



FCC 47 CFR § 2.1093
IEC/IEEE Std 62209-1528 : 2020
Std IEC 62232 :2022

RF EVALUATION REPORT (Above 6GHz)

FOR

GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT

MODEL NUMBER: SM-S921U, SM-S921U1

FCC ID: A3LSMS921U

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Testing Laboratory

TL-637

Revision History

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1. Attestation of Test Results

| | | | | | |
|---|-------------------------------------|--|---|------------------------------|---------------------------|
| Applicant Name | | SAMSUNG ELECTRONICS CO.,LTD. | | | |
| FCC ID | | A3LSMS921U | | | |
| Model Number | | SM-S921U | | | |
| Applicable Standards | | FCC 47 CFR § 2.1093 IEC/IEEE Std 62209-1528 : 2020 Std IEC 62232 :2022 Published RF exposure KDB procedures | | | |
| Exposure Category | SAR Limits (W/Kg) | | Power Density Limits (mW/cm ² over 4cm ²) | | |
| | Peak spatial-average (1g of tissue) | Product Specific 10g (10g of tissue) | APD (Absorbed Power Density) | IPD (Incident Power Density) | |
| General population / Uncontrolled exposure | | 1.6 | 4.0 | N/A | 1.0 |
| Equipment Class | | | | | |
| RF Exposure Conditions | | The Highest Reported SAR (W/kg) | | APD (mW/cm ²) | IPD (mW/cm ²) |
| | | 6CD | | 6CD | 6CD |
| Phablet-Head | | 0.30 | 0.14 | 0.89 | |
| Phablet-Body-worn & Hotspot | | 0.08 | 0.05 | | |
| Phablet-Product Specific 10g | | 0.51 | 0.96 | | |
| Simultaneous TX of Phablet | Head | 1.58 | | | |
| | Body-worn & Hotspot | 1.57 | | | |
| | Product Specific 10g | 3.10 | | | |
| Date Tested | | 10/22/2023 to 10/25/2023 | | | |
| Test Results | | Pass | | | |
| <p>UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</p> <p>Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.</p> | | | | | |
| Approved & Released By: | | | Prepared By: | | |
|  | | |  | | |
| Justin Park Operations Leader UL Korea, Ltd. Suwon Laboratory | | | Seungyeon Kim Laboratory Engineer UL Korea, Ltd. Suwon Laboratory | | |

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE Std 1528-2013, IEC TR 63170-2018, IEC 62479:2010, IEC/IEEE 63195-1:2022 the following FCC Published RF exposure [KDB](#) procedures:

- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D01 General RF Exposure Guidance v06
- 648474 D04 Handset SAR v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 941225 D07 UMPC Mini Tablet v01r02

In addition to the above, the following information was used:

- [TCB workshop](#) April, 2021; RF Exposure Policies (U-NII 6-7 GHz Interim Procedures)
- [TCB workshop](#) Oct, 2022; Mobile and Portable Device RF Exposure Policies and Procedures(IPD and SAR evaluation of f-above-6 GHz portable devices)
- SPEAG, 5G Module Application Note : 5G Compliance Testing
- SPEAG, DASY8 Module mmWave Manual, April 2023
- SPEAG DASY6 Application Note : Interim Procedures (Version 9.0) for Devices Operating at 6 – 10 GHz

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at

| |
|------------|
| Suwon |
| SAR 8 Room |
| SAR 9 Room |

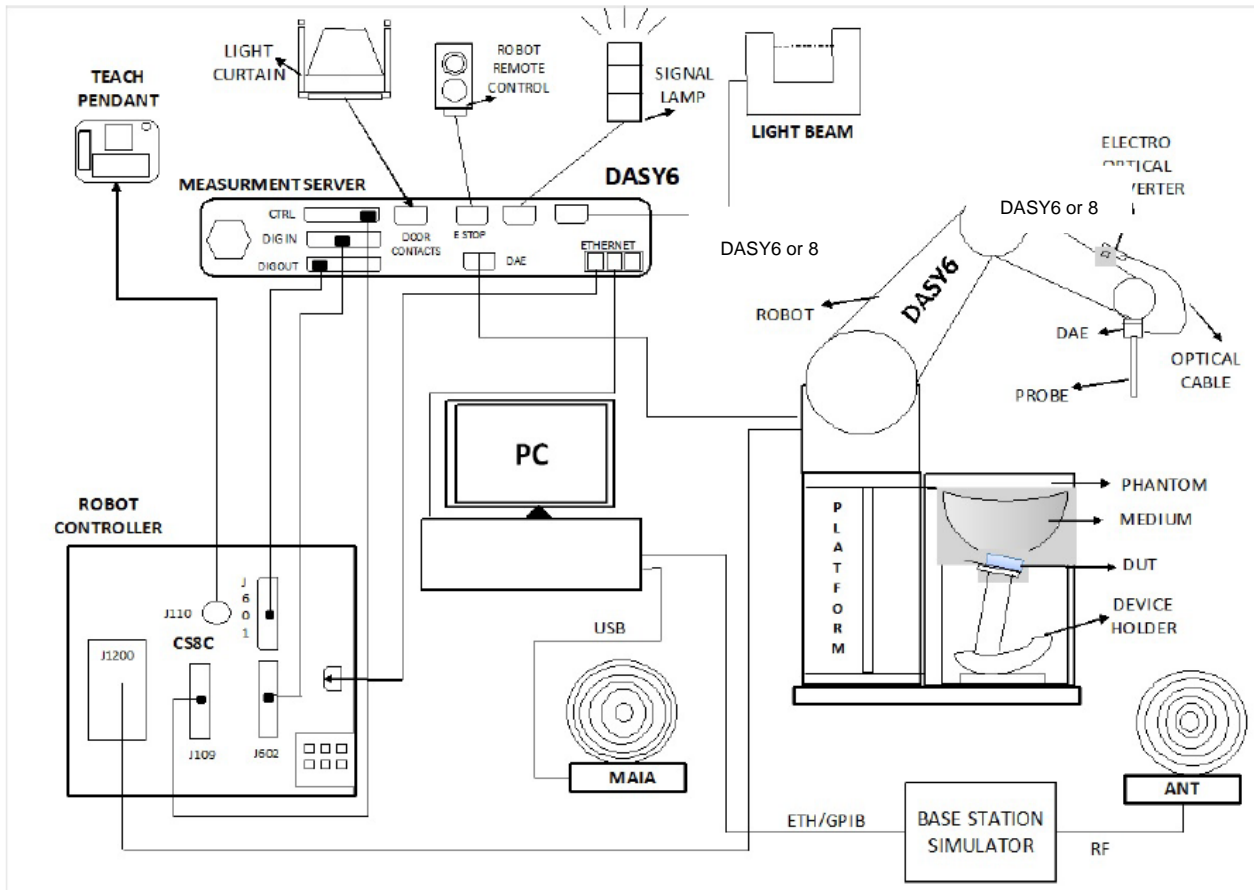
UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637.

The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

4. SAR and Power Density Measurement System & Test Equipment

4.1. SAR Measurement System

The DASY6 & 8 system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win10 and the DASY6 or 8 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

4.1.1. SAR Scan Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEC/IEEE Standard 62209-1528, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from IEC/IEEE Standard 62209-1528.

| Parameter | DUT transmit frequency being tested | |
|--|---|--|
| | $f \leq 3 \text{ GHz}$ | $3 \text{ GHz} < f \leq 10 \text{ GHz}$ |
| Maximum distance between the measured points (geometric centre of the sensors) and the inner phantom surface (z_{M1} in Figure 20 in mm) | 5 ± 1 | $\delta \ln(2)/2 \pm 0,5^a$ |
| Maximum spacing between adjacent measured points in mm (see O.8.3.1) ^b | 20, or half of the corresponding zoom scan length, whichever is smaller | $60/f$, or half of the corresponding zoom scan length, whichever is smaller |
| Maximum angle between the probe axis and the phantom surface normal (α in Figure 20) ^c | 5° (flat phantom only) 30° (other phantoms) | 5° (flat phantom only) 20° (other phantoms) |
| Tolerance in the probe angle | 1° | 1° |
| <p>^a δ is the penetration depth for a plane-wave incident normally on a planar half-space.</p> <p>^b See Clause O.8 on how Δx and Δy may be selected for individual area scan requirements.</p> <p>^c The probe angle relative to the phantom surface normal is restricted due to the degradation in the measurement accuracy in fields with steep spatial gradients. The measurement accuracy decreases with increasing probe angle and increasing frequency. This is the reason for the tighter probe angle restriction at frequencies above 3 GHz.</p> | | |

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from IEC/IEEE Standard 62209-1528.

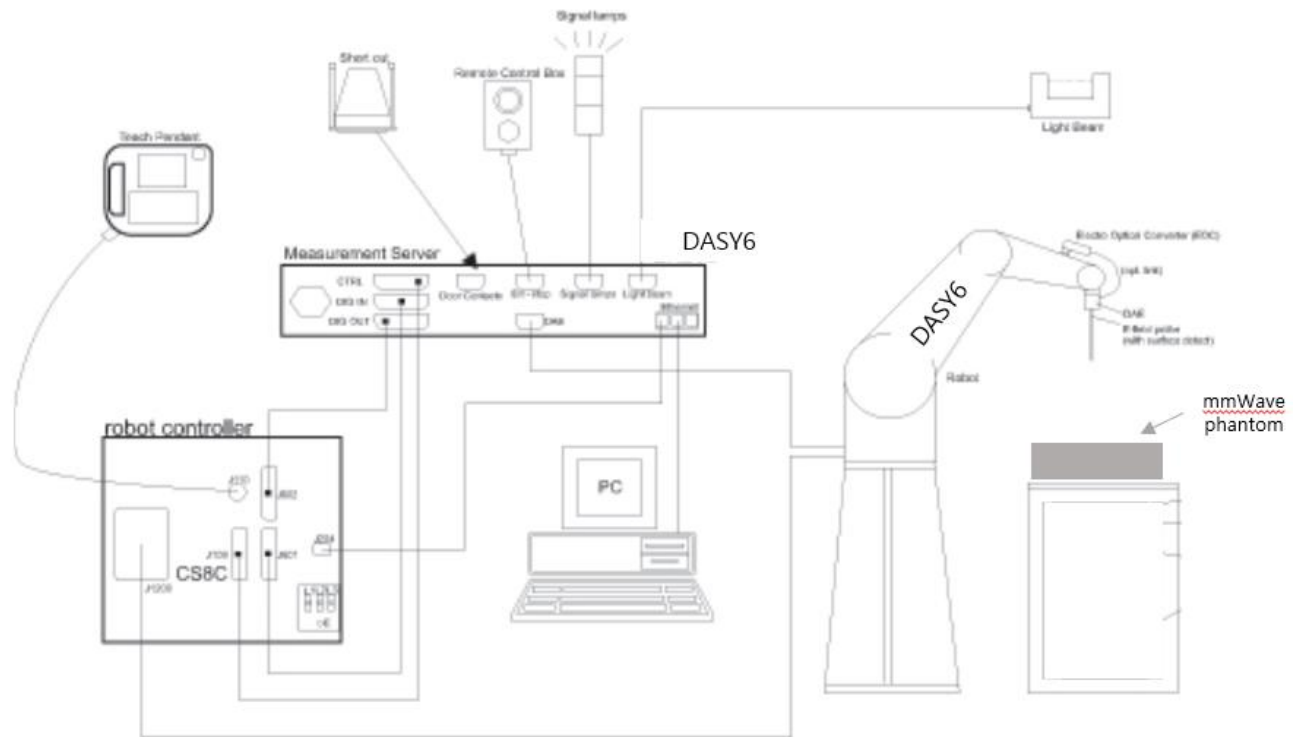
| Parameter | DUT transmit frequency being tested | |
|---|--|--|
| | $f \leq 3$ GHz | 3 GHz $< f \leq 10$ GHz |
| Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 20 and Table 3, in mm) | 5 | $\delta \ln(2)/2^a$ |
| Maximum angle between the probe axis and the phantom surface normal (α in Figure 20) | 5° (flat phantom only) 30° (other phantoms) | 5° (flat phantom only) 20° (other phantoms) |
| Maximum spacing between measured points in the x- and y-directions (Δx and Δy , in mm) | 8 | $24/f^b$ |
| For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm) | 5 | $10/(f - 1)$ |
| For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm) | 4 | $12/f$ |
| For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 20) | 1,5 | 1,5 |
| Minimum edge length of the zoom scan volume in the x- and y-directions (L_z in O.8.3.2, in mm) | 30 | 22 |
| Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in O.8.3.2 in mm) | 30 | 22 |
| Tolerance in the probe angle | 1° | 1° |
| ^a δ is the penetration depth for a plane-wave incident normally on a planar half-space. | | |
| ^b This is the maximum spacing allowed, which might not work for all circumstances. | | |

