# RF EXPOSURE TEST REPORT

## Test Report No. 15192522H-A-R1

| | |
|---|---|
| **Customer** | **Murata Manufacturing Co., Ltd.** |
| **Description of EUT** | **Communication Module** |
| **Model Number of EUT** | **2FJ** |
| **FCC ID** | **VPYLB2FJ1** |
| **Test Regulation** | **FCC47CFR 2.1093** |
| **Test Result** | **Complied** |
| **Issue Date** | **October 21, 2024** |
| **Remarks** | - For Permissive change<br>- This is a SAR report which one of the RF exposures.<br>*The highest reported SAR<br>Standalone 0.16 W/kg |

| Representative test engineer | Approved by |
|---|---|
| Tomohisa Nakagawa<br>Engineer | Satofumi Matsuyama<br>Engineer |

CERTIFICATE 5107.02

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.
☒ There is no testing item of "Non-accreditation".

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 23.0

# ANNOUNCEMENT

- This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
- The results in this report apply only to the sample tested. (Laboratory was not involved in sampling.)
- This sample tested is in compliance with the limits of the above regulation.
- The test results in this test report are traceable to the national or international standards.
- This test report must not be used by the customer to claim product certification, approval, or endorsement by the A2LA accreditation body.
- This test report covers RF exposure technical requirements.
- It does not cover administrative issues such as Manual or non-RF exposure test related Requirements. (if applicable)
- The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
- The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan, Inc. has been accredited.
- The information provided by the customer for this report is identified in SECTION 1.
- The laboratory is not responsible for information provided by the customer which can impact the validity of the results.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

# REVISION HISTORY

## Original Test Report No. 15192522H-A

This report is a revised version of 15192522H-A. 15192522H-A is replaced with this report.

| Revision | Test report No. | Date | Page Revised Contents |
|---|---|---|---|
| - (Original) | 15192522H-A | October 15, 2024 | - |
| 1 | 15192522H-A-R1 | October 21, 2024 | **Section 9.1**<br>Table Test exemption<br>-Modified tune up limit of BT BR.<br>8.50 dBm → 8.65 dBm<br>7.08 mW → 7.33 mW |

**Reference: Abbreviations (Including words undescribed in this report)**

| | | | |
|---|---|---|---|
| AAN | Asymmetric Artificial Network | GPS | Global Positioning System |
| AC | Alternating Current | Hori. | Horizontal |
| AM | Amplitude Modulation | ICES | Interference-Causing Equipment Standard |
| AMN | Artificial Mains Network | I/O | Input/Output |
| Amp, AMP | Amplifier | IEC | International Electrotechnical Commission |
| ANSI | American National Standards Institute | IEEE | Institute of Electrical and Electronics Engineers |
| Ant, ANT | Antenna | IF | Intermediate Frequency |
| AP | Access Point | ILAC | International Laboratory Accreditation Conference |
| ASK | Amplitude Shift Keying | ISED | Innovation, Science and Economic Development Canada |
| Atten., ATT | Attenuator | ISN | Impedance Stabilization Network |
| AV | Average | ISO | International Organization for Standardization |
| BPSK | Binary Phase-Shift Keying | JAB | Japan Accreditation Board |
| BR | Bluetooth Basic Rate | LAN | Local Area Network |
| BT | Bluetooth | LCL | Longitudinal Conversion Loss |
| BT LE | Bluetooth Low Energy | LIMS | Laboratory Information Management System |
| BW | BandWidth | LISN | Line Impedance Stabilization Network |
| C.F | Correction Factor | MRA | Mutual Recognition Arrangement |
| Cal Int | Calibration Interval | N/A | Not Applicable |
| CAV | CISPR AV | NIST | National Institute of Standards and Technology |
| CCK | Complementary Code Keying | NS | No signal detect. |
| CDN | Coupling Decoupling Network | NSA | Normalized Site Attenuation |
| Ch., CH | Channel | OBW | Occupied BandWidth |
| CISPR | Comite International Special des Perturbations Radioelectriques | OFDM | Orthogonal Frequency Division Multiplexing |
| Corr. | Correction | PER | Packet Error Rate |
| CPE | Customer premise equipment | PK | Peak |
| CW | Continuous Wave | $P_{LT}$ | long-term flicker severity |
| DBPSK | Differential BPSK | POHC(A) | Partial Odd Harmonic Current |
| DC | Direct Current | Pol., Pola. | Polarization |
| DET | Detector | PR-ASK | Phase Reversal ASK |
| D-factor | Distance factor | $P_{ST}$ | short-term flicker severity |
| Dmax | maximum absolute voltage change during an observation period | QAM | Quadrature Amplitude Modulation |
| DQPSK | Differential QPSK | QP | Quasi-Peak |
| DSSS | Direct Sequence Spread Spectrum | QPSK | Quadrature Phase Shift Keying |
| DUT | Device Under Test | r.m.s., RMS | Root Mean Square |
| EDR | Enhanced Data Rate | RBW | Resolution BandWidth |
| e.i.r.p., EIRP | Equivalent Isotropically Radiated Power | RE | Radio Equipment |
| EM clamp | Electromagnetic clamp | REV | Reverse |
| EMC | ElectroMagnetic Compatibility | RF | Radio Frequency |
| EMI | ElectroMagnetic Interference | RFID | Radio Frequency Identifier |
| EMS | ElectroMagnetic Susceptibility | RNSS | Radio Navigation Satellite Service |
| EN | European Norm | RSS | Radio Standards Specifications |
| e.r.p., ERP | Effective Radiated Power | Rx | Receiving |
| ETSI | European Telecommunications Standards Institute | SINAD | Ratio of (Signal + Noise + Distortion) to (Noise + Distortion) |
| EU | European Union | S/N | Signal to Noise ratio |
| EUT | Equipment Under Test | SA, S/A | Spectrum Analyzer |
| Fac. | Factor | SG | Signal Generator |
| FCC | Federal Communications Commission | SVSWR | Site-Voltage Standing Wave Ratio |
| FHSS | Frequency Hopping Spread Spectrum | THC(A) | Total Harmonic Current |
| FM | Frequency Modulation | THD(%) | Total Harmonic Distortion |
| Freq. | Frequency | TR, T/R | Test Receiver |
| FSK | Frequency Shift Keying | Tx | Transmitting |
| Fund | Fundamental | VBW | Video BandWidth |
| FWD | Forward | Vert. | Vertical |
| GFSK | Gaussian Frequency-Shift Keying | WLAN | Wireless LAN |
| GNSS | Global Navigation Satellite System | xDSL | Generic term for all types of DSL technology |
| | | | (DSL: Digital Subscriber Line) |

Contains

# Section 1 Customer information

| | |
|---|---|
| Company Name | Murata Manufacturing Co., Ltd. |
| Address | 1-10-1 Higashikotari, Nagaokakyo-shi, Kyoto 617-8555 Japan |
| Telephone Number | +81-50-1737-2801 |
| Contact Person | Kenji Hayashikoshi |

The information provided by the customer is as follows;
- Customer, Description of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer Information
- SECTION 2: Equipment Under Test (EUT) other than the Receipt Date and Test Date
- Appendix Antenna location

# Section 2 Equipment under test (EUT)

## 2.1 Identification of EUT

| | |
|---|---|
| Description | Communication Module |
| Model Number | 2FJ |
| Serial Number | 8 |
| Condition | Engineering prototype<br>(Not for Sale: This sample is equivalent to mass-produced items.) |
| Modification | No Modification by the test lab |
| Receipt Date | September 9, 2024 for SAR<br>June 6, 2024 for power measurement |
| Test Date | September 30, 2024 for SAR<br>June 6, 2024 for power measurement |

EUT operates only with the specified Digital Camera.
Therefore the test was performed with the Digital Camera (Host) in which the distance to the exterior surface is shortest.

## 2.2 Product description

**General Specification**

| | |
|---|---|
| Rating | Typ: DC 3.3 V / Min: DC 3.0 V / Max: DC 3.6 V |
| Body-worn accessory | ☒ None ☐Belt clip ☐ earphone |
| Battery option | ☒ None ☐( ) |

## 2.3 Radio Specification

**WLAN (IEEE802.11b/11g/11n-20)**

| | |
|---|---|
| Equipment Type | Transceiver |
| Frequency of Operation | 2412 MHz to 2462 MHz |
| Type of Modulation | DSSS, OFDM |
| Antenna Gain | 1.33 dBi |

**Bluetooth (BR/EDR/Low Energy)**

| | |
|---|---|
| Equipment Type | Transceiver |
| Frequency of Operation | 2402 MHz to 2480 MHz |
| Type of Modulation | BT: FHSS (GFSK, π/4 DQPSK, 8 DPSK)<br>BT LE: GFSK |
| Antenna Gain | 1.33 dBi |

## 2.4 Software information

The power value of the EUT was set for testing as follows (setting value might be different from product specification value).

[BT]
Software: Written in FW for SAR
Power settings: setting file are 2FJ certification.hcd and 2FJ certification_BLE.hcd

[WLAN]
Software: Tera term version 4.106.0.0
Power settings: shown in appendix of power measurement

*This setting of software is the worst case.

Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

## 2.5 Tune-up tolerance information

If not specified, listed values are maximum power level.
For WLAN Maximum tune-up tolerance limit is defined by a customer as duty100%.

### 2.5.1 WLAN

| Band [GHz] | BW [MHz] | Output Power [dBm] | Output Power [mW] |
|---|---|---|---|
| 2.4 | 20 | 10.5 | 11.22 |

### 2.5.2 BT

| Mode | Output Power [dBm] | Output Power [mW] |
|---|---|---|
| BT BR | 8.65 | 7.33 |
| BT EDR | 8.65 | 7.33 |
| BT LE | 8.65 | 7.33 |

## 2.6 Antenna information

Antenna location information is shown in appendix.

### 2.6.1 Antenna configuration

The EUT has an antenna, which transmits WLAN/BT

### 2.6.2 Simultaneous transmission combinations

This device does not have a concurrent transmission, only supported single transmission.

### 2.6.3 Antenna location

| Position | [mm] |
|---|---|
| Front | 137.3 |
| Rear | 34.4 |
| Left | 6.8 |
| Right | 140.0 |
| Top | 44.2 |
| Bottom | 19.8 |

### 2.6.4 Antenna gain

Antenna gain 1.33 dBi for WLAN/BT

## Section 3 Definitions

This may contain the definitions which are not used in this report.

| | |
|---|---|
| Specific Absorption Rate (SAR) | The time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ), as shown in the following equation:<br>$$SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dV}\right)$$ |
| Power density (PD) or $S_{av}$ | The energy per unit time and unit area crossing a surface of area *A* characterized by the normal unit vector **n**ˆ and averaging time.<br>$$S_{av} = \frac{1}{AT}\iint (E \times H) \cdot \hat{n} dA dT$$ |
| Absorbed power density (APD) | The APD (absorbed power density) shall be derived from the measured SAR values using the formulas in the Compliance Assessment of the Epithelial.<br>*APD 1cm²(W/m²) = 10(kg/m²) × SAR_1g(W/kg)*<br>*APD 4cm²(W/m²) = 20(kg/m²) ×SAR_8g(W/kg)* |
| Reported SAR / PD (IPD or APD) | Measured SAR / PD (IPD or APD) is scaled to the maximum tune-up tolerance limit and the maximum duty by the following formulas.<br>$$Reported\ \text{SAR, PD} = Measured\ \text{SAR, or PD} \times scale\ factor\ for\ power \times scaled\ factor\ for\ duty(if\ needed) \times Compensatefactor(if\ needed)$$<br>*Where:*<br>$$Scaled\ factor\ for\ duty = \frac{1}{Duty}$$<br>$$Compensate\ factor = 10^{\frac{measurement\ uncert.[dB]}{10}} - 1 + 0.7$$ |
| Maximum Tune-up tolerance limit, Tune up limit or Tune-up limit | Maximum power including tolerance power specified by customer. |

| Symbol | Quantity | Unit | Dimensions |
|---|---|---|---|
| E | Electric field | volt per meter | V / m |
| f | Frequency | hertz | Hz |
| H | Magnetic field | ampere per meter | A / m |
| λ | Wavelength | meter | m |
| S | Local power density | watt per square meter | W / m² |
| PD | Spatial-average power density | watt per square meter | W / m² or mW / cm² |
| SAR | Specific Absorption Rate | watt per square meter | W / kg |

# Section 4 Test standard information

## 4.1 Test specification

| | |
|---|---|
| ☒FCC47CFR 2.1093 | RF Exposure Procedures and Equipment Authorization Policies for Portable Devices |
| ☐RSS-102 Issue 6 | Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) |
| ☐RSS-102 Issue 5 Amendment 1 | Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) |

## 4.2 Published RF exposure KDB procedures and companion procedures

| Name of documents | Title |
|---|---|
| ☐KDB 447498 D01(v06) | RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices |
| ☒KDB 447498 D04(v01) | Interim General RF Exposure Guidance |
| ☐KDB 447498 D02(v02r01) | SAR Measurement Procedures for USB Dongle Transmitters |
| ☐KDB 648474 D04(v01r04) | SAR Evaluation Considerations for Wireless Handsets |
| ☐KDB 941225 D01(v03r01) | 3G SAR Measurement Procedures |
| ☐KDB 941225 D05(v02r05) | SAR Evaluation Considerations for LTE Devices |
| ☐KDB 941225 D06(v02r01) | SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities |
| ☐KDB 941225 D07(v01r02) | SAR Evaluation Procedures for UMPC Mini-Tablet Devices |
| ☐KDB 616217 D04(v01r02) | SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers |
| ☒KDB 865664 D01(v01r04) | SAR Measurement Requirements for 100MHz to 6 GHz |
| ☒KDB 248227 D01(v02r02) | SAR Guidance for IEEE 802.11 (Wi-Fi) transmitters |
| ☐KDB 680106 D01(v04) | Equipment authorization of wireless power transfer device |
| ☐SPR-APD Issue 1 | Supplementary Procedure for Assessing Specific Absorption Rate (SAR) and Absorbed Power Density (APD) Compliance of Portable Devices in the 6 GHz Band (5925-7125 MHz) |
| ☐RSS-102.SAR.MEAS | Measurement Procedure for Assessing Specific Absorption Rate (SAR) Compliance in Accordance with RSS-102 |
| ☐Authority inquiry response | Included in the submission document. |

## 4.3 Work Procedures

| Name of documents | Title or details |
|---|---|
| ☒C/N: Work Instructions-ULID-003598 | UL Japan, Inc.'s SAR Measurement Equipment Calibration and Inspection Work Procedure |
| ☒C/N: Work Instructions-ULID-003599 | UL Japan, Inc.'s SAR Measurement Work Procedure |
| ☒IEEE Std 1528-2013 | IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques. |
| ☐IEC/IEEE 62209-1528 Edition 1.0 2020-10 | 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 - Human models, instrumentation and procedures (Frequency range of 4 MHz to 10 GHz) |
| ☒ IEC 62209-1 | Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Part 1: Devices used next to the ear (Frequency range of 300 MHz to 6 GHz) |
| ☐C/N: Work Instructions-ULID-003619 | UL Japan, Inc.'s Power Density Measurement Procedure |
| ☐IEC/IEEE 63195-1:2021 | Assessment of power density of human exposure to radio frequency fields from wireless devices in close proximity to the head and body (frequency range of 6 GHz to 300 GHz) - Part 1: Measurement procedure |
| ☐IEC/IEEE 63195-2:2021 | Assessment of power density of human exposure to radio frequency fields from wireless devices in close proximity to the head and body (frequency range of 6 GHz to 300 GHz) - Part 2: Computational procedure |

## 4.4 Addition to Standard

No addition, exclusion nor deviation has been made from the standard.

## 4.5 Reference

Schmid & Partner Engineering AG, DASY Manual
TCB workshop slide decks.

# Section 5 Limits

General Population / Uncontrolled Environments limit is applied.

## 5.1 Exposure limit for SAR (FCC)

(A) Limits for Occupational/Controlled Exposure (W/kg)

| Spatial Average (averaged over the whole body) | Spatial Peak (averaged over any 1g of tissue) | Spatial Peak (hands/wrists/feet/ankles averaged over 10g) |
|---|---|---|
| 0.4 | 8.0 | 20.0 |

(B) Limits for General population/Uncontrolled Exposure (W/kg)

| Spatial Average (averaged over the whole body | Spatial Peak (averaged over any 1g of tissue) | Spatial Peak (hands/wrists/feet/ankles averaged over 10g) |
|---|---|---|
| 0.08 | 1.6 | 4.0 |

Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. because of employment or occupation).

