# FCC SAR Test Report

# FCC ID: BEJNT-14T90S

| | | |
|---|---|---|
| **Report No.** | : | BTL-FCC SAR-1-2308T045 |
| **Equipment** | : | Notebook Computer |
| **Model Name** | : | 14T90S |
| **Brand Name** | : | LG |
| **Applicant** | : | LG Electronics USA, Inc. |
| **Address** | : | 111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey 07632, United States |
| **Radio Function** | : | Bluetooth, WLAN 2.4G, WLAN 5G, WLAN 6E |
| **Standard(s)** | : | **KDB447498 D04** Interim General RF Exposure Guidance v01<br>**KDB248227 D01** 802.11 Wi-Fi SAR v02r02<br>**KDB865664 D01** SAR measurement 100 MHz to 6 GHz v01r04<br>**KDB865664 D02** SAR Reporting v01r02<br>**KDB616217 D04** SAR for laptop and Tablets v01r02<br>**FCC§2.1093** Radiofrequency radiation exposure evaluation: portable devices<br>**IEEE C95.1:2019** Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.<br>**IEC/IEEE 62209-1528:2020** 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 1528: Human models, instrumentation, and procedures(Frequency range of 4 MHz to 10 GHz) |
| **Date of Receipt** | : | Aug. 16, 2023 |
| **Date of Test** | : | Aug. 21, 2023 ~ Oct. 25, 2023 |
| **Issued Date** | : | Nov. 6, 2023 |

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

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**Declaration**

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

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The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

**Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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**REPORT ISSUED HISTORY**

| Report Version | Description | Issued Date |
|---|---|---|
| R00 | Original Issue. | 2023/9/14 |
| R01 | Revised PD Test Results. | 2023/10/26 |
| R02 | Revised PD Test Photos, Add PD Test Limit. | 2023/11/6 |

# 1. GENERAL INFORMATION

## 1.1. GENERAL DESCRIPTION OF EUT

| | | | |
|---|---|---|---|
| Equipment | Notebook Computer | | |
| Model Name | 14T90S | | |
| Brand Name | LG | | |
| Series Model | 14T90S, 14TD90S, 14TG90S, 14TB90S, 14TW90S, 14TN90S, 14T90S* (* can be 0 to 9 or A to Z or blank denoting buyer request) | | |
| Model Difference | Different model distribute to different area. | | |
| Power Rating | Brand: LG<br>Model: LP65WFC20P-NJ<br>Input: 100-240V~ 1.6A, 50-60Hz<br>Output: 5.0Vdc 3.0A 15.0W or 9.0Vdc 3.0A 27.0W or 15.0Vdc 3.0A 45.0W or 20.0Vdc 3.25A 65.0W (PPS)5.0V-20.0Vdc 3.25A Max 65.0W | | |
| Battery Information | Brand Name: LG<br>Model Name: LBZ722DM<br>Power Rating: 7.76V, 72Wh, Typ 9279mAh | | |
| WIFI+BT Module | AX211D2W | | |
| Operation Frequency | Function | Band | Frequency (MHz) |
| | WiFi | 2.4G | TX : 2412 - 2472 MHz |
| | | 5G_UNII 1 | TX : 5180 - 5250 MHz |
| | | 5G_UNII 2a | TX : 5250 - 5350 MHz |
| | | 5G_UNII 2c | TX : 5500 - 5700 MHz |
| | | 5G_UNII 3 | TX : 5745 - 5825 MHz |
| | | 5G_UNII 4 | TX : 5850 - 5895 MHz |
| | | 6E_UNII 5 | TX : 5945 – 6425 MHz |
| | | 6E_UNII 6 | TX : 6425 – 6525 MHz |
| | | 6E_UNII 7 | TX : 6525 – 6875 MHz |
| | | 6E_UNII 8 | TX : 6875 – 7125 MHz |
| | Bluetooth | Basic Rate (BR) | TX : 2402 - 2480 MHz |
| | | Enhance Data Rate | TX : 2402 - 2480 MHz |
| | | Bluetooth Low Energy | TX : 2402 - 2480 MHz |
| Sample Status | Engineering Sample | | |
| EUT Modification(s) | N/A | | |

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc. The test data, data evaluation, and equipment configuration contained in our test report were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

# 2. RF EMISSIONS MEASUREMENT

## 2.1. TEST FACILITY

The test locations stated below are under the TAF Accreditation Number 0659.
The test facilities used to collect the test data in this report is **SAR Test room** at the location of No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan.
(FCC DN: TW0659)

☒SAR 01 ☐SAR 02 ☐SAR 03

## 2.2. MEASUREMENT UNCERTAINTY

Uncertainty Budget for Frequency range of 300 MHz to 3 GHz

| Error Description | Uncertainty Value (± %) | Probability Distribution | Divisor | Ci (1g) | Ci (10g) | Standard Uncertainty (1g) | Standard Uncertainty (10g) | Vi $V_{eff}$ |
|---|---|---|---|---|---|---|---|---|
| **Measurement System** | | | | | | | | |
| Probe Calibration | 6.0 | Normal | 1 | 1 | 1 | ± 6.0 % | ± 6.0 % | ∞ |
| Axial Isotropy | 4.7 | Rectangular | $\sqrt{3}$ | 0.7 | 0.7 | ± 1.9 % | ± 1.9 % | ∞ |
| Hemispherical Isotropy | 9.6 | Rectangular | $\sqrt{3}$ | 0.7 | 0.7 | ± 3.9 % | ± 3.9 % | ∞ |
| Boundary Effects | 1 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 0.6 % | ± 0.6 % | ∞ |
| Linearity | 4.7 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 2.7 % | ± 2.7 % | ∞ |
| Detection Limits | 1 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 0.6 % | ± 0.6 % | ∞ |
| Modulation response | 2.4 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.4 % | ± 1.4 % | ∞ |
| Readout Electronics | 0.3 | Normal | 1 | 1 | 1 | ± 0.3 % | ± 0.3 % | ∞ |
| Response Time | 0.8 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 0.5% | ± 0.5 % | ∞ |
| Integration Time | 2.6 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.5 % | ± 1.5 % | ∞ |
| RF Ambient – Noise | 3 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.7 % | ± 1.7 % | ∞ |
| RF Ambient– Reflections | 3 | Rectangula | $\sqrt{3}$ | 1 | 1 | ± 1.7 % | ± 1.7 % | ∞ |
| Probe Positioner | 0.02 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 0.0 % | ± 0.0 % | ∞ |
| Probe Positioning | 0.4 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 0.2 % | ± 0.2 % | ∞ |
| Max.SAR Evaluation | 2 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.2 % | ± 1.2 % | ∞ |
| **Test Sample Related** | | | | | | | | |
| Device Positioning | 2.9 | Normal | 1 | 1 | 1 | ± 2.9 % | ± 2.9 % | 145 |
| Device Holder | 3.6 | Normal | 1 | 1 | 1 | ± 3.6 % | ± 3.6 % | 5 |
| Power Drift | 5.0 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 2.9 % | ± 2.9 % | ∞ |
| **Phantom and Setup** | | | | | | | | |
| Phantom Production Tolerances | 6.1 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 3.5 % | ± 3.5 % | ∞ |
| SAR correction | 1.9 | Rectangular | $\sqrt{3}$ | 1 | 0.84 | ± 1.9 % | ± 1.6 % | |
| Liquid Conductivity (mea.) | 2.5 | Rectangular | $\sqrt{3}$ | 0.78 | 0.71 | ± 2.0 % | ± 1.8 % | ∞ |
| Liquid Permittivity (mea.) | 2.5 | Rectangular | $\sqrt{3}$ | 0.26 | 0.26 | ± 0.6 % | ± 0.7 % | ∞ |
| Temp. unc. - Conductivity | 3.4 | Rectangular | $\sqrt{3}$ | 0.78 | 0.71 | ± 1.5 % | ± 1.4 % | ∞ |
| Temp. unc. - Permittivity | 0.4 | Rectangular | $\sqrt{3}$ | 0.23 | 0.26 | ± 0.1 % | ± 0.1 % | ∞ |
| **Combined Standard Uncertainty (K = 1)** | | | | | | ± 11.28 % | ± 11.19 % | 361 |
| **Expanded Uncertainty (K = 2)** | | | | | | **± 22.56 %** | **± 22.37 %** | |