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

4.2. Incident Power Density Measurement System

The DASY6 & 8 system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- The EUmmWVx probe is based on the pseudo-vector probe design, which not only measures the field magnitude but also derives its polarization ellipse.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win10 and the DASY6 or 8 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom which is specialized for 5G other accessories according to the targeted measurement.

4.2.1. Power Density Scan Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to device under test.

Step 2: 5G Scan

The steps in the X, Y, and Z directions are specified in terms of fractions of the signal wavelength, λ . Area Scan Parameters extracted from DASY8 Module mmWave Manual.

Recommended settings for measurement of verification sources

| Frequency [GHz] | Grid step | Grid extent X/Y [mm] | Measurement points |
|-----------------|-------------------------------|----------------------|--------------------|
| 10 | 0.125 ($\frac{\lambda}{8}$) | 60/60 | 18 × 18 |
| 30 | 0.25 ($\frac{\lambda}{4}$) | 60/60 | 26 × 26 |
| 45 | 0.25 ($\frac{\lambda}{4}$) | 42/42 | 28 × 28 |
| 60 | 0.25 ($\frac{\lambda}{4}$) | 32.5/32.5 | 28 × 28 |
| 90 | 0.25 ($\frac{\lambda}{4}$) | 30/30 | 38 × 38 |

The minimum distance of probe sensors to verification source surface, horn antenna, is 10 mm.

Per equipment manufacturer guidance for 6 – 10GHz, Power density was measured at d=2mm.

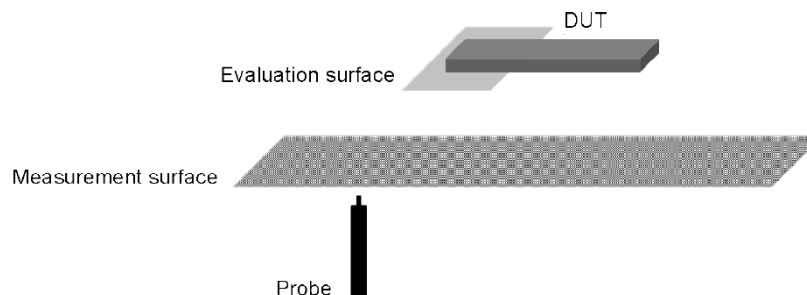
Step 3: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1. When the drift is larger than $\pm 5\%$, test is repeated from step1.

4.2.2. Total Field and Power Flux Density Reconstruction(measurement distance)

Reconstruction algorithms are used to project or transform the measured fields from the measurement surface to the evaluation surface (below fig) in order to determine power density or to compute spatial-average and/or local power density with known uncertainty.

Manufacture has developed a reconstruction approach based on the Gerchberg-Saxton algorithm, which benefits from the availability of the E-field polarization ellipse information obtained with the EUmmWVx probe. This reconstruction algorithm, together with the ability of the probe to measure extremely close to the source without perturbing the field, permits reconstruction of the E- and H-fields, as well as of the power density, on measurement planes.



4.3. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers’ recommendations, and is traceable to recognized national standards.

4.3.1. SAR Test Equipment

Dielectric Property Measurements

| Name of Equipment | Manufacturer | Type/Model | Serial No. | Cal. Due Date |
|---------------------------|-----------------|---------------|---------------|---------------|
| Network Analyzer | ROHDE & SCHWARZ | ZNB 20 | 102256 | 7-24-2024 |
| Dielectric Assessment Kit | SPEAG | DAK-3.5 | 1196 | 7-17-2024 |
| Shorting block | SPEAG | DAK-3.5 Short | SM DAK 200 BA | N/A |
| Thermometer | LKM | DTM3000 | 3851 | 7-25-2024 |
| Thermometer | LKM | DTM3000 | 3862 | 7-25-2024 |

System Check

| Name of Equipment | Manufacturer | Type/Model | Serial No. | Cal. Due Date |
|------------------------------|------------------------|-------------------------------|------------|---------------|
| MXG Analog Signal Generator | Keysight | N5181B | MY59100587 | 7-26-2024 |
| Power Sensor | KEYSIGHT | U2000A | MY60180020 | 7-27-2024 |
| Power Sensor | KEYSIGHT | U2000A | MY54260007 | 7-26-2024 |
| Power Amplifier | EXODUS | AMP2027ADB | 10002 | 1-6-2024 |
| Directional Coupler | KRYTAR | 100318010 | 215542 | 1-5-2024 |
| Low Pass Filter | Wainwright Instruments | WLKX10-11000-13640-21000-60TS | 1 | 7-25-2024 |
| Attenuator | KEYSIGHT | 8491B/010 | MY39272011 | 7-25-2024 |
| Attenuator | KEYSIGHT | 8491B/020 | MY39271973 | 7-25-2024 |
| Attenuator | MINI-CIRCUITS | BW-S3W10+ | N/A | 1-6-2024 |
| E-Field Probe | SPEAG | EX3DV4 | 7376 | 7-25-2024 |
| E-Field Probe | SPEAG | EX3DV4 | 7545 | 8-25-2024 |
| Data Acquisition Electronics | SPEAG | DAE4 | 1670 | 5-24-2024 |
| Data Acquisition Electronics | SPEAG | DAE4 | 1468 | 8-24-2024 |
| System Validation Dipole | SPEAG | D6.5GHz | 1010 | 5-27-2024 |
| Thermometer | Lutron | MHB-382SD | AK.12102 | 7-26-2024 |

Note(s):

1. For System Validation Dipole, Calibration interval applied every 2 years according to referencing KDB 865664 guidance.
2. Refer to Appendix F that mentioned about justification for Extended SAR Dipole Calibrations (for blue box item).
3. All equipments were used until Cal.Due date.

4.3.2 Incident Power Density Test Equipment

System Check

| Name of Equipment | Manufacturer | Type/Model | Serial No. | Cal. Due Date |
|------------------------------|------------------------|-------------------------------|------------|---------------|
| MXG Analog Signal Generator | Keysight | N5181B | MY59100587 | 7/26/2024 |
| Power Sensor | KEYSIGHT | U2000A | MY60180020 | 7/27/2024 |
| Power Sensor | KEYSIGHT | U2000A | MY54260007 | 7/26/2024 |
| Power Amplifier | EXODUS | AMP2027ADB | 10002 | 1/6/2024 |
| Directional Coupler | KRYTAR | 100318010 | 215542 | 1/5/2024 |
| Low Pass Filter | Wainwright Instruments | WLKX10-11000-13640-21000-60TS | 1 | 7/25/2024 |
| Attenuator | KEYSIGHT | 8491B/010 | MY39272011 | 7/25/2024 |
| Attenuator | KEYSIGHT | 8491B/020 | MY39271973 | 7/25/2024 |
| Attenuator | MINI-CIRCUITS | BW-S3W10+ | N/A | 1/6/2024 |
| 5G probe | SPEAG | EummWV4 | 9559 | 2/16/2024 |
| Data Acquisition Electronics | SPEAG | DAE4 | 1468 | 8/24/2024 |
| Verification kit | SPEAG | 5G verification source_10GHz | 1022 | 2/20/2024 |
| Thermometer | Lutron | MHB-382SD | AK.12102 | 7/26/2024 |