General Population/Uncontrolled Environments: are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

## 5.2 For PD (Above 6 GHz) (FCC)

| Frequency Range [MHz] | Power Density [$mW/cm^2$] | Average Time [Minutes] |
|---|---|---|
| (A) Limits For Occupational / Controlled Environments | | |
| 1,500 – 100,000 | 5 | 6 |
| (B) Limits For General Population / Uncontrolled Environments | | |
| 1,500 – 100,000 | 1 | 30 |

Note: 1.0 $mW/cm^2$ is 10 $W/m^2$

# Section 6 Location

UL Japan, Inc. Ise EMC Lab.
Shielded room for SAR testing.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81-596-24-8999

A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919
ISED Lab Company Number: 2973C / CAB identifier: JP0002

# Section 7 Test result

## 7.1 Verdict

Complied
Higest result are next section.

## 7.2 Stand-alone SAR result

| RF Exposure Conditions | | Highest Reported exposure value | | | | | |
|---|---|---|---|---|---|---|---|
| | | WWAN | 2.4 GHz (Including BT LE) | 2.4 GHz (BT BR/EDR) | (5 to 6) GHz | (6 to 10) GHz | RFID |
| Standalone Tx (1-g SAR) (W/kg) | Head | N/A | N/A | N/A | N/A | N/A | N/A |
| | Body | N/A | 0.162 | 0.077 | N/A | N/A | N/A |
| | Hotspot | N/A | N/A | N/A | N/A | N/A | N/A |
| Standalone Tx (10-g SAR) (W/kg) | Limbs | N/A | N/A | N/A | N/A | N/A | N/A |
| Standalone Tx (Power density) ($W/m^2$) | | N/A | N/A | N/A | N/A | N/A | N/A |

Details are shown in appendix.

## 7.3 Simultaneous transmission SAR result

Not applicable because of no combination transmitters simutanoeusly.

# Section 8 Uncertainty

## 8.1 0.3GHz - 6GHz range

| Error Description | Uncert. value | | Prob. Dist. | Div. | (ci) 1g | (ci) 10g | Std. Unc. (1g) | Std.Unc. (10g) |
|---|---|---|---|---|---|---|---|---|
| **Measurement System Errors** | | | | | | | | |
| Probe Calibration | ± 13.10 | % | N | 2 | 1 | 1 | ±6.6% | ±6.55% |
| Probe Calibration Drift | ± 1.7 | % | R | √3 | 1 | 1 | ±1.0% | ±1.0% |
| Probe Linearity | ± 4.7 | % | R | √3 | 1 | 1 | ±2.7% | ±2.7% |
| Broadband Signal | ± 2.6 | % | R | √3 | 1 | 1 | ±1.5% | ±1.5% |
| Probe Isotropy | ± 7.6 | % | R | √3 | 1 | 1 | ±4.4% | ±4.4% |
| Other Probe ᵌElectronic | ± 1.2 | % | N | 1 | 1 | 1 | ±1.2% | ±1.2% |
| RF Ambient | ± 1.8 | % | N | 1 | 1 | 1 | ±1.8% | ±1.8% |
| Probe Positioning | ± 0.005 | mm | N | 1 | 0.29 | 0.29 | ±0.2% | ±0.2% |
| Data Processing | ± 2.3 | % | N | 1 | 1 | 1 | ±2.3% | ±2.3% |
| **Phantom and Device Errors** | | | | | | | | |
| Conductivity (meas.)$^{DAK}$ | ± 10.0 | % | N | 1 | 0.78 | 0.71 | ±7.8% | ±7.1% |
| Conductivity (temp.)$^{BB}$ | ± 10.0 | % | R | √3 | 0.78 | 0.71 | ±4.5% | ±4.1% |
| Phantom Permittivity | ± 14.0 | % | R | √3 | 0.25 | 0.25 | ±2.0% | ±2.0% |
| Distance DUT - TSL | ± 2.0 | % | N | 1 | 2 | 2 | ±4.0% | ±4.0% |
| Device Positioning (+/- 0.5mm) | ± 1.0 | % | N | 1 | 1 | 1 | ±1.0% | ±1.0% |
| Device Holder | ± 3.6 | % | N | 1 | 1 | 1 | ±3.6% | ±3.6% |
| DUT Modulation$^{m}$ | ± 2.4 | % | R | √3 | 1 | 1 | ±1.4% | ±1.4% |
| Time-average SAR | ± 1.7 | % | R | √3 | 1 | 1 | ±1.0% | ±1.0% |
| DUT drift | ± 2.5 | % | N | 1 | 1 | 1 | ±2.5% | ±2.5% |
| Val Antenna Unc.$^{val}$ | ± 0.0 | % | N | 1 | 1 | 1 | ±0.0% | ±0.0% |
| Unc. Input Power$^{val}$ | ± 0.0 | % | N | 1 | 1 | 1 | ±0.0% | ±0.0% |
| **Correction to the SAR results** | | | | | | | | |
| Deviation to Target | ± 1.9 | % | N | 1 | 1 | 0.84 | ±1.9% | ±1.6% |
| SAR scaling$^{p}$ | ± 0.0 | % | R | √3 | 1 | 1 | ±0.0% | ±0.0% |
| Combined Std. Uncertainty | | | | | | | ±14.5% | ±14.0% |
| **Expanded STD Uncertainty (κ=2)** | | | | | | | ±29.1% | ±28.0% |

# Section 9 RF Exposure Conditions

## 9.1 SAR-based Exemption - FCC section 1.1307

Exception condition as per section 1.1307 (b)(3)(i)(B)
the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold $P_{th}$ (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). $P_{th}$ is given by:

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

*Where*

$$x = -log_{10}\left(\frac{60}{ERP_{20dm}\sqrt{f}}\right)\ and\ f\ is\ in\ GHz;$$

*And*

$$ERP_{20cm}(mW) = \begin{cases} 2040\ f & 0.3\ GHz \leq f < 1.5\ GHz \\ 3060 & 1.5\ GHz \leq f \leq 6\ GHz \end{cases}$$

d = the separation distance in cm.

In the table below, when the minimum test separation distance is < 5 mm, a distance, 5 mm, is applied to determine SAR test exclusion[1].

when 10-g extremity SAR applies, SAR test exemption is considered by applying a factor of 2.5 to the SAR-based exemption thresholds.

As per section 1.1307 (b)(2)
*Separation distance* is the minimum distance in any direction from any part of a radiating structure and any part of the body of a nearby person.

*Radiating structure* is an unshielded RF current-carrying conductor that generates an RF reactive near electric or magnetic field and/or radiates an RF electromagnetic wave. It is the component of an RF source that transmits, generates, or reradiates an RF fields, such as an antenna, aperture, coil, or plate.

Table Test exemption

| RAT | Frequency | Output Power | | Ant Gain | ERP | | Separation Distances / Pth / Jadge | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | dBm | mW | dBi | dBm | mW | Front | Rear | Left | Right | Top | Bottom |
| BT BR | 2402.00 | 8.65 | 7.33 | 1.33 | 7.84 | 6.08 | 137.3 mm / 1498.61 mW / Excluded | 34.4 mm / 108.36 mW / Excluded | 6.8 mm / 5.00 mW / Required | 140 mm / 1555.03 mW / Excluded | 44.2 mm / 174.37 mW / Excluded | 19.8 mm / 37.98 mW / Excluded |
| WLAN 2.4 | 2412.00 | 10.50 | 11.22 | 1.33 | 9.69 | 9.31 | 137.3 mm / 1498.10 mW / Excluded | 34.4 mm / 108.19 mW / Excluded | 6.8 mm / 4.98 mW / Required | 140 mm / 1554.53 mW / Excluded | 44.2 mm / 174.13 mW / Excluded | 19.8 mm / 37.90 mW / Excluded |

## 9.2 Test position

According to the previous considerations, following position is required.

The test was conservatively performed with test distance 0 mm.

Table Test position

| Position | Separation distance | Test is |
|---|---|---|
| Front | 0 mm | ☐ |
| Rear | 0 mm | ☐ |
| Left | 0 mm | ☒ |
| Right | 0 mm | ☐ |
| Top | 0 mm | ☐ |
| Bottom | 0 mm | ☐ |

[1] TCB workshop slide deck October 2021.

# Section 10 Dielectric Property

## 10.1 Dielectric Property for SAR

The dielectric parameters were checked prior to assessment using the DAK dielectric probe kit.

+/- 5 % tolerances are required for εr and σ and below table is the target value of the simulated tissue liquid.

For SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013 or IEC/IEEE 62209-1528, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for εr and σ may be relaxed to ± 10%.

The dielectric parameters are linearly interpolated between the closest pair of target frequencies to determine the applicable dielectric parameters corresponding to the device test frequency.

Tissue dielectric parameters are typically re-measured every three to four days or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

Measured value is rounded off on the test plot data, so some differences might be observed. However, differences don't affect the result of SAR. Results are listed in appendix.

Table standard parameters on the IEC 62209-1[2]

| Frequency MHz | Relative permittivity $\varepsilon_r$ | Conductivity S/m |
|---|---|---|
| 300 | 45.3 | 0.87 |
| 450 | 43.5 | 0.87 |
| 750 | 41.9 | 0.89 |
| 835 | 41.5 | 0.90 |
| 900 | 41.5 | 0.97 |
| 1450 | 40.5 | 1.20 |
| 1500 | 40.4 | 1.23 |
| 1640 | 40.2 | 1.31 |
| 1750 | 40.1 | 1.37 |
| 1800 | 40.0 | 1.40 |
| 1900 | 40.0 | 1.40 |
| 2000 | 40.0 | 1.40 |
| 2100 | 39.8 | 1.49 |

| Frequency MHz | Relative permittivity $\varepsilon_r$ | Conductivity S/m |
|---|---|---|
| 2300 | 39.5 | 1.67 |
| 2450 | 39.2 | 1.80 |
| 2600 | 39.0 | 1.96 |
| 3000 | 38.5 | 2.40 |
| 3500 | 37.9 | 2.91 |
| 4000 | 37.4 | 3.43 |
| 4500 | 36.8 | 3.94 |
| 5000 | 36.2 | 4.45 |
| 5200 | 36.0 | 4.66 |
| 5400 | 35.8 | 4.86 |
| 5600 | 35.5 | 5.07 |
| 5800 | 35.3 | 5.27 |
| 6000 | 35.1 | 5.48 |

Table standard parameters on the IEC/IEEE 62209-1528[3],

| Frequency MHz | Real part of the complex relative permittivity, $\varepsilon_r$ | Conductivity, σ S/m |
|---|---|---|
| 6000 | 35.1 | 5.48 |
| 6500 | 34.5 | 6.07 |
| 7000 | 33.9 | 6.65 |
| 7500 | 33.3 | 7.24 |
| 8000 | 32.7 | 7.84 |
| 8500 | 32.1 | 8.46 |
| 9000 | 31.6 | 9.08 |
| 9500 | 31.0 | 9.71 |
| 10000 | 30.4 | 10.40 |

| Frequency MHz | Real part of the complex relative permittivity, $\varepsilon_r$ | Conductivity, σ S/m |
|---|---|---|
| 4 | 55.0 | 0.75 |
| 13 | 55.0 | 0.75 |
| 30 | 55.0 | 0.75 |

[2] TCB workshop April 2019, Tissue Simulating Liquids (TSL)
[3] TCB workshop October 2020, for U-NII 6-7GHz Measurement considerations.

# Section 11 SAR Measurements

## 11.1 Measurement configuration for SAR

### 11.1.1 SAR evaluation procedure

**The evaluation was performed with the following procedure:**

**Step 1:** Measurement of the E-field at a fixed location above the ear point, central position of flat phantom or found highest point based on fast scan was used as a reference value for assessing the power drop.

**Step 2:** The SAR distribution at the exposed side of head or body position was measured at a distance of each device from the inner surface of the shell. The area covered the entire dimension of the antenna of EUT and the horizontal grid spacing was based on standard's grids size.

**Step 3:** Around this point found in the Step 2 (area scan), zoom scan is conducted based on the standard's grids size.

And for any secondary peaks found in the Step2 which are within 2 dB of maximum peak and not with this Step3 (Zoom scan) is repeated. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

**Step 4**: Re-measurement of the point of SAR at the same location as in Step 1.
Confirmation after SAR testing
It was checked that the power drift [W/kg] is within +/-5 %. The verification of power drift during the SAR test is that DASY system calculates the power drift by measuring the e-filed at the same location at beginning and the end of the scan measurement for each test position.

DASY system calculation power drift value [dB] = $10 \log (\frac{Wa}{Wb})$
Before SAR testing : Wb [W/kg]
After SAR testing : Wa [W/kg]

Limit of power drift[W] = +/- 5 %
X[dB] = 10log[P] = 10log(1.05/1) = 10log(1.05) -10log(1) = 0.212 dB

Table step size.

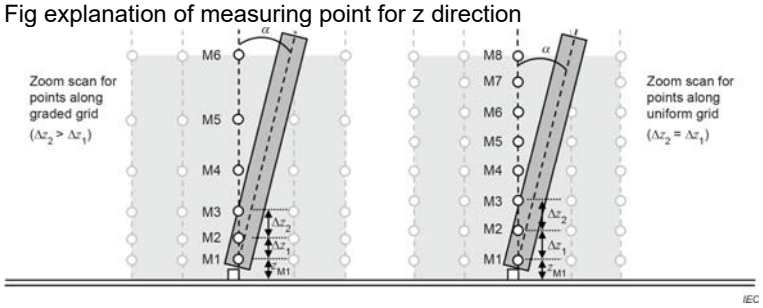
| | | | ≤ 3 GHz | > 3 GHz |
|---|---|---|---|---|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface | | | 5 mm ± 1 mm | ½·δ·ln(2) mm ± 0.5 mm |
| Maximum probe angle from probe axis to phantomsurface normal at the measurement location | | | 30° ± 1° | 20° ± 1° |
| Maximum area scan spatial resolution: $\Delta x_{Area}$, $\Delta y_{Area}$ | | | ≤ 2 GHz: ≤ 15 mm<br>2 – 3 GHz: ≤ 12 mm | 3 – 4 GHz: ≤ 12 mm<br>4 – 6 GHz: ≤ 10 mm<br>6 – 7 GHz: ≤ 8.57 mm |
| | | | When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device withat least one measurement point on the test device. | |
| Maximum zoom scan spatial resolution: $\Delta x_{Zoom}$, $\Delta y_{Zoom}$ | | | ≤ 2 GHz: ≤ 8 mm<br>2 – 3 GHz: ≤ 5 mm' | 3 – 4 GHz: ≤ 5 mm<br>4 – 6 GHz: ≤ 4 mm<br>6 – 7 GHz: ≤ 3.4 mm |
| Maximum zoom scan spatial resolution, normal to phantom surface | uniform grid: $\Delta z_{Zoom}(n)$ | | ≤ 5 mm | 3– 4 GHz: ≤ 4 mm<br>4– 5 GHz: ≤ 3 mm<br>5– 6 GHz: ≤ 2 mm<br>6– 7 GHz: ≤ 1.6 mm |
| | graded grid | $\Delta z_{Zoom}(1)$: between 1st two points closestto phantom surface | ≤ 4 mm | 3 – 4 GHz: ≤ 3 mm<br>4 – 5 GHz: ≤ 2.5 mm<br>5 – 6 GHz: ≤ 2 mm<br>6 – 7 GHz: ≤ 1.7 mm |
| | | $\Delta z_{Zoom}(n>1)$: between subsequentpoints | ≤ 1.5·$\Delta z_{Zoom}$(n-1) mm | |
| Minimum zoomscan volume | x, y, z | | ≥ 30 mm | 3 – 4 GHz: ≥ 28 mm<br>4 – 5 GHz: ≥ 25 mm<br>5 – 7 GHz: ≥ 22 mm |
| Note: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std1528-2013 for details. | | | | |

Additional Requirements[4]

Unless the following criteria are met, zoom-scan measurement shall be successively repeated using smaller increments, at 2 mm or less from phantom surface

- maximum 1 g SAR < 0.1 W/kg, or
- both of the following are met:
  - shortest transverse distances $d_x$ and $d_y$ between SAR peak location and -3 dB points shall be larger than $\Delta x_{Zoom}$ and $\Delta y_{Zoom}$, respectively.
  - at the SAR peak location, the ratio of SAR values from the first two z-axis, M1 to M2 points is ≤ 30 %.

