, 90pc dc)       | WLAN      | 8.79     | ±9.6                   |
| 10638 | AAC | IEEE 802.11ac WiFi (160 MHz, MCS2, 90pc dc)       | WLAN      | 8.86     | ±9.6                   |
| 10639 | AAC | IEEE 802.11ac WiFi (160 MHz, MCS3, 90pc dc)       | WLAN      | 8.85     | ±9.6                   |
| 10640 | AAC | IEEE 802.11ac WiFi (160 MHz, MCS4, 90pc dc)       | WLAN      | 8.98     | ±9.6                   |
| 10641 | AAC | IEEE 802.11ac WiFi (160 MHz, MCS5, 90pc dc)       | WLAN      | 9.06     | ±9.6                   |
| 10642 | AAC | IEEE 802.11ac WiFi (160 MHz, MCS6, 90pc dc)       | WLAN      | 9.06     | ±9.6                   |
| 10643 | AAC | IEEE 802.11ac WiFi (160 MHz, MCS7, 90pc dc)       | WLAN      | 8.89     | ±9.6                   |
| 10644 | AAC | IEEE 802.11ac WiFi (160 MHz, MCS8, 90pc dc)       | WLAN      | 9.05     | ±9.6                   |
| 10645 | AAC | IEEE 802.11ac WiFi (160 MHz, MCS9, 90pc dc)       | WLAN      | 9.11     | ±9.6                   |
| 10646 | AAC | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Sub=2,7)  | LTE-TDD   | 11.96    | ±9.6                   |
| 10647 | AAC | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub=2,7) | LTE-TDD   | 11.96    | ±9.6                   |
| 10648 | AAC | CDMA2000 (1x Advanced)                            | CDMA2000  | 3.45     | ±9.6                   |
| 10652 | AAC | LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)    | LTE-TDD   | 6.91     | ±9.6                   |
| 10653 | AAC | LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)   | LTE-TDD   | 7.42     | ±9.6                   |
| 10654 | AAC | LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)   | LTE-TDD   | 6.96     | ±9.6                   |
| 10655 | AAC | LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)   | LTE-TDD   | 7.21     | ±9.6                   |
| 10658 | AAC | Pulse Waveform (200 Hz, 10%)                      | Test      | 10.00    | ±9.6                   |
| 10659 | AAC | Pulse Waveform (200 Hz, 20%)                      | Test      | 6.99     | ±9.6                   |
| 10660 | AAC | Pulse Waveform (200 Hz, 40%)                      | Test      | 3.98     | ±9.6                   |
| 10661 | AAC | Pulse Waveform (200 Hz, 60%)                      | Test      | 2.22     | ±9.6                   |
| 10662 | AAC | Pulse Waveform (200 Hz, 80%)                      | Test      | 0.97     | ±9.6                   |
| 10670 | AAC | Bluetooth Low Energy                              | Bluetooth | 2.19     | ±9.6                   |
| 10671 | AAD | IEEE 802.11ax (20 MHz, MCS0, 90pc dc)             | WLAN      | 9.09     | ±9.6                   |
| 10672 | AAD | IEEE 802.11ax (20 MHz, MCS1, 90pc dc)             | WLAN      | 8.57     | ±9.6                   |
| 10673 | AAD | IEEE 802.11ax (20 MHz, MCS2, 90pc dc)             | WLAN      | 8.78     | ±9.6                   |
| 10674 | AAD | IEEE 802.11ax (20 MHz, MCS3, 90pc dc)             | WLAN      | 8.74     | ±9.6                   |
| 10675 | AAD | IEEE 802.11ax (20 MHz, MCS4, 90pc dc)             | WLAN      | 8.90     | ±9.6                   |
| 10676 | AAD | IEEE 802.11ax (20 MHz, MCS5, 90pc dc)             | WLAN      | 8.77     | ±9.6                   |
| 10677 | AAD | IEEE 802.11ax (20 MHz, MCS6, 90pc dc)             | WLAN      | 8.73     | ±9.6                   |
| 10678 | AAD | IEEE 802.11ax (20 MHz, MCS7, 90pc dc)             | WLAN      | 8.78     | ±9.6                   |
| 10679 | AAD | IEEE 802.11ax (20 MHz, MCS8, 90pc dc)             | WLAN      | 8.89     | ±9.6                   |
| 10680 | AAD | IEEE 802.11ax (20 MHz, MCS9, 90pc dc)             | WLAN      | 8.80     | ±9.6                   |
| 10681 | AAG | IEEE 802.11ax (20 MHz, MCS10, 90pc dc)            | WLAN      | 8.62     | ±9.6                   |
| 10682 | AAF | IEEE 802.11ax (20 MHz, MCS11, 90pc dc)            | WLAN      | 8.83     | ±9.6                   |
| 10683 | AAA | IEEE 802.11ax (20 MHz, MCS0, 99pc dc)             | WLAN      | 8.42     | ±9.6                   |
| 10684 | AAC | IEEE 802.11ax (20 MHz, MCS1, 99pc dc)             | WLAN      | 8.26     | ±9.6                   |
| 10685 | AAC | IEEE 802.11ax (20 MHz, MCS2, 99pc dc)             | WLAN      | 8.33     | ±9.6                   |
| 10686 | AAC | IEEE 802.11ax (20 MHz, MCS3, 99pc dc)             | WLAN      | 8.28     | ±9.6                   |