Uncertainty Budget for Frequency range of 3 GHz to 6 GHz

| Error Description | Uncertainty Value (± %) | Probability Distribution | Divisor | Ci (1g) | Ci (10g) | Standard Uncertainty (1g) | Standard Uncertainty (10g) | Vi $V_{eff}$ |
|---|---|---|---|---|---|---|---|---|
| **Measurement System** | | | | | | | | |
| Probe Calibration | 7.00 | Normal | 1 | 1 | 1 | ± 7.0 % | ± 7.00 % | ∞ |
| Axial Isotropy | 4.7 | Rectangular | $\sqrt{3}$ | 0.7 | 0.7 | ± 1.9 % | ± 1.9 % | ∞ |
| Hemispherical Isotropy | 9.6 | Rectangular | $\sqrt{3}$ | 0.7 | 0.7 | ± 3.9 % | ± 3.9 % | ∞ |
| Boundary Effects | 2 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.2 % | ± 1.2 % | ∞ |
| Linearity | 4.7 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 2.7 % | ± 2.7 % | ∞ |
| Detection Limits | 1 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 0.6 % | ± 0.6 % | ∞ |
| Modulation response | 2.4 | Rectangular | $\sqrt{3}$ | 1 | 1 | ±1.4 % | ±1.4 % | ∞ |
| Readout Electronics | 0.3 | Normal | 1 | 1 | 1 | ± 0.3 % | ± 0.3 % | ∞ |
| Response Time | 0.8 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 0.5% | ± 0.5 % | ∞ |
| Integration Time | 2.6 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.5 % | ± 1.5 % | ∞ |
| RF Ambient – Noise | 3 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.7 % | ± 1.7 % | ∞ |
| RF Ambient– Reflections | 3 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.7 % | ± 1.7 % | ∞ |
| Probe Positioner | 0.04 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 0.0 % | ± 0.0 % | ∞ |
| Probe Positioning | 0.8 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 0.5 % | ± 0.5 % | ∞ |
| Max.SAR Evaluation | 4 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 2.3 % | ± 2.3 % | ∞ |
| **Test Sample Related** | | | | | | | | |
| Device Positioning | 2.9 | Normal | 1 | 1 | 1 | ± 2.9 % | ± 2.9 % | 145 |
| Device Holder | 3.6 | Normal | 1 | 1 | 1 | ± 3.6 % | ± 3.6 % | 5 |
| Power Drift | 5.0 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 2.9 % | ± 2.9 % | ∞ |
| **Phantom and Setup** | | | | | | | | |
| Phantom Production Tolerances | 6.6 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 3.8 % | ± 3.8 % | ∞ |
| SAR correction | 1.9 | Rectangular | $\sqrt{3}$ | 1 | 0.84 | ± 1.9 % | ± 1.6 % | |
| Liquid Conductivity (mea.) | 2.5 | Rectangular | $\sqrt{3}$ | 0.78 | 0.71 | ± 2.0 % | ± 1.8 % | ∞ |
| Liquid Permittivity (mea.) | 2.5 | Rectangular | $\sqrt{3}$ | 0.26 | 0.26 | ± 0.6 % | ± 0.7 % | ∞ |
| Temp. unc. - Conductivity | 3.4 | Rectangular | $\sqrt{3}$ | 0.78 | 0.71 | ± 1.5 % | ± 1.4 % | ∞ |
| Temp. unc. - Permittivity | 0.4 | Rectangular | $\sqrt{3}$ | 0.23 | 0.26 | ± 0.1 % | ± 0.1 % | ∞ |
| **Combined Standard Uncertainty (K = 1)** | | | | | | ± 12.14 % | ± 12.06 % | 361 |
| **Expanded Uncertainty (K = 2)** | | | | | | **± 24.28 %** | **± 24.12 %** | |

Uncertainty Budget for Frequency range of 6 GHz to 10 GHz

| Error Description | Uncertainty Value (±%) | Probability Distribution | Divisor | Ci (1g) | Ci (10g) | Standard Uncertainty (1g) | Standard Uncertainty (10g) | Vi $V_{eff}$ |
|---|---|---|---|---|---|---|---|---|
| **Measurement System** | | | | | | | | |
| Probe Calibration | 18.6 | Normal | 2 | 1 | 1 | ± 9.3 % | ± 9.3 % | ∞ |
| Probe Calibration Drift | 1.7 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.0 % | ± 1.0 % | ∞ |
| Probe Linearity | 4.7 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 2.7 % | ± 2.7 % | ∞ |
| Broadband Signal | 2.8 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.6 % | ± 1.6 % | ∞ |
| Probe Isotropy | 7.6 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 4.4 % | ± 4.4 % | ∞ |
| Other Probe+Electronic | 2.4 | Normal | 1 | 1 | 1 | ± 2.4% | ± 2.4% | ∞ |
| RF Ambient | 1.8 | Normal | 1 | 1 | 1 | ± 1.8 % | ± 1.8 % | ∞ |
| Probe Positioning | ±0.005mm | Normal | 1 | 0.5 | 0.5 | ± 0.25 % | ± 0.25 % | ∞ |
| Data Processing | 3.5 | Normal | 1 | 1 | 1 | ± 3.5 % | ± 3.5 % | ∞ |
| **Phantom and Device Errors** | | | | | | | | |
| Conductivity(meas.) | 2.5 | Normal | 1 | 0.78 | 0.71 | ± 2.0 % | ± 1.8 % | ∞ |
| Conductivity(temp.) | 2.4 | Rectangular | $\sqrt{3}$ | 0.78 | 0.71 | ± 1.1 % | ± 1.0 % | ∞ |
| PhantomPermittivity | 14.0 | Rectangular | $\sqrt{3}$ | 0.5 | 0.5 | ± 4.0 % | ± 4.0 % | ∞ |
| Distance DUT - TSL | 2.0 | Normal | 1 | 2 | 2 | ± 4.0 % | ± 4.0 % | ∞ |
| Device Positioning | 1.0 | Normal | 1 | 1 | 1 | ± 1.0 % | ± 1.0 % | 145 |
| Device Holder | 3.6 | Normal | 1 | 1 | 1 | ± 3.6 % | ± 3.6 % | 5 |
| DUT Modulation | 2.4 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.4 % | ± 1.4 % | ∞ |
| Time-average SAR | 1.7 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 1.0 % | ± 1.0 % | ∞ |
| DUT drift | 2.5 | Normal | 1 | 1 | 1 | ± 2.5 % | ± 2.5 % | ∞ |
| Val Antenna Unc. | 0 | Normal | 1 | 1 | 1 | ± 0 % | ± 0 % | ∞ |
| Unc. Input Power | 0 | Normal | 1 | 1 | 1 | ± 0 % | ± 0 % | ∞ |
| **Correction to the SAR results** | | | | | | | | |
| Deviation to Target | 1.9 | Normal | 1 | 1 | 0.84 | ± 1.9 % | ± 1.6 % | ∞ |
| SAR scaling | 0 | Rectangular | $\sqrt{3}$ | 1 | 1 | ± 0 % | ± 0 % | ∞ |
| **Combined Standard Uncertainty (K = 1)** | | | | | | ± 14.23% | ± 14.16% | 361 |
| **Expanded Uncertainty (K = 2)** | | | | | | **± 28.46 %** | **± 28.32 %** | |