Fig explanation of measuring point for z direction




[4] TCB workshop slide deck, November 2019

## Section 12 SAR System check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device.The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, for FCC typically every three to four days, for ISED every 24 h when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm ± 0.5 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm ± 0.5 cm for measurements > 3 GHz.
The DASY system with an E-Field Probe was used for the measurements.
The reference transmitter was mounted on the small tripod so that the transmitter feed point was positioned below the center marking of the flat phantom section and the transmitter was oriented parallel to the body axis (the long side of the phantom).

Table: The standard measuring distance

| Frequency range | Distance between dipole or CLA |
|---|---|
| 13 MHz | 0 mm |
| 0.3 GHz to 1 GHz | 15 mm |
| 1 GHz to 6 GHz | 10 mm |
| 6 GHz to 10 GHz | 5 mm |

The scan step was conducted based on the previous section specified.
Distance between probe sensors and phantom surface was set to 1.4 mm.
The transmitter input power (forward power) was 1W, 100 mW, 250 mW or 17 dBm (50.11 mW), this is not adjustable, so measured value is listed in the table of SPC.
The results are normalized to 1 W input power other than 1 W input power.
The target(reference) SAR values can be obtained from the calibration certificate of system validation dipoles or CLA, refer to appendix. The target SAR values are quoted from “SAR for nominal Head TSL parameters” on calibration record. The scaled SAR value shall not deviate from the targets by more than ±10 %. System check results are listed on appendix.

# Section 13 SAR requirement

## 13.1 Common

This procedure covers every condition, so some conditions are not applicable.
When reported SAR value is exceed 1.2 W/kg (if any), device holder perturbation verification is required; however, since distance between device holder and antenna of EUT is enough, it was not conducted.
The sample calculations are shown in definition.
Next section describes the general RF exposure evaluation requirements and serves as an entry point. If the more specific RF exposure guidance existed, it takes procced than this.

When 10-g extremity SAR applies, flowing SAR thresholds are considered by applying a factor of 2.5 to the SAR-based exemption thresholds.

## 13.2 Channel Selection Requirement

This test reduction process provides for the use of test data for one specific channel, while referencing to those data for demonstrating compliance in other required channels for each test position of an exposure condition, within the operating mode of a frequency band. This is limited specifically to when the reported 1-g or 10-g SAR for the mid-band or highest output power channel meets any of the following conditions:

1. SAR ≤ 0.8 W/kg for 1-g, or SAR ≤ 2.0 W/kg for 10-g, when the transmission band span is ≤ 100 MHz
2. SAR ≤ 0.6 W/kg for 1-g, or SAR ≤ 1.5 W/kg for 10-g, when the transmission band span is between 100 MHz and 200 MHz
3. SAR ≤ 0.4 W/kg for 1-g, or SAR ≤ 1.0 W/kg for 10-g, when the transmission band span is ≥ 200 MHz

SAR measurement standards such as IEEE Std 1528-2013 requires the middle channel to be tested first. This generally applies to wireless devices that are designed to operate in technologies with tight tolerances for maximum output power variations across channels in the band. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.

## 13.3 Repeated measurement

According to KDB 865664 D01.
1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10 % from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Repeat measurements are not required because of maximum measured SAR value is < 0.8 W/kg

# Section 14 WLAN SAR requirement

This porcdure covers every condition, so some conditions are not applicable.

## 14.1 Channel Selection Requirement

According to KDB 248227 D01, the initial test configuration for 2.4 GHz and 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

1. The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
2. If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
3. If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
4. When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected, i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n.

After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.

1. The channel closest to mid-band frequency is selected for SAR measurement.
2. For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

## 14.2 802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1. When the reported SAR of the highest measured maximum output power channel (see 3.1) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
2. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

## 14.3 2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.

1. When KDB Publication 447498 D01 SAR test exclusion applies to the OFDM configuration.
2. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

## 14.4 U-NII1 and U-NII-2A SAR Test Exclusion Requirements

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following, with respect to the highest reported SAR and maximum output power specified for production units. The procedures are applied independently to each exposure configuration; for example, head, body, hotspot mode etc.

1. When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, each band is tested independently for SAR.
2. When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, each band is tested independently for SAR.
3. The two U-NII bands may be aggregated to support a 160 MHz channel on channel number. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest reported SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

## 14.5 SAR Test Requirements for OFDM Configurations

When SAR measurement is required for 802.11 a/g/n/ac OFDM configurations, each standalone and aggregated frequency band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 band are supported and the aggregated band option of previous one is used, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

## 14.6 U-NII 6-7 GHz Interim Procedures[5]

Evaluate SAR using 6-7 GHz parameters per IEC/IEEE 62209-1528: 2020, for the highest SAR test configurations evaluate incident PD using the mill wave near-field probe and total-field/power-density reconstruction method (2 mm closest meas. plane).

Per procedures of KDB Pubs. 447498 and 248227, and applicable product-specific procedures among KDB Pubs. 648474 (handsets/phablets), 616217 (tablets/ laptops), 941225 (D06 hotspots, D07 UMPCs).

For the interim procedures specified KDB Pub. 447498 D01 v06, start instead with a minimum of 5 test channels across the full band, then adapt and apply conducted power.

Test channel is selected based on SAR testing result.

[5] TCB workshop slide decks, October 2020

## Section 15 Test instrument

Power measurement

| Test Item | LIMS ID | Description | Manufacturer | Model | Serial | Last Cal Date | Interval |
|---|---|---|---|---|---|---|---|
| AT | 244709 | Thermo-Hygrometer | HIOKI E.E. CORPORATION | LR5001 | 231202103 | 2024/01/25 | 12 |
| AT | 141532 | DIGITAL HiTESTER | HIOKI E.E. CORPORATION | 3805 | 051201197 | 2024/01/31 | 12 |
| AT | 141809 | Power Meter | Anritsu Corporation | ML2495A | 825002 | 2024/05/22 | 12 |
| AT | 141830 | Power sensor | Anritsu Corporation | MA2411B | 738285 | 2024/05/22 | 12 |
| AT | 141885 | Spectrum Analyzer | Keysight Technologies Inc | E4448A | US44300523 | 2023/11/29 | 12 |

SAR measurement

| LIMS ID | Description | Manufacturer | Model | Serial | Last Cal Date | Interval |
|---|---|---|---|---|---|---|
| 141482 | Data Acquisition Electronics | Schmid & Partner Engineering AG | DAE4 | 509 | 2024/08/09 | 12 |
| 141597 | Dosimetric E-Field Probe | Schmid & Partner Engineering AG | EX3DV4 | 3825 | 2024/07/10 | 12 |
| 142484 | Device holder | Schmid & Partner Engineering AG | Mounting device for transmitter | - | 2023/11/17 | 12 |
| 141471 | Dielectric assessment kit | Schmid & Partner Engineering AG | DAKS-3.5 | 0008 | 2024/04/16 | 12 |
| 141182 | Dielectric assessment software | Schmid & Partner Engineering AG | DAK | - | - | - |
| 141574 | Digital thermometer | LKM electronic | DTM3000 | - | 2024/08/24 | 12 |
| 141457 | Dipole Antenna | Schmid & Partner Engineering AG | D2450V2 | 713 | 2022/09/12 | 36 |
| 141808 | Dual Power Meter | Keysight Technologies Inc | E4419B | MY45102060 | 2024/08/20 | 12 |
| 176484 | Head Simulating Liquid | Schmid & Partner Engineering AG | HBBL600-10000V6 | SL AAH U16 BC | - | - |
| 221492 | Power sensor | Keysight Technologies Inc | E9300H | MY62080002 | 2024/08/20 | 12 |
| 249557 | RF Power Source | Schmid & Partner Engineering AG | POWERSOURCE1 | 4357 | 2024/05/27 | 12 |
| 142248 | SAR robot | Schmid & Partner Engineering AG | TX60 Lspeag | F13/5PP1D1/A/01 | 2024/04/30 | 12 |
| 141904 | Spectrum Analyzer | Keysight Technologies Inc | N9030A | US51350215 | 2023/11/08 | 12 |
| 244703 | Thermo-Hygrometer | A & D | AD-5648A | 1001 | 2024/01/25 | 12 |
| 142057 | 2mm Oval Flat Phantom | Schmid&Partner Engineering AG | QDOVA001BB | 1203 | 2024/05/31 | 12 |
| 251453 | Analyzer, Network | Rohde & Schwarz | ZNL14 | 200030 | 2024/07/12 | 12 |
| 141338 | Attenuator | Weinschel Associates | WA1-20-33 | 100130 | 2024/04/03 | 12 |

*Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

# Appendix 1 Dielectric Property result

| Date | Tem | Humidity | Frequency | Permittivity | | | Conductivity | | | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Measured | Target | Delta | Measured | Target | Delta | |
| | [deg. C] | [RH %] | [MHz] | ε' | ε' | [%] | σ [S/m] | σ [S/m] | [%] | |
| 2024/9/30 | 21.0 | 51 | 2402 | 40.18 | 39.28 | 2.29 | 1.82 | 1.76 | 3.49 | |
| 2024/9/30 | 21.0 | 51 | 2412 | 40.17 | 39.27 | 2.30 | 1.83 | 1.77 | 3.43 | |
| 2024/9/30 | 21.0 | 51 | 2437 | 40.11 | 39.22 | 2.28 | 1.85 | 1.79 | 3.30 | |
| 2024/9/30 | 21.0 | 51 | 2450 | 40.09 | 39.20 | 2.28 | 1.86 | 1.80 | 3.34 | SPC |
| 2024/9/30 | 21.0 | 51 | 2462 | 40.08 | 39.18 | 2.30 | 1.87 | 1.81 | 3.12 | |

# Appendix 2 System performance check result.

| Date | Freq [MHz] | Feed pow er [mW] | Meas val 1gSAR [W/kg] | Meas val 10gSAR [W/kg] | Norm val 1gSAR [W/kg] | Norm val 10gSAR [W/kg] | Target val 1gSAR [W/kg] | Target val 10gSAR [W/kg] | 1g dev | 10g dev |
|---|---|---|---|---|---|---|---|---|---|---|
| 2024/9/30 | 2450 | 50.12 | 2.65 | 1.23 | 52.87 | 24.54 | 52.30 | 24.50 | 1.10% | 0.17% |

# Appendix 3 System performance check Plot

2450.000 MHz, CW, 2024-09-30, 08:45

**SAR1 Exposure Conditions**

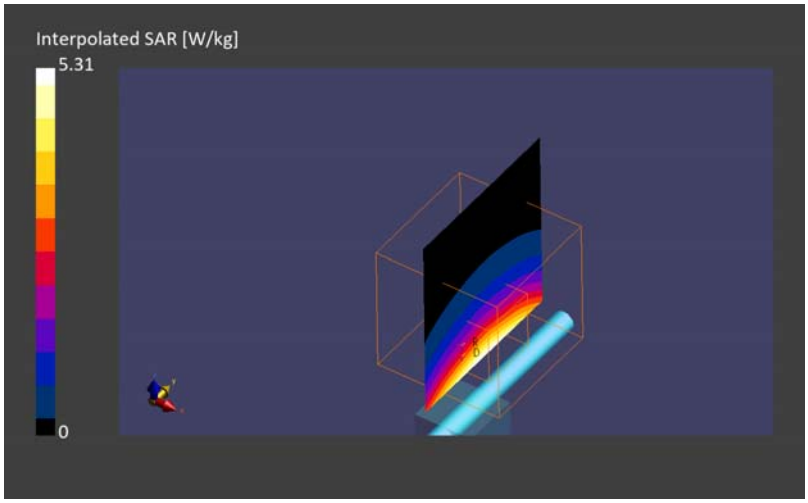
| Frequency [MHz] | Conversion Factor | TSL Permittivity | TSL Conductivity [S/m] |
|---|---|---|---|
| 2450.000 | 7.58 | 40.1 | 1.86 |

**Hardware Setup**

| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| ELI V5.0 (20deg probe tilt) - 1203 | HBBL-600-10000 2.45 240930, 2024-09-30 | EX3DV4 - SN3825, 2024-07-10 | DAE4 Sn509, 2024-08-09 |

| **Scans Setup** | - | - |
|---|---|---|
| Scan | Area Scan | Zoom Scan |
| Grid Extents [mm] | 40.0 x 80.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 10.0 x 10.0 | 5.0 x 5.0 x 1.5 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | N/A | Yes |
| Grading Ratio | N/A | 1.5 |
| MAIA | Y | Y |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |
| **Measurement Results** | - | - |
| Scan | Area Scan | Zoom Scan |
| Date | 2024-09-30, 08:40 | 2024-09-30, 08:45 |
| psSAR1g [W/Kg] | 2.77 | 2.65 |
| psSAR10g [W/Kg] | 1.31 | 1.23 |
| psSAR8g [W/Kg] | 1.44 | 1.36 |
| Power Drift [dB] | - | 0.01 |
| Power Scaling | Disabled | Disabled |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | - | 83.3 |
| Dist 3dB Peak [mm] | - | 9.1 |

During the test, temperature fluctuation is within 2 degree Celsius.



# Appendix 4 Power measurement and duty result

Power

| | |
|---|---|
| Test place | Ise EMC Lab. No.3 Measurement Room |
| Date | June 6, 2024 |
| Temperature / Humidity | 20 deg. C / 50 % RH |
| Engineer | Yuichiro Yamazaki |
| Mode | Tx |

BT DH5 Module No 8

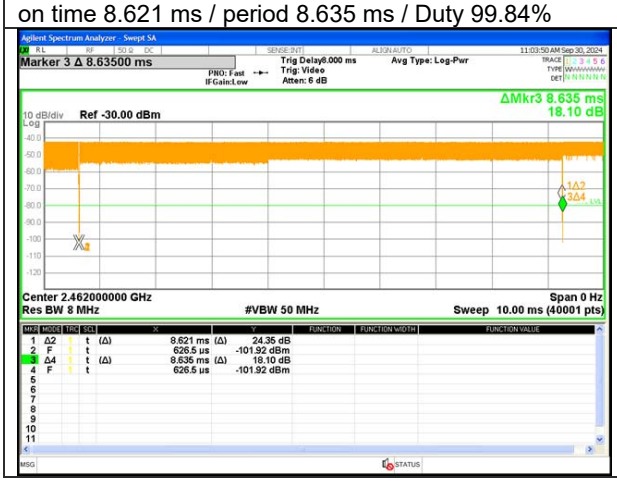
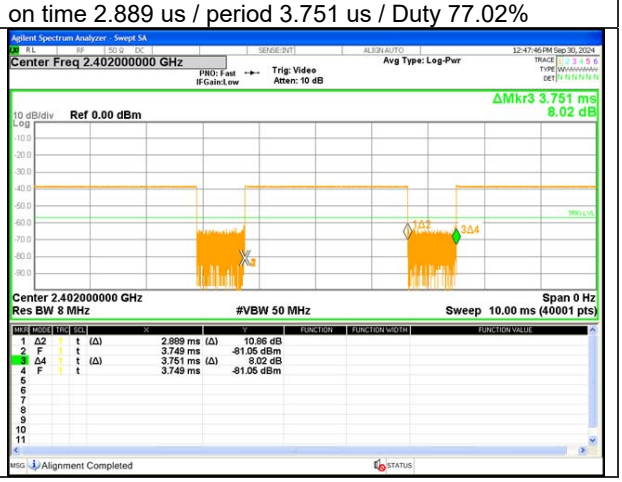
| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. Loss [dB] | Result (Time average) [dBm] | [mW] |
|---|---|---|---|---|---|
| 2402 | -1.71 | 0.50 | 9.52 | ***8.31*** | ***6.78*** |
| 2441 | -1.83 | 0.50 | 9.52 | 8.19 | 6.59 |
| 2480 | -1.97 | 0.50 | 9.52 | 8.05 | 6.38 |