| UID   | Rev | Communication System Name              | Group | PAR (dB) | Unc <sup>E</sup> k = 2 |
|-------|-----|--|-------|----------|------------------------|
| 10687 | AAE | IEEE 802.11ax (20 MHz, MCS4, 99pc dc)  | WLAN  | 8.45     | ±9.6                   |
| 10688 | AAE | IEEE 802.11ax (20 MHz, MCS5, 99pc dc)  | WLAN  | 8.29     | ±9.6                   |
| 10689 | AAD | IEEE 802.11ax (20 MHz, MCS6, 99pc dc)  | WLAN  | 8.55     | ±9.6                   |
| 10690 | AAE | IEEE 802.11ax (20 MHz, MCS7, 99pc dc)  | WLAN  | 8.29     | ±9.6                   |
| 10691 | AAB | IEEE 802.11ax (20 MHz, MCS8, 99pc dc)  | WLAN  | 8.25     | ±9.6                   |
| 10692 | AAA | IEEE 802.11ax (20 MHz, MCS9, 99pc dc)  | WLAN  | 8.29     | ±9.6                   |
| 10693 | AAA | IEEE 802.11ax (20 MHz, MCS10, 99pc dc) | WLAN  | 8.25     | ±9.6                   |
| 10694 | AAA | IEEE 802.11ax (20 MHz, MCS11, 99pc dc) | WLAN  | 8.57     | ±9.6                   |
| 10695 | AAA | IEEE 802.11ax (40 MHz, MCS0, 90pc dc)  | WLAN  | 8.78     | ±9.6                   |
| 10696 | AAA | IEEE 802.11ax (40 MHz, MCS1, 90pc dc)  | WLAN  | 8.91     | ±9.6                   |
| 10697 | AAA | IEEE 802.11ax (40 MHz, MCS2, 90pc dc)  | WLAN  | 8.61     | ±9.6                   |
| 10698 | AAA | IEEE 802.11ax (40 MHz, MCS3, 90pc dc)  | WLAN  | 8.89     | ±9.6                   |
| 10699 | AAA | IEEE 802.11ax (40 MHz, MCS4, 90pc dc)  | WLAN  | 8.82     | ±9.6                   |
| 10700 | AAA | IEEE 802.11ax (40 MHz, MCS5, 90pc dc)  | WLAN  | 8.73     | ±9.6                   |
| 10701 | AAA | IEEE 802.11ax (40 MHz, MCS6, 90pc dc)  | WLAN  | 8.86     | ±9.6                   |
| 10702 | AAA | IEEE 802.11ax (40 MHz, MCS7, 90pc dc)  | WLAN  | 8.70     | ±9.6                   |
| 10703 | AAA | IEEE 802.11ax (40 MHz, MCS8, 90pc dc)  | WLAN  | 8.82     | ±9.6                   |
| 10704 | AAA | IEEE 802.11ax (40 MHz, MCS9, 90pc dc)  | WLAN  | 8.56     | ±9.6                   |
| 10705 | AAA | IEEE 802.11ax (40 MHz, MCS10, 90pc dc) | WLAN  | 8.69     | ±9.6                   |
| 10706 | AAC | IEEE 802.11ax (40 MHz, MCS11, 90pc dc) | WLAN  | 8.66     | ±9.6                   |
| 10707 | AAC | IEEE 802.11ax (40 MHz, MCS0, 99pc dc)  | WLAN  | 8.32     | ±9.6                   |
| 10708 | AAC | IEEE 802.11ax (40 MHz, MCS1, 99pc dc)  | WLAN  | 8.55     | ±9.6                   |
| 10709 | AAC | IEEE 802.11ax (40 MHz, MCS2, 99pc dc)  | WLAN  | 8.33     | ±9.6                   |
| 10710 | AAC | IEEE 802.11ax (40 MHz, MCS3, 99pc dc)  | WLAN  | 8.29     | ±9.6                   |
| 10711 | AAC | IEEE 802.11ax (40 MHz, MCS4, 99pc dc)  | WLAN  | 8.39     | ±9.6                   |
| 10712 | AAC | IEEE 802.11ax (40 MHz, MCS5, 99pc dc)  | WLAN  | 8.67     | ±9.6                   |
| 10713 | AAC | IEEE 802.11ax (40 MHz, MCS6, 99pc dc)  | WLAN  | 8.33     | ±9.6                   |
| 10714 | AAC | IEEE 802.11ax (40 MHz, MCS7, 99pc dc)  | WLAN  | 8.26     | ±9.6                   |
| 10715 | AAC | IEEE 802.11ax (40 MHz, MCS8, 99pc dc)  | WLAN  | 8.45     | ±9.6                   |
| 10716 | AAC | IEEE 802.11ax (40 MHz, MCS9, 99pc dc)  | WLAN  | 8.30     | ±9.6                   |
| 10717 | AAC | IEEE 802.11ax (40 MHz, MCS10, 99pc dc) | WLAN  | 8.48     | ±9.6                   |
| 10718 | AAC | IEEE 802.11ax (40 MHz, MCS11, 99pc dc) | WLAN  | 8.24     | ±9.6                   |
| 10719 | AAC | IEEE 802.11ax (80 MHz, MCS0, 90pc dc)  | WLAN  | 8.81     | ±9.6                   |
| 10720 | AAC | IEEE 802.11ax (80 MHz, MCS1, 90pc dc)  | WLAN  | 8.87     | ±9.6                   |
| 10721 | AAC | IEEE 802.11ax (80 MHz, MCS2, 90pc dc)  | WLAN  | 8.76     | ±9.6                   |
| 10722 | AAC | IEEE 802.11ax (80 MHz, MCS3, 90pc dc)  | WLAN  | 8.55     | ±9.6                   |
| 10723 | AAC | IEEE 802.11ax (80 MHz, MCS4, 90pc dc)  | WLAN  | 8.70     | ±9.6                   |
| 10724 | AAC | IEEE 802.11ax (80 MHz, MCS5, 90pc dc)  | WLAN  | 8.90     | ±9.6                   |
| 10725 | AAC | IEEE 802.11ax (80 MHz, MCS6, 90pc dc)  | WLAN  | 8.74     | ±9.6                   |
| 10726 | AAC | IEEE 802.11ax (80 MHz, MCS7, 90pc dc)  | WLAN  | 8.72     | ±9.6                   |
| 10727 | AAC | IEEE 802.11ax (80 MHz, MCS8, 90pc dc)  | WLAN  | 8.66     | ±9.6                   |
| 10728 | AAC | IEEE 802.11ax (80 MHz, MCS9, 90pc dc)  | WLAN  | 8.65     | ±9.6                   |
| 10729 | AAC | IEEE 802.11ax (80 MHz, MCS10, 90pc dc) | WLAN  | 8.64     | ±9.6                   |
| 10730 | AAC | IEEE 802.11ax (80 MHz, MCS11, 90pc dc) | WLAN  | 8.67     | ±9.6                   |
| 10731 | AAC | IEEE 802.11ax (80 MHz, MCS0, 99pc dc)  | WLAN  | 8.42     | ±9.6                   |
| 10732 | AAC | IEEE 802.11ax (80 MHz, MCS1, 99pc dc)  | WLAN  | 8.46     | ±9.6                   |
| 10733 | AAC | IEEE 802.11ax (80 MHz, MCS2, 99pc dc)  | WLAN  | 8.40     | ±9.6                   |
| 10734 | AAC | IEEE 802.11ax (80 MHz, MCS3, 99pc dc)  | WLAN  | 8.25     | ±9.6                   |
| 10735 | AAC | IEEE 802.11ax (80 MHz, MCS4, 99pc dc)  | WLAN  | 8.33     | ±9.6                   |
| 10736 | AAC | IEEE 802.11ax (80 MHz, MCS5, 99pc dc)  | WLAN  | 8.27     | ±9.6                   |
| 10737 | AAC | IEEE 802.11ax (80 MHz, MCS6, 99pc dc)  | WLAN  | 8.36     | ±9.6                   |
| 10738 | AAC | IEEE 802.11ax (80 MHz, MCS7, 99pc dc)  | WLAN  | 8.42     | ±9.6                   |
| 10739 | AAC | IEEE 802.11ax (80 MHz, MCS8, 99pc dc)  | WLAN  | 8.29     | ±9.6                   |
| 10740 | AAC | IEEE 802.11ax (80 MHz, MCS9, 99pc dc)  | WLAN  | 8.48     | ±9.6                   |
| 10741 | AAC | IEEE 802.11ax (80 MHz, MCS10, 99pc dc) | WLAN  | 8.40     | ±9.6                   |
| 10742 | AAC | IEEE 802.11ax (80 MHz, MCS11, 99pc dc) | WLAN  | 8.43     | ±9.6                   |
| 10743 | AAC | IEEE 802.11ax (160 MHz, MCS0, 90pc dc) | WLAN  | 8.94     | ±9.6                   |
| 10744 | AAC | IEEE 802.11ax (160 MHz, MCS1, 90pc dc) | WLAN  | 9.16     | ±9.6                   |
| 10745 | AAC | IEEE 802.11ax (160 MHz, MCS2, 90pc dc) | WLAN  | 8.93     | ±9.6                   |
| 10746 | AAC | IEEE 802.11ax (160 MHz, MCS3, 90pc dc) | WLAN  | 9.11     | ±9.6                   |
| 10747 | AAC | IEEE 802.11ax (160 MHz, MCS4, 90pc dc) | WLAN  | 9.04     | ±9.6                   |
| 10748 | AAC | IEEE 802.11ax (160 MHz, MCS5, 90pc dc) | WLAN  | 8.93     | ±9.6                   |
| 10749 | AAC | IEEE 802.11ax (160 MHz, MCS6, 90pc dc) | WLAN  | 8.90     | ±9.6                   |
| 10750 | AAC | IEEE 802.11ax (160 MHz, MCS7, 90pc dc) | WLAN  | 8.79     | ±9.6                   |
| 10751 | AAC | IEEE 802.11ax (160 MHz, MCS8, 90pc dc) | WLAN  | 8.82     | ±9.6                   |
| 10752 | AAC | IEEE 802.11ax (160 MHz, MCS9, 90pc dc) | WLAN  | 8.81     | ±9.6                   |