5. Measurement Uncertainty

5.1. SAR Measurement Uncertainty

Measurement uncertainty for 6 GHz to 10 GHz
 (According to IEEE 62209-1528)

| a | b | c | | d | e f(d,k) | f | g | h = cx _f /e | l = cx _g /e | k |
|--|-----------|------------------|-------------------|----------------|-------------|-------------------------|--------------------------|-------------------------------|--------------------------------|----------------|
| Uncertainty component | Reference | Tol. 1 g (±%) | Tol. 10 g (±%) | Prob. Dist. | Div. | c _i (1 g) | c _i (10 g) | 1 g u _i (±%) | 10 g u _i (±%) | v _i |
| Measurement System Errors | | | | | | | | | | |
| Probe Calibration | 8.4.1.1 | 18.6 | | Normal | 2 | 1 | 1 | 9.3 | 9.3 | ∞ |
| Probe Calibration Drift | 8.4.1.2 | 1.7 | | Rectangular | 1.732 | 1 | 1 | 1.0 | 1.0 | ∞ |
| Probe Linearity | 8.4.1.3 | 4.7 | | Rectangular | 1.732 | 1 | 1 | 2.7 | 2.7 | ∞ |
| Broadband Signal | 8.4.1.4 | 2.8 | | Rectangular | 1.732 | 1 | 1 | 1.6 | 1.6 | ∞ |
| Probe Isotropy | 8.4.1.5 | 7.6 | | Rectangular | 1.732 | 1 | 1 | 4.4 | 4.4 | ∞ |
| Data Acquisition | 8.4.1.6 | 0.3 | | Normal | 1 | 1 | 1 | 0.3 | 0.3 | ∞ |
| RF Ambient | 8.4.1.7 | 1.8 | | Normal | 1 | 1 | 1 | 1.8 | 1.8 | ∞ |
| Probe Positioning | 8.4.1.8 | 0.005 | | Normal | 1 | 0.50 | 0.50 | 0.25 | 0.25 | ∞ |
| Data Processing | 8.4.1.9 | 3.5 | | Normal | 1 | 1 | 1 | 3.5 | 3.5 | ∞ |
| Phantom and Device Errors | | | | | | | | | | |
| Conductivity (meas.)DAK | 8.4.2.1 | 2.5 | | Normal | 1 | 0.78 | 0.71 | 2.0 | 1.8 | ∞ |
| Conductivity (temp.)BB | 8.4.2.2 | 2.4 | | Rectangular | 1.732 | 0.78 | 0.71 | 1.1 | 1.0 | ∞ |
| Phantom Permittivity | 8.4.2.3 | 14.0 | | Rectangular | 1.732 | 0 | 0 | 0.0 | 0.0 | ∞ |
| Distance DUT - TSL | 8.4.2.4 | 2.0 | | Normal | 1 | 2 | 2 | 4.0 | 4.0 | ∞ |
| Device Positioning | 8.4.2.5 | 3.1 | 4.2 | Normal | 1 | 1 | 1 | 3.1 | 4.2 | 50 |
| Device Holder | 8.4.2.6 | 3.6 | | Normal | 1 | 1 | 1 | 3.6 | 3.6 | ∞ |
| DUT Modulation | 8.4.2.7 | 2.4 | | Rectangular | 1.732 | 1 | 1 | 1.4 | 1.4 | ∞ |
| Time-average SAR | 8.4.2.8 | 1.7 | | Rectangular | 1.732 | 1 | 1 | 1.0 | 1.0 | ∞ |
| DUT drift | 8.4.2.9 | 5.0 | | Normal | 1 | 1 | 1 | 5.0 | 5.0 | ∞ |
| Correction to the SAR results | | | | | | | | | | |
| Deviation to Target | 8.4.3.1 | 1.9 | | Normal | 1 | 1 | 0.84 | 1.9 | 1.6 | ∞ |
| Combined Standard Uncertainty U _c (y) = | | | | | | | | RSS | 14.39 | 14.61 |
| Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = | | | | | | | | 28.79 | 29.23 | |

5.1.1. Decision rule

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2021.

5.2. Uncertainty of psAPD (for 6GHz to 10GHz)

(According to SPEAG's Updated Interim Procedures for 6-10GHz)

| Uncertainty Budget for psSAR / psAPD Assessments | | | | | | | | |
|---|--------------------------------------|-------------|------------|-------|--------------------------------|------------------------------------|--|---|
| (Frequency band : 6 - 10GHz range) | | | | | | | | |
| Symbol | Error Description | Uncert. | Prob. Dist | Div. | ci (1g) / (1 cm ²) | ci (8g/10g) / (4 cm ²) | Std. Unc. (1 g) / (1 cm ²) | Std. Unc. (8g/10g) / (4 cm ²) |
| psSAR | Module SAR V16.2 (Table 6.3.3) | ±14.2/14.1% | N | 1 | 1 | 1 | ±14.2% | ±14.1% |
| PDC | Power Density Conversion | ±13.5% | R | 1.732 | 1 | 1 | ±7.8% | ±7.8% |
| u(ΔSAR) | Combined Uncertainty | | | | | | ±16.2% | ±16.9% |
| U | Expanded Uncertainty in dB | | | | | | ±32.4% | ±32.2% |
| | | | | | | | ±1.2dB | ±1.2dB |

5.2.1. Decision rule

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2021.

5.3. Incident Power Density Measurement Uncertainty

Measurement Uncertainty for cDASY8 Module mmWave

| Error Description | Uncertainty value (\pm dB) | Probe Dist. | Divisor | (Ci) | Std. Unc. (\pm dB) | (Vi) |
|---|-------------------------------|-------------|---------|------|-----------------------|----------|
| Uncertainty terms dependent on the measurement system | | | | | | |
| Calibration | 0.49 | Normal | 1 | 1 | 0.49 | Infinity |
| Probe correction | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Frequency response (BW = < 1 GHz) | 0.20 | Rectangular | 1.73 | 1 | 0.12 | Infinity |
| Sensor cross coupling | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Isotropy | 0.50 | Rectangular | 1.73 | 1 | 0.29 | Infinity |
| Linearity | 0.20 | Rectangular | 1.73 | 1 | 0.12 | Infinity |
| Probe scattering | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Probe positioning offset | 0.30 | Rectangular | 1.73 | 1 | 0.17 | Infinity |
| Probe positioning repeatability | 0.04 | Rectangular | 1.73 | 1 | 0.02 | Infinity |
| Sensor mechanical offset | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Probe spatial resolution | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Field impedance dependance | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Measurement drift | 0.05 | Rectangular | 1.73 | 1 | 0.03 | Infinity |
| Amplitude and phase noise | 0.04 | Rectangular | 1.73 | 1 | 0.02 | Infinity |
| Measurement area truncation | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Data acquisition | 0.03 | Normal | 1.00 | 1 | 0.03 | Infinity |
| Sampling | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Field reconstruction | 0.60 | Rectangular | 1.73 | 1 | 0.35 | Infinity |
| Signal-to-Noise Ratio | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| FTE/MEO | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Power density scaling | - | Rectangular | 1.73 | 1 | - | Infinity |
| Spatial averaging | 0.10 | Rectangular | 1.73 | 1 | 0.06 | Infinity |
| Uncertainty terms dependent on the DUT and environmental factors | | | | | | |
| Probe coupling with DUT | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Modulation response | 0.40 | Rectangular | 1.73 | 1 | 0.23 | Infinity |
| Integration time | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Response time | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Device holder influence | 0.10 | Rectangular | 1.73 | 1 | 0.06 | Infinity |
| DUT alignment | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| RF ambient conditions | 0.04 | Rectangular | 1.73 | 1 | 0.02 | Infinity |
| Laboratory Temperature | 0.05 | Rectangular | 1.73 | 1 | 0.03 | Infinity |
| Laboratory Reflections | 0.04 | Rectangular | 1.73 | 1 | 0.02 | Infinity |
| Immunity / secondary reception | 0.00 | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Drift of the DUT | - | Rectangular | 1.73 | 1 | 0.00 | Infinity |
| Combined Std. Uncertainty | | | | | 0.75 | Infinity |
| Expanded Standard Uncertainty (95%) | | | | | 1.51 | |

5.3.1. Decision rule

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2021.

6. Device Under Test (DUT) Information

6.1. DUT Description

| | | | |
|-------------------------|---|-------------|--------------|
| Device Dimension | Refer to Appendix A. | | |
| Back Cover | <input checked="" type="checkbox"/> The Back Cover is not removable. | | |
| Battery Options | <input checked="" type="checkbox"/> The rechargeable battery is not user accessible | | |
| Test Sample Information | No. | S/N | Notes |
| | 1 | R3CW90BXLKA | Conducted |
| | 2 | R3CW90HRRPN | Radiated |
| | 3 | R3CW90BXLBE | Radiated |

6.2. Wireless Technologies of UNII 6E

| Wireless technologies | Frequency bands | Operating mode | Duty Cycle used for SAR & PD testing |
|-------------------------------|--|--|--------------------------------------|
| Wi-Fi_UNII 6e (Above 6GHz) | UNII Band 5 (5925-6425 MHz) UNII Band 6 (6425-6525 MHz) UNII Band 7 (6525-6885 MHz) UNII Band 8 (6885-7125 MHz) | 802.11a 802.11ax (HE20) 802.11ax (HE40) 802.11ax (HE80) 802.11ax (HE160) | 99.63% (802.11ax (HE160)) |

Notes:

Duty cycle for Wi-Fi is referenced from the UNII report.

6.3. Nominal Output Power

| RF Air interface | Mode | Indoor AP | | | | | |
|-----------------------|----------------|-------------|------------|----------------------|------------------|------------|----------------------|
| | | Pmax | | | Plimit (DSI=0,1) | | |
| | | WLAN Ant.1 | WLAN Ant.2 | MIMO (Ant.1 + Ant.2) | WLAN Ant.1 | WLAN Ant.2 | MIMO (Ant.1 + Ant.2) |
| WiFi 6 GHz (UNII - 5) | 802.11a | 10.0 | 10.0 | 13.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE20 | 10.0 | 10.0 | 13.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE40 | 12.0 | 12.0 | 15.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE80 | 14.0 | 14.0 | 17.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE160 | 14.0 | 14.0 | 17.0 | 10.0 | 10.0 | 13.0 |
| WiFi 6 GHz (UNII - 6) | 802.11a | 10.0 | 10.0 | 13.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE20 | 10.0 | 10.0 | 13.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE40 | 12.0 | 12.0 | 15.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE80 | 14.0 | 14.0 | 17.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE160 | 14.0 | 14.0 | 17.0 | 10.0 | 10.0 | 13.0 |
| WiFi 6 GHz (UNII - 7) | 802.11a | 10.0 | 10.0 | 13.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE20 | 10.0 | 10.0 | 13.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE40 | 12.0 | 12.0 | 15.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE80 | 14.0 | 14.0 | 17.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE160 | 14.0 | 14.0 | 17.0 | 10.0 | 10.0 | 13.0 |
| WiFi 6 GHz (UNII - 8) | 802.11a | 10.0 | 10.0 | 13.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE20 | 10.0 | 10.0 | 13.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE40 | 12.0 | 12.0 | 15.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE80 | 14.0 | 14.0 | 17.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE160 | 14.0 | 14.0 | 17.0 | 10.0 | 10.0 | 13.0 |
| RF Air interface | Mode | Standard AP | | | | | |
| | | Pmax | | | Plimit (DSI=0,1) | | |
| | | WLAN Ant.1 | WLAN Ant.2 | MIMO (Ant.1 + Ant.2) | WLAN Ant.1 | WLAN Ant.2 | MIMO (Ant.1 + Ant.2) |
| WiFi 6 GHz (UNII - 5) | 802.11a | 16.0 | 16.0 | 19.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE20 | 16.0 | 16.0 | 19.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE40 | 16.0 | 16.0 | 19.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE80 | 16.0 | 16.0 | 19.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE160 | 14.0 | 14.0 | 17.0 | 10.0 | 10.0 | 13.0 |
| WiFi 6 GHz (UNII - 7) | 802.11a | 16.0 | 16.0 | 19.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE20 | 16.0 | 16.0 | 19.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE40 | 16.0 | 16.0 | 19.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE80 | 16.0 | 16.0 | 19.0 | 10.0 | 10.0 | 13.0 |
| | 802.11ax HE160 | 14.0 | 14.0 | 17.0 | 10.0 | 10.0 | 13.0 |

Notes:

1. This device has support Dual Client (6CD) in UNII 6-7GHz. So Indoor AP support to UNII 5-8, and Standard AP supports to UNII 5, 7.