**11b** **1Mbps** Module No. 8

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. Loss [dB] | Result (Time average) [dBm] | [mW] | Power setting [dB] |
|---|---|---|---|---|---|---|
| 2412 | 0.37 | 0.50 | 9.52 | 10.39 | 10.94 | 43 |
| 2437 | 0.34 | 0.50 | 9.52 | 10.36 | 10.86 | 44 |
| 2462 | 0.42 | 0.50 | 9.52 | ***10.44*** | ***11.07*** | 44 |

Sample Calculation:
Result (Burst average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

Duty

| 11b<br>on time 8.621 ms / period 8.635 ms / Duty 99.84% | DH5<br>on time 2.889 us / period 3.751 us / Duty 77.02% |
|---|---|
|  |  |

# Appendix 5 SAR measurement result

| Test Position | Dist. (mm) | Mode | Freq. (MHz) | Tune-up upper Power(dBm) | Measured average Power(dBm) | Power Scaled factor | Duty (%) | Duty Scaled factor | 1g meas. SAR | Reported SAR | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Left | 0 | 11b | 2412 | 10.50 | 10.39 | 1.026 | 99.84 | 1.002 | 0.158 | ***0.162*** | WL |
| | | | 2437 | 10.50 | 10.36 | 1.033 | 99.84 | 1.002 | 0.126 | 0.130 | |
| | | | 2462 | 10.50 | 10.44 | 1.014 | 99.84 | 1.002 | 0.110 | 0.112 | |
| Left | 0 | BT DH5 | 2402 | 8.65 | 8.31 | 1.081 | 77.02 | 1.298 | 0.055 | 0.077 | BT |
| | | | 2441 | 8.65 | 8.19 | 1.112 | 77.02 | 1.298 | | | |
| | | | 2480 | 8.65 | 8.05 | 1.148 | 77.02 | 1.298 | | | |

# Appendix 6 Measurement plot

Plot No. WL

**SAR1 Exposure Conditions**

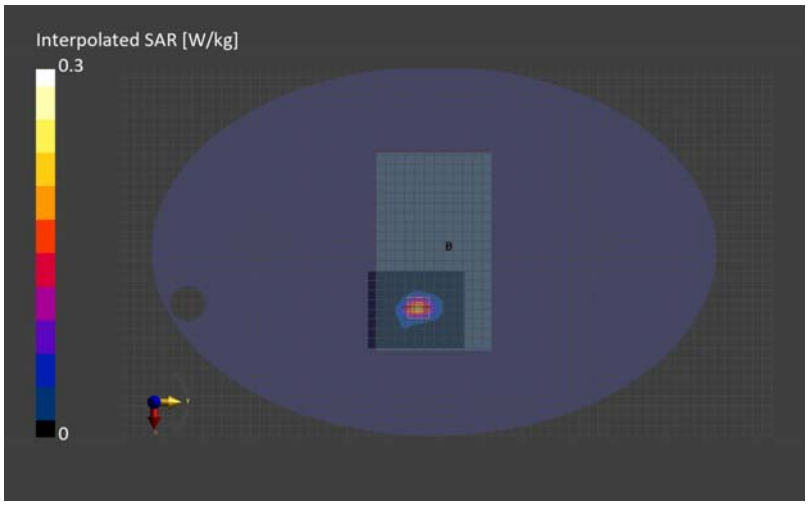
| Position, Test Distance [mm] | Frequency [MHz] | Conversion Factor | TSL Permittivity | TSL Conductivity [S/m] |
|---|---|---|---|---|
| EDGE LEFT, 0.00 | 2412.000 | 7.58 | 40.2 | 1.83 |

**Hardware Setup**

| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| ELI V5.0 (20deg probe tilt) - 1203 | HBBL-600-10000 2.45 240930, 2024-09-30 | EX3DV4 - SN3825, 2024-07-10 | DAE4 Sn509, 2024-08-09 |

| **Scans Setup** | - | - |
|---|---|---|
| Scan | Area Scan | Zoom Scan |
| Grid Extents [mm] | 75.0 x 100.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 10.0 x 10.0 | 5.0 x 5.0 x 1.5 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | N/A | Yes |
| Grading Ratio | N/A | 1.5 |
| MAIA | Y | Y |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |
| **Measurement Results** | - | - |
| Scan | Area Scan | Zoom Scan |
| Date | 2024-09-30, 15:27 | 2024-09-30, 15:34 |
| psSAR1g [W/Kg] | 0.158 | 0.158 |
| psSAR8g [W/Kg] | 0.078 | 0.074 |
| psSAR10g [W/Kg] | 0.070 | 0.066 |
| Power Drift [dB] | -0.02 | -0.00 |
| Power Scaling | Disabled | Disabled |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | - | 77.5 |
| Dist 3dB Peak [mm] | - | 7.7 |

During the test, temperature fluctuation is within 2 degree Celsius.



Plot No. BT

**SAR1 Exposure Conditions**

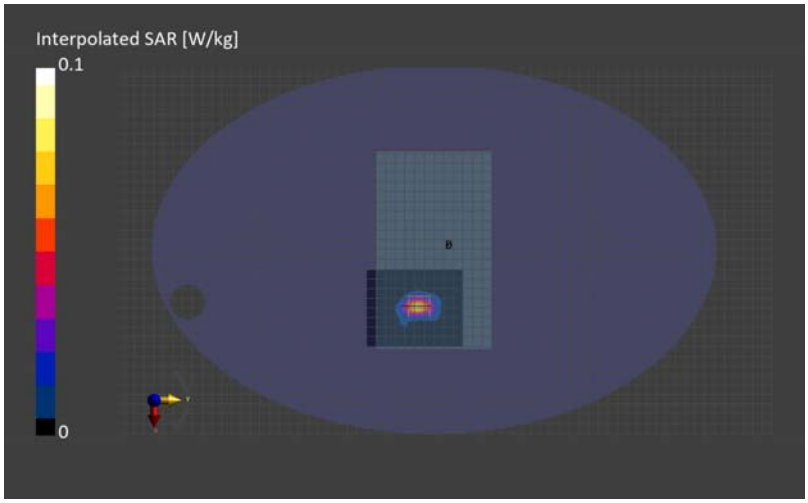
| Position, Test Distance [mm] | Frequency [MHz] | Conversion Factor | TSL Permittivity | TSL Conductivity [S/m] |
|---|---|---|---|---|
| EDGE LEFT, 0.00 | 2402.000 | 7.58 | 40.2 | 1.82 |

**Hardware Setup**

| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| ELI V5.0 (20deg probe tilt) - 1203 | HBBL-600-10000 2.45 240930, 2024-09-30 | EX3DV4 - SN3825, 2024-07-10 | DAE4 Sn509, 2024-08-09 |

| **Scans Setup** | - | - |
|---|---|---|
| Scan | Area Scan | Zoom Scan |
| Grid Extents [mm] | 75.0 x 100.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 10.0 x 10.0 | 5.0 x 5.0 x 1.5 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | N/A | Yes |
| Grading Ratio | N/A | 1.5 |
| MAIA | Y | Y |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |
| **Measurement Results** | - | - |
| Scan | Area Scan | Zoom Scan |
| Date | 2024-09-30, 12:46 | 2024-09-30, 12:53 |
| psSAR1g [W/Kg] | 0.058 | 0.055 |
| psSAR8g [W/Kg] | 0.028 | 0.024 |
| psSAR10g [W/Kg] | 0.025 | 0.021 |
| Power Drift [dB] | -0.09 | 0.11 |
| Power Scaling | Disabled | Disabled |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | - | 78.8 |
| Dist 3dB Peak [mm] | - | 7.7 |

During the test, temperature fluctuation is within 2 degree Celsius.



# Appendix 7 Probe calibration record

EX3DV4 – SN:3825

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

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

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

**Accreditation No.: SCS 0108**

| Client | UL Japan Head Office<br>Ise, Japan | Certificate No. | EX-3825_Jul24 |
|---|---|---|---|

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | EX3DV4 - SN:3825 |
| Calibration procedure(s) | QA CAL-01.v10, QA CAL-12.v10, QA CAL-14.v7, QA CAL-23.v6, QA CAL-25.v8<br>Calibration procedure for dosimetric E-field probes |
| Calibration date | July 10, 2024 |

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 NRP2 | SN: 104778 | 26-Mar-24 (No. 217-04036/04037) | Mar-25 |
| Power sensor NRP-Z91 | SN: 103244 | 26-Mar-24 (No. 217-04036) | Mar-25 |
| OCP DAK-3.5 (weighted) | SN: 1249 | 05-Oct-23 (OCP-DAK3.5-1249_Oct23) | Oct-24 |
| OCP DAK-12 | SN: 1016 | 05-Oct-23 (OCP-DAK12-1016_Oct23) | Oct-24 |
| Reference 20 dB Attenuator | SN: CC2552 (20x) | 26-Mar-24 (No. 217-04046) | Mar-25 |
| DAE4 | SN: 660 | 23-Feb-24 (No. DAE4-660_Feb24) | Feb-25 |
| Reference Probe EX3DV4 | SN: 7349 | 03-Jun-24 (No. EX3-7349_Jun24) | Jun-25 |

| Secondary Standards | ID | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power meter E4419B | SN: GB41293874 | 06-Apr-16 (in house check Jun-24) | In house check: Jun-26 |
| Power sensor E4412A | SN: MY41498087 | 06-Apr-16 (in house check Jun-24) | In house check: Jun-26 |
| Power sensor E4412A | SN: 000110210 | 06-Apr-16 (in house check Jun-24) | In house check: Jun-26 |
| RF generator HP 8648C | SN: US3642U01700 | 04-Aug-99 (in house check Jun-24) | In house check: Jun-26 |
| Network Analyzer E8358A | SN: US41080477 | 31-Mar-14 (in house check Oct-22) | In house check: Oct-24 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by | Joanna Lleshaj | Laboratory Technician | |
| Approved by | Sven Kühn | Technical Manager | |

Issued: July 10, 2024

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

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

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

**Accreditation No.: SCS 0108**

## Glossary

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| 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:

- *NORMx,y,z*: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the $E^2$-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * 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.
- *DCPx,y,z*: 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
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: 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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ±50 MHz to ±100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

## Parameters of Probe: EX3DV4 - SN:3825

### Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc ($k = 2$) |
|---|---|---|---|---|
| Norm ($\mu V/(V/m)^2$) [A] | 0.42 | 0.39 | 0.44 | ±10.1% |
| DCP (mV) [B] | 99.7 | 102.4 | 99.3 | ±4.7% |

### Calibration Results for Modulation Response

| UID | Communication System Name | | A dB | B dB$\sqrt{\mu V}$ | C | D dB | VR mV | Max dev. | Max Unc[E] $k = 2$ |
|---|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.00 | 0.00 | 1.00 | 0.00 | 142.6 | ±0.8% | ±4.7% |
| | | Y | 0.00 | 0.00 | 1.00 | | 131.4 | | |
| | | Z | 0.00 | 0.00 | 1.00 | | 118.9 | | |
| 10352 | Pulse Waveform (200Hz, 10%) | X | 36.00 | 98.00 | 23.00 | 10.00 | 60.0 | ±2.6% | ±9.6% |
| | | Y | 20.00 | 90.82 | 20.62 | | 60.0 | | |
| | | Z | 20.00 | 93.01 | 22.53 | | 60.0 | | |
| 10353 | Pulse Waveform (200Hz, 20%) | X | 20.00 | 91.51 | 20.05 | 6.99 | 80.0 | ±1.4% | ±9.6% |
| | | Y | 20.00 | 93.60 | 20.87 | | 80.0 | | |
| | | Z | 20.00 | 93.44 | 21.48 | | 80.0 | | |
| 10354 | Pulse Waveform (200Hz, 40%) | X | 20.00 | 93.30 | 19.41 | 3.98 | 95.0 | ±1.3% | ±9.6% |
| | | Y | 20.00 | 100.68 | 22.94 | | 95.0 | | |
| | | Z | 20.00 | 95.24 | 20.84 | | 95.0 | | |
| 10355 | Pulse Waveform (200Hz, 60%) | X | 20.00 | 95.95 | 19.39 | 2.22 | 120.0 | ±1.3% | ±9.6% |
| | | Y | 20.00 | 111.58 | 26.70 | | 120.0 | | |
| | | Z | 20.00 | 98.11 | 20.84 | | 120.0 | | |
| 10387 | QPSK Waveform, 1 MHz | X | 1.59 | 64.51 | 14.09 | 1.00 | 150.0 | ±1.9% | ±9.6% |
| | | Y | 1.67 | 67.13 | 15.39 | | 150.0 | | |
| | | Z | 1.68 | 64.94 | 14.48 | | 150.0 | | |
| 10388 | QPSK Waveform, 10 MHz | X | 2.07 | 66.43 | 14.77 | 0.00 | 150.0 | ±1.0% | ±9.6% |
| | | Y | 2.17 | 68.12 | 15.92 | | 150.0 | | |
| | | Z | 2.19 | 67.15 | 15.12 | | 150.0 | | |
| 10396 | 64-QAM Waveform, 100 kHz | X | 2.87 | 69.45 | 18.01 | 3.01 | 150.0 | ±0.7% | ±9.6% |
| | | Y | 2.84 | 71.29 | 19.16 | | 150.0 | | |
| | | Z | 3.12 | 70.21 | 18.40 | | 150.0 | | |
| 10399 | 64-QAM Waveform, 40 MHz | X | 3.42 | 66.46 | 15.30 | 0.00 | 150.0 | ±1.0% | ±9.6% |
| | | Y | 3.47 | 67.25 | 15.85 | | 150.0 | | |
| | | Z | 3.52 | 66.86 | 15.53 | | 150.0 | | |
| 10414 | WLAN CCDF, 64-QAM, 40 MHz | X | 4.85 | 65.37 | 15.28 | 0.00 | 150.0 | ±2.3% | ±9.6% |
| | | Y | 4.77 | 65.78 | 15.56 | | 150.0 | | |
| | | Z | 4.97 | 65.60 | 15.44 | | 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%.

[A] The uncertainties of Norm X,Y,Z do not affect the $E^2$-field uncertainty inside TSL (see Pages 5 and 6).
[B] Linearization parameter uncertainty for maximum specified field strength.
[E] 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:3825

### Sensor Model Parameters

| | C1 fF | C2 fF | $\alpha$ $V^{-1}$ | T1 $ms\,V^{-2}$ | T2 $ms\,V^{-1}$ | T3 ms | T4 $V^{-2}$ | T5 $V^{-1}$ | T6 |
|---|---|---|---|---|---|---|---|---|---|
| x | 49.5 | 365.98 | 34.83 | 12.45 | 0.63 | 5.03 | 1.27 | 0.27 | 1.01 |
| y | 37.7 | 272.22 | 33.50 | 12.20 | 0.18 | 5.05 | 1.95 | 0.00 | 1.01 |
| z | 55.1 | 410.27 | 35.32 | 16.65 | 0.69 | 5.06 | 0.91 | 0.41 | 1.01 |

### Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle | -31.6° |
| 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.

## Parameters of Probe: EX3DV4 - SN:3825

### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz)[C] | Relative Permittivity[F] | Conductivity[F] (S/m) | ConvF X | ConvF Y | ConvF Z | Alpha[G] | Depth[G] (mm) | Unc[H] ($k = 2$) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 9.96 | 9.79 | 9.05 | 0.33 | 1.27 | ±11.0% |
| 835 | 41.5 | 0.90 | 9.37 | 9.21 | 8.51 | 0.33 | 1.27 | ±11.0% |
| 900 | 41.5 | 0.97 | 9.42 | 9.26 | 8.56 | 0.33 | 1.27 | ±11.0% |
| 1750 | 40.1 | 1.37 | 8.24 | 8.10 | 7.49 | 0.33 | 1.27 | ±11.0% |
| 1900 | 40.0 | 1.40 | 7.99 | 7.85 | 7.26 | 0.33 | 1.27 | ±11.0% |
| 2450 | 39.2 | 1.80 | 7.58 | 7.45 | 6.89 | 0.34 | 1.27 | ±11.0% |
| 2600 | 39.0 | 1.96 | 7.67 | 7.53 | 6.97 | 0.34 | 1.27 | ±11.0% |
| 3500 | 37.9 | 2.91 | 6.91 | 6.79 | 6.28 | 0.34 | 1.27 | ±13.1% |
| 3700 | 37.7 | 3.12 | 6.93 | 6.81 | 6.30 | 0.34 | 1.27 | ±13.1% |
| 3900 | 37.5 | 3.32 | 6.79 | 6.67 | 6.17 | 0.35 | 1.27 | ±13.1% |
| 4600 | 36.7 | 4.04 | 6.35 | 6.24 | 5.77 | 0.35 | 1.27 | ±13.1% |
| 5250 | 35.9 | 4.71 | 5.64 | 5.55 | 5.13 | 0.31 | 1.27 | ±13.1% |
| 5600 | 35.5 | 5.07 | 5.11 | 5.02 | 4.64 | 0.28 | 1.27 | ±13.1% |
| 5800 | 35.3 | 5.27 | 5.12 | 5.04 | 4.66 | 0.26 | 1.27 | ±13.1% |
| 5850 | 35.2 | 5.32 | 5.14 | 5.06 | 4.67 | 0.26 | 1.27 | ±13.1% |

[C] Frequency validity above 300 MHz of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ±10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4–9 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

[F] The probes are calibrated using tissue simulating liquids (TSL) that deviate for $\varepsilon$ and $\sigma$ by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10% if SAR correction is applied.