Uncertainty Budget for psSAR / psAPD Assessments

## UncertaintyBudgetforpsSAR/psAPDAssessments

**(Frequency band: 6 – 10 GHz range)**

| Symbol | Error Description | Uncert. | Prob. Dist. | Div. | ci (1g) / (1 cm2) | ci (8 g/10 g) / (4 cm2) | Std. Unc.0(1 g)/ (1 cm2) | Std. Unc. (8 g/10 g) / (4 cm2) |
|---|---|---|---|---|---|---|---|---|
| psSAR | Module SAR V16.0 (Table 6.3.3) | ±14.23/14.16% | N | 1 | 1 | 1 | ±14.23% | ±14.16% |
| PDC | Power Density Conversion | ±13.5% | R | $\sqrt{3}$ | 1 | 1 | ±7.8% | ±7.8% |
| u(Δ SAR) | Combined Uncertainty | | | | | | ±15.6% | ±15.5 % |
| U | **Expanded Uncertainty** in dB | | | | | | ±31.2% ±1.2 dB | ±31.0% ±1.2 dB |

Uncertainty Budget for mmWave

| Error Description | Uncertainty Value (±dB) | Probability Distribution | Divisor | Ci | Standard Uncertainty | Vi $V_{eff}$ |
|---|---|---|---|---|---|---|
| **Uncertainty terms dependent on the measurement system** | | | | | | |
| Probe Calibration | 0.49 | Normal | 1 | 1 | ±0.49dB | ∞ |
| Probe correction | 0 | Rectangular | $\sqrt{3}$ | 1 | ±0dB | ∞ |
| Frequency response(BW≤1GHz) | 0.20 | Rectangular | $\sqrt{3}$ | 1 | ±0.12 dB | ∞ |
| Sensor cross coupling | 0 | Rectangular | $\sqrt{3}$ | 1 | ±0 dB | ∞ |
| Isotropy | 0.50 | Rectangular | $\sqrt{3}$ | 1 | ±0.29 dB | ∞ |
| Linearity | 0.20 | Rectangular | $\sqrt{3}$ | 1 | ±0.12 dB | ∞ |
| Probe scattering | 0 | Rectangular | $\sqrt{3}$ | 1 | ±0 dB | ∞ |
| Probe Positioning offset | 0.30 | Rectangular | $\sqrt{3}$ | 1 | ±0.17 dB | ∞ |
| Probe Positioning repeatability | 0.04 | Rectangular | $\sqrt{3}$ | 1 | ±0.02 dB | ∞ |
| Sensor mechanical offset | 0 | Rectangular | $\sqrt{3}$ | 1 | ± 0 dB | ∞ |
| Probe spatial resolution | 0 | Rectangular | $\sqrt{3}$ | 1 | ± 0 dB | ∞ |
| Field impedance dependance | 0 | Rectangular | $\sqrt{3}$ | 1 | ± 0 dB | ∞ |
| Amplitude and phase drift | 0 | Rectangular | $\sqrt{3}$ | 1 | ± 0 dB | ∞ |
| Amplitude and phase noise | 0.04 | Rectangular | $\sqrt{3}$ | 1 | ± 0.02 dB | ∞ |
| Measurement area truncation | 0 | Rectangular | $\sqrt{3}$ | 1 | ±0 dB | ∞ |
| Data acquisition | 0.03 | Normal | 1 | 1 | ±0.03 dB | ∞ |
| Sampling | 0 | Rectangular | $\sqrt{3}$ | 1 | ±0 dB | ∞ |
| Field reconstruction | 2.00 | Rectangular | $\sqrt{3}$ | 1 | ±1.15 dB | ∞ |
| Forward transformation | 0 | Rectangular | $\sqrt{3}$ | 1 | ±0 dB | ∞ |
| Power density scaling | - | Rectangular | $\sqrt{3}$ | 1 | ±0 dB | ∞ |
| Spatial averaging | 0.10 | Rectangular | $\sqrt{3}$ | 1 | ±0.06 dB | ∞ |
| System detection limit | 0.04 | Rectangular | $\sqrt{3}$ | 1 | ±0.02 dB | ∞ |
| **Uncertainty terms dependent on the DUT and environmental factors** | | | | | | |
| Probe coupling with DUT | 0 | Rectangular | $\sqrt{3}$ | 1 | ± 0 dB | ∞ |
| Modulation response | 0.40 | Rectangular | $\sqrt{3}$ | 1 | ± 0.2 dB | ∞ |
| Integration time | 0 | Rectangular | $\sqrt{3}$ | 1 | ± 0 dB | ∞ |
| Response time | 0 | Rectangular | $\sqrt{3}$ | 1 | ± 0 dB | ∞ |
| Device holder influence | 0.10 | Rectangular | $\sqrt{3}$ | 1 | ± 0.1 dB | ∞ |
| DUT alignment | 0 | Rectangular | $\sqrt{3}$ | 1 | ± 0 dB | ∞ |
| RF ambient conditions | 0.04 | Rectangular | $\sqrt{3}$ | 1 | ±0.02 dB | ∞ |
| Ambient Reflections | 0.04 | Rectangular | $\sqrt{3}$ | 1 | ±0.02 dB | ∞ |
| Immunity / secondary reception | 0 | Rectangular | $\sqrt{3}$ | 1 | ±0 dB | ∞ |
| Drift of the DUT | 0.10 | Rectangular | $\sqrt{3}$ | 1 | ±0.06 dB | ∞ |
| **Combined Standard Uncertainty (K = 1)** | | | | | ± 1.34dB | ∞ |
| **Expanded Uncertainty (K = 2)** | | | | | **± 2.68dB** | |