7. RF Exposure Conditions (Test Configurations)

Refer to Appendix A for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

Forder Closed configuration

| Wireless technologies | RF Exposure Conditions | Antena | DUT-to-User Separation | Test Position | Antenna-to-edge/surface | SAR Required | Note | | |
|-----------------------|------------------------|--------------------|------------------------|--------------------|-------------------------|------------------|------|-----|--|
| UNII 6e | Head | WiFi 6G SISO Ant 1 | 0 mm | Left Touch | N/A | Yes | | | |
| | | | | Left Tilt (15°) | N/A | Yes | | | |
| | | | | Right Touch | N/A | Yes | | | |
| | | | | Right Tilt (15°) | N/A | Yes | | | |
| | Body-worn & Hotspot | | 10 mm | Rear | N/A | Yes | | | |
| | | | | Front | N/A | Yes | | | |
| | | | | 0 mm | Rear | < 25 mm | Yes | | |
| | | | | | Front | < 25 mm | Yes | | |
| | Product Specific 10-g | | 0 mm | Top | < 25 mm | Yes | | | |
| | | | | Left | > 25 mm | No | 1 | | |
| | | | | Bottom | > 25 mm | No | 1 | | |
| | | | | Right | < 25 mm | Yes | | | |
| | | Head | | WiFi 6G SISO Ant 2 | 0 mm | Left Touch | N/A | Yes | |
| | | | | | | Left Tilt (15°) | N/A | Yes | |
| | | | | | | Right Touch | N/A | Yes | |
| | | | | | | Right Tilt (15°) | N/A | Yes | |
| | Body-worn & Hotspot | 10 mm | Rear | | N/A | Yes | | | |
| | | | Front | | N/A | Yes | | | |
| | Product Specific 10-g | 0 mm | Rear | | < 25 mm | Yes | | | |
| | | | Front | | < 25 mm | Yes | | | |
| | | | Top | | < 25 mm | Yes | | | |
| | | | Left | | < 25 mm | Yes | | | |
| | | | Bottom | | > 25 mm | No | 1 | | |
| | | | Right | | > 25 mm | No | 1 | | |
| Head | | | WiFi 6G MIMO | 0 mm | Left Touch | N/A | Yes | | |
| | | | | | Left Tilt (15°) | N/A | Yes | | |
| | Right Touch | N/A | | | Yes | | | | |
| | Right Tilt (15°) | N/A | | | Yes | | | | |
| Body-worn & Hotspot | 10 mm | Rear | | N/A | Yes | | | | |
| | | Front | | N/A | Yes | | | | |
| Product Specific 10-g | 0 mm | Rear | | < 25 mm | Yes | | | | |
| | | Front | | < 25 mm | Yes | | | | |
| | | Top | | < 25 mm | Yes | | | | |
| | | Left | | < 25 mm | Yes | | | | |
| | | Bottom | | > 25 mm | No | 1 | | | |
| | | Right | | < 25 mm | Yes | | | | |

Notes:

- SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
- For Phablet devices: When hotspot mode applies, Product specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.
- For Phablet devices: When hotspot mode is not supported, Product specific 10-g SAR is required for all surfaces and edges with an antenna located at ≤ 25mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.

8. SAR System Check with Dielectric Property Measurements

8.1. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after 1 days of use; for example, when the parameters are marginal at the beginning of the measurement series. Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

Tissue Dielectric Parameters

Refer to Table 2 within the IEC/IEEE Std 62209-1528 : 2020

| Target Frequency (MHz) | Tissue parameters | |
|------------------------|-------------------|----------------|
| | ϵ_r | σ (S/m) |
| 5800 | 35.3 | 5.27 |
| 6000 | 35.1 | 5.48 |
| 6500 | 34.5 | 6.07 |
| 7000 | 33.9 | 6.65 |

Dielectric Property Measurements Results:

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| Date | Freq. (MHz) | Liquid Parameters | | Measured | Target | Delta (%) | Limit ±(%) | | |
|------------|-------------|-------------------|---------|---|---|-----------|------------|-------|---|
| 10/22/2023 | Head 6000 | e' | 35.3900 | Relative Permittivity (ϵ_r): | 35.39 | 35.10 | 0.83 | 5 | |
| | | e" | 16.1000 | Conductivity (σ): | 5.37 | 5.48 | -1.98 | 5 | |
| | Head 6200 | e' | 35.2900 | Relative Permittivity (ϵ_r): | 35.29 | 34.86 | 1.23 | 5 | |
| | | e" | 16.3100 | Conductivity (σ): | 5.62 | 5.72 | -1.63 | 5 | |
| | Head 6500 | e' | 34.9100 | Relative Permittivity (ϵ_r): | 34.91 | 34.50 | 1.19 | 5 | |
| | | e" | 16.8200 | Conductivity (σ): | 6.08 | 6.07 | 0.15 | 5 | |
| | Head 6600 | e' | 34.3400 | Relative Permittivity (ϵ_r): | 34.34 | 34.38 | -0.12 | 5 | |
| | | e" | 17.0600 | Conductivity (σ): | 6.26 | 6.19 | 1.21 | 5 | |
| | Head 6800 | e' | 34.3000 | Relative Permittivity (ϵ_r): | 34.30 | 34.14 | 0.47 | 5 | |
| | | e" | 17.0300 | Conductivity (σ): | 6.44 | 6.42 | 0.33 | 5 | |
| | Head 7000 | e' | 34.0400 | Relative Permittivity (ϵ_r): | 34.04 | 33.90 | 0.41 | 5 | |
| | | e" | 16.9900 | Conductivity (σ): | 6.61 | 6.65 | -0.56 | 5 | |
| | 10/23/2023 | Head 6000 | e' | 35.7900 | Relative Permittivity (ϵ_r): | 35.79 | 35.10 | 1.97 | 5 |
| | | | e" | 16.1600 | Conductivity (σ): | 5.39 | 5.48 | -1.62 | 5 |
| Head 6200 | | e' | 35.6800 | Relative Permittivity (ϵ_r): | 35.68 | 34.86 | 2.35 | 5 | |
| | | e" | 16.3300 | Conductivity (σ): | 5.63 | 5.72 | -1.51 | 5 | |
| Head 6500 | | e' | 35.1100 | Relative Permittivity (ϵ_r): | 35.11 | 34.50 | 1.77 | 5 | |
| | | e" | 16.8200 | Conductivity (σ): | 6.08 | 6.07 | 0.15 | 5 | |
| Head 6600 | | e' | 34.7100 | Relative Permittivity (ϵ_r): | 34.71 | 34.38 | 0.96 | 5 | |
| | | e" | 16.7400 | Conductivity (σ): | 6.14 | 6.19 | -0.69 | 5 | |
| Head 6800 | | e' | 34.3600 | Relative Permittivity (ϵ_r): | 34.36 | 34.14 | 0.64 | 5 | |
| | | e" | 17.0300 | Conductivity (σ): | 6.44 | 6.42 | 0.33 | 5 | |
| Head 7000 | | e' | 33.9400 | Relative Permittivity (ϵ_r): | 33.94 | 33.90 | 0.12 | 5 | |
| | | e" | 16.9000 | Conductivity (σ): | 6.58 | 6.65 | -1.08 | 5 | |
| 10/24/2023 | | Head 6000 | e' | 35.9400 | Relative Permittivity (ϵ_r): | 35.94 | 35.10 | 2.39 | 5 |
| | | | e" | 16.2100 | Conductivity (σ): | 5.41 | 5.48 | -1.31 | 5 |
| | Head 6200 | e' | 35.7700 | Relative Permittivity (ϵ_r): | 35.77 | 34.86 | 2.61 | 5 | |
| | | e" | 16.4000 | Conductivity (σ): | 5.65 | 5.72 | -1.09 | 5 | |
| | Head 6500 | e' | 35.1800 | Relative Permittivity (ϵ_r): | 35.18 | 34.50 | 1.97 | 5 | |
| | | e" | 16.8800 | Conductivity (σ): | 6.10 | 6.07 | 0.51 | 5 | |
| | Head 6600 | e' | 34.9000 | Relative Permittivity (ϵ_r): | 34.90 | 34.38 | 1.51 | 5 | |
| | | e" | 16.8000 | Conductivity (σ): | 6.17 | 6.19 | -0.34 | 5 | |
| | Head 6800 | e' | 34.5300 | Relative Permittivity (ϵ_r): | 34.53 | 34.14 | 1.14 | 5 | |
| | | e" | 17.1500 | Conductivity (σ): | 6.48 | 6.42 | 1.04 | 5 | |
| | Head 7000 | e' | 34.1600 | Relative Permittivity (ϵ_r): | 34.16 | 33.90 | 0.77 | 5 | |
| | | e" | 17.0000 | Conductivity (σ): | 6.62 | 6.65 | -0.50 | 5 | |