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

[H] The stated uncertainty is the total calibration uncertainty ($k = 2$) of Norm-ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

## Parameters of Probe: EX3DV4 - SN:3825

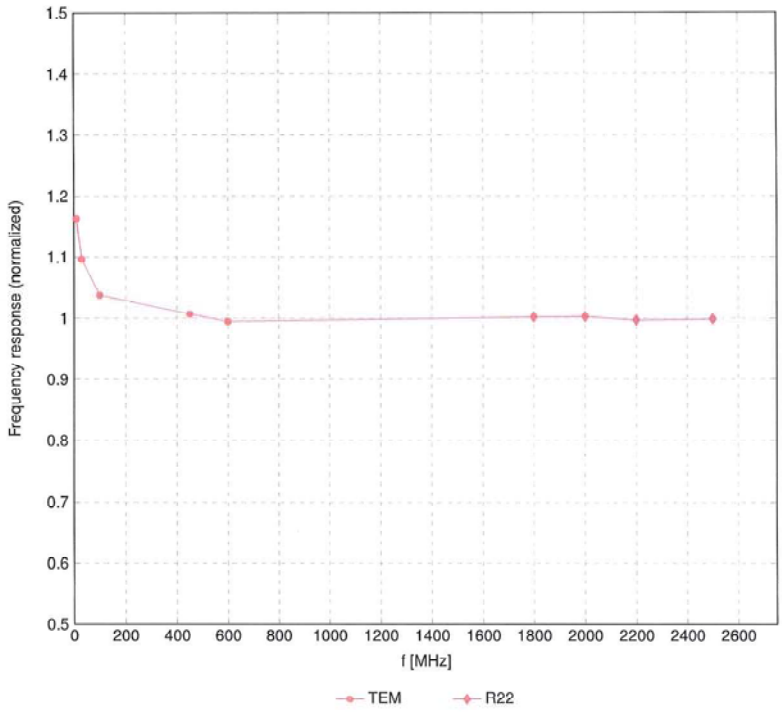
### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz)[C] | Relative Permittivity[F] | Conductivity[F] (S/m) | ConvF X | ConvF Y | ConvF Z | Alpha[G] | Depth[G] (mm) | Unc[H] ($k = 2$) |
|---|---|---|---|---|---|---|---|---|
| 6500 | 34.5 | 6.07 | 5.45 | 5.36 | 4.95 | 0.20 | 1.27 | ±18.6% |

[C] Frequency validity at 6.5 GHz is −600/+700 MHz, and ±700 MHz at or above 7 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] The probes are calibrated using tissue simulating liquids (TSL) that deviate for $\varepsilon$ and $\sigma$ by less than ±10% from the target values (typically better than ±6%) and are valid for TSL with deviations of up to ±10%.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3–6 GHz; and below ±4% for frequencies between 6–10 GHz at any distance larger than half the probe tip diameter from the boundary.
[H] The stated uncertainty is the total calibration uncertainty ($k = 2$) of Norm·ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

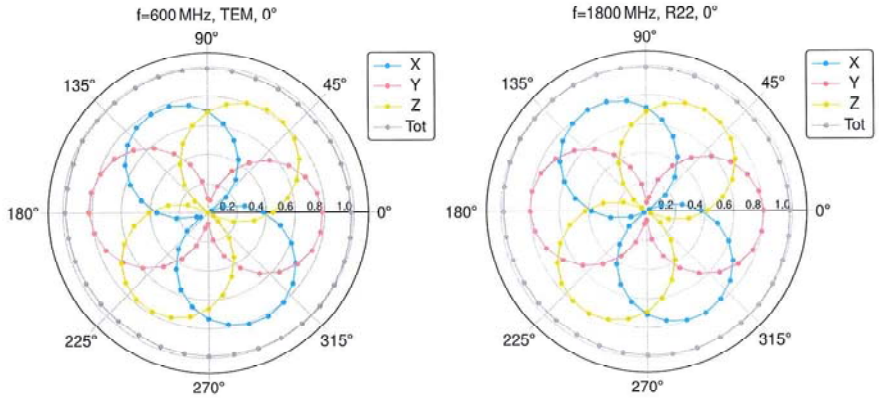
## Frequency Response of E-Field

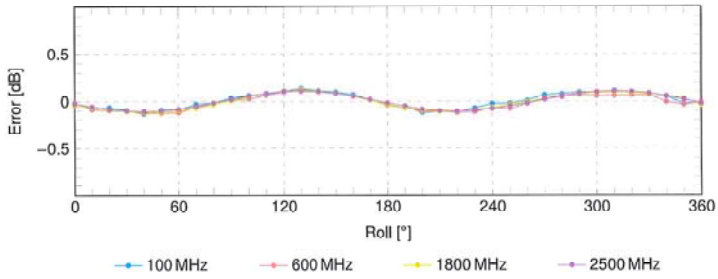
(TEM-Cell:ifi110 EXX, Waveguide:R22)




Uncertainty of Frequency Response of E-field: ±6.3% (k=2)

**Receiving Pattern ($\phi$), $\vartheta = 0°$**

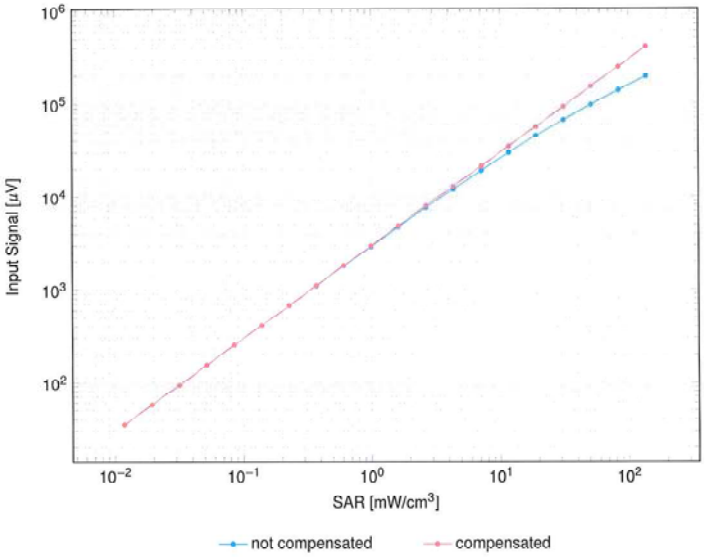


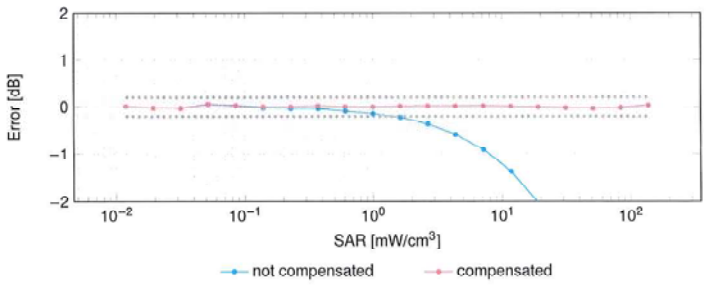




Uncertainty of Axial Isotropy Assessment: ±0.5% (k=2)

## Dynamic Range f($SAR_{head}$)

(TEM cell, $f_{eval}$ = 1900 MHz)

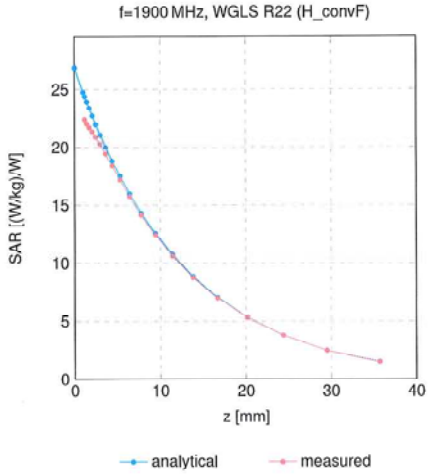


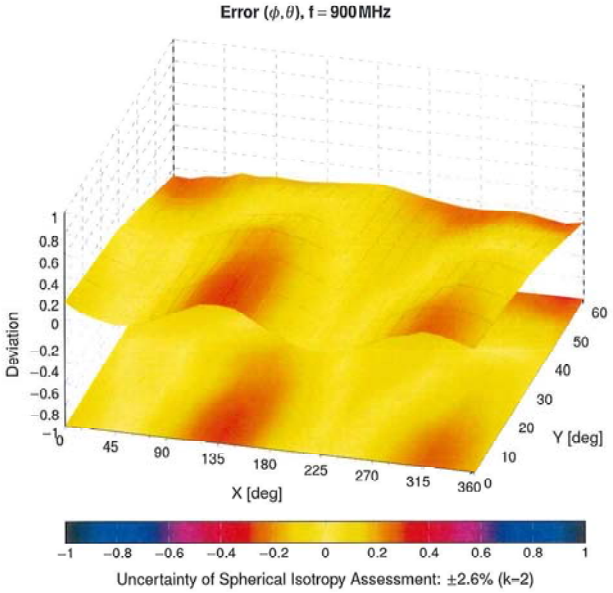

Uncertainty of Linearity Assessment: ±0.6% (k=2)

EX3DV4 - SN:3825 July 10, 2024

## Conversion Factor Assessment




## Deviation from Isotropy in Liquid



## Appendix: Modulation Calibration Parameters

| UID | Rev | Communication System Name | Group | PAR (dB) | Unc$^E$ $k = 2$ |
|---|---|---|---|---|---|
| 0 | | CW | CW | 0.00 | ±4.7 |
| 10010 | CAB | SAR Validation (Square, 100 ms, 10 ms) | Test | 10.00 | ±9.6 |
| 10011 | CAC | UMTS-FDD (WCDMA) | WCDMA | 2.91 | ±9.6 |
| 10012 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps) | WLAN | 1.87 | ±9.6 |
| 10013 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps) | WLAN | 9.46 | ±9.6 |
| 10021 | DAC | GSM-FDD (TDMA, GMSK) | GSM | 9.39 | ±9.6 |
| 10023 | DAC | GPRS-FDD (TDMA, GMSK, TN 0) | GSM | 9.57 | ±9.6 |
| 10024 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1) | GSM | 6.56 | ±9.6 |
| 10025 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0) | GSM | 12.62 | ±9.6 |
| 10026 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1) | GSM | 9.55 | ±9.6 |
| 10027 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2) | GSM | 4.80 | ±9.6 |
| 10028 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2-3) | GSM | 3.55 | ±9.6 |
| 10029 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2) | GSM | 7.78 | ±9.6 |
| 10030 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1) | Bluetooth | 5.30 | ±9.6 |
| 10031 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3) | Bluetooth | 1.87 | ±9.6 |
| 10032 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5) | Bluetooth | 1.16 | ±9.6 |
| 10033 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1) | Bluetooth | 7.74 | ±9.6 |
| 10034 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3) | Bluetooth | 4.53 | ±9.6 |
| 10035 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5) | Bluetooth | 3.83 | ±9.6 |
| 10036 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH1) | Bluetooth | 8.01 | ±9.6 |
| 10037 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3) | Bluetooth | 4.77 | ±9.6 |
| 10038 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH5) | Bluetooth | 4.10 | ±9.6 |
| 10039 | CAB | CDMA2000 (1xRTT, RC1) | CDMA2000 | 4.57 | ±9.6 |
| 10042 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate) | AMPS | 7.78 | ±9.6 |
| 10044 | CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM) | AMPS | 0.00 | ±9.6 |
| 10048 | CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24) | DECT | 13.80 | ±9.6 |
| 10049 | CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12) | DECT | 10.79 | ±9.6 |
| 10056 | CAA | UMTS-TDD (TD-SCDMA, 1.28 Mcps) | TD-SCDMA | 11.01 | ±9.6 |
| 10058 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3) | GSM | 6.52 | ±9.6 |
| 10059 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps) | WLAN | 2.12 | ±9.6 |
| 10060 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps) | WLAN | 2.83 | ±9.6 |
| 10061 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps) | WLAN | 3.60 | ±9.6 |
| 10062 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps) | WLAN | 8.68 | ±9.6 |
| 10063 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps) | WLAN | 8.63 | ±9.6 |
| 10064 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps) | WLAN | 9.09 | ±9.6 |
| 10065 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps) | WLAN | 9.00 | ±9.6 |
| 10066 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps) | WLAN | 9.38 | ±9.6 |
| 10067 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps) | WLAN | 10.12 | ±9.6 |
| 10068 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps) | WLAN | 10.24 | ±9.6 |
| 10069 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps) | WLAN | 10.56 | ±9.6 |
| 10071 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps) | WLAN | 9.83 | ±9.6 |
| 10072 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps) | WLAN | 9.62 | ±9.6 |
| 10073 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps) | WLAN | 9.94 | ±9.6 |
| 10074 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps) | WLAN | 10.30 | ±9.6 |
| 10075 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps) | WLAN | 10.77 | ±9.6 |
| 10076 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps) | WLAN | 10.94 | ±9.6 |
| 10077 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps) | WLAN | 11.00 | ±9.6 |
| 10081 | CAB | CDMA2000 (1xRTT, RC3) | CDMA2000 | 3.97 | ±9.6 |
| 10082 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | AMPS | 4.77 | ±9.6 |
| 10090 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-4) | GSM | 6.56 | ±9.6 |
| 10097 | CAC | UMTS-FDD (HSDPA) | WCDMA | 3.98 | ±9.6 |
| 10098 | CAC | UMTS-FDD (HSUPA, Subtest 2) | WCDMA | 3.98 | ±9.6 |
| 10099 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-4) | GSM | 9.55 | ±9.6 |
| 10100 | CAF | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK) | LTE-FDD | 5.67 | ±9.6 |
| 10101 | CAF | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM) | LTE-FDD | 6.42 | ±9.6 |
| 10102 | CAF | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) | LTE-FDD | 6.60 | ±9.6 |
| 10103 | CAH | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK) | LTE-TDD | 9.29 | ±9.6 |
| 10104 | CAH | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM) | LTE-TDD | 9.97 | ±9.6 |
| 10105 | CAH | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) | LTE-TDD | 10.01 | ±9.6 |
| 10108 | CAH | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK) | LTE-FDD | 5.80 | ±9.6 |
| 10109 | CAH | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM) | LTE-FDD | 6.43 | ±9.6 |
| 10110 | CAH | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK) | LTE-FDD | 5.75 | ±9.6 |
| 10111 | CAH | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) | LTE-FDD | 6.44 | ±9.6 |