## 2.3. WLAN ANTENNA INFORMATION:

**NB Mode:**

| Ant. | Brand | Model | Type | Frequency Range (MHz) | Gain (dBi) |
|---|---|---|---|---|---|
| Main | Pulse | DQ602118000 (TZ21180) | PIFA | 2400-2500 | 2.97 |
| | | | | 5150-5250 | 2.18 |
| | | | | 5250-5350 | 1.01 |
| | | | | 5470-5725 | 2.19 |
| | | | | 5725-5850 | 2.29 |
| | | | | 5850-5895 | 1.61 |
| | | | | 5925-6425 | 1.10 |
| | | | | 6425-6525 | -1.20 |
| | | | | 6525-6875 | -0.35 |
| | | | | 6875-7125 | -0.35 |
| Aux | Pulse | DQ602118000 (TZ21180) | PIFA | 2400-2500 | 2.96 |
| | | | | 5150-5250 | 2.21 |
| | | | | 5250-5350 | 3.69 |
| | | | | 5470-5725 | 3.34 |
| | | | | 5725-5850 | 1.29 |
| | | | | 5850-5895 | 0.86 |
| | | | | 5925-6425 | 0.66 |
| | | | | 6425-6525 | -0.34 |
| | | | | 6525-6875 | 0.75 |
| | | | | 6875-7125 | 0.17 |

| Ant. | Brand | Model | Type | Frequency Range (MHz) | Gain (dBi) |
|---|---|---|---|---|---|
| Main | CHILISIN | DQ600111501 (BTEA00111525GC1A02) | PIFA | 2400-2500 | 2.45 |
| | | | | 5150-5250 | 2.14 |
| | | | | 5250-5350 | 0.94 |
| | | | | 5470-5725 | 1.80 |
| | | | | 5725-5850 | 1.72 |
| | | | | 5850-5895 | 1.61 |
| | | | | 5925-6425 | 0.97 |
| | | | | 6425-6525 | -1.44 |
| | | | | 6525-6875 | -0.67 |
| | | | | 6875-7125 | -0.99 |
| Aux | CHILISIN | DQ600111501 (BTEA00111525GC1A02) | PIFA | 2400-2500 | 1.39 |
| | | | | 5150-5250 | 2.12 |
| | | | | 5250-5350 | 2.64 |
| | | | | 5470-5725 | 2.40 |
| | | | | 5725-5850 | 0.90 |
| | | | | 5850-5895 | 0.86 |
| | | | | 5925-6425 | 0.39 |
| | | | | 6425-6525 | -0.53 |
| | | | | 6525-6875 | 0.47 |
| | | | | 6875-7125 | 0.09 |

**TB Mode:**

| Ant. | Brand | Model | Type | Frequency Range (MHz) | Gain (dBi) |
|---|---|---|---|---|---|
| Main | Pulse | DQ602118000 (TZ21180) | PIFA | 2400-2500 | 0.03 |
| | | | | 5150-5250 | 1.65 |
| | | | | 5250-5350 | 1.05 |
| | | | | 5470-5725 | 1.36 |
| | | | | 5725-5850 | 0.58 |
| | | | | 5850-5895 | 0.58 |
| | | | | 5925-6425 | 0.10 |
| | | | | 6425-6525 | -1.82 |
| | | | | 6525-6875 | -1.29 |
| | | | | 6875-7125 | -1.14 |
| Aux | Pulse | DQ602118000 (TZ21180) | PIFA | 2400-2500 | 1.91 |
| | | | | 5150-5250 | 1.25 |
| | | | | 5250-5350 | 0.98 |
| | | | | 5470-5725 | 1.91 |
| | | | | 5725-5850 | 1.57 |
| | | | | 5850-5895 | 0.67 |
| | | | | 5925-6425 | 0.57 |
| | | | | 6425-6525 | -0.44 |
| | | | | 6525-6875 | -0.29 |
| | | | | 6875-7125 | 1.50 |

| Ant. | Brand | Model | Type | Frequency Range (MHz) | Gain (dBi) |
|---|---|---|---|---|---|
| Main | CHILISIN | DQ600111501 (BTEA00111525GC1A02) | PIFA | 2400-2500 | -0.50 |
| | | | | 5150-5250 | 1.37 |
| | | | | 5250-5350 | 0.75 |
| | | | | 5470-5725 | 1.30 |
| | | | | 5725-5850 | -0.42 |
| | | | | 5850-5895 | 0.58 |
| | | | | 5925-6425 | -0.28 |
| | | | | 6425-6525 | -1.87 |
| | | | | 6525-6875 | -1.44 |
| | | | | 6875-7125 | -1.30 |
| Aux | CHILISIN | DQ600111501 (BTEA00111525GC1A02) | PIFA | 2400-2500 | 1.48 |
| | | | | 5150-5250 | 1.02 |
| | | | | 5250-5350 | 0.86 |
| | | | | 5470-5725 | 1.40 |
| | | | | 5725-5850 | 1.29 |
| | | | | 5850-5895 | 0.67 |
| | | | | 5925-6425 | 0.35 |
| | | | | 6425-6525 | -0.87 |
| | | | | 6525-6875 | -0.43 |
| | | | | 6875-7125 | 1.13 |

Note:
The above Antenna information are derived from the antenna data sheet provided by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

## 2.4. THE MAXIMUM SAR-1G & POWER DENSITY VALUES

| Band | Mode | Highest Body Reported SAR-1g(W/kg) |
|---|---|---|
| FHSS | Bluetooth_DH5 | 0.429 |
| DTS | Wi-Fi 2.4G | 1.070 |
| UNII | 5G UNII 1&2a | 0.615 |
| | 5G UNII 2c | 0.620 |
| | 5G UNII 3 | 0.669 |
| | 5G UNII 4 | 0.635 |
| | 6E UNII 5 | 0.539 |
| | 6E UNII 6 | 0.608 |
| | 6E UNII 7 | 0.692 |
| | 6E UNII 8 | 0.588 |

| Band | Mode | 4cm^2 APD (W/m^2) |
|---|---|---|
| 6E | 6E UNII 7 | 4.08 |

| Band | Mode | Highest Averaged Power Density(W/m^2) |
|---|---|---|
| 6E | 6E UNII 7 | 3.465 |

Note:

1) The device is in compliance with Specific Absorption Rate(SAR)for general population uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI C95.1:2019/IEEE C95.1:2019, the NCRP Report Number 86 for uncontrolled environment and had been tested in accordance with the measurement methods and procedures specified in IEC/IEEE 62209-1528:2020 .

## 2.5. LABORATORY ENVIRONMENT

| | |
|---|---|
| Temperature | Min. = 18ºC, Max. = 25ºC |
| Relative humidity | Min. = 30%, Max. = 70% |
| Ground system resistance | < 0.5Ω |
| Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards. | |