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| Date | Freq. (MHz) | Liquid Parameters | | Measured | Target | Delta (%) | Limit ±(%) | | |
|------------|-------------|-------------------|---------|---|---|-----------|------------|-------|---|
| 10/22/2023 | Head 6000 | e' | 34.3400 | Relative Permittivity (ϵ_r): | 34.34 | 35.10 | -2.17 | 5 | |
| | | e" | 15.7500 | Conductivity (σ): | 5.25 | 5.48 | -4.12 | 5 | |
| | Head 6200 | e' | 34.2500 | Relative Permittivity (ϵ_r): | 34.25 | 34.86 | -1.75 | 5 | |
| | | e" | 15.9100 | Conductivity (σ): | 5.48 | 5.72 | -4.04 | 5 | |
| | Head 6500 | e' | 33.7400 | Relative Permittivity (ϵ_r): | 33.74 | 34.50 | -2.20 | 5 | |
| | | e" | 16.4300 | Conductivity (σ): | 5.94 | 6.07 | -2.17 | 5 | |
| | Head 6600 | e' | 33.4300 | Relative Permittivity (ϵ_r): | 33.43 | 34.38 | -2.76 | 5 | |
| | | e" | 16.3300 | Conductivity (σ): | 5.99 | 6.19 | -3.12 | 5 | |
| | Head 6800 | e' | 33.1100 | Relative Permittivity (ϵ_r): | 33.11 | 34.14 | -3.02 | 5 | |
| | | e" | 16.6400 | Conductivity (σ): | 6.29 | 6.42 | -1.97 | 5 | |
| | Head 7000 | e' | 32.8100 | Relative Permittivity (ϵ_r): | 32.81 | 33.90 | -3.22 | 5 | |
| | | e" | 16.4800 | Conductivity (σ): | 6.41 | 6.65 | -3.54 | 5 | |
| | 10/23/2023 | Head 6000 | e' | 34.3500 | Relative Permittivity (ϵ_r): | 34.35 | 35.10 | -2.14 | 5 |
| | | | e" | 16.4000 | Conductivity (σ): | 5.47 | 5.48 | -0.16 | 5 |
| Head 6200 | | e' | 34.2900 | Relative Permittivity (ϵ_r): | 34.29 | 34.86 | -1.64 | 5 | |
| | | e" | 16.6300 | Conductivity (σ): | 5.73 | 5.72 | 0.30 | 5 | |
| Head 6500 | | e' | 33.8000 | Relative Permittivity (ϵ_r): | 33.80 | 34.50 | -2.03 | 5 | |
| | | e" | 17.1600 | Conductivity (σ): | 6.20 | 6.07 | 2.17 | 5 | |
| Head 6600 | | e' | 33.4500 | Relative Permittivity (ϵ_r): | 33.45 | 34.38 | -2.71 | 5 | |
| | | e" | 17.1300 | Conductivity (σ): | 6.29 | 6.19 | 1.62 | 5 | |
| Head 6800 | | e' | 33.1100 | Relative Permittivity (ϵ_r): | 33.11 | 34.14 | -3.02 | 5 | |
| | | e" | 17.4400 | Conductivity (σ): | 6.59 | 6.42 | 2.74 | 5 | |
| Head 7000 | | e' | 32.7100 | Relative Permittivity (ϵ_r): | 32.71 | 33.90 | -3.51 | 5 | |
| | | e" | 17.3200 | Conductivity (σ): | 6.74 | 6.65 | 1.37 | 5 | |

8.2. 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, typically every days.

System Performance Check Measurement Conditions:

- 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 Simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 10.0 cm for measurements > 6 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 5 mm (above 6GHz) from dipole center to the simulating liquid surface.
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

Reference Target SAR Values

The reference SAR values can be obtained from the calibration certificate of system validation dipoles.

| System Dipole | Serial No. | Cal. Date | Freq. (MHz) | Target SAR Values (W/kg) | |
|---------------|------------|------------|-------------|--------------------------|---------|
| | | | | 1g/10g | Head |
| D6.5GHzV2 | 1010 | 2022-05-27 | 6500 | 1g | 285.00 |
| | | | | 10g | 52.90 |
| | | | | APD(4cm ²) | 1300.00 |

System Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

SAR 4 Room

| Date Tested | System Dipole | | T.S. Liquid | Measured Results | | Target (Ref. Value) | Delta ±10 % | Plot No. | |
|-------------|---------------|----------|-------------|------------------------|------------------|---------------------|-------------|----------|---|
| | Type | Serial # | | Zoom Scan to 100 mW | Normalize to 1 W | | | | |
| 10/22/2023 | D6.5GHzV2 | 1010 | Head | 1g | 29.7 | 297.0 | 285.00 | 4.21 | 1 |
| | | | | 10g | 5.7 | 57.3 | 52.90 | 8.32 | |
| | | | | APD(4cm ²) | 135.0 | 1350.0 | 1300.00 | 3.85 | |
| 10/23/2023 | D6.5GHzV2 | 1010 | Head | 1g | 28.5 | 285.0 | 285.00 | 0.00 | |
| | | | | 10g | 5.6 | 55.8 | 52.90 | 5.48 | |
| | | | | APD(4cm ²) | 135.0 | 1350.0 | 1300.00 | 3.85 | |
| 10/24/2023 | D6.5GHzV2 | 1010 | Head | 1g | 27.9 | 279.0 | 285.00 | -2.11 | |
| | | | | 10g | 5.5 | 55.0 | 52.90 | 3.97 | |
| | | | | APD(4cm ²) | 133.0 | 1330.0 | 1300.00 | 2.31 | |

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| Date Tested | System Dipole | | T.S. Liquid | Measured Results | | Target (Ref. Value) | Delta ±10 % | Plot No. | |
|-------------|---------------|----------|-------------|------------------------|------------------|---------------------|-------------|----------|---|
| | Type | Serial # | | Zoom Scan to 100 mW | Normalize to 1 W | | | | |
| 10/22/2023 | D6.5GHzV2 | 1010 | Head | 1g | 28.70 | 287.0 | 285.00 | 0.70 | |
| | | | | 10g | 5.33 | 53.3 | 52.90 | 0.76 | |
| | | | | APD(4cm ²) | 135.00 | 1350.0 | 1300.00 | 3.85 | |
| 10/23/2023 | D6.5GHzV2 | 1010 | Head | 1g | 29.40 | 294.0 | 285.00 | 3.16 | 2 |
| | | | | 10g | 5.69 | 56.9 | 52.90 | 7.56 | |
| | | | | APD(4cm ²) | 138.00 | 1380.0 | 1300.00 | 6.15 | |

9. IPD(Incident Power Density) System with Dielectric Property

9.1. Dielectric Property

Media is air so Relative Permittivity (ϵ_r) and Conductivity (σ) is 1.

9.2. System Check

Per Nov 2017,TCB Workshop

System validation is required before a system is deployed for measurement

System check is also required before each series of continuous measurement and, as applicable, repeated at least weekly

Peak and spatially averaged power density at the peak location(s) must be compared to calibrated results according to the defined test conditions

- the same spatial resolution and measurement region used in the waveguide calibration should be applied to system validation and system check
- 4 cm² spatial averaging have been used according to FCC requirement.
- power density distribution should also be verified, both spatially (shape) and numerically (level) through visual inspection for noticeable differences
- The Horn antenna input power (forward power) was 100mW.
- The measured psPDn+, psPDtot+, and psPDmod+ values over 1 cm² or 4 cm² for the desired averaging geometry are compared to the calibrated value and expected to be below 0.66 dB

Reference Target PD Values

Per the manufacturer's guide, the target value of the calibration report was converted to a value of 100mW input power.

| 5G verification Source | Serial No. | Cal. Date | Freq. (MHz) | Averaging area | Prad (mW) | Input power (mW) | Target PD Values (W/m ²) | | Note |
|------------------------|------------|-----------|-------------|----------------|-----------|------------------|--------------------------------------|-------------------|--------------------------------|
| | | | | | | | 1 cm ² | 4 cm ² | |
| 10GHz | 1022 | 2-20-2023 | 100000 | Circular | 89.1 | | 58.60 | 53.90 | Cal.report target |
| 10GHz | 1022 | 2-20-2023 | 100000 | Circular | | 100 | 65.77 | 60.49 | Convert target from Cal.report |

SAR 9 Room

| Date | Sorce SN | Sorce Cal. Due Data | Input Power (mW) | Measured Results for 1cm ² (W/m ²) | Target (Ref. Value) (W/m ²) | Delta ±10 % | Measured Total psPD for 4cm ² (W/m ²) | Target (Ref. Value) (W/m ²) | Delta ±10 % | visual inspection | Plot No. |
|------------|----------|---------------------|------------------|---|---|-------------|--|---|-------------|-------------------|----------|
| 10/24/2022 | 1022 | 3/1/2023 | 100.0 | 62.9 | 65.77 | -4.36 | 57.9 | 60.49 | -4.28 | confirmed | 3 |
| 10/25/2022 | 1022 | 3/1/2023 | 100.0 | 63.5 | 65.77 | -3.45 | 57.9 | 60.49 | -4.28 | confirmed | |

Note(s):

psPD value used the ps_{tot} avg value of test result plot.

9.3. Wi-Fi 6 GHz (U-NII Bands)

WLAN SISO Ant 1, 2

| Band (GHz) | Mode | Data Rate | Ch # | Freq. (MHz) | Plimit (DSI=0,1) Average Power | | | | SAR Test (Yes/No) |
|----------------------------|------------------|-----------|------|-------------|--------------------------------|--------------------------|-----------------|--------------------------|-------------------|
| | | | | | WLAN SISO Ant.1 | | WLAN SISO Ant.2 | | |
| | | | | | Avg Pwr (dBm) | Max. Tune-up Limit (dBm) | Avg Pwr (dBm) | Max. Tune-up Limit (dBm) | |
| UNII 5 (5.925 - 6.425 GHz) | 802.11a | 6 Mbps | 1 | 5955 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 45 | 6175 | | | | | |
| | | | 93 | 6415 | | | | | |
| | 802.11ax (HE20) | 7.3 Mbps | 1 | 5935 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 45 | 6175 | | | | | |
| | | | 93 | 6415 | | | | | |
| | 802.11ax (HE40) | 14.6 Mbps | 3 | 5965 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 43 | 6165 | | | | | |
| | | | 91 | 6405 | | | | | |
| | 802.11ax (HE80) | 36.0 Mbps | 7 | 5985 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 39 | 6145 | | | | | |
| | | | 87 | 6385 | | | | | |
| | 802.11ax (HE160) | 72.0 Mbps | 15 | 6025 | 8.90 | 10.00 | 9.14 | 10.00 | Yes |
| | | | 47 | 6185 | 9.06 | | 9.16 | | |
| | | | 79 | 6345 | 8.95 | | 9.07 | | |
| UNII 6 (6.425 - 6.525 GHz) | 802.11a | 6 Mbps | 97 | 6435 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 105 | 6475 | | | | | |
| | | | 113 | 6515 | | | | | |
| | 802.11ax (HE20) | 7.3 Mbps | 97 | 6435 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 105 | 6475 | | | | | |
| | | | 113 | 6515 | | | | | |
| | 802.11ax (HE40) | 14.6 Mbps | 99 | 6445 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 115 | 6525 | | | | | |
| | 802.11ax (HE80) | 36.0 Mbps | 103 | 6465 | Not Required | 10.00 | Not Required | 10.00 | No |
| | 802.11ax (HE160) | 72.0 Mbps | 111 | 6505 | 9.13 | 10.00 | 8.97 | 10.00 | Yes |
| UNII 7 (6.525 - 6.885 GHz) | 802.11a | 6 Mbps | 117 | 6535 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 149 | 6695 | | | | | |
| | | | 185 | 6875 | | | | | |
| | 802.11ax (HE20) | 7.3 Mbps | 117 | 6535 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 149 | 6695 | | | | | |
| | | | 185 | 6875 | | | | | |
| | 802.11ax (HE40) | 14.6 Mbps | 123 | 6565 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 147 | 6685 | | | | | |
| | | | 179 | 6845 | | | | | |
| | 802.11ax (HE80) | 36.0 Mbps | 119 | 6545 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 151 | 6705 | | | | | |
| | | | 183 | 6865 | | | | | |
| | 802.11ax (HE160) | 72.0 Mbps | 143 | 6665 | 9.30 | 10.00 | 9.13 | 10.00 | Yes |
| 175 | | | 6825 | 8.90 | 8.63 | | | | |
| UNII 8 (6.885 - 7.125 GHz) | 802.11a | 6 Mbps | 189 | 5955 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 209 | 6175 | | | | | |
| | | | 233 | 6415 | | | | | |
| | 802.11ax (HE20) | 7.3 Mbps | 189 | 5955 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 209 | 6175 | | | | | |
| | | | 233 | 6415 | | | | | |
| | 802.11ax (HE40) | 14.6 Mbps | 187 | 6885 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 203 | 6965 | | | | | |
| | | | 227 | 7085 | | | | | |
| | 802.11ax (HE80) | 36.0 Mbps | 199 | 6945 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 215 | 7025 | | | | | |
| 802.11ax (HE160) | 72.0 Mbps | 207 | 6985 | 9.28 | 10.00 | 9.18 | 10.00 | Yes | |

Note(s):

- Indoor AP for Plimit(DSI=0,1) target power is equal to Standard AP related all RF exposure conditions.
- Per TCB workshop April.2021's guide, Channel power verification was performed for UNII 6e (5925MHz-7125MHz). So, 5 test channels of 802.11ax (HE160) were determined for SAR test. Refer to blue box in table.