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

| UID | Rev | Communication System Name | Group | PAR (dB) | Unc$^E$ $k = 2$ |
|---|---|---|---|---|---|
| 10225 | CAC | UMTS-FDD (HSPA+) | WCDMA | 5.97 | ±9.6 |
| 10226 | CAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM) | LTE-TDD | 9.49 | ±9.6 |
| 10227 | CAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM) | LTE-TDD | 10.26 | ±9.6 |
| 10228 | CAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK) | LTE-TDD | 9.22 | ±9.6 |
| 10229 | CAE | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM) | LTE-TDD | 9.48 | ±9.6 |
| 10230 | CAE | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM) | LTE-TDD | 10.25 | ±9.6 |
| 10231 | CAE | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK) | LTE-TDD | 9.19 | ±9.6 |
| 10232 | CAH | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) | LTE-TDD | 9.48 | ±9.6 |
| 10233 | CAH | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM) | LTE-TDD | 10.25 | ±9.6 |
| 10234 | CAH | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK) | LTE-TDD | 9.21 | ±9.6 |
| 10235 | CAH | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM) | LTE-TDD | 9.48 | ±9.6 |
| 10236 | CAH | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM) | LTE-TDD | 10.25 | ±9.6 |
| 10237 | CAH | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK) | LTE-TDD | 9.21 | ±9.6 |
| 10238 | CAG | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM) | LTE-TDD | 9.48 | ±9.6 |
| 10239 | CAG | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM) | LTE-TDD | 10.25 | ±9.6 |
| 10240 | CAG | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK) | LTE-TDD | 9.21 | ±9.6 |
| 10241 | CAC | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM) | LTE-TDD | 9.82 | ±9.6 |
| 10242 | CAC | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM) | LTE-TDD | 9.86 | ±9.6 |
| 10243 | CAC | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK) | LTE-TDD | 9.46 | ±9.6 |
| 10244 | CAE | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | LTE-TDD | 10.06 | ±9.6 |
| 10245 | CAE | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM) | LTE-TDD | 10.06 | ±9.6 |
| 10246 | CAE | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK) | LTE-TDD | 9.30 | ±9.6 |
| 10247 | CAH | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM) | LTE-TDD | 9.91 | ±9.6 |
| 10248 | CAH | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM) | LTE-TDD | 10.09 | ±9.6 |
| 10249 | CAH | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK) | LTE-TDD | 9.29 | ±9.6 |
| 10250 | CAH | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM) | LTE-TDD | 9.81 | ±9.6 |
| 10251 | CAH | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM) | LTE-TDD | 10.17 | ±9.6 |
| 10252 | CAH | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK) | LTE-TDD | 9.24 | ±9.6 |
| 10253 | CAG | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM) | LTE-TDD | 9.90 | ±9.6 |
| 10254 | CAG | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM) | LTE-TDD | 10.14 | ±9.6 |
| 10255 | CAG | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK) | LTE-TDD | 9.20 | ±9.6 |
| 10256 | CAC | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | LTE-TDD | 9.96 | ±9.6 |
| 10257 | CAC | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | LTE-TDD | 10.08 | ±9.6 |
| 10258 | CAC | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK) | LTE-TDD | 9.34 | ±9.6 |
| 10259 | CAE | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM) | LTE-TDD | 9.98 | ±9.6 |
| 10260 | CAE | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM) | LTE-TDD | 9.97 | ±9.6 |
| 10261 | CAE | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK) | LTE-TDD | 9.24 | ±9.6 |
| 10262 | CAH | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) | LTE-TDD | 9.83 | ±9.6 |
| 10263 | CAH | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM) | LTE-TDD | 10.16 | ±9.6 |
| 10264 | CAH | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK) | LTE-TDD | 9.23 | ±9.6 |
| 10265 | CAH | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM) | LTE-TDD | 9.92 | ±9.6 |
| 10266 | CAH | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM) | LTE-TDD | 10.07 | ±9.6 |
| 10267 | CAH | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK) | LTE-TDD | 9.30 | ±9.6 |
| 10268 | CAG | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM) | LTE-TDD | 10.06 | ±9.6 |
| 10269 | CAG | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM) | LTE-TDD | 10.13 | ±9.6 |
| 10270 | CAG | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK) | LTE-TDD | 9.58 | ±9.6 |
| 10274 | CAC | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10) | WCDMA | 4.87 | ±9.6 |
| 10275 | CAC | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4) | WCDMA | 3.96 | ±9.6 |
| 10277 | CAA | PHS (QPSK) | PHS | 11.81 | ±9.6 |
| 10278 | CAA | PHS (QPSK, BW 884 MHz, Rolloff 0.5) | PHS | 11.81 | ±9.6 |
| 10279 | CAA | PHS (QPSK, BW 884 MHz, Rolloff 0.38) | PHS | 12.18 | ±9.6 |
| 10290 | AAB | CDMA2000, RC1, SO55, Full Rate | CDMA2000 | 3.91 | ±9.6 |
| 10291 | AAB | CDMA2000, RC3, SO55, Full Rate | CDMA2000 | 3.46 | ±9.6 |
| 10292 | AAB | CDMA2000, RC3, SO32, Full Rate | CDMA2000 | 3.39 | ±9.6 |
| 10293 | AAB | CDMA2000, RC3, SO3, Full Rate | CDMA2000 | 3.50 | ±9.6 |
| 10295 | AAB | CDMA2000, RC1, SO3, 1/8th Rate 25 fr. | CDMA2000 | 12.49 | ±9.6 |
| 10297 | AAE | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK) | LTE-FDD | 5.81 | ±9.6 |
| 10298 | AAE | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK) | LTE-FDD | 5.72 | ±9.6 |
| 10299 | AAE | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM) | LTE-FDD | 6.39 | ±9.6 |
| 10300 | AAE | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM) | LTE-FDD | 6.60 | ±9.6 |
| 10301 | AAA | IEEE 802.16e WiMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC) | WiMAX | 12.03 | ±9.6 |
| 10302 | AAA | IEEE 802.16e WiMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC, 3 CTRL symbols) | WiMAX | 12.57 | ±9.6 |
| 10303 | AAA | IEEE 802.16e WiMAX (31:15, 5 ms, 10 MHz, 64QAM, PUSC) | WiMAX | 12.52 | ±9.6 |
| 10304 | AAA | IEEE 802.16e WiMAX (29:18, 5 ms, 10 MHz, 64QAM, PUSC) | WiMAX | 11.86 | ±9.6 |
| 10305 | AAA | IEEE 802.16e WiMAX (31:15, 10 ms, 10 MHz, 64QAM, PUSC, 15 symbols) | WiMAX | 15.24 | ±9.6 |
| 10306 | AAA | IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, 64QAM, PUSC, 18 symbols) | WiMAX | 14.67 | ±9.6 |

| UID | Rev | Communication System Name | Group | PAR (dB) | Unc$^E$ $k = 2$ |
|---|---|---|---|---|---|
| 10307 | AAA | IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, QPSK, PUSC, 18 symbols) | WiMAX | 14.49 | ±9.6 |
| 10308 | AAA | IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, 16QAM, PUSC) | WiMAX | 14.46 | ±9.6 |
| 10309 | AAA | IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, 16QAM, AMC 2x3, 18 symbols) | WiMAX | 14.58 | ±9.6 |
| 10310 | AAA | IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, QPSK, AMC 2x3, 18 symbols) | WiMAX | 14.57 | ±9.6 |
| 10311 | AAE | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK) | LTE-FDD | 6.06 | ±9.6 |
| 10313 | AAA | iDEN 1:3 | iDEN | 10.51 | ±9.6 |
| 10314 | AAA | iDEN 1:6 | iDEN | 13.48 | ±9.6 |
| 10315 | AAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle) | WLAN | 1.71 | ±9.6 |
| 10316 | AAB | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle) | WLAN | 8.36 | ±9.6 |
| 10317 | AAE | IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle) | WLAN | 8.36 | ±9.6 |
| 10352 | AAA | Pulse Waveform (200Hz, 10%) | Generic | 10.00 | ±9.6 |
| 10353 | AAA | Pulse Waveform (200Hz, 20%) | Generic | 6.99 | ±9.6 |
| 10354 | AAA | Pulse Waveform (200Hz, 40%) | Generic | 3.98 | ±9.6 |
| 10355 | AAA | Pulse Waveform (200Hz, 60%) | Generic | 2.22 | ±9.6 |
| 10356 | AAA | Pulse Waveform (200Hz, 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 | AAF | IEEE 802.11ac WiFi (20 MHz, 64-QAM, 99pc duty cycle) | WLAN | 8.37 | ±9.6 |
| 10401 | AAF | IEEE 802.11ac WiFi (40 MHz, 64-QAM, 99pc duty cycle) | WLAN | 8.60 | ±9.6 |
| 10402 | AAF | IEEE 802.11ac WiFi (80 MHz, 64-QAM, 99pc duty cycle) | 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 | AAB | CDMA2000, RC3, SO32, SCH0, Full Rate | CDMA2000 | 5.22 | ±9.6 |
| 10410 | AAH | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4) | 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 duty cycle) | WLAN | 1.54 | ±9.6 |
| 10416 | AAA | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle) | WLAN | 8.23 | ±9.6 |
| 10417 | AAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle) | WLAN | 8.23 | ±9.6 |
| 10418 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule) | WLAN | 8.14 | ±9.6 |
| 10419 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule) | WLAN | 8.19 | ±9.6 |
| 10422 | AAD | IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK) | WLAN | 8.32 | ±9.6 |
| 10423 | AAD | IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM) | WLAN | 8.47 | ±9.6 |
| 10424 | AAD | IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM) | WLAN | 8.40 | ±9.6 |
| 10425 | AAD | IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK) | WLAN | 8.41 | ±9.6 |
| 10426 | AAD | IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM) | WLAN | 8.45 | ±9.6 |
| 10427 | AAD | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM) | WLAN | 8.41 | ±9.6 |
| 10430 | AAE | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1) | LTE-FDD | 8.28 | ±9.6 |
| 10431 | AAE | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1) | LTE-FDD | 8.38 | ±9.6 |
| 10432 | AAD | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1) | LTE-FDD | 8.34 | ±9.6 |
| 10433 | AAD | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1) | LTE-FDD | 8.34 | ±9.6 |
| 10434 | AAB | W-CDMA (BS Test Model 1, 64 DPCH) | WCDMA | 8.60 | ±9.6 |
| 10435 | AAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.82 | ±9.6 |
| 10447 | AAE | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%) | LTE-FDD | 7.56 | ±9.6 |
| 10448 | AAE | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%) | LTE-FDD | 7.53 | ±9.6 |
| 10449 | AAD | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%) | LTE-FDD | 7.51 | ±9.6 |
| 10450 | AAD | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | LTE-FDD | 7.48 | ±9.6 |
| 10451 | AAB | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%) | WCDMA | 7.59 | ±9.6 |
| 10453 | AAE | Validation (Square, 10 ms, 1 ms) | Test | 10.00 | ±9.6 |
| 10456 | AAD | IEEE 802.11ac WiFi (160 MHz, 64-QAM, 99pc duty cycle) | WLAN | 8.63 | ±9.6 |
| 10457 | AAB | UMTS-FDD (DC-HSDPA) | WCDMA | 6.62 | ±9.6 |
| 10458 | AAA | CDMA2000 (1xEV-DO, Rev. B, 2 carriers) | CDMA2000 | 6.55 | ±9.6 |
| 10459 | AAA | CDMA2000 (1xEV-DO, Rev. B, 3 carriers) | CDMA2000 | 8.25 | ±9.6 |
| 10460 | AAB | UMTS-FDD (WCDMA, AMR) | WCDMA | 2.39 | ±9.6 |
| 10461 | AAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.82 | ±9.6 |
| 10462 | AAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.30 | ±9.6 |
| 10463 | AAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.56 | ±9.6 |
| 10464 | AAD | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.82 | ±9.6 |
| 10465 | AAD | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.32 | ±9.6 |
| 10466 | AAD | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.57 | ±9.6 |
| 10467 | AAG | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.82 | ±9.6 |
| 10468 | AAG | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.32 | ±9.6 |
| 10469 | AAG | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.56 | ±9.6 |
| 10470 | AAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.82 | ±9.6 |
| 10471 | AAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.32 | ±9.6 |

| UID | Rev | Communication System Name | Group | PAR (dB) | Unc$^E$ $k=2$ |
|---|---|---|---|---|---|
| 10472 | AAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.57 | ±9.6 |
| 10473 | AAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.82 | ±9.6 |
| 10474 | AAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.32 | ±9.6 |
| 10475 | AAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.57 | ±9.6 |
| 10477 | AAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.32 | ±9.6 |
| 10478 | AAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.57 | ±9.6 |
| 10479 | AAC | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.74 | ±9.6 |
| 10480 | AAC | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.18 | ±9.6 |
| 10481 | AAC | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.45 | ±9.6 |
| 10482 | AAD | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.71 | ±9.6 |
| 10483 | AAD | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.39 | ±9.6 |
| 10484 | AAD | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.47 | ±9.6 |
| 10485 | AAG | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.59 | ±9.6 |
| 10486 | AAG | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.38 | ±9.6 |
| 10487 | AAG | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.60 | ±9.6 |
| 10488 | AAG | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.70 | ±9.6 |
| 10489 | AAG | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.31 | ±9.6 |
| 10490 | AAG | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.54 | ±9.6 |
| 10491 | AAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.74 | ±9.6 |
| 10492 | AAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.41 | ±9.6 |
| 10493 | AAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.55 | ±9.6 |
| 10494 | AAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.74 | ±9.6 |
| 10495 | AAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.37 | ±9.6 |
| 10496 | AAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.54 | ±9.6 |
| 10497 | AAC | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.67 | ±9.6 |
| 10498 | AAC | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.40 | ±9.6 |
| 10499 | AAC | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.68 | ±9.6 |
| 10500 | AAD | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.67 | ±9.6 |
| 10501 | AAD | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.44 | ±9.6 |
| 10502 | AAD | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.52 | ±9.6 |
| 10503 | AAG | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.72 | ±9.6 |
| 10504 | AAG | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.31 | ±9.6 |
| 10505 | AAG | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.54 | ±9.6 |
| 10506 | AAG | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.74 | ±9.6 |
| 10507 | AAG | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.36 | ±9.6 |
| 10508 | AAG | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.55 | ±9.6 |
| 10509 | AAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.99 | ±9.6 |
| 10510 | AAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.49 | ±9.6 |
| 10511 | AAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.51 | ±9.6 |
| 10512 | AAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 7.74 | ±9.6 |
| 10513 | AAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.42 | ±9.6 |
| 10514 | AAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.45 | ±9.6 |
| 10515 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle) | WLAN | 1.58 | ±9.6 |
| 10516 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle) | WLAN | 1.57 | ±9.6 |
| 10517 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle) | WLAN | 1.58 | ±9.6 |
| 10518 | AAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle) | WLAN | 8.23 | ±9.6 |
| 10519 | AAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle) | WLAN | 8.39 | ±9.6 |
| 10520 | AAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) | WLAN | 8.12 | ±9.6 |
| 10521 | AAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) | WLAN | 7.97 | ±9.6 |
| 10522 | AAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) | WLAN | 8.45 | ±9.6 |
| 10523 | AAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) | WLAN | 8.08 | ±9.6 |
| 10524 | AAD | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) | WLAN | 8.27 | ±9.6 |
| 10525 | AAD | IEEE 802.11ac WiFi (20 MHz, MCS0, 99pc duty cycle) | WLAN | 8.36 | ±9.6 |
| 10526 | AAD | IEEE 802.11ac WiFi (20 MHz, MCS1, 99pc duty cycle) | WLAN | 8.42 | ±9.6 |
| 10527 | AAD | IEEE 802.11ac WiFi (20 MHz, MCS2, 99pc duty cycle) | WLAN | 8.21 | ±9.6 |
| 10528 | AAD | IEEE 802.11ac WiFi (20 MHz, MCS3, 99pc duty cycle) | WLAN | 8.36 | ±9.6 |
| 10529 | AAD | IEEE 802.11ac WiFi (20 MHz, MCS4, 99pc duty cycle) | WLAN | 8.36 | ±9.6 |
| 10531 | AAD | IEEE 802.11ac WiFi (20 MHz, MCS6, 99pc duty cycle) | WLAN | 8.43 | ±9.6 |
| 10532 | AAD | IEEE 802.11ac WiFi (20 MHz, MCS7, 99pc duty cycle) | WLAN | 8.29 | ±9.6 |
| 10533 | AAD | IEEE 802.11ac WiFi (20 MHz, MCS8, 99pc duty cycle) | WLAN | 8.38 | ±9.6 |
| 10534 | AAD | IEEE 802.11ac WiFi (40 MHz, MCS0, 99pc duty cycle) | WLAN | 8.45 | ±9.6 |
| 10535 | AAD | IEEE 802.11ac WiFi (40 MHz, MCS1, 99pc duty cycle) | WLAN | 8.45 | ±9.6 |
| 10536 | AAD | IEEE 802.11ac WiFi (40 MHz, MCS2, 99pc duty cycle) | WLAN | 8.32 | ±9.6 |
| 10537 | AAD | IEEE 802.11ac WiFi (40 MHz, MCS3, 99pc duty cycle) | WLAN | 8.44 | ±9.6 |
| 10538 | AAD | IEEE 802.11ac WiFi (40 MHz, MCS4, 99pc duty cycle) | WLAN | 8.54 | ±9.6 |
| 10540 | AAD | IEEE 802.11ac WiFi (40 MHz, MCS6, 99pc duty cycle) | WLAN | 8.39 | ±9.6 |