## 2.6. MAIN TEST INSTRUMENTS

| Item | Equipment | Manufacturer | Model | Serial No. | Cal. Date | Cal. Interval |
|---|---|---|---|---|---|---|
| 1 | DASY5 | Speag | DASY 5(Version 52.10.4.1527) | N/A | N/A | N/A |
| 2 | DASY6 | Speag | cDASY6 Module SAR (Version 16.0.2.136) | N/A | N/A | N/A |
| 3 | mm Wave | Speag | cDASY 6 Module mm Wave (Version 2.4.2.62) | N/A | N/A | N/A |
| 4 | Data Acquisition Electronics | Speag | DAE4 | 1486 | Jun. 16, 2023 | 1 Year |
| 5 | E-field Probe | Speag | EX3DV4 | 7369 | May. 22, 2023 | 1 Year |
| 6 | System Validation Dipole | Speag | D2450V2 | 973 | Feb. 08, 2021 | 3 Year |
| 7 | System Validation Dipole | Speag | D5GHzV2 | 1221 | Feb. 09, 2021 | 3 Year |
| 8 | System Validation Dipole | Speag | D6.5GHzV2 | 1041 | Sep 02, 2021 | 3 Year |
| 9 | E-Field probe | Speag | EUmmWV4 | 9583 | Apr 18, 2023 | 1 Year |
| 10 | 5G Verification Source | Speag | 5G Verification Source 10GHz | 2011 | Apr 20, 2023 | 1 Year |
| 11 | ELI4 Phantom | Speag | ELI4 Phantom V8.0 | 2149 | N/A | N/A |
| 12 | mmWave Phantom | Speag | QD 015 025 CA | 1085 | N/A | N/A |
| 13 | ENA Network Analyzer | Agilent | E5071C | MY46524658 | Mar. 17, 2023 | 1 Year |
| 14 | Signal Generator | R&S | SMR40 | 100502 | Feb. 23, 2023 | 1 Year |
| 15 | Spectrum Analyzer | R&S | FSV7 | 103032 | Aug. 10, 2023 | 1 Year |
| 16 | Power Meter | Anritsu | ML2495A | 1128008 | May. 12, 2023 | 1 Year |
| 17 | Power Sensor | Anritsu | MA2411B | 1126001 | May. 12, 2023 | 1 Year |
| 18 | Dielectric Probe Kit | Agilent | 85070E | 2593 | N/A | N/A |
| 19 | Low pass filter | Mini-Circuits | SLP-2950+ | M108294 | N/A | N/A |
| 20 | Power Amplifier | Mini-Circuits | ZVE-2W-272+ | N650001538 | N/A | N/A |
| 21 | Power Amplifier | Mini-Circuits | ZVE-8G+ | N628801631 | N/A | N/A |
| 22 | Power Amplifier | EMCI | EMC053035 | 980869 | N/A | N/A |
| 23 | Thermometer | PA | TA298 | h001 | Mar. 21, 2023 | 1 Year |
| 24 | Directional Coupler | Woken | 50W Coupler | DOM5CIW3E2 | N/A | N/A |
| 25 | Attenuator | Woken | WATT-518FS-10 | N/A | N/A | N/A |

Remark:“N/A” denotes no model name, serial No. or calibration specified.

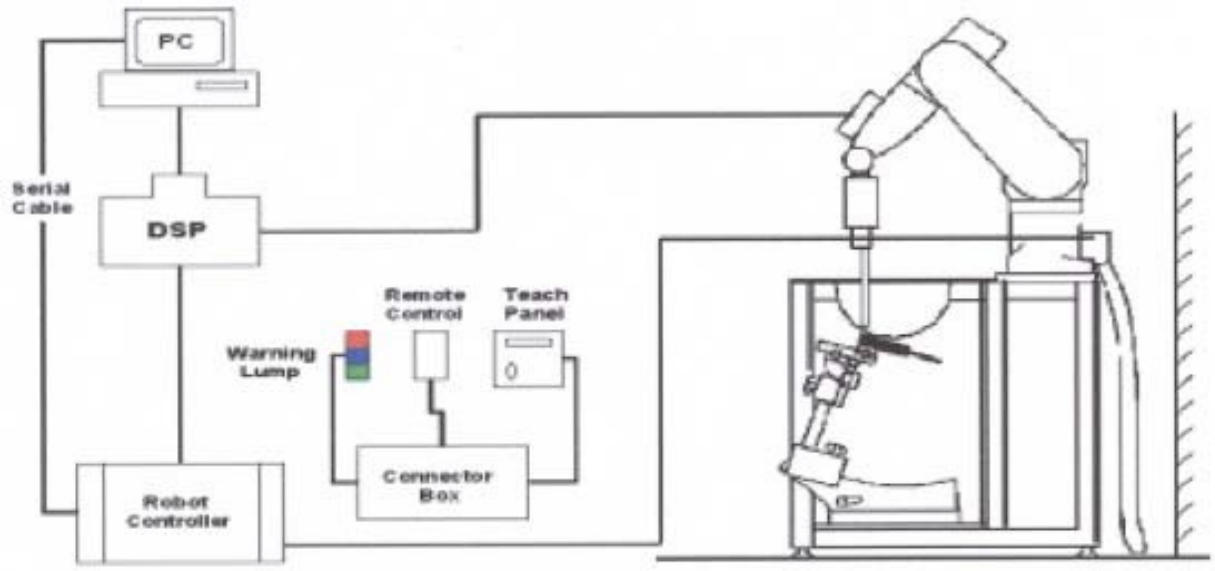
# 3. SAR MEASUREMENTS SYSTEM CONFIGURATION

## 3.1. SAR MEASUREMENT SETUP

The DASY5 system for performing compliance tests consists of the following items:

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronic (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.
4. A unit to operate the optical surface detector which is connected to the EOC.
5. The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
6. The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows.
7. DASY5 software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

### 3.1.1. TEST SETUP LAYOUT

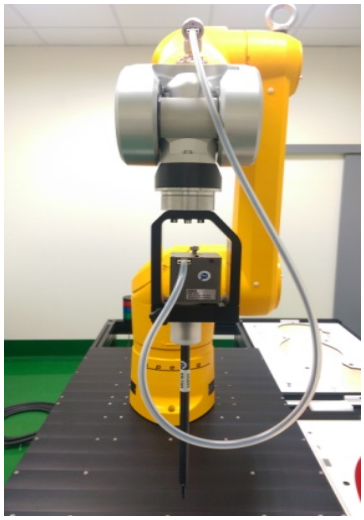


## 3.2. DASY5 E-FIELD PROBE SYSTEM

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

### 3.2.1. EX3DV4 PROBE SPECIFICATION

| | |
|---|---|
| **Construction** | Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |
| **Calibration** | ISO/IEC 17025 calibration service available |
| **Frequency** | 10 MHz to 6 GHz<br>Linearity: ± 0.2 dB (30 MHz to 6 GHz) |
| **Directivity** | ± 0.3 dB in HSL (rotation around probe axis)<br>± 0.5 dB in tissue material (rotation normal to probe axis) |
| **Dynamic Range** | 10 µW/g to > 100 mW/g<br>Linearity: ± 0.2dB |
| **Dimensions** | Overall length: 330 mm (Tip: 20 mm)<br>Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm |



**EX3DV4 E-field Probe**

### 3.2.2. E-FIELD PROBE CALIBRATION

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than ±10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$\mathbf{SAR} = \mathbf{C}\frac{\Delta T}{\Delta t}$$

Where: $\Delta t$ = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

$\Delta T$ = Temperature increase due to RF exposure.

Or $$\mathbf{SAR} = \frac{|E|^2 \sigma}{\rho}$$

Where: σ = Simulated tissue conductivity,

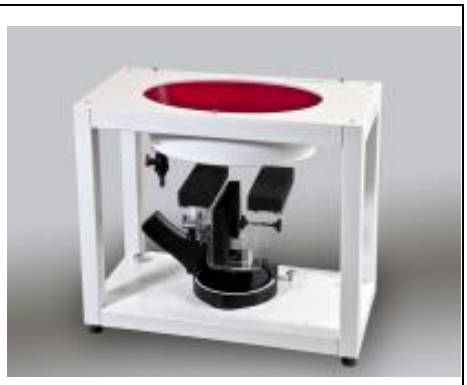
ρ = Tissue density (kg/m3).