WLAN MIMO Ant

| Band (GHz) | Mode | Data Rate | Ch # | Freq. (MHz) | Pmax (=Plimit) Average Power | | | | SAR Test (Yes/No) |
|-------------------------------|------------------|-----------|------|-------------|------------------------------|--------------------------|-----------------|--------------------------|-------------------|
| | | | | | WLAN MIMO Ant.1 | | WLAN MIMO Ant.2 | | |
| | | | | | Avg Pwr (dBm) | Max. Tune-up Limit (dBm) | Avg Pwr (dBm) | Max. Tune-up Limit (dBm) | |
| UNII 5 (5.925 - 6.425 GHz) | 802.11a | 6 Mbps | 1 | 5955 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 45 | 6175 | | | | | |
| | | | 93 | 6415 | | | | | |
| | 802.11ax (HE20) | 7.3 Mbps | 1 | 5935 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 45 | 6175 | | | | | |
| | | | 93 | 6415 | | | | | |
| | 802.11ax (HE40) | 14.6 Mbps | 3 | 5965 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 43 | 6165 | | | | | |
| | | | 91 | 6405 | | | | | |
| | 802.11ax (HE80) | 36.0 Mbps | 7 | 5985 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 39 | 6145 | | | | | |
| | | | 87 | 6385 | | | | | |
| | 802.11ax (HE160) | 72.0 Mbps | 15 | 6025 | 8.66 | 10.00 | 9.20 | 10.00 | Yes |
| | | | 47 | 6185 | 8.94 | | 9.26 | | |
| | | | 79 | 6345 | 9.08 | | 9.10 | | |
| UNII 6 (6.425 - 6.525 GHz) | 802.11a | 6 Mbps | 97 | 6435 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 105 | 6475 | | | | | |
| | | | 113 | 6515 | | | | | |
| | 802.11ax (HE20) | 7.3 Mbps | 97 | 6435 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 105 | 6475 | | | | | |
| | | | 113 | 6515 | | | | | |
| | 802.11ax (HE40) | 14.6 Mbps | 99 | 6445 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 115 | 6525 | | | | | |
| | 802.11ax (HE80) | 36.0 Mbps | 103 | 6465 | Not Required | 10.00 | Not Required | 10.00 | No |
| | 802.11ax (HE160) | 72.0 Mbps | 111 | 6505 | 9.41 | 10.00 | 8.97 | 10.00 | Yes |
| UNII 7 (6.525 - 6.885 GHz) | 802.11a | 6 Mbps | 117 | 6535 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 149 | 6695 | | | | | |
| | | | 185 | 6875 | | | | | |
| | 802.11ax (HE20) | 7.3 Mbps | 117 | 6535 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 149 | 6695 | | | | | |
| | | | 185 | 6875 | | | | | |
| | 802.11ax (HE40) | 14.6 Mbps | 123 | 6565 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 147 | 6685 | | | | | |
| | | | 179 | 6845 | | | | | |
| | 802.11ax (HE80) | 36.0 Mbps | 119 | 6545 | Not Required | 10.00 | Not Required | 10.00 | No |
| 151 | | | 6705 | | | | | | |
| 183 | | | 6865 | | | | | | |
| 802.11ax (HE160) | 72.0 Mbps | 143 | 6665 | 9.59 | 10.00 | 9.15 | 10.00 | Yes | |
| | | 175 | 6825 | 9.10 | | 8.70 | | | |
| UNII 8 (6.885 - 7.125 GHz) | 802.11a | 6 Mbps | 189 | 5955 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 209 | 6175 | | | | | |
| | | | 233 | 6415 | | | | | |
| | 802.11ax (HE20) | 7.3 Mbps | 189 | 5955 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 209 | 6175 | | | | | |
| | | | 233 | 6415 | | | | | |
| | 802.11ax (HE40) | 14.6 Mbps | 187 | 6885 | Not Required | 10.00 | Not Required | 10.00 | No |
| | | | 203 | 6965 | | | | | |
| | | | 227 | 7085 | | | | | |
| | 802.11ax (HE80) | 36.0 Mbps | 199 | 6945 | Not Required | 10.00 | Not Required | 10.00 | No |
| 215 | | | 7025 | | | | | | |
| 802.11ax (HE160) | 72.0 Mbps | 207 | 6985 | 9.47 | 10.00 | 9.17 | 10.00 | Yes | |

Note(s):

- Indoor AP for Plimit(DSI=0,1) target power is equal to Standard AP related all RF exposure conditions.
- Per TCB workshop April.2021's guide, Channel power verification was performed for UNII 6e (5925MHz-7125MHz). So, 5 test channels of 802.11ax (HE160) were determined for SAR test. Refer to blue box in table.

10. SAR and APD(Absorbed Power Density) Results

SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for Wi-Fi = Measured SAR * Tune-up scaling factor * Duty Cycle scaling factor
- Duty Cycle scaling factor = 1 / Duty cycle (%)

KDB 447498 D01 General RF Exposure Guidance:

Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

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

KDB 648474 D04 Handset SAR:

With headset attached, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

KDB 648474 D04 Handset SAR (Phablet Only):

For smart phones, with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm.

When hotspot mode does not apply, 10-g extremity SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; However, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

Additional 1-g SAR testing at 5 mm is not required when hotspot mode 10-g extremity SAR is not required for the surfaces and edges; since all 1-g reported SAR < 1.2 W/kg.

10.1. WiFi (UNII Bands-Above 6GHz)

SISO Ant SAR test results

| Antenna | RF Exposure Conditions | Mode | PWR Back-off | Dist. (mm) | Test Position | Ch # | Freq. (MHz) | Duty Cycle (%) | Power (dBm) | | 1-g SAR (W/kg) | | 10-g SAR (W/kg) | | Plot No. |
|-----------------|------------------------|--------------------------|--------------|------------|---------------|--------|-------------|----------------|---------------|-------|----------------|--------|-----------------|--------|----------|
| | | | | | | | | | Tune-up limit | Meas. | Meas. | Scaled | Meas. | Scaled | |
| WLAN SISO Ant.1 | Head | 802.11ax HE160 72.0 Mbps | N/A | 0 | Left Touch | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.011 | 0.013 | | | |
| | | | | | Left Tilt | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.006 | 0.007 | | | |
| | | | | | Right Touch | 15 | 6025.0 | 99.6% | 10.00 | 8.90 | 0.122 | 0.158 | | | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 8.95 | 0.238 | 0.304 | | | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 9.13 | 0.148 | 0.181 | | | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.073 | 0.086 | | | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.28 | 0.038 | 0.045 | | | |
| | Right Tilt | | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.051 | 0.060 | | | | | | |
| | Body-worn & Hotspot | | N/A | 10 | Rear | 15 | 6025.0 | 99.6% | 10.00 | 8.90 | 0.021 | 0.027 | | | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 8.95 | 0.061 | 0.078 | | | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 9.13 | 0.048 | 0.059 | | | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.044 | 0.052 | | | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.28 | 0.017 | 0.020 | | | |
| | Front | | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.010 | 0.012 | | | | | | |
| | Product Specific 10-g | N/A | 0 | Rear | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | | | 0.129 | 0.152 | | |
| | | | | Front | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | | | 0.026 | 0.031 | | |
| | | | | Top | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | | | 0.040 | 0.047 | | |
| | | | | Right | 15 | 6025.0 | 99.6% | 10.00 | 8.90 | | | 0.308 | 0.398 | | |
| 79 | | | | | 6345.0 | 99.6% | 10.00 | 8.95 | 0.401 | | | 0.513 | | | |
| 111 | | | | | 6505.0 | 99.6% | 10.00 | 9.13 | 0.292 | | | 0.358 | | | |
| 143 | | | | | 6665.0 | 99.6% | 10.00 | 9.30 | 0.209 | | | 0.246 | | | |
| 207 | 6985.0 | 99.6% | 10.00 | 9.28 | 0.124 | 0.147 | | | | | | | | | |
| WLAN SISO Ant.2 | Head | 802.11ax HE160 72.0 Mbps | N/A | 0 | Left Touch | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.029 | 0.035 | | | |
| | | | | | Left Tilt | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.031 | 0.038 | | | |
| | | | | | Right Touch | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.029 | 0.035 | | | |
| | | | | | Right Tilt | 111 | 6505.0 | 99.6% | 10.00 | 9.14 | 0.003 | 0.004 | | | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.07 | 0.017 | 0.021 | | | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.13 | 0.018 | 0.022 | | | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.032 | 0.039 | | | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.032 | 0.039 | | | |
| | Body | | N/A | 10 | Rear | 15 | 6025.0 | 99.6% | 10.00 | 9.14 | 0.017 | 0.021 | | | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 9.07 | 0.007 | 0.009 | | | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 8.97 | 0.004 | 0.005 | | | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.13 | 0.004 | 0.005 | | | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.019 | 0.023 | | | |
| | Front | | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.005 | 0.006 | | | | | | |
| | Product Specific 10-g | N/A | 0 | Rear | 15 | 6025.0 | 99.6% | 10.00 | 9.14 | | | 0.089 | 0.109 | | |
| | | | | | 79 | 6345.0 | 99.6% | 10.00 | 9.07 | | | 0.035 | 0.044 | | |
| | | | | | 111 | 6505.0 | 99.6% | 10.00 | 8.97 | | | 0.024 | 0.031 | | |
| | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.13 | | | 0.017 | 0.021 | | |
| | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | | | 0.023 | 0.028 | | |
| | | | | | Front | 207 | 6985.0 | 99.6% | 10.00 | | | 9.18 | 0.031 | 0.038 | |
| | | | | | Top | 207 | 6985.0 | 99.6% | 10.00 | | | 9.18 | 0.010 | 0.012 | |
| Left | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | | | 0.002 | 0.002 | | |