EX3DV4 - SN:3825 July 10, 2024

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

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

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

| UID | Rev | Communication System Name | Group | PAR (dB) | Unc$^E$ $k = 2$ |
|---|---|---|---|---|---|
| 10753 | AAC | IEEE 802.11ax (160 MHz, MCS10, 90pc duty cycle) | WLAN | 9.00 | ±9.6 |
| 10754 | AAC | IEEE 802.11ax (160 MHz, MCS11, 90pc duty cycle) | WLAN | 8.94 | ±9.6 |
| 10755 | AAC | IEEE 802.11ax (160 MHz, MCS0, 99pc duty cycle) | WLAN | 8.64 | ±9.6 |
| 10756 | AAC | IEEE 802.11ax (160 MHz, MCS1, 99pc duty cycle) | WLAN | 8.77 | ±9.6 |
| 10757 | AAC | IEEE 802.11ax (160 MHz, MCS2, 99pc duty cycle) | WLAN | 8.77 | ±9.6 |
| 10758 | AAC | IEEE 802.11ax (160 MHz, MCS3, 99pc duty cycle) | WLAN | 8.69 | ±9.6 |
| 10759 | AAC | IEEE 802.11ax (160 MHz, MCS4, 99pc duty cycle) | WLAN | 8.58 | ±9.6 |
| 10760 | AAC | IEEE 802.11ax (160 MHz, MCS5, 99pc duty cycle) | WLAN | 8.49 | ±9.6 |
| 10761 | AAC | IEEE 802.11ax (160 MHz, MCS6, 99pc duty cycle) | WLAN | 8.58 | ±9.6 |
| 10762 | AAC | IEEE 802.11ax (160 MHz, MCS7, 99pc duty cycle) | WLAN | 8.49 | ±9.6 |
| 10763 | AAC | IEEE 802.11ax (160 MHz, MCS8, 99pc duty cycle) | WLAN | 8.53 | ±9.6 |
| 10764 | AAC | IEEE 802.11ax (160 MHz, MCS9, 99pc duty cycle) | WLAN | 8.54 | ±9.6 |
| 10765 | AAC | IEEE 802.11ax (160 MHz, MCS10, 99pc duty cycle) | WLAN | 8.54 | ±9.6 |
| 10766 | AAC | IEEE 802.11ax (160 MHz, MCS11, 99pc duty cycle) | WLAN | 8.51 | ±9.6 |
| 10767 | AAG | 5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 7.99 | ±9.6 |
| 10768 | AAE | 5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.01 | ±9.6 |
| 10769 | AAD | 5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.01 | ±9.6 |
| 10770 | AAE | 5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.02 | ±9.6 |
| 10771 | AAD | 5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.02 | ±9.6 |
| 10772 | AAE | 5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.23 | ±9.6 |
| 10773 | AAF | 5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.03 | ±9.6 |
| 10774 | AAE | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.02 | ±9.6 |
| 10775 | AAF | 5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.31 | ±9.6 |
| 10776 | AAE | 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 | AAE | 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 | AAE | 5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.38 | ±9.6 |
| 10781 | AAF | 5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.38 | ±9.6 |
| 10782 | AAE | 5G NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.43 | ±9.6 |
| 10783 | AAG | 5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.31 | ±9.6 |
| 10784 | AAE | 5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.29 | ±9.6 |
| 10785 | AAD | 5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.40 | ±9.6 |
| 10786 | AAE | 5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.35 | ±9.6 |
| 10787 | AAD | 5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.44 | ±9.6 |
| 10788 | AAE | 5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.39 | ±9.6 |
| 10789 | AAF | 5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.37 | ±9.6 |
| 10790 | AAE | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.39 | ±9.6 |
| 10791 | AAG | 5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.83 | ±9.6 |
| 10792 | AAE | 5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.92 | ±9.6 |
| 10793 | AAD | 5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.95 | ±9.6 |
| 10794 | AAE | 5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.82 | ±9.6 |
| 10795 | AAD | 5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.84 | ±9.6 |
| 10796 | AAE | 5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.82 | ±9.6 |
| 10797 | AAF | 5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.01 | ±9.6 |
| 10798 | AAE | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.89 | ±9.6 |
| 10799 | AAF | 5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.93 | ±9.6 |
| 10801 | AAF | 5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.89 | ±9.6 |
| 10802 | AAE | 5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.87 | ±9.6 |
| 10803 | AAF | 5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 7.93 | ±9.6 |
| 10805 | AAE | 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 | AAE | 5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.34 | ±9.6 |
| 10810 | AAF | 5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.34 | ±9.6 |
| 10812 | AAF | 5G NR (CP-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.35 | ±9.6 |
| 10817 | AAG | 5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.35 | ±9.6 |
| 10818 | AAE | 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 | AAE | 5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.30 | ±9.6 |
| 10821 | AAD | 5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.41 | ±9.6 |
| 10822 | AAE | 5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.41 | ±9.6 |
| 10823 | AAF | 5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.36 | ±9.6 |
| 10824 | AAE | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.39 | ±9.6 |
| 10825 | AAF | 5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.41 | ±9.6 |
| 10827 | AAF | 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$^E$ $k = 2$ |
|---|---|---|---|---|---|
| 10829 | AAF | 5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.40 | ±9.6 |
| 10830 | AAE | 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 | AAE | 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 | AAE | 5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 7.75 | ±9.6 |
| 10835 | AAF | 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 | AAF | 5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 7.68 | ±9.6 |
| 10839 | AAF | 5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 7.70 | ±9.6 |
| 10840 | AAE | 5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 7.67 | ±9.6 |
| 10841 | AAF | 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 | AAE | 5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 8.34 | ±9.6 |
| 10846 | AAE | 5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 8.41 | ±9.6 |
| 10854 | AAE | 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 | AAE | 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 | AAE | 5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 8.36 | ±9.6 |
| 10859 | AAF | 5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 8.34 | ±9.6 |
| 10860 | AAE | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 8.41 | ±9.6 |
| 10861 | AAF | 5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 8.40 | ±9.6 |
| 10863 | AAF | 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 | AAF | 5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz) | 5G NR FR1 TDD | 8.41 | ±9.6 |
| 10866 | AAF | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.68 | ±9.6 |
| 10868 | AAF | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.89 | ±9.6 |
| 10869 | AAE | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz) | 5G NR FR2 TDD | 5.75 | ±9.6 |
| 10870 | AAE | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz) | 5G NR FR2 TDD | 5.86 | ±9.6 |
| 10871 | AAE | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz) | 5G NR FR2 TDD | 5.75 | ±9.6 |
| 10872 | AAE | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz) | 5G NR FR2 TDD | 6.52 | ±9.6 |
| 10873 | AAE | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz) | 5G NR FR2 TDD | 6.61 | ±9.6 |
| 10874 | AAE | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz) | 5G NR FR2 TDD | 6.65 | ±9.6 |
| 10875 | AAE | 5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz) | 5G NR FR2 TDD | 7.78 | ±9.6 |
| 10876 | AAE | 5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz) | 5G NR FR2 TDD | 8.39 | ±9.6 |
| 10877 | AAE | 5G NR (CP-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz) | 5G NR FR2 TDD | 7.95 | ±9.6 |
| 10878 | AAE | 5G NR (CP-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz) | 5G NR FR2 TDD | 8.41 | ±9.6 |
| 10879 | AAE | 5G NR (CP-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz) | 5G NR FR2 TDD | 8.12 | ±9.6 |
| 10880 | AAE | 5G NR (CP-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz) | 5G NR FR2 TDD | 8.38 | ±9.6 |
| 10881 | AAE | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz) | 5G NR FR2 TDD | 5.75 | ±9.6 |
| 10882 | AAE | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz) | 5G NR FR2 TDD | 5.96 | ±9.6 |
| 10883 | AAE | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz) | 5G NR FR2 TDD | 6.57 | ±9.6 |
| 10884 | AAE | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz) | 5G NR FR2 TDD | 6.53 | ±9.6 |
| 10885 | AAE | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz) | 5G NR FR2 TDD | 6.61 | ±9.6 |
| 10886 | AAE | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz) | 5G NR FR2 TDD | 6.65 | ±9.6 |
| 10887 | AAE | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz) | 5G NR FR2 TDD | 7.78 | ±9.6 |
| 10888 | AAE | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz) | 5G NR FR2 TDD | 8.35 | ±9.6 |
| 10889 | AAE | 5G NR (CP-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz) | 5G NR FR2 TDD | 8.02 | ±9.6 |
| 10890 | AAE | 5G NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz) | 5G NR FR2 TDD | 8.40 | ±9.6 |
| 10891 | AAE | 5G NR (CP-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz) | 5G NR FR2 TDD | 8.13 | ±9.6 |
| 10892 | AAE | 5G NR (CP-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz) | 5G NR FR2 TDD | 8.41 | ±9.6 |
| 10897 | AAE | 5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.66 | ±9.6 |
| 10898 | AAC | 5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.67 | ±9.6 |
| 10899 | AAB | 5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.67 | ±9.6 |
| 10900 | AAC | 5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.68 | ±9.6 |
| 10901 | AAB | 5G NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.68 | ±9.6 |
| 10902 | AAC | 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 | AAC | 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 | AAE | 5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.78 | ±9.6 |
| 10908 | AAC | 5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.93 | ±9.6 |
| 10909 | AAB | 5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.96 | ±9.6 |
| 10910 | AAC | 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$^E$ $k = 2$ |
|---|---|---|---|---|---|
| 10911 | AAB | 5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.93 | ±9.6 |
| 10912 | AAC | 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 | AAC | 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 | AAE | 5G NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.86 | ±9.6 |
| 10919 | AAC | 5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.86 | ±9.6 |
| 10920 | AAB | 5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.87 | ±9.6 |
| 10921 | AAC | 5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.84 | ±9.6 |
| 10922 | AAB | 5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 5.82 | ±9.6 |
| 10923 | AAC | 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 | AAC | 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 | AAC | 5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.52 | ±9.6 |
| 10931 | AAC | 5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.51 | ±9.6 |
| 10932 | AAC | 5G NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.51 | ±9.6 |
| 10933 | AAC | 5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.51 | ±9.6 |
| 10934 | AAC | 5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.51 | ±9.6 |
| 10935 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.51 | ±9.6 |
| 10936 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.90 | ±9.6 |
| 10937 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.77 | ±9.6 |
| 10938 | AAC | 5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.90 | ±9.6 |
| 10939 | AAC | 5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.82 | ±9.6 |
| 10940 | AAC | 5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.89 | ±9.6 |
| 10941 | AAC | 5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.83 | ±9.6 |
| 10942 | AAC | 5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.85 | ±9.6 |
| 10943 | AAD | 5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.95 | ±9.6 |
| 10944 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.81 | ±9.6 |
| 10945 | AAD | 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 | AAC | 5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.87 | ±9.6 |
| 10948 | AAC | 5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.94 | ±9.6 |
| 10949 | AAC | 5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.87 | ±9.6 |
| 10950 | AAC | 5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.94 | ±9.6 |
| 10951 | AAD | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz) | 5G NR FR1 FDD | 5.92 | ±9.6 |
| 10952 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.25 | ±9.6 |
| 10953 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.15 | ±9.6 |
| 10954 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.23 | ±9.6 |
| 10955 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.42 | ±9.6 |
| 10956 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz) | 5G NR FR1 FDD | 8.14 | ±9.6 |
| 10957 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz) | 5G NR FR1 FDD | 8.31 | ±9.6 |
| 10958 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz) | 5G NR FR1 FDD | 8.61 | ±9.6 |
| 10959 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz) | 5G NR FR1 FDD | 8.33 | ±9.6 |
| 10960 | AAE | 5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.32 | ±9.6 |
| 10961 | AAC | 5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.36 | ±9.6 |
| 10962 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.40 | ±9.6 |
| 10963 | AAC | 5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.55 | ±9.6 |
| 10964 | AAE | 5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.29 | ±9.6 |
| 10965 | AAC | 5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.37 | ±9.6 |
| 10966 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.55 | ±9.6 |
| 10967 | AAC | 5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.42 | ±9.6 |
| 10968 | AAD | 5G NR DL (CP-OFDM, TM 3.1, 100 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.49 | ±9.6 |
| 10972 | AAC | 5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 11.59 | ±9.6 |
| 10973 | AAD | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 9.06 | ±9.6 |
| 10974 | AAD | 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 | 1.16 | ±9.6 |
| 10979 | AAA | ULLA HDR4 | ULLA | 8.58 | ±9.6 |
| 10980 | AAA | ULLA HDR8 | ULLA | 10.32 | ±9.6 |
| 10981 | AAA | ULLA HDRp4 | ULLA | 3.19 | ±9.6 |
| 10982 | AAA | ULLA HDRp8 | ULLA | 3.43 | ±9.6 |

| UID | Rev | Communication System Name | Group | PAR (dB) | Unc[E] $k = 2$ |
|---|---|---|---|---|---|
| 10983 | AAC | 5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.31 | ±9.6 |
| 10984 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 9.42 | ±9.6 |
| 10985 | AAC | 5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.54 | ±9.6 |
| 10986 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.50 | ±9.6 |
| 10987 | AAC | 5G NR DL (CP-OFDM, TM 3.1, 60 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.53 | ±9.6 |
| 10988 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.38 | ±9.6 |
| 10989 | AAC | 5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.33 | ±9.6 |
| 10990 | AAB | 5G NR DL (CP-OFDM, TM 3.1, 90 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 9.52 | ±9.6 |
| 11003 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz) | 5G NR FR1 TDD | 10.24 | ±9.6 |
| 11004 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz) | 5G NR FR1 TDD | 10.73 | ±9.6 |
| 11005 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.70 | ±9.6 |
| 11006 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.55 | ±9.6 |
| 11007 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.46 | ±9.6 |
| 11008 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz) | 5G NR FR1 FDD | 8.51 | ±9.6 |
| 11009 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 30 kHz) | 5G NR FR1 FDD | 8.76 | ±9.6 |
| 11010 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz) | 5G NR FR1 FDD | 8.95 | ±9.6 |
| 11011 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz) | 5G NR FR1 FDD | 8.96 | ±9.6 |
| 11012 | AAA | 5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz) | 5G NR FR1 FDD | 8.68 | ±9.6 |
| 11013 | AAB | IEEE 802.11be (320 MHz, MCS1, 99pc duty cycle) | WLAN | 8.47 | ±9.6 |
| 11014 | AAB | IEEE 802.11be (320 MHz, MCS2, 99pc duty cycle) | WLAN | 8.45 | ±9.6 |
| 11015 | AAB | IEEE 802.11be (320 MHz, MCS3, 99pc duty cycle) | WLAN | 8.44 | ±9.6 |
| 11016 | AAB | IEEE 802.11be (320 MHz, MCS4, 99pc duty cycle) | WLAN | 8.44 | ±9.6 |
| 11017 | AAB | IEEE 802.11be (320 MHz, MCS5, 99pc duty cycle) | WLAN | 8.41 | ±9.6 |
| 11018 | AAB | IEEE 802.11be (320 MHz, MCS6, 99pc duty cycle) | WLAN | 8.40 | ±9.6 |
| 11019 | AAB | IEEE 802.11be (320 MHz, MCS7, 99pc duty cycle) | WLAN | 8.29 | ±9.6 |
| 11020 | AAB | IEEE 802.11be (320 MHz, MCS8, 99pc duty cycle) | WLAN | 8.27 | ±9.6 |
| 11021 | AAB | IEEE 802.11be (320 MHz, MCS9, 99pc duty cycle) | WLAN | 8.46 | ±9.6 |
| 11022 | AAB | IEEE 802.11be (320 MHz, MCS10, 99pc duty cycle) | WLAN | 8.36 | ±9.6 |
| 11023 | AAB | IEEE 802.11be (320 MHz, MCS11, 99pc duty cycle) | WLAN | 8.09 | ±9.6 |
| 11024 | AAB | IEEE 802.11be (320 MHz, MCS12, 99pc duty cycle) | WLAN | 8.42 | ±9.6 |
| 11025 | AAB | IEEE 802.11be (320 MHz, MCS13, 99pc duty cycle) | WLAN | 8.37 | ±9.6 |
| 11026 | AAB | IEEE 802.11be (320 MHz, MCS0, 99pc duty cycle) | WLAN | 8.39 | ±9.6 |