## 3.2.3. OTHER TEST EQUIPMENT

### 3.2.3.1. DEVICE HOLDER FOR TRANSMITTERS

**Construction:** Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.) It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI4 and SAM v6.0 Phantoms.
**Material:** POM, Acrylic glass, Foam

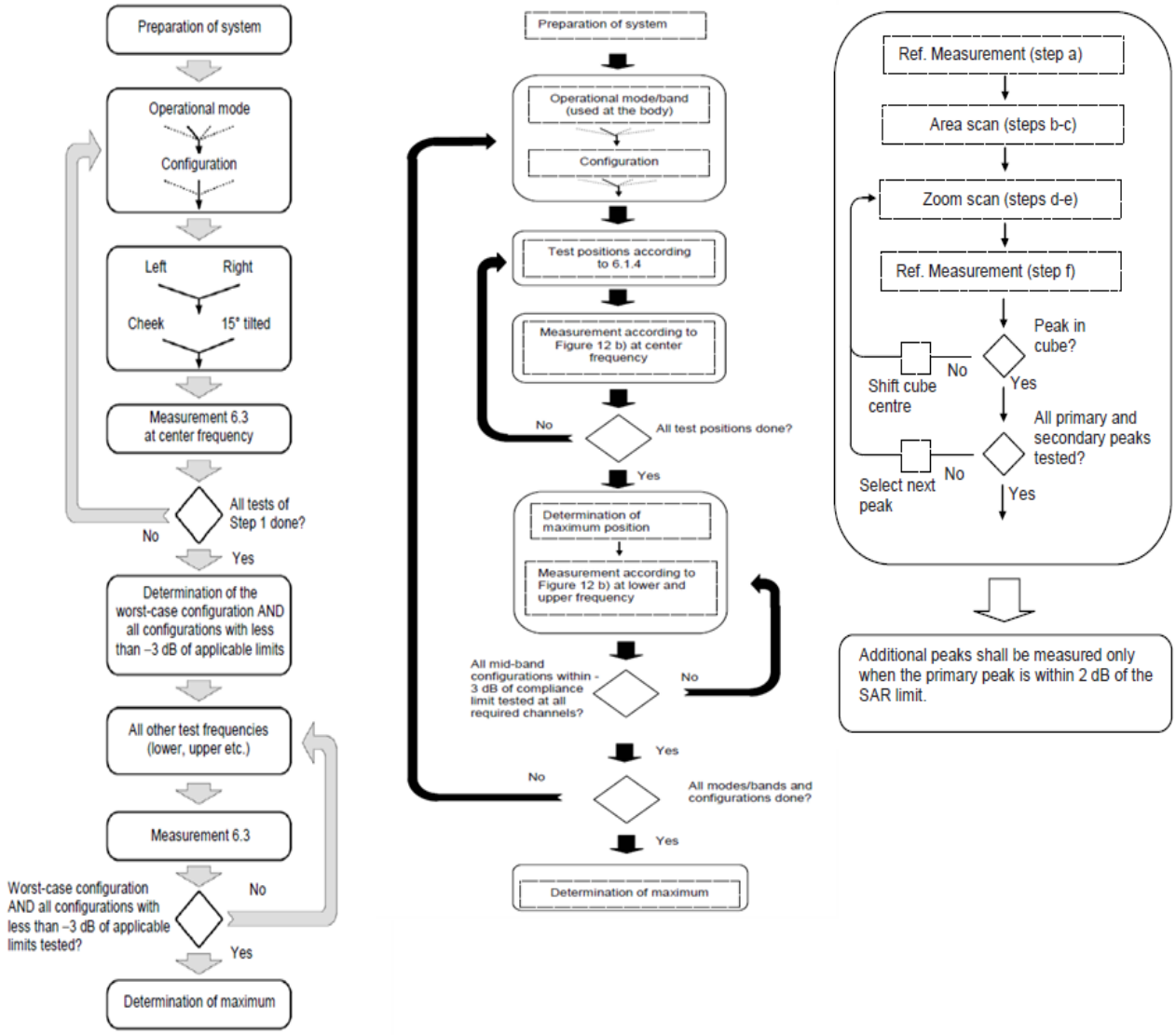
### 3.2.3.2. PHANTOM

| Model | ELI4 Phantom | |
|---|---|---|
| Construction | Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles. |  |
| Shell Thickness | 2±0.1 mm | |
| Filling Volume | Approx. 30 liters | |
| Dimensions | Length: 600 mm ; Width: 190mm<br>Height: adjustable feet | |
| Aailable | Special | |

| Model | Twin SAM | |
|---|---|---|
| Construction | The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot. | |
| Shell Thickness | 2 ± 0.2 mm | |
| Filling Volume | Approx. 25 liters | |
| Dimensions | Length:1000mm; Width: 500mm<br>Height: adjustable feet | |
| Aailable | Special | |

### 3.2.4. SCANNING PROCEDURE

The SAR test against the head and body-worn phantom was carried out as follow:




After an area scan has been done at a fixed distance of 1.4mm from the surface of the phantom on the source side, a 3D scan is set up around the location of the maximum spot SAR. First, a point within the scan area is visited by the probe and a SAR reading taken at the start of testing. At the end of testing, the probe is returned to the same point and a second reading is taken. Comparison between these start and end readings enables the power drift during measurement to be assessed.

Above is the scanning procedure flow chart and table from the IEEE1528 standard.

This is the procedure for which all compliant testing should be carried out to ensure that all variations of the device position and transmission behavior are tested.

## 3.2.5. DATA STORAGE AND EVALUATION

### 3.2.5.1. DATA STORAGE

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension “DAE4”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

### 3.2.6. DATA EVALUATION BY SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

| | | |
|---|---|---|
| Probe parameters: | Sensitivity | Normi, $a_{i0}$, $a_{i1}$, $a_{i2}$ |
| | Conversion factor | $ConvF_i$ |
| | Diode compression point | $Dcp_i$ |
| Device parameters: | Frequency | f |
| | Crest factor | cf |
| Media parameters: | Conductivity | |
| | Density | |

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

| | | |
|---|---|---|
| With | $V_i$ = compensated signal of channel i | ( i = x, y, z ) |
| | $U_i$ = input signal of channel i | ( i = x, y, z ) |
| | cf = crest factor of exciting field | (DASY parameter) |
| | $dcp_i$ = diode compression point | (DASY parameter) |

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes: $Ei = ( Vi / Normi \cdot ConvF )^{1/2}$

H-field probes: $Hi = ( Vi )^{1/2} \cdot ( ai0 + ai1\, f + a_i2f^2 ) / f$

With Vi = compensated signal of channel i ( i = x, y, z )

$Norm_i$ = sensor sensitivity of channel i ( i = x, y, z )
[$mV/(V/m)^2$] for E-field Probes

ConvF = sensitivity enhancement in solution

aij = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

Ei = electric field strength of channel i in V/m

Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$Etot = (EX^2 + EY^2 + EZ^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (Etot)^2 \cdot \sigma / (\rho \cdot 1000)$$

With SAR = local specific absorption rate in mW/g

$E_{tot}$ = total field strength in V/m
= conductivity in [mho/m] or [Siemens/m]
= equivalent tissue density in $g/cm^3$

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \text{ or } P_{pwe} = H_{tot}^2 \cdot 37.7$$

With $P_{pwe}$ = equivalent power density of a plane wave in $mW/cm^2$

$E_{tot}$ = total field strength in V/m
$H_{tot}$ = total magnetic field strength in A/m

# 4. TISSUE-EQUIVALENT LIQUID

## 4.1. TISSUE-EQUIVALENT LIQUID INGREDIENTS

The liquid is consisted of water, salt and Glycol, Sugar, Preventol and Cellulose. The liquid has previously been proven to be suited for worst-case. The measured conductivity and relative permittivity should be within ±5% of the target values. The below table shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEC 62209.