| UID   | Rev | Communication System Name                      | Group         | PAR (dB) | Unc <sup>E</sup> k = 2 |
|-------|-----|--|---------------|----------|------------------------|
| 10753 | AAC | IEEE 802.11ax (160 MHz, MCS10, 90pc dc)        | WLAN          | 9.00     | ±9.6                   |
| 10754 | AAC | IEEE 802.11ax (160 MHz, MCS11, 90pc dc)        | WLAN          | 8.94     | ±9.6                   |
| 10755 | AAC | IEEE 802.11ax (160 MHz, MCS0, 99pc dc)         | WLAN          | 8.64     | ±9.6                   |
| 10756 | AAC | IEEE 802.11ax (160 MHz, MCS1, 99pc dc)         | WLAN          | 8.77     | ±9.6                   |
| 10757 | AAC | IEEE 802.11ax (160 MHz, MCS2, 99pc dc)         | WLAN          | 8.77     | ±9.6                   |
| 10758 | AAC | IEEE 802.11ax (160 MHz, MCS3, 99pc dc)         | WLAN          | 8.69     | ±9.6                   |
| 10759 | AAC | IEEE 802.11ax (160 MHz, MCS4, 99pc dc)         | WLAN          | 8.58     | ±9.6                   |
| 10760 | AAC | IEEE 802.11ax (160 MHz, MCS5, 99pc dc)         | WLAN          | 8.49     | ±9.6                   |
| 10761 | AAC | IEEE 802.11ax (160 MHz, MCS6, 99pc dc)         | WLAN          | 8.58     | ±9.6                   |
| 10762 | AAC | IEEE 802.11ax (160 MHz, MCS7, 99pc dc)         | WLAN          | 8.49     | ±9.6                   |
| 10763 | AAC | IEEE 802.11ax (160 MHz, MCS8, 99pc dc)         | WLAN          | 8.53     | ±9.6                   |
| 10764 | AAC | IEEE 802.11ax (160 MHz, MCS9, 99pc dc)         | WLAN          | 8.54     | ±9.6                   |
| 10765 | AAC | IEEE 802.11ax (160 MHz, MCS10, 99pc dc)        | WLAN          | 8.54     | ±9.6                   |
| 10766 | AAC | IEEE 802.11ax (160 MHz, MCS11, 99pc dc)        | WLAN          | 8.51     | ±9.6                   |
| 10767 | AAC | 5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)     | 5G NR FR1 TDD | 7.99     | ±9.6                   |
| 10768 | AAC | 5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.01     | ±9.6                   |
| 10769 | AAC | 5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.01     | ±9.6                   |
| 10770 | AAC | 5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.02     | ±9.6                   |
| 10771 | AAC | 5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.02     | ±9.6                   |
| 10772 | AAC | 5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.23     | ±9.6                   |
| 10773 | AAC | 5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.03     | ±9.6                   |
| 10774 | AAC | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.02     | ±9.6                   |
| 10775 | AAC | 5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)   | 5G NR FR1 TDD | 8.31     | ±9.6                   |
| 10776 | AAC | 5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.30     | ±9.6                   |
| 10777 | AAC | 5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.30     | ±9.6                   |
| 10778 | AAC | 5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.34     | ±9.6                   |
| 10779 | AAC | 5G NR (CP-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.42     | ±9.6                   |
| 10780 | AAC | 5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.38     | ±9.6                   |
| 10781 | AAC | 5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.38     | ±9.6                   |
| 10782 | AAC | 5G NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.43     | ±9.6                   |
| 10783 | AAC | 5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.31     | ±9.6                   |
| 10784 | AAC | 5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.29     | ±9.6                   |
| 10785 | AAC | 5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.40     | ±9.6                   |
| 10786 | AAC | 5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.35     | ±9.6                   |
| 10787 | AAC | 5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.44     | ±9.6                   |
| 10788 | AAC | 5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.39     | ±9.6                   |
| 10789 | AAC | 5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.37     | ±9.6                   |
| 10790 | AAC | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.39     | ±9.6                   |
| 10791 | AAC | 5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)     | 5G NR FR1 TDD | 7.83     | ±9.6                   |
| 10792 | AAC | 5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.92     | ±9.6                   |
| 10793 | AAC | 5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.95     | ±9.6                   |
| 10794 | AAC | 5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.82     | ±9.6                   |
| 10795 | AAC | 5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.84     | ±9.6                   |
| 10796 | AAC | 5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.82     | ±9.6                   |
| 10797 | AAC | 5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 8.01     | ±9.6                   |
| 10798 | AAC | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.89     | ±9.6                   |
| 10799 | AAC | 5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.93     | ±9.6                   |
| 10801 | AAC | 5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.89     | ±9.6                   |
| 10802 | AAC | 5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.87     | ±9.6                   |
| 10803 | AAE | 5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)   | 5G NR FR1 TDD | 7.93     | ±9.6                   |
| 10805 | AAD | 5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.34     | ±9.6                   |
| 10806 | AAD | 5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.37     | ±9.6                   |
| 10809 | AAD | 5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.34     | ±9.6                   |
| 10810 | AAD | 5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.34     | ±9.6                   |
| 10812 | AAD | 5G NR (CP-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.35     | ±9.6                   |
| 10817 | AAD | 5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.35     | ±9.6                   |
| 10818 | AAD | 5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.34     | ±9.6                   |
| 10819 | AAD | 5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.33     | ±9.6                   |
| 10820 | AAD | 5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.30     | ±9.6                   |
| 10821 | AAC | 5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.41     | ±9.6                   |
| 10822 | AAD | 5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.41     | ±9.6                   |
| 10823 | AAC | 5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.36     | ±9.6                   |
| 10824 | AAD | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.39     | ±9.6                   |
| 10825 | AAD | 5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.41     | ±9.6                   |
| 10827 | AAD | 5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.42     | ±9.6                   |
| 10828 | AAE | 5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.43     | ±9.6                   |