[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

# Appendix 8 Dipole / Verification source calibration record

D2450V2 – SN:713

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

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

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

**Accreditation No.: SCS 0108**

**Client** UL Japan Head Office (RCC) **Certificate No: D2450V2-713_Sep22**

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D2450V2 - SN:713 |
| Calibration procedure(s) | QA CAL-05.v11<br>Calibration Procedure for SAR Validation Sources between 0.7-3 GHz |
| Calibration date: | September 12, 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 |
| Power sensor NRP-Z91 | SN: 103245 | 04-Apr-22 (No. 217-03525) | Apr-23 |
| Reference 20 dB Attenuator | SN: BH9394 (20k) | 04-Apr-22 (No. 217-03527) | Apr-23 |
| Type-N mismatch combination | SN: 310982 / 06327 | 04-Apr-22 (No. 217-03528) | Apr-23 |
| Reference Probe EX3DV4 | SN: 7349 | 31-Dec-21 (No. EX3-7349_Dec21) | Dec-22 |
| DAE4 | SN: 601 | 31-Aug-22 (No. DAE4-601_Aug22) | Aug-23 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power meter E4419B | SN: GB39512475 | 30-Oct-14 (in house check Oct-20) | In house check: Oct-22 |
| Power sensor HP 8481A | SN: US37292783 | 07-Oct-15 (in house check Oct-20) | In house check: Oct-22 |
| Power sensor HP 8481A | SN: MY41093315 | 07-Oct-15 (in house check Oct-20) | In house check: Oct-22 |
| RF generator R&S SMT-06 | SN: 100972 | 15-Jun-15 (in house check Oct-20) | In house check: Oct-22 |
| Network Analyzer Agilent E8358A | SN: US41080477 | 31-Mar-14 (in house check Oct-20) | In house check: Oct-22 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Michael Weber | Laboratory Technician | |
| Approved by: | Sven Kühn | Technical Manager | |

Issued: September 13, 2022

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

Certificate No: D2450V2-713_Sep22 Page 1 of 8

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

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

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

**Accreditation No.: SCS 0108**

**Glossary:**

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

**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"

**Additional Documentation:**

c) DASY 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 source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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

## Measurement Conditions

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

| | | |
|---|---|---|
| **DASY Version** | DASY52 | V52.10.4 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Modular Flat Phantom | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 2450 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 39.2 | 1.80 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 37.8 ± 6 % | 1.84 mho/m ± 6 % |
| **Head TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 cm³ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 13.3 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **52.3 W/kg ± 17.0 % (k=2)** |

| **SAR averaged over 10 cm³ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 6.19 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **24.5 W/kg ± 16.5 % (k=2)** |

## Body TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 52.7 | 1.95 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 51.0 ± 6 % | 2.03 mho/m ± 6 % |
| **Body TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Body TSL

| **SAR averaged over 1 cm³ (1 g) of Body TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 13.0 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **50.6 W/kg ± 17.0 % (k=2)** |

| **SAR averaged over 10 cm³ (10 g) of Body TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 6.15 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **24.2 W/kg ± 16.5 % (k=2)** |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 53.0 Ω + 1.9 jΩ |
| Return Loss | - 29.2 dB |

### Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 49.7 Ω + 4.7 jΩ |
| Return Loss | - 26.5 dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.160 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 |

**DASY5 Validation Report for Head TSL**

Date: 12.09.2022

Test Laboratory: SPEAG, Zurich, Switzerland

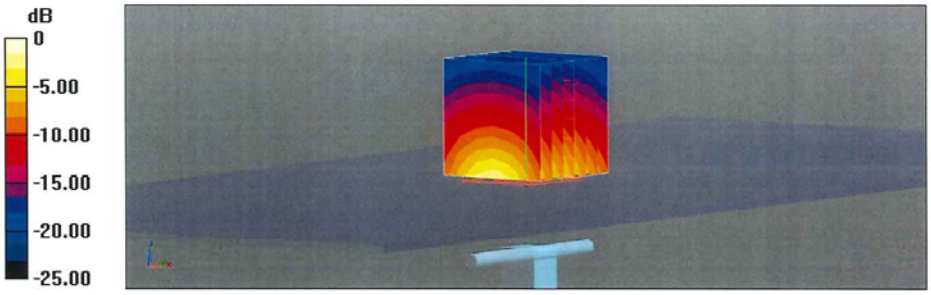
**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 713**

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.84 S/m; $\varepsilon_r$ = 37.8; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

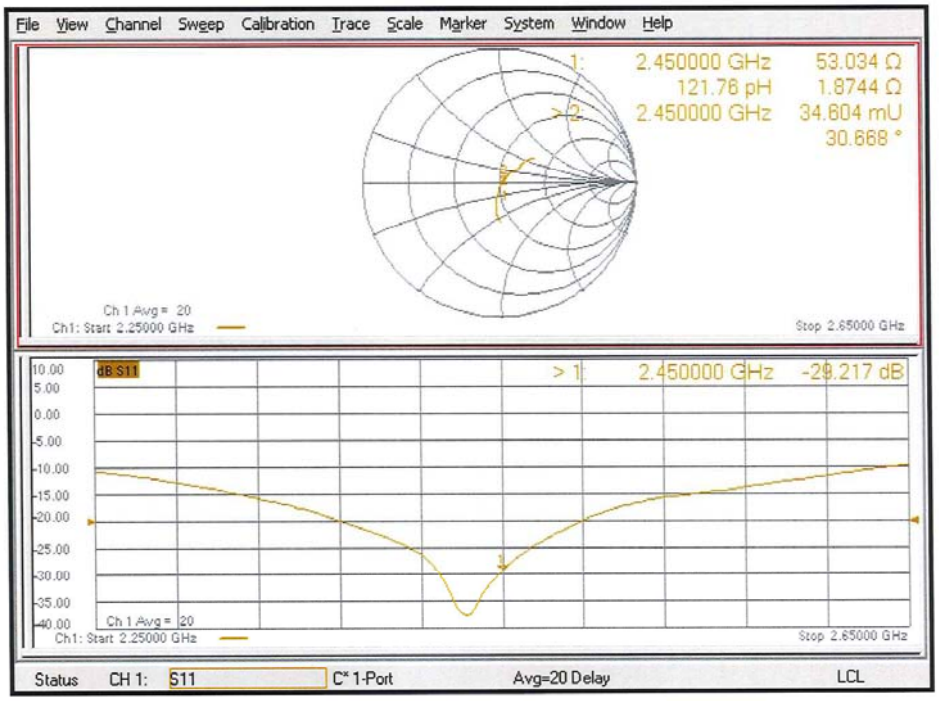
- Probe: EX3DV4 - SN7349; ConvF(7.96, 7.96, 7.96) @ 2450 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 31.08.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

**Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 114.4 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 26.0 W/kg
**SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.19 W/kg**
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 51.3%
Maximum value of SAR (measured) = 21.6 W/kg




0 dB = 21.6 W/kg = 13.34 dBW/kg

**Impedance Measurement Plot for Head TSL**



**DASY5 Validation Report for Body TSL**

Date: 12.09.2022

Test Laboratory: SPEAG, Zurich, Switzerland

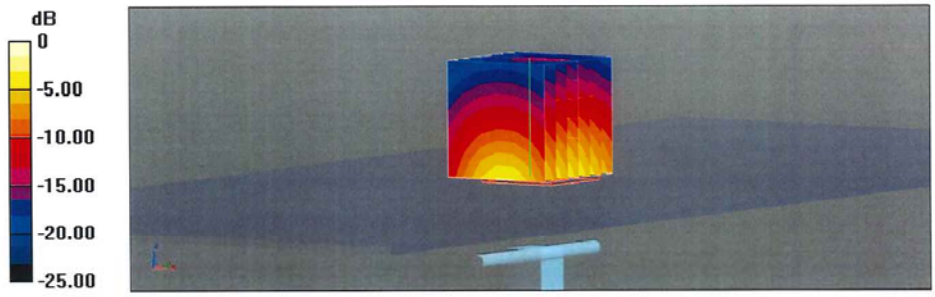
**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 713**

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; $\sigma$ = 2.03 S/m; $\varepsilon_r$ = 51; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

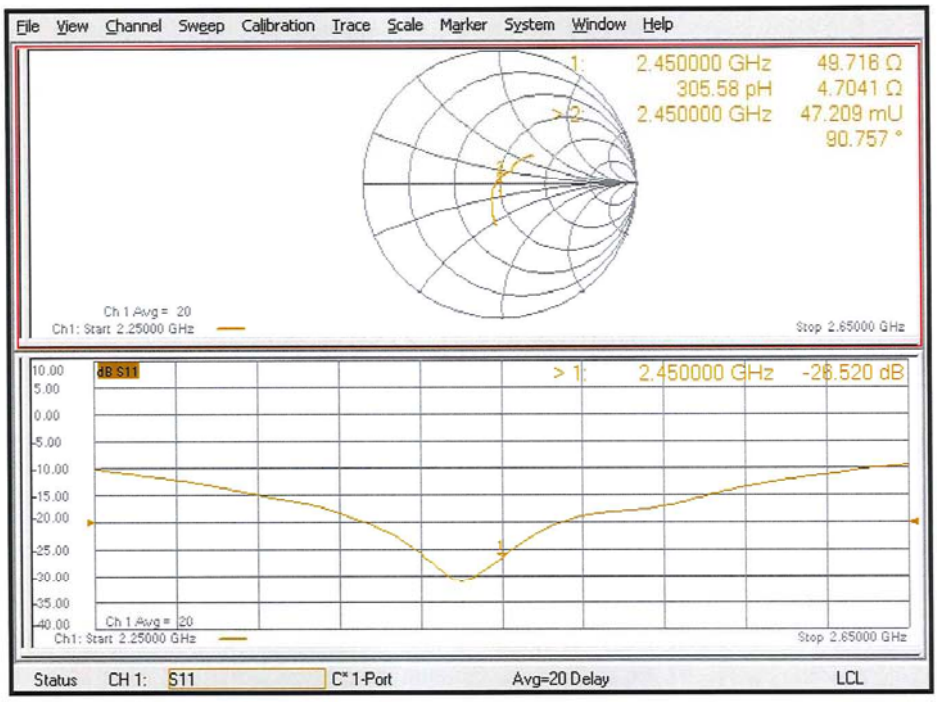
- Probe: EX3DV4 - SN7349; ConvF(8.12, 8.12, 8.12) @ 2450 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 31.08.2022
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

**Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 108.3 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 24.2 W/kg
**SAR(1 g) = 13.0 W/kg; SAR(10 g) = 6.15 W/kg**
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 55.3%
Maximum value of SAR (measured) = 19.7 W/kg




0 dB = 19.7 W/kg = 12.93 dBW/kg

**Impedance Measurement Plot for Body TSL**



D2450V2 Calibration for Impedance and Return-loss

| | | | |
|---|---|---|---|
| Equipment | Dipole Antenna | Model | D2450V2 |
| Manufacture | Schmid & Partner Engineering AG | Serial | 713 |
| Tested by | Hisayoshi Sato (2023) | Tested by | Tomohisa Nakagawa (2024) |

## 1. Test environment

| | | | |
|---|---|---|---|
| Date | August 1, 2023 | Date | September 6, 2024 |
| Ambient Temperature | 22.5 deg.C | Ambient Temperature | 21 deg.C |
| Relative humidity | 40 %RH | Relative humidity | 58 %RH |

## 2. Equipment used

2023

| LIMS ID | Description | Manufacturer | Model | Serial | Last Cal Date | Interval |
|---|---|---|---|---|---|---|
| 88581 | Thermo-Hygrometer | CUSTOM. Inc | CTH-201 | - | 2023/07/18 | 12 |
| 142060 | SAM Phantom | Schmid & Partner Engineering AG | QD000P40CB | 1333 | 2023/05/10 | 12 |
| 142056 | 2mm Oval Flat Phantom | Schmid & Partner Engineering AG | QDOVA001BB | 1045 | 2023/05/10 | 12 |
| 176484 | Head Simulating Liquid | Schmid & Partner Engineering AG | HBBL600-10000V6 | SL AAH U16 BC | - | - |
| 150815 | Network Analyzer | Keysight Technologies Inc | E5071C | MY46523746 | 2022/08/23 | 12 |
| 141991 | 2.4mm Calibration Kit | CUSTOM. Inc | 85056A | MY44300225 | 2022/08/18 | 12 |

2024

| LIMS ID | Description | Manufacturer | Model | Serial | Last Cal Date | Interval |
|---|---|---|---|---|---|---|
| 251453 | Analyzer, Network | Rohde & Schwarz | ZNL14 | 200030 | 2024/07/12 | 12 |
| 251454 | RF Device, Passive, Calibration Kit | Rohde & Schwarz | ZN-Z135 | 101032 | 2024/06/21 | 12 |
| 176484 | Head Simulating Liquid | Schmid & Partner Engineering AG | HBBL600-10000V6 | SL AAH U16 BC | - | - |
| 142056 | 2mm Oval Flat Phantom | Schmid & Partner Engineering AG | QDOVA001BB | 1045 | 2024/05/31 | 12 |
| 141574 | Digital thermometer | LKM electronic | DTM3000 | - | 2024/08/24 | 12 |
| 244705 | Thermo-Hygrometer | A & D | AD-5648A | 1002 | 2024/01/25 | 12 |

## 3. Test Result

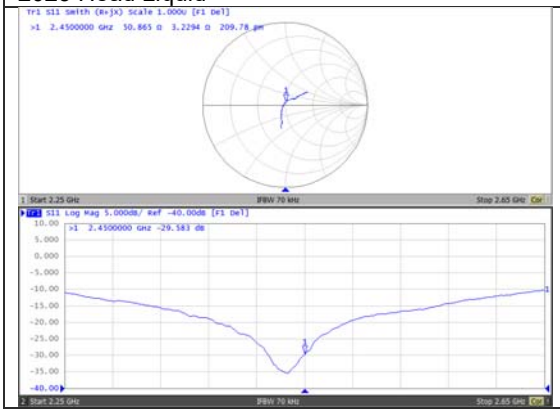
| Impeadance,Transformed to feed poin | cal day | Head (real part) [Ω] | Head (img part) [jΩ] | Deviation (real part) [Ω] | Deviation (img part) [jΩ] | Tolerance | Result |
|---|---|---|---|---|---|---|---|
| Calibration (SPEAG) | 2022/9/12 | 53.03 | 1.87 | - | - | - | - |
| Calibration(ULJ) | 2023/8/1 | 50.87 | 3.23 | -2.17 | 1.36 | +/- 5 Ω +/- 5 jΩ | Complied |
| Calibration(ULJ) | 2024/9/6 | 52.23 | 0.23 | -0.81 | -1.64 | +/- 5 Ω +/- 5 jΩ | Complied |

| Return loss | cal day | Head [dB] | Deviation [%] | Deviation [dB] | Tolerance [%] | Tolerance [+/- dB] | Result |
|---|---|---|---|---|---|---|---|
| Calibration (SPEAG) | 2022/9/12 | -29.22 | - | - | - | - | - |
| Calibration(ULJ) | 2023/8/1 | -29.58 | 1.25 | -0.37 | +/- 20.00 | 5.84 | Complied |
| Calibration(ULJ) | 2024/9/6 | -33.19 | 12.18 | -3.97 | +/- 20.00 | 5.92 | Complied |

Tolerance: According to the KDB 865664 D1

Measurement Plots

2023 Head Liquid



2024 Head Liquid