**Composition of the Tissue Equivalent Matter**

| Tissue Type | Bactericide | DGBE | HEC | NaCl | Sucrose | Triton X-100 | Water | Diethylene Glycol Mono-hexylether | Oxidized Mineral Oil |
|---|---|---|---|---|---|---|---|---|---|
| Head 2450 | - | 45.0 | - | 0.1 | - | - | 54.9 | - | - |
| Head 5G | - | - | - | - | - | 17.2 | 65.5 | 17.3 | - |
| Head 6G | - | - | - | - | - | - | 56.0 | - | 44.0 |

## 4.2. TISSUE-EQUIVALENT LIQUID PROPERTIES

Dielectric Performance of Tissue Simulating Liquid

| Tissue Verification | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Date | Tissue Type | Frequency (MHz) | Conductivity (σ) | Permittivity (εr) | Targeted Conductivity (σ) | Targeted Permittivity (εr) | Deviation Conductivity (σ) (%) | Deviation Permittivity (εr) (%) | Limit (%) ±5 |
| 2023/8/21 | Head | 2402 | 1.70 | 38.94 | 1.76 | 39.29 | -3.30 | -0.89 | ±5 |
| 2023/8/21 | Head | 2412 | 1.71 | 38.87 | 1.77 | 39.27 | -3.23 | -1.02 | ±5 |
| 2023/8/21 | Head | 2422 | 1.72 | 38.79 | 1.78 | 39.25 | -3.04 | -1.17 | ±5 |
| 2023/8/21 | Head | 2437 | 1.74 | 38.69 | 1.79 | 39.22 | -2.63 | -1.35 | ±5 |
| 2023/8/21 | Head | 2441 | 1.75 | 38.68 | 1.79 | 39.21 | -2.51 | -1.35 | ±5 |
| 2023/8/21 | Head | 2450 | 1.76 | 38.65 | 1.80 | 39.20 | -2.22 | -1.40 | ±5 |
| 2023/8/21 | Head | 2452 | 1.76 | 38.64 | 1.80 | 39.19 | -2.16 | -1.40 | ±5 |
| 2023/8/21 | Head | 2457 | 1.77 | 38.64 | 1.81 | 39.19 | -1.99 | -1.40 | ±5 |
| 2023/8/21 | Head | 2462 | 1.78 | 38.64 | 1.81 | 39.18 | -1.88 | -1.38 | ±5 |
| 2023/8/21 | Head | 2467 | 1.79 | 38.64 | 1.82 | 39.17 | -1.82 | -1.35 | ±5 |
| 2023/8/21 | Head | 2472 | 1.79 | 38.65 | 1.82 | 39.17 | -1.76 | -1.33 | ±5 |
| 2023/8/21 | Head | 2480 | 1.80 | 38.65 | 1.83 | 39.16 | -1.75 | -1.30 | ±5 |
| 2023/8/24 | Head | 5180 | 4.45 | 37.46 | 4.64 | 36.02 | -4.16 | 4.00 | ±5 |
| 2023/8/24 | Head | 5200 | 4.46 | 37.38 | 4.66 | 36.00 | -4.33 | 3.83 | ±5 |
| 2023/8/24 | Head | 5220 | 4.50 | 37.36 | 4.68 | 35.98 | -3.85 | 3.82 | ±5 |
| 2023/8/24 | Head | 5240 | 4.54 | 37.33 | 4.70 | 35.96 | -3.36 | 3.82 | ±5 |
| 2023/8/24 | Head | 5260 | 4.57 | 37.30 | 4.72 | 35.94 | -3.25 | 3.77 | ±5 |
| 2023/8/24 | Head | 5280 | 4.57 | 37.25 | 4.74 | 35.92 | -3.49 | 3.70 | ±5 |
| 2023/8/24 | Head | 5300 | 4.58 | 37.20 | 4.76 | 35.90 | -3.74 | 3.62 | ±5 |
| 2023/8/24 | Head | 5320 | 4.62 | 37.14 | 4.78 | 35.88 | -3.32 | 3.52 | ±5 |
| 2023/8/24 | Head | 5500 | 4.83 | 37.76 | 4.96 | 35.60 | -2.70 | 6.07 | ±5 |
| 2023/8/24 | Head | 5520 | 4.86 | 37.29 | 4.98 | 35.58 | -2.55 | 4.81 | ±5 |
| 2023/8/24 | Head | 5540 | 4.88 | 36.82 | 5.00 | 35.56 | -2.39 | 3.55 | ±5 |
| 2023/8/24 | Head | 5560 | 4.91 | 36.57 | 5.03 | 35.54 | -2.34 | 2.90 | ±5 |
| 2023/8/24 | Head | 5580 | 4.93 | 36.54 | 5.05 | 35.52 | -2.39 | 2.86 | ±5 |
| 2023/8/24 | Head | 5600 | 4.95 | 36.50 | 5.07 | 35.50 | -2.45 | 2.82 | ±5 |
| 2023/8/24 | Head | 5620 | 4.98 | 36.45 | 5.09 | 35.48 | -2.22 | 2.73 | ±5 |
| 2023/8/24 | Head | 5640 | 5.01 | 36.40 | 5.11 | 35.46 | -2.00 | 2.64 | ±5 |
| 2023/8/24 | Head | 5660 | 5.03 | 36.36 | 5.13 | 35.44 | -1.90 | 2.60 | ±5 |
| 2023/8/24 | Head | 5680 | 5.05 | 36.34 | 5.15 | 35.42 | -1.91 | 2.60 | ±5 |
| 2023/8/24 | Head | 5700 | 5.07 | 36.32 | 5.17 | 35.40 | -1.91 | 2.60 | ±5 |
| 2023/8/24 | Head | 5720 | 5.10 | 36.25 | 5.19 | 35.38 | -1.83 | 2.46 | ±5 |
| 2023/8/24 | Head | 5745 | 5.13 | 36.17 | 5.22 | 35.35 | -1.73 | 2.31 | ±5 |
| 2023/8/24 | Head | 5765 | 5.15 | 36.14 | 5.24 | 35.33 | -1.59 | 2.28 | ±5 |
| 2023/8/24 | Head | 5785 | 5.18 | 36.12 | 5.26 | 35.31 | -1.44 | 2.28 | ±5 |
| 2023/8/24 | Head | 5800 | 5.20 | 36.10 | 5.27 | 35.30 | -1.33 | 2.27 | ±5 |
| 2023/8/24 | Head | 5805 | 5.21 | 36.09 | 5.28 | 35.29 | -1.32 | 2.25 | ±5 |
| 2023/8/24 | Head | 5825 | 5.23 | 36.03 | 5.30 | 35.27 | -1.32 | 2.14 | ±5 |
| 2023/8/24 | Head | 5850 | 5.25 | 35.95 | 5.32 | 35.24 | -1.30 | 2.01 | ±5 |
| 2023/8/24 | Head | 5900 | 5.33 | 35.92 | 5.37 | 35.19 | -0.87 | 2.09 | ±5 |