| UID   | Rev | Communication System Name                            | Group         | PAR (dB) | Unc <sup>F</sup> k = 2 |
|-------|-----|--|---------------|----------|------------------------|
| 10829 | AAD | 5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)      | 5G NR FR1 TDD | 8.40     | ±9.6                   |
| 10830 | AAD | 5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 60 kHz)          | 5G NR FR1 TDD | 7.63     | ±9.6                   |
| 10831 | AAD | 5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 60 kHz)          | 5G NR FR1 TDD | 7.73     | ±9.6                   |
| 10832 | AAD | 5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 60 kHz)          | 5G NR FR1 TDD | 7.74     | ±9.6                   |
| 10833 | AAD | 5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 60 kHz)          | 5G NR FR1 TDD | 7.70     | ±9.6                   |
| 10834 | AAD | 5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz)          | 5G NR FR1 TDD | 7.75     | ±9.6                   |
| 10835 | AAD | 5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 60 kHz)          | 5G NR FR1 TDD | 7.70     | ±9.6                   |
| 10836 | AAE | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 60 kHz)          | 5G NR FR1 TDD | 7.66     | ±9.6                   |
| 10837 | AAD | 5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 60 kHz)          | 5G NR FR1 TDD | 7.68     | ±9.6                   |
| 10839 | AAD | 5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 60 kHz)          | 5G NR FR1 TDD | 7.70     | ±9.6                   |
| 10840 | AAD | 5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 60 kHz)          | 5G NR FR1 TDD | 7.67     | ±9.6                   |
| 10841 | AAD | 5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.71     | ±9.6                   |
| 10843 | AAD | 5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 60 kHz)        | 5G NR FR1 TDD | 8.49     | ±9.6                   |
| 10844 | AAD | 5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 60 kHz)        | 5G NR FR1 TDD | 8.34     | ±9.6                   |
| 10846 | AAD | 5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz)        | 5G NR FR1 TDD | 8.41     | ±9.6                   |
| 10854 | AAD | 5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.34     | ±9.6                   |
| 10855 | AAD | 5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.36     | ±9.6                   |
| 10856 | AAD | 5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.37     | ±9.6                   |
| 10857 | AAD | 5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.35     | ±9.6                   |
| 10858 | AAD | 5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.36     | ±9.6                   |
| 10859 | AAD | 5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.34     | ±9.6                   |
| 10860 | AAD | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.41     | ±9.6                   |
| 10861 | AAD | 5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.40     | ±9.6                   |
| 10863 | AAD | 5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.41     | ±9.6                   |
| 10864 | AAE | 5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.37     | ±9.6                   |
| 10865 | AAD | 5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.41     | ±9.6                   |
| 10866 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)      | 5G NR FR1 TDD | 5.68     | ±9.6                   |
| 10868 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)   | 5G NR FR1 TDD | 5.89     | ±9.6                   |
| 10869 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)     | 5G NR FR2 TDD | 5.75     | ±9.6                   |
| 10870 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)  | 5G NR FR2 TDD | 5.86     | ±9.6                   |
| 10871 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)    | 5G NR FR2 TDD | 5.75     | ±9.6                   |
| 10872 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz) | 5G NR FR2 TDD | 6.52     | ±9.6                   |
| 10873 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)    | 5G NR FR2 TDD | 6.61     | ±9.6                   |
| 10874 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz) | 5G NR FR2 TDD | 6.65     | ±9.6                   |
| 10875 | AAD | 5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)        | 5G NR FR2 TDD | 7.78     | ±9.6                   |
| 10876 | AAD | 5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)     | 5G NR FR2 TDD | 8.39     | ±9.6                   |
| 10877 | AAD | 5G NR (CP-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)       | 5G NR FR2 TDD | 7.95     | ±9.6                   |
| 10878 | AAD | 5G NR (CP-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)    | 5G NR FR2 TDD | 8.41     | ±9.6                   |
| 10879 | AAD | 5G NR (CP-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)       | 5G NR FR2 TDD | 8.12     | ±9.6                   |
| 10880 | AAD | 5G NR (CP-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)    | 5G NR FR2 TDD | 8.38     | ±9.6                   |
| 10881 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)      | 5G NR FR2 TDD | 5.75     | ±9.6                   |
| 10882 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)   | 5G NR FR2 TDD | 5.96     | ±9.6                   |
| 10883 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)     | 5G NR FR2 TDD | 6.57     | ±9.6                   |
| 10884 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)  | 5G NR FR2 TDD | 6.53     | ±9.6                   |
| 10885 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)     | 5G NR FR2 TDD | 6.61     | ±9.6                   |
| 10886 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)  | 5G NR FR2 TDD | 6.65     | ±9.6                   |
| 10887 | AAD | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)         | 5G NR FR2 TDD | 7.78     | ±9.6                   |
| 10888 | AAD | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)      | 5G NR FR2 TDD | 8.35     | ±9.6                   |
| 10889 | AAD | 5G NR (CP-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)        | 5G NR FR2 TDD | 8.02     | ±9.6                   |
| 10890 | AAD | 5G NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)     | 5G NR FR2 TDD | 8.40     | ±9.6                   |
| 10891 | AAD | 5G NR (CP-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)        | 5G NR FR2 TDD | 8.13     | ±9.6                   |
| 10892 | AAD | 5G NR (CP-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)     | 5G NR FR2 TDD | 8.41     | ±9.6                   |
| 10897 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)        | 5G NR FR1 TDD | 5.66     | ±9.6                   |
| 10898 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)       | 5G NR FR1 TDD | 5.67     | ±9.6                   |
| 10899 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)       | 5G NR FR1 TDD | 5.67     | ±9.6                   |
| 10900 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)       | 5G NR FR1 TDD | 5.68     | ±9.6                   |
| 10901 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)       | 5G NR FR1 TDD | 5.68     | ±9.6                   |
| 10902 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)       | 5G NR FR1 TDD | 5.68     | ±9.6                   |
| 10903 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)       | 5G NR FR1 TDD | 5.68     | ±9.6                   |
| 10904 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)       | 5G NR FR1 TDD | 5.68     | ±9.6                   |
| 10905 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)       | 5G NR FR1 TDD | 5.68     | ±9.6                   |
| 10906 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)       | 5G NR FR1 TDD | 5.68     | ±9.6                   |
| 10907 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)      | 5G NR FR1 TDD | 5.78     | ±9.6                   |
| 10908 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)     | 5G NR FR1 TDD | 5.93     | ±9.6                   |
| 10909 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)     | 5G NR FR1 TDD | 5.96     | ±9.6                   |
| 10910 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 30 kHz)     | 5G NR FR1 TDD | 5.83     | ±9.6                   |