MIMO Ant SAR test results

| Antenna | RF Exposure Conditions | Mode | PWR Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Duty Cycle (%) | Power (dBm) | | 1-g SAR (W/kg) | | 10-g SAR (W/kg) | | Plot No. | | |
|-----------------|------------------------|--------------------------|--------------|------------|---------------|--------|-------------|----------------|---------------|-------|----------------|--------|-----------------|--------|----------|-------|-------|
| | | | | | | | | | Tune-up limit | Meas. | Meas. | Scaled | Meas. | Scaled | | | |
| WLAN MIMO Ant.1 | Head | 802.11ax HE160 72.0 Mbps | N/A | 0 | Left Touch | 143 | 6665.0 | 99.6% | 10.00 | 9.59 | 0.022 | 0.024 | | | 7 | | |
| | | | | | Left Tilt | 143 | 6665.0 | 99.6% | 10.00 | 9.59 | 0.028 | 0.031 | | | | | |
| | | | | | Right Touch | 15 | 6025.0 | 99.6% | 10.00 | 8.66 | 0.105 | 0.143 | | | | | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 9.08 | 0.180 | 0.223 | | | | | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 9.41 | 0.092 | 0.106 | | | | | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.59 | 0.068 | 0.075 | | | | | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.47 | 0.021 | 0.024 | | | | | |
| | Right Tilt | | 143 | 6665.0 | 99.6% | 10.00 | 9.59 | 0.045 | 0.050 | | | | | | | | |
| | Body-worn & Hotspot | | N/A | 10 | Rear | 15 | 6025.0 | 99.6% | 10.00 | 8.66 | 0.027 | 0.037 | | | 8 | | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 9.08 | 0.053 | 0.066 | | | | | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 9.41 | 0.049 | 0.056 | | | | | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.59 | 0.032 | 0.035 | | | | | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.47 | 0.024 | 0.027 | | | | | |
| | Front | | 143 | 6665.0 | 99.6% | 10.00 | 9.59 | 0.003 | 0.003 | | | | | | | | |
| | Product Specific 10-g | N/A | 0 | Rear | 143 | 6665.0 | 99.6% | 10.00 | 9.59 | | | 0.517 | 0.570 | 9 | | | |
| | | | | | Front | 143 | 6665.0 | 99.6% | 10.00 | | | 9.59 | 0.269 | | 0.297 | | |
| | | | | | Top | 143 | 6665.0 | 99.6% | 10.00 | | | 9.59 | | | | | |
| | | | | | Left | 143 | 6665.0 | 99.6% | 10.00 | | | 9.59 | | | | | |
| | | | | | Right | 15 | 6025.0 | 99.6% | 10.00 | | | 8.66 | 0.269 | | 0.368 | | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | | | 9.08 | 0.304 | | 0.377 | | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | | | 9.41 | 0.211 | | 0.243 | | |
| 143 | | | | | | 6665.0 | 99.6% | 10.00 | 9.59 | | | 0.162 | 0.179 | | | | |
| 207 | 6985.0 | 99.6% | 10.00 | 9.47 | 0.074 | 0.084 | | | | | | | | | | | |
| WLAN MIMO Ant.2 | Head | 802.11ax HE160 72.0 Mbps | N/A | 0 | Left Touch | 143 | 6665.0 | 99.6% | 10.00 | 9.15 | | | | | | | |
| | | | | | Left Tilt | 143 | 6665.0 | 99.6% | 10.00 | 9.15 | | | | | | | |
| | | | | | Right Touch | 15 | 6025.0 | 99.6% | 10.00 | 9.20 | | | | | | | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 9.10 | | | | | | | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 8.97 | | | | | | | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.15 | | | | | | | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.17 | | | | | | | |
| | Right Tilt | | 143 | 6665.0 | 99.6% | 10.00 | 9.15 | | | | | | | | | | |
| | Body | | N/A | 10 | Rear | 15 | 6025.0 | 99.6% | 10.00 | 9.20 | | | | | | | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 9.10 | | | | | | | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 8.97 | | | | | | | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.15 | | | | | | 0.032 | 0.039 |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.17 | | | | | | 0.024 | 0.029 |
| | Front | | 143 | 6665.0 | 99.6% | 10.00 | 9.15 | | | | | | | | | | |
| | Product Specific 10-g | N/A | 0 | Rear | 143 | 6665.0 | 99.6% | 10.00 | 9.15 | | | | | | | | |
| | | | | | Front | 143 | 6665.0 | 99.6% | 10.00 | | | | | | 9.15 | 0.019 | 0.023 |
| | | | | | Top | 143 | 6665.0 | 99.6% | 10.00 | | | | | | 9.15 | | |
| | | | | | Left | 143 | 6665.0 | 99.6% | 10.00 | | | | | | 9.15 | 0.013 | 0.016 |
| | | | | | Right | 15 | 6025.0 | 99.6% | 10.00 | | | | | | 9.20 | | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | | | | | | 9.10 | | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | | | | | | 8.97 | | |
| 143 | | | | | | 6665.0 | 99.6% | 10.00 | 9.15 | | | | | | | | |
| 207 | 6985.0 | 99.6% | 10.00 | 9.17 | | | | | | | | | | | | | |

APD (Absorbed Power Density) results

SISO Ant SAR test results

| Antenna | RF Exposure Conditions | Mode | PWR Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Duty Cycle (%) | Power (dBm) | | Measured APD (mW/cm ² over 4cm ²) | Plot No. |
|-----------------|------------------------|--------------------------|--------------|------------|---------------|--------|-------------|----------------|---------------|--------|--|----------|
| | | | | | | | | | Tune-up limit | Meas. | | |
| WLAN SISO Ant.1 | Head | 802.11ax HE160 72.0 Mbps | N/A | 0 | Left Touch | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.0042 | |
| | | | | | Left Tilt | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.0038 | |
| | | | | | Right Touch | 15 | 6025.0 | 99.6% | 10.00 | 8.90 | 0.0674 | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 8.95 | 0.1360 | 1 |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 9.13 | 0.0851 | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.0379 | |
| | 207 | | 6985.0 | 99.6% | 10.00 | 9.28 | 0.0195 | | | | | |
| | Right Tilt | | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.0250 | | | | |
| | Body-worn & Hotspot | | N/A | 10 | Rear | 15 | 6025.0 | 99.6% | 10.00 | 8.90 | 0.0155 | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 8.95 | 0.0471 | 2 |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 9.13 | 0.0357 | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.0325 | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.28 | 0.0099 | |
| | Front | | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.0083 | | | | |
| | Product Specific 10-g | | N/A | 0 | Rear | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.3070 | |
| | | | | | Front | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.0607 | |
| | | | | | Top | 143 | 6665.0 | 99.6% | 10.00 | 9.30 | 0.0919 | |
| | | | | | Right | 15 | 6025.0 | 99.6% | 10.00 | 8.90 | 0.7360 | |
| 79 | | 6345.0 | | | | 99.6% | 10.00 | 8.95 | 0.9610 | 3 | | |
| 111 | | 6505.0 | | | | 99.6% | 10.00 | 9.13 | 0.7000 | | | |
| 143 | | 6665.0 | | | | 99.6% | 10.00 | 9.30 | 0.5030 | | | |
| 207 | 6985.0 | 99.6% | 10.00 | 9.28 | 0.2990 | | | | | | | |
| WLAN SISO Ant.2 | Head | 802.11ax HE160 72.0 Mbps | N/A | 0 | Left Touch | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.0113 | |
| | | | | | Left Tilt | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.0142 | |
| | | | | | Right Touch | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.0122 | |
| | | | | | Right Tilt | 15 | 6025.0 | 99.6% | 10.00 | 9.14 | 0.0016 | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 9.07 | 0.0066 | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 8.97 | 0.0040 | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.13 | 0.0065 | |
| | 207 | | 6985.0 | 99.6% | 10.00 | 9.18 | 0.0149 | 4 | | | | |
| | Body-worn & Hotspot | | N/A | 10 | Rear | 15 | 6025.0 | 99.6% | 10.00 | 9.14 | 0.0105 | |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 9.07 | 0.0034 | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 8.97 | 0.0052 | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.13 | 0.0029 | |
| | | | | | | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.0187 | 5 |
| | Front | | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.0072 | | | | |
| | Product Specific 10-g | | N/A | 0 | Rear | 15 | 6025.0 | 99.6% | 10.00 | 9.14 | 0.2090 | 6 |
| | | | | | | 79 | 6345.0 | 99.6% | 10.00 | 9.07 | 0.0846 | |
| | | | | | | 111 | 6505.0 | 99.6% | 10.00 | 8.97 | 0.0561 | |
| | | | | | | 143 | 6665.0 | 99.6% | 10.00 | 9.13 | 0.0409 | |
| 207 | | 6985.0 | | | | 99.6% | 10.00 | 9.18 | 0.0557 | | | |
| Front | | 207 | | | | 6985.0 | 99.6% | 10.00 | 9.18 | 0.0762 | | |
| Top | | 207 | | | | 6985.0 | 99.6% | 10.00 | 9.18 | 0.0248 | | |
| Left | 207 | 6985.0 | 99.6% | 10.00 | 9.18 | 0.0053 | | | | | | |

Note(s):

1. APD (Absorbed Power Density) over 4cm² averaging area is reported based on SAR measurements.
2. 10 W/m² = 1.0 mW/cm²

MIMO Ant SAR test results

| Antenna | RF Exposure Conditions | Mode | PWR Back-off | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Duty Cycle (%) | Power (dBm) | | Measured APD (mW/cm ² over 4cm ²) | Plot No. |
|-----------------|------------------------|--------------------------|--------------|------------|---------------|--------|-------------|----------------|---------------|-------|--|----------|
| | | | | | | | | | Tune-up limit | Meas. | | |
| WLAN MIMO Ant.1 | Head | 802.11ax HE160 72.0 Mbps | N/A | 0 | Left Touch | 143 | 6665.0 | 99.63% | 10.00 | 9.59 | 0.0079 | |
| | | | | | Left Tilt | 143 | 6665.0 | 99.63% | 10.00 | 9.59 | 0.0093 | |
| | | | | | Right Touch | 15 | 6025.0 | 99.63% | 10.00 | 8.66 | 0.0523 | |
| | | | | | | 79 | 6345.0 | 99.63% | 10.00 | 9.08 | 0.0891 | 7 |
| | | | | | | 111 | 6505.0 | 99.63% | 10.00 | 9.41 | 0.0474 | |
| | | | | | | 143 | 6665.0 | 99.63% | 10.00 | 9.59 | 0.0352 | |
| | | | | | | 207 | 6985.0 | 99.63% | 10.00 | 9.47 | 0.0092 | |
| | Right Tilt | | 143 | 6665.0 | 99.63% | 10.00 | 9.59 | 0.0244 | | | | |
| | Body-worn & Hotspot | | N/A | 10 | Rear | 15 | 6025.0 | 99.63% | 10.00 | 8.66 | 0.0132 | |
| | | | | | | 79 | 6345.0 | 99.63% | 10.00 | 9.08 | 0.0326 | 8 |
| | | | | | | 111 | 6505.0 | 99.63% | 10.00 | 9.41 | 0.0283 | |
| | | | | | | 143 | 6665.0 | 99.63% | 10.00 | 9.59 | | |
| | | | | | | 207 | 6985.0 | 99.63% | 10.00 | 9.47 | | |
| | Front | | 143 | 6665.0 | 99.63% | 10.00 | 9.59 | 0.0000 | | | | |
| | Product Specific 10-g | | N/A | 0 | Rear | 143 | 6665.0 | 99.63% | 10.00 | 9.59 | 0.2990 | |
| | | | | | Front | 143 | 6665.0 | 99.63% | 10.00 | 9.59 | 0.1580 | |
| | | | | | Top | 143 | 6665.0 | 99.63% | 10.00 | 9.59 | | |
| | | | | | Left | 143 | 6665.0 | 99.63% | 10.00 | 9.59 | | |
| | | | | | Right | 15 | 6025.0 | 99.63% | 10.00 | 8.66 | 0.6550 | |
| | | | | | | 79 | 6345.0 | 99.63% | 10.00 | 9.08 | 0.7410 | 9 |
| | | | | | | 111 | 6505.0 | 99.63% | 10.00 | 9.41 | 0.5080 | |
| 143 | | 6665.0 | | | | 99.63% | 10.00 | 9.59 | 0.3960 | | | |
| 207 | 6985.0 | 99.63% | 10.00 | 9.47 | 0.1810 | | | | | | | |
| WLAN MIMO Ant.2 | Head | 802.11ax HE160 72.0 Mbps | N/A | 0 | Left Touch | 143 | 6665.0 | 99.63% | 10.00 | 9.20 | | |
| | | | | | Left Tilt | 143 | 6665.0 | 99.63% | 10.00 | 9.20 | | |
| | | | | | Right Touch | 15 | 6025.0 | 99.63% | 10.00 | 9.20 | | |
| | | | | | | 79 | 6345.0 | 99.63% | 10.00 | 9.10 | | |
| | | | | | | 111 | 6505.0 | 99.63% | 10.00 | 8.97 | | |
| | | | | | | 143 | 6665.0 | 99.63% | 10.00 | 9.15 | | |
| | | | | | | 207 | 6985.0 | 99.63% | 10.00 | 9.17 | | |
| | Right Tilt | | 143 | 6665.0 | 99.63% | 10.00 | 9.20 | | | | | |
| | Body-worn & Hotspot | | N/A | 10 | Rear | 15 | 6025.0 | 99.63% | 10.00 | 9.20 | | |
| | | | | | | 79 | 6345.0 | 99.63% | 10.00 | 9.10 | | |
| | | | | | | 111 | 6505.0 | 99.63% | 10.00 | 8.97 | | |
| | | | | | | 143 | 6665.0 | 99.63% | 10.00 | 9.15 | 0.0202 | |
| | | | | | | 207 | 6985.0 | 99.63% | 10.00 | 9.17 | 0.0086 | |
| | Front | | 143 | 6665.0 | 99.63% | 10.00 | 9.20 | 0.0000 | | | | |
| | Product Specific 10-g | | N/A | 0 | Rear | 143 | 6665.0 | 99.63% | 10.00 | 9.20 | | |
| | | | | | Front | 143 | 6665.0 | 99.63% | 10.00 | 9.20 | | |
| | | | | | Top | 143 | 6665.0 | 99.63% | 10.00 | 9.20 | 0.0455 | |
| | | | | | Left | 143 | 6665.0 | 99.63% | 10.00 | 9.20 | 0.0328 | |
| | | | | | Right | 15 | 6025.0 | 99.63% | 10.00 | 9.20 | | |
| | | | | | | 79 | 6345.0 | 99.63% | 10.00 | 9.10 | | |
| | | | | | | 111 | 6505.0 | 99.63% | 10.00 | 8.97 | | |
| 143 | | 6665.0 | | | | 99.63% | 10.00 | 9.15 | | | | |
| 207 | 6985.0 | 99.63% | 10.00 | 9.17 | | | | | | | | |

Note(s):

1. APD (Absorbed Power Density) over 4cm² averaging area is reported based on SAR measurements.
2. 10 W/m² = 1.0 mW/cm²

11. IPD(Incident Power density) Results

11.1. WiFi (UNII Bands-Above 6GHz)

SISO Ant SAR test results

| Antenna | Mode | Test Position | Dist. (mm) | Ch. | Freq. (MHz) | Duty Cycle | Grid Step (Lamda) | Power (dBm) | | Measured. Normal psPD | Measured. Total psPD | Reported. Normal psPD <i>Note 2</i> | Reported. Total psPD <i>Note 2</i> | Scaling factor for Measurement Uncertainty per IEC 62479 <i>Note 2</i> | Scaled Normal psPD | Scaled Total psPD | Plot No. |
|-----------------|-----------------|---------------|------------|-----|-------------|------------|-------------------|---------------|-------|-----------------------|----------------------|-------------------------------------|------------------------------------|--|--------------------|-------------------|----------|
| | | | | | | | | Tune-up limit | Meas. | | | | | | | | |
| WLAN SISO Ant.1 | 802.11ax HE 160 | Right | 2.00 | 79 | 6345.0 | 99.6% | 0.043 | 10.00 | 8.95 | 0.3200 | 0.6270 | 0.4070 | 0.7990 | 1.116 | 0.4542 | 0.8917 | 10 |
| WLAN SISO Ant.2 | 802.11ax HE 160 | Rear | 2.00 | 207 | 6985.0 | 99.6% | 0.048 | 10.00 | 9.18 | 0.0514 | 0.0722 | 0.0621 | 0.0872 | 1.116 | 0.0693 | 0.0973 | 11 |

MIMO Ant SAR test results

| Antenna | Mode | Test Position | Dist. (mm) | Ch. | Freq. (MHz) | Duty Cycle | Grid Step (Lamda) | Power (dBm) | | Measured. Normal psPD | Measured. Total psPD | Reported. Normal psPD <i>Note 2</i> | Reported. Total psPD <i>Note 2</i> | Scaling factor for Measurement Uncertainty per IEC 62479 <i>Note 2</i> | Scaled Normal psPD | Scaled Total psPD | Plot No. | |
|-----------------|-----------------|---------------|------------|-----|-------------|------------|-------------------|---------------|-------|-----------------------|----------------------|-------------------------------------|------------------------------------|--|--------------------|-------------------|----------|--|
| | | | | | | | | Tune-up limit | Meas. | | | | | | | | | |
| WLAN MIMO Ant.1 | 802.11ax HE 160 | Rear | 2.00 | 79 | 6345.0 | 99.6% | 0.043 | 10.00 | 9.08 | 0.1280 | 0.1950 | 0.1610 | 0.2450 | 1.116 | 0.1797 | 0.2734 | 11 | |
| | | Front | | 79 | 6345.0 | 99.6% | 0.043 | 10.00 | 9.08 | 0.0611 | 0.1120 | 0.0768 | 0.1400 | 1.116 | 0.0857 | 0.1562 | | |
| | | Top | | 79 | 6345.0 | 99.6% | 0.043 | 10.00 | 9.08 | 0.0671 | 0.1130 | 0.0843 | 0.1420 | 1.116 | 0.0941 | 0.1585 | | |
| | | Left | | 79 | 6345.0 | 99.6% | 0.043 | | | | | | | | | | | |
| | | Right | | 79 | 6345.0 | 99.6% | 0.043 | 10.00 | 9.08 | 0.3100 | 0.5600 | 0.3890 | 0.7030 | 1.116 | 0.4341 | 0.7845 | | |
| WLAN MIMO Ant.1 | 802.11ax HE 160 | Rear | 2.00 | 79 | 6345.0 | 99.6% | 0.043 | | | | | | | 1.116 | | | | |
| | | Front | | 79 | 6345.0 | 99.6% | 0.043 | | | | | | | | 1.116 | | | |
| | | Top | | 79 | 6345.0 | 99.6% | 0.043 | 10.00 | 9.10 | 0.0671 | 0.1130 | 0.0826 | 0.1390 | 1.116 | 0.0922 | 0.1551 | | |
| | | Left | | 79 | 6345.0 | 99.6% | 0.043 | 10.00 | 9.10 | 0.0112 | 0.0211 | 0.0138 | 0.0260 | 1.116 | 0.0154 | 0.0290 | | |
| | | Right | | 79 | 6345.0 | 99.6% | 0.043 | | | | | | | | 1.116 | | | |

Note(s):

- 10 W/m² = 1.0 mW/cm²
- Per TCBC workshop guide, Incident power density results were scaled according to IEC 62479:2010 for the portion of the measurement uncertainty > 30%. Total expanded uncertainty of 1.51 dB (41.6%) was used to determine the psPD measurement scaling factor.
- Power density test data were scaled to tune-up limit using measurement system tool.
- Per manufacturer guide, Grid Step setting were using the automatic grid step function of measurement system tool.
- Per manufacturer guide, Incident power density was measured at d=2mm.
- ESR Algorithm was used during psPD measurement and calculations.
- SISO Ant mode was evaluated in the worst case configuration of SAR test results.
- MIMO Ant mode was evaluated for the entire measurement position in the worst case configuration of SAR test results.

12. Simultaneous Transmission Analysis

Please refer to section.12 in FCC SAR report S1.

Appendixes

Refer to separated files for the following appendixes.

4790976523-S2 FCC Report Above 6GHz _App A_PD Photos & Ant. Locations

4790976523-S2 FCC Report Above 6GHz _App B_Highest SAR and PD Test Plots

4790976523-S2 FCC Report Above 6GHz _App C_System Check Plots

4790976523-S2 FCC Report Above 6GHz _App D_SAR Tissue Ingredients

4790976523-S2 FCC Report Above 6GHz _App E_Probe Cal. Certificates

4790976523-S2 FCC Report Above 6GHz _App F_Dipole and Horn antenna Cal. Certificates

END OF REPORT