| UID   | Rev | Communication System Name                          | Group         | PAR (dB) | Unc <sup>E</sup> k = 2 |
|-------|-----|--|---------------|----------|------------------------|
| 10911 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 30 kHz)   | 5G NR FR1 TDD | 5.93     | ±9.6                   |
| 10912 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)   | 5G NR FR1 TDD | 5.84     | ±9.6                   |
| 10913 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)   | 5G NR FR1 TDD | 5.84     | ±9.6                   |
| 10914 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)   | 5G NR FR1 TDD | 5.85     | ±9.6                   |
| 10915 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)   | 5G NR FR1 TDD | 5.83     | ±9.6                   |
| 10916 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 80 MHz, QPSK, 30 kHz)   | 5G NR FR1 TDD | 5.87     | ±9.6                   |
| 10917 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 100 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.94     | ±9.6                   |
| 10918 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)   | 5G NR FR1 TDD | 5.86     | ±9.6                   |
| 10919 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.86     | ±9.6                   |
| 10920 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.87     | ±9.6                   |
| 10921 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.84     | ±9.6                   |
| 10922 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.82     | ±9.6                   |
| 10923 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.84     | ±9.6                   |
| 10924 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.84     | ±9.6                   |
| 10925 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.95     | ±9.6                   |
| 10926 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.84     | ±9.6                   |
| 10927 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.94     | ±9.6                   |
| 10928 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)      | 5G NR FR1 FDD | 5.52     | ±9.6                   |
| 10929 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)     | 5G NR FR1 FDD | 5.52     | ±9.6                   |
| 10930 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)     | 5G NR FR1 FDD | 5.52     | ±9.6                   |
| 10931 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)     | 5G NR FR1 FDD | 5.51     | ±9.6                   |
| 10932 | AAB | 5G NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)     | 5G NR FR1 FDD | 5.51     | ±9.6                   |
| 10933 | AAA | 5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)     | 5G NR FR1 FDD | 5.51     | ±9.6                   |
| 10934 | AAA | 5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)     | 5G NR FR1 FDD | 5.51     | ±9.6                   |
| 10935 | AAA | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)     | 5G NR FR1 FDD | 5.51     | ±9.6                   |
| 10936 | AAC | 5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)    | 5G NR FR1 FDD | 5.90     | ±9.6                   |
| 10937 | AAB | 5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)   | 5G NR FR1 FDD | 5.77     | ±9.6                   |
| 10938 | AAB | 5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)   | 5G NR FR1 FDD | 5.90     | ±9.6                   |
| 10939 | AAB | 5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)   | 5G NR FR1 FDD | 5.82     | ±9.6                   |
| 10940 | AAB | 5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)   | 5G NR FR1 FDD | 5.89     | ±9.6                   |
| 10941 | AAB | 5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)   | 5G NR FR1 FDD | 5.83     | ±9.6                   |
| 10942 | AAB | 5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)   | 5G NR FR1 FDD | 5.85     | ±9.6                   |
| 10943 | AAB | 5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)   | 5G NR FR1 FDD | 5.95     | ±9.6                   |
| 10944 | AAB | 5G NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)   | 5G NR FR1 FDD | 5.81     | ±9.6                   |
| 10945 | AAB | 5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)  | 5G NR FR1 FDD | 5.85     | ±9.6                   |
| 10946 | AAC | 5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)  | 5G NR FR1 FDD | 5.83     | ±9.6                   |
| 10947 | AAB | 5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)  | 5G NR FR1 FDD | 5.87     | ±9.6                   |
| 10948 | AAB | 5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)  | 5G NR FR1 FDD | 5.94     | ±9.6                   |
| 10949 | AAB | 5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)  | 5G NR FR1 FDD | 5.87     | ±9.6                   |
| 10950 | AAB | 5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)  | 5G NR FR1 FDD | 5.94     | ±9.6                   |
| 10951 | AAB | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)  | 5G NR FR1 FDD | 5.92     | ±9.6                   |
| 10952 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)  | 5G NR FR1 FDD | 8.25     | ±9.6                   |
| 10953 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.15     | ±9.6                   |
| 10954 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.23     | ±9.6                   |
| 10955 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.42     | ±9.6                   |
| 10956 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.14     | ±9.6                   |
| 10957 | AAC | 5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.31     | ±9.6                   |
| 10958 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 35 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.61     | ±9.6                   |
| 10959 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.33     | ±9.6                   |
| 10960 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 45 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 9.32     | ±9.6                   |
| 10961 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.36     | ±9.6                   |
| 10962 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 55 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.40     | ±9.6                   |
| 10963 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 60 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.55     | ±9.6                   |
| 10964 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 65 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.29     | ±9.6                   |
| 10965 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.37     | ±9.6                   |
| 10966 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 75 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.55     | ±9.6                   |
| 10967 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.42     | ±9.6                   |
| 10968 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 85 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.49     | ±9.6                   |
| 10972 | AAB | 5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)        | 5G NR FR1 TDD | 11.59    | ±9.6                   |
| 10973 | AAB | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 9.06     | ±9.6                   |
| 10974 | AAB | 5G NR (CP-OFDM, 100% RB, 100 MHz, 256-QAM, 30 kHz) | 5G NR FR1 TDD | 10.28    | ±9.6                   |
| 10978 | AAA | ULLA BDR   | ULLA          | 2.23     | ±9.6                   |
| 10979 | AAA | ULLA HDR4  | ULLA          | 7.02     | ±9.6                   |
| 10980 | AAA | ULLA HDR8  | ULLA          | 8.82     | ±9.6                   |
| 10981 | AAA | ULLA HDRp4   | ULLA          | 1.50     | ±9.6                   |
| 10982 | AAA | ULLA HDRp8   | ULLA          | 1.44     | ±9.6                   |

| UID   | Rev | Communication System Name                          | Group         | PAR (dB) | Unc <sup>E</sup> k = 2 |
|-------|-----|--|---------------|----------|------------------------|
| 10983 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.31     | ±9.6                   |
| 10984 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.42     | ±9.6                   |
| 10985 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.54     | ±9.6                   |
| 10986 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.50     | ±9.6                   |
| 10987 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 60 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.53     | ±9.6                   |
| 10988 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.38     | ±9.6                   |
| 10989 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.33     | ±9.6                   |
| 10990 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 90 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.52     | ±9.6                   |

<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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Certificate No: Z21-60532

## CALIBRATION CERTIFICATE

Object: D2450V2 - SN: 977

Calibration Procedure(s): FF-Z11-003-01  
Calibration Procedures for dipole validation kits

Calibration date: December 17, 2021

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|---|-----------------------|
| Power Meter NRP2        | 106277     | 24-Sep-21 (CTTL, No.J21X08326)            | Sep-22                |
| Power sensor NRP8S      | 104291     | 24-Sep-21 (CTTL, No.J21X08326)            | Sep-22                |
| Reference Probe EX3DV4  | SN 7307    | 26-May-21(SPEAG,No.EX3-7307_May21)        | May-22                |
| DAE4                    | SN 1556    | 15-Jan-21(SPEAG,No.DAE4-1556_Jan21)       | Jan-22                |
| Secondary Standards     | ID #       | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
| Signal Generator E4438C | MY49071430 | 01-Feb-21 (CTTL, No.J21X00593)            | Jan-22                |
| NetworkAnalyzer E5071C  | MY46110673 | 14-Jan-21 (CTTL, No.J21X00232)            | Jan-22                |

|                | Name        | Function           | Signature |
|----------------|-------------|--------------------|-----------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer  |           |
| Reviewed by:   | Lin Hao     | SAR Test Engineer  |           |
| Approved by:   | Qi Dianyuan | SAR Project Leader |           |

Issued: December 24, 2021

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### Glossary:

|       |  |
|-------|--|
| TSL   | tissue simulating liquid                   |
| ConvF | sensitivity in TSL / NORM <sub>x,y,z</sub> |
| 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, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, 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%.





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### Measurement Conditions

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

|                                     |                          |             |
|-------------------------------------|--------------------------|-------------|
| <b>DASY Version</b>                 | DASY52                   | V52.10.4    |
| <b>Extrapolation</b>                | Advanced Extrapolation   |             |
| <b>Phantom</b>                      | Triple Flat Phantom 5.1C |             |
| <b>Distance Dipole Center - TSL</b> | 10 mm                    | with Spacer |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm        |             |
| <b>Frequency</b>                    | 2450 MHz ± 1 MHz         |             |

### Head TSL parameters

The following parameters and calculations were applied.

|  | Temperature     | Permittivity | Conductivity     |
|--|-----------------|--------------|------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C         | 39.2         | 1.80 mho/m       |
| <b>Measured Head TSL parameters</b>            | (22.0 ± 0.2) °C | 39.9 ± 6 %   | 1.79 mho/m ± 6 % |
| <b>Head TSL temperature change during test</b> | <1.0 °C         | ----         | ----             |

### SAR result with Head TSL

|   |                    |                                 |
|---|--------------------|---------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>   | Condition          |                                 |
| SAR measured  | 250 mW input power | 13.2 W/kg                       |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>53.2 W/kg ± 18.8 % (k=2)</b> |
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                 |
| SAR measured  | 250 mW input power | 6.02 W/kg                       |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>24.2 W/kg ± 18.7 % (k=2)</b> |



## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 56.4Ω+ 0.96jΩ |
| Return Loss                          | - 24.3dB      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.061 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 |
|-----------------|-------|



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**DASY5 Validation Report for Head TSL**

Date: 2021-12-17

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 977**

Communication System: UID-0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.785$  S/m;  $\epsilon_r = 39.91$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN7307; ConvF(7.75, 7.75, 7.75) @ 2450 MHz; Calibrated: 2021-05-26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2021-01-15
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

**Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 109.9 V/m; Power Drift = -0.01 dB

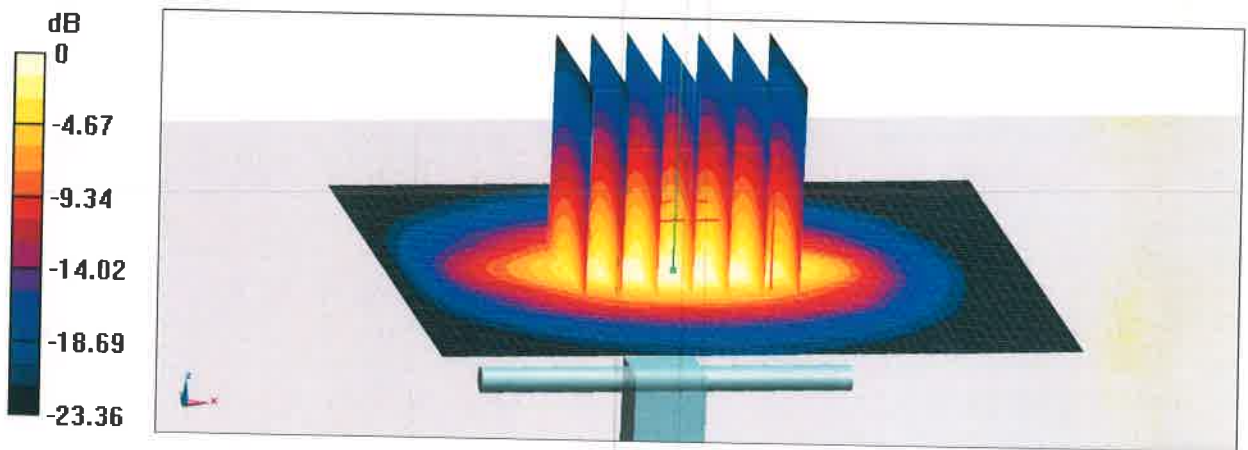
Peak SAR (extrapolated) = 28.2 W/kg

**SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.02 W/kg**

Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 46.4%

Maximum value of SAR (measured) = 22.6 W/kg



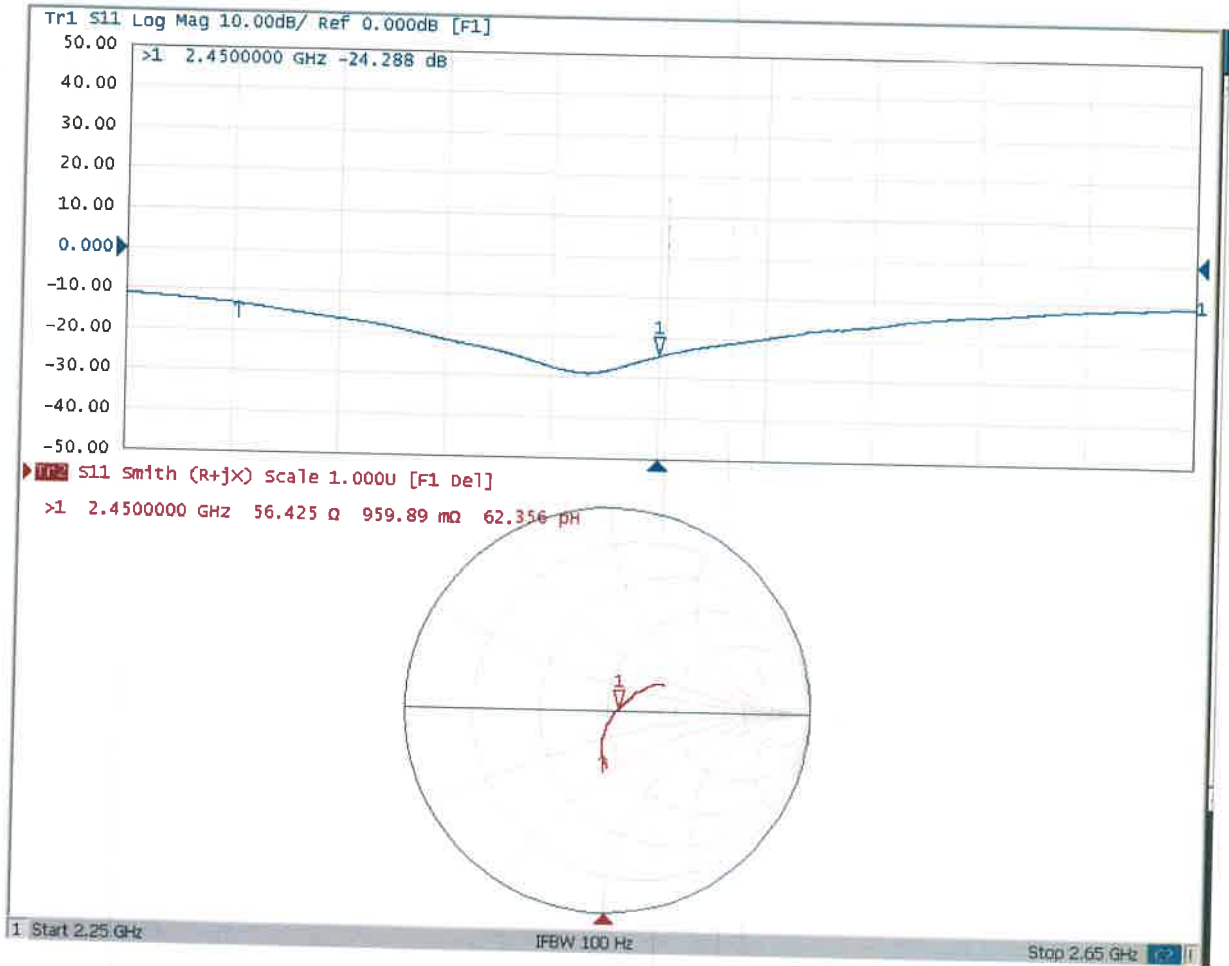
0 dB = 22.6 W/kg = 13.54 dBW/kg



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### Impedance Measurement Plot for Head TSL





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 CNAS L0570

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Certificate No: Z21-60534

## CALIBRATION CERTIFICATE

Object

D5GHzV2 - SN: 1231

Calibration Procedure(s)

FF-Z11-003-01

Calibration Procedures for dipole validation kits

Calibration date:

December 16, 2021

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|---|-----------------------|
| Power Meter NRP2        | 106277     | 24-Sep-21 (CTTL, No.J21X08326)            | Sep-22                |
| Power sensor NRP8S      | 104291     | 24-Sep-21 (CTTL, No.J21X08326)            | Sep-22                |
| ReferenceProbe EX3DV4   | SN 3617    | 27-Jan-21(SPEAG,No.EX3-3617_Jan21)        | Jan-22                |
| DAE4                    | SN 1556    | 15-Jan-21(SPEAG,No.DAE4-1556_Jan21)       | Jan-22                |
| Secondary Standards     | ID #       | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
| Signal Generator E4438C | MY49071430 | 01-Feb-21 (CTTL, No.J21X00593)            | Jan-22                |
| NetworkAnalyzerE5071C   | MY46110673 | 14-Jan-21 (CTTL, No.J21X00232)            | Jan-22                |

|                | Name        | Function           | Signature |
|----------------|-------------|--------------------|-----------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer  |           |
| Reviewed by:   | Lin Hao     | SAR Test Engineer  |           |
| Approved by:   | Qi Dianyuan | SAR Project Leader |           |

Issued: December 24, 2021

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### Glossary:

|       |  |
|-------|--|
| TSL   | tissue simulating liquid                   |
| ConvF | sensitivity in TSL / NORM <sub>x,y,z</sub> |
| 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, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, 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%.





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### Measurement Conditions

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

|                                     |  |                                  |
|-------------------------------------|--|----------------------------------|
| <b>DASY Version</b>                 | DASY52   | V52.10.4                         |
| <b>Extrapolation</b>                | Advanced Extrapolation                                   |                                  |
| <b>Phantom</b>                      | Triple Flat Phantom 5.1C                                 |                                  |
| <b>Distance Dipole Center - TSL</b> | 10 mm  | with Spacer                      |
| <b>Zoom Scan Resolution</b>         | dx, dy = 4 mm, dz = 1.4 mm                               | Graded Ratio = 1.4 (Z direction) |
| <b>Frequency</b>                    | 5250 MHz ± 1 MHz<br>5600 MHz ± 1 MHz<br>5750 MHz ± 1 MHz |                                  |

### Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

|  | Temperature     | Permittivity | Conductivity     |
|--|-----------------|--------------|------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C         | 35.9         | 4.71 mho/m       |
| <b>Measured Head TSL parameters</b>            | (22.0 ± 0.2) °C | 35.7 ± 6 %   | 4.69 mho/m ± 6 % |
| <b>Head TSL temperature change during test</b> | <1.0 °C         | ----         | ----             |

### SAR result with Head TSL at 5250 MHz

|   |                    |                                 |
|---|--------------------|---------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>   | Condition          |                                 |
| SAR measured  | 100 mW input power | 7.80 W/kg                       |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>77.9 W/kg ± 24.4 % (k=2)</b> |
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                 |
| SAR measured  | 100 mW input power | 2.26 W/kg                       |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>22.6 W/kg ± 24.2 % (k=2)</b> |



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### Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

|  | Temperature     | Permittivity | Conductivity     |
|--|-----------------|--------------|------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C         | 35.5         | 5.07 mho/m       |
| <b>Measured Head TSL parameters</b>            | (22.0 ± 0.2) °C | 35.1 ± 6 %   | 5.07 mho/m ± 6 % |
| <b>Head TSL temperature change during test</b> | <1.0 °C         | ----         | ----             |

### SAR result with Head TSL at 5600 MHz

|   |                    |                                 |
|---|--------------------|---------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>   | Condition          |                                 |
| SAR measured  | 100 mW input power | 8.11 W/kg                       |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>80.9 W/kg ± 24.4 % (k=2)</b> |
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                 |
| SAR measured  | 100 mW input power | 2.34 W/kg                       |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>23.3 W/kg ± 24.2 % (k=2)</b> |

### Head TSL parameters at 5750 MHz

The following parameters and calculations were applied.

|  | Temperature     | Permittivity | Conductivity     |
|--|-----------------|--------------|------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C         | 35.4         | 5.22 mho/m       |
| <b>Measured Head TSL parameters</b>            | (22.0 ± 0.2) °C | 34.9 ± 6 %   | 5.23 mho/m ± 6 % |
| <b>Head TSL temperature change during test</b> | <1.0 °C         | ----         | ----             |

### SAR result with Head TSL at 5750 MHz

|   |                    |                                 |
|---|--------------------|---------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>   | Condition          |                                 |
| SAR measured  | 100 mW input power | 7.85 W/kg                       |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>78.3 W/kg ± 24.4 % (k=2)</b> |
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                 |
| SAR measured  | 100 mW input power | 2.25 W/kg                       |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>22.4 W/kg ± 24.2 % (k=2)</b> |



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## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL at 5250 MHz

|                                      |                |
|--------------------------------------|----------------|
| Impedance, transformed to feed point | 49.0Ω - 5.89jΩ |
| Return Loss                          | - 24.4dB       |

### Antenna Parameters with Head TSL at 5600 MHz

|                                      |                |
|--------------------------------------|----------------|
| Impedance, transformed to feed point | 50.6Ω - 1.18jΩ |
| Return Loss                          | - 37.7dB       |

### Antenna Parameters with Head TSL at 5750 MHz

|                                      |                |
|--------------------------------------|----------------|
| Impedance, transformed to feed point | 54.7Ω + 0.03jΩ |
| Return Loss                          | - 26.9dB       |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.102 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 |
|-----------------|-------|



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## DASY5 Validation Report for Head TSL

Date: 2021-12-16

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1231**

Communication System: CW; Frequency: 5250 MHz, Frequency: 5600 MHz,  
Frequency: 5750 MHz,

Medium parameters used:  $f = 5250$  MHz;  $\sigma = 4.692$  S/m;  $\epsilon_r = 35.68$ ;  $\rho = 1000$  kg/m<sup>3</sup>,  
Medium parameters used:  $f = 5600$  MHz;  $\sigma = 5.071$  S/m;  $\epsilon_r = 35.08$ ;  $\rho = 1000$  kg/m<sup>3</sup>,  
Medium parameters used:  $f = 5750$  MHz;  $\sigma = 5.234$  S/m;  $\epsilon_r = 34.86$ ;  $\rho = 1000$  kg/m<sup>3</sup>,

Phantom section: Right Section

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

### DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(5.4, 5.4, 5.4) @ 5250 MHz; ConvF(5, 5, 5) @ 5600 MHz; ConvF(5.12, 5.12, 5.12) @ 5750 MHz; Calibrated: 2021-01-27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2021-01-15
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

### Dipole Calibration /Pin=100mW, d=10mm, f=5250 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 71.60 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 30.6 W/kg

**SAR(1 g) = 7.8 W/kg; SAR(10 g) = 2.26 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.4 mm

Ratio of SAR at M2 to SAR at M1 = 65.4%

Maximum value of SAR (measured) = 17.9 W/kg

### Dipole Calibration /Pin=100mW, d=10mm, f=5600 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 70.58 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 34.6 W/kg

**SAR(1 g) = 8.11 W/kg; SAR(10 g) = 2.34 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.4 mm

Ratio of SAR at M2 to SAR at M1 = 63.1%

Maximum value of SAR (measured) = 20.0 W/kg



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**Dipole Calibration /Pin=100mW, d=10mm, f=5750 MHz/Zoom Scan,**  
**dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm**  
Reference Value = 68.78 V/m; Power Drift = 0.00 dB

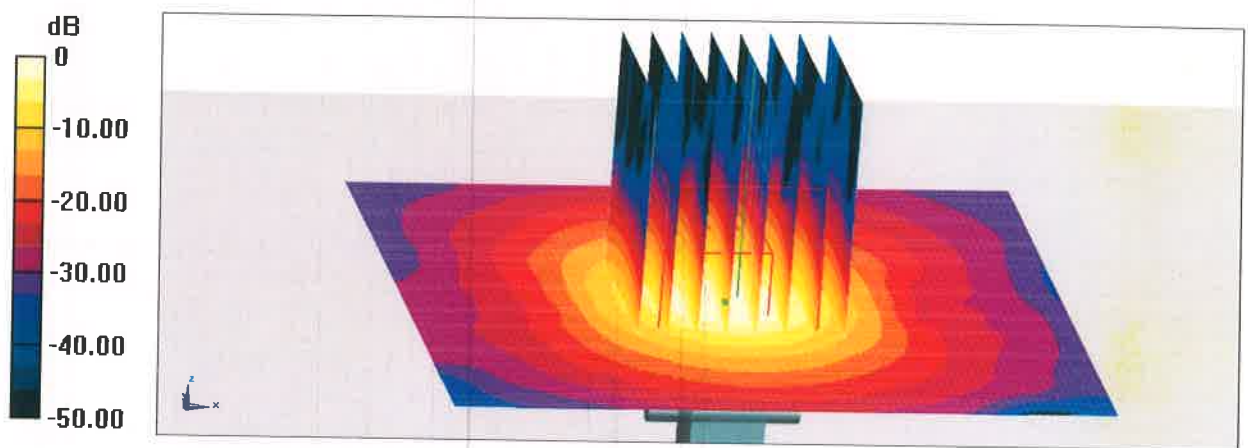
Peak SAR (extrapolated) = 34.7 W/kg

**SAR(1 g) = 7.85 W/kg; SAR(10 g) = 2.25 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.4 mm

Ratio of SAR at M2 to SAR at M1 = 62%

Maximum value of SAR (measured) = 18.9 W/kg



**0 dB = 18.9 W/kg = 12.76 dBW/kg**



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### Impedance Measurement Plot for Head TSL