Dielectric Performance of Tissue Simulating Liquid

| Tissue Verification | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Date | Tissue Type | Frequency (MHz) | Conductivity (σ) | Permittivity (εr) | Targeted Conductivity (σ) | Targeted Permittivity (εr) | Deviation Conductivity (σ) (%) | Deviation Permittivity (εr) (%) | Limit (%) ±5 |
| 2023/8/29 | Head | 6000 | 5.64 | 34.20 | 5.48 | 35.07 | 2.88 | -2.48 | ±5 |
| 2023/8/29 | Head | 6050 | 5.70 | 34.09 | 5.54 | 35.01 | 2.83 | -2.63 | ±5 |
| 2023/8/29 | Head | 6100 | 5.76 | 33.97 | 5.59 | 34.95 | 3.08 | -2.80 | ±5 |
| 2023/8/29 | Head | 6150 | 5.83 | 33.88 | 5.65 | 34.89 | 3.13 | -2.89 | ±5 |
| 2023/8/29 | Head | 6200 | 5.89 | 33.78 | 5.71 | 34.83 | 3.15 | -3.01 | ±5 |
| 2023/8/29 | Head | 6250 | 5.95 | 33.68 | 5.77 | 34.77 | 3.08 | -3.13 | ±5 |
| 2023/8/29 | Head | 6300 | 6.01 | 33.57 | 5.83 | 34.70 | 3.10 | -3.26 | ±5 |
| 2023/8/29 | Head | 6350 | 6.08 | 33.51 | 5.89 | 34.64 | 3.16 | -3.26 | ±5 |
| 2023/8/29 | Head | 6400 | 6.13 | 33.40 | 5.95 | 34.58 | 2.94 | -3.41 | ±5 |
| 2023/8/29 | Head | 6450 | 6.19 | 33.30 | 6.01 | 34.52 | 2.98 | -3.53 | ±5 |
| 2023/8/29 | Head | 6500 | 6.25 | 33.22 | 6.07 | 34.46 | 2.93 | -3.60 | ±5 |
| 2023/8/29 | Head | 6550 | 6.32 | 33.13 | 6.13 | 34.40 | 3.02 | -3.69 | ±5 |
| 2023/8/29 | Head | 6600 | 6.37 | 33.04 | 6.19 | 34.34 | 2.88 | -3.79 | ±5 |
| 2023/8/29 | Head | 6650 | 6.43 | 32.92 | 6.25 | 34.29 | 2.83 | -4.00 | ±5 |
| 2023/8/29 | Head | 6700 | 6.50 | 32.83 | 6.30 | 34.23 | 3.11 | -4.09 | ±5 |
| 2023/8/29 | Head | 6750 | 6.55 | 32.75 | 6.36 | 34.17 | 3.02 | -4.16 | ±5 |
| 2023/8/29 | Head | 6800 | 6.61 | 32.63 | 6.42 | 34.11 | 2.94 | -4.34 | ±5 |
| 2023/8/29 | Head | 6850 | 6.67 | 32.55 | 6.48 | 34.05 | 2.98 | -4.41 | ±5 |
| 2023/8/29 | Head | 6900 | 6.73 | 32.47 | 6.53 | 33.99 | 3.06 | -4.47 | ±5 |
| 2023/8/29 | Head | 6950 | 6.79 | 32.39 | 6.59 | 33.94 | 3.00 | -4.57 | ±5 |
| 2023/8/29 | Head | 7000 | 6.84 | 32.29 | 6.65 | 33.88 | 2.83 | -4.69 | ±5 |

Note:

1)The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.

2)KDB 865664 was ensured to be applied for probe calibration frequencies greater than or equal to 50MHz of the EUT frequencies.

3)The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies. The SAR test plots may slightly differ from the table above since the DASY rounds to three significant digits.

4) According to FCC TCB workshop April, 2019 RF Exposure Procedures Update(Effective February 19,2019, FCC has permitted the use of single head-tissue simulating liquid specified in IEEE 62209-1- for all SAR tests.

# 5. SYSTEM CHECK

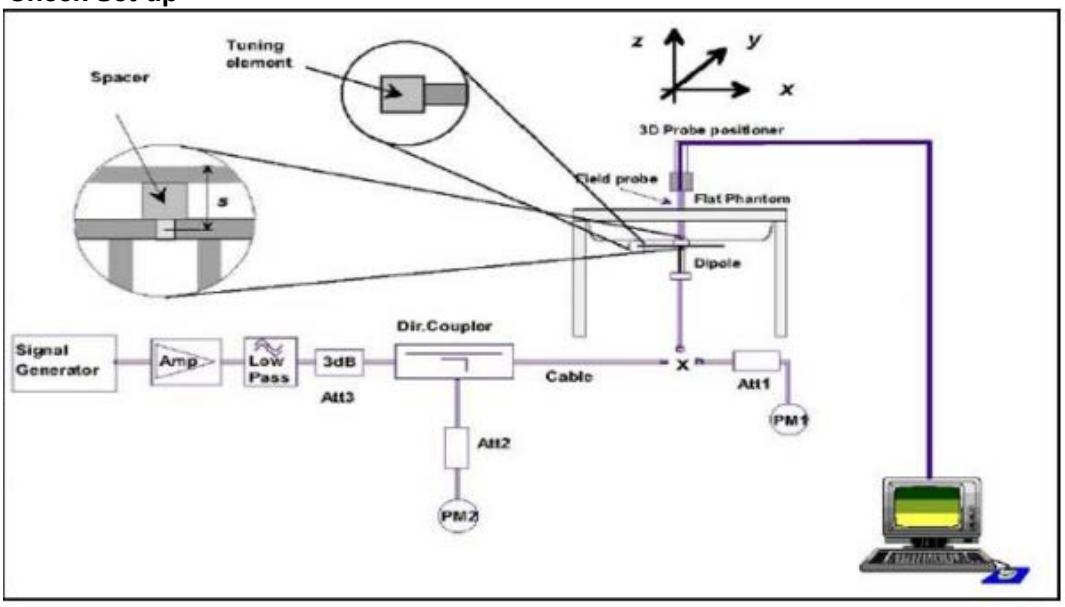
## 5.1. DESCRIPTION OF SYSTEM CHECK

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyzer. A system check measurement was made following the determination of the dielectric parameters of the simulant, using the dipole validation kit. A power level of 250 mW(below 3GHz) or 100mW(3-6GHz), which was placed under the flat section of the twin SAM phantom. The system check results (dielectric parameters and SAR values) are given in the 6.2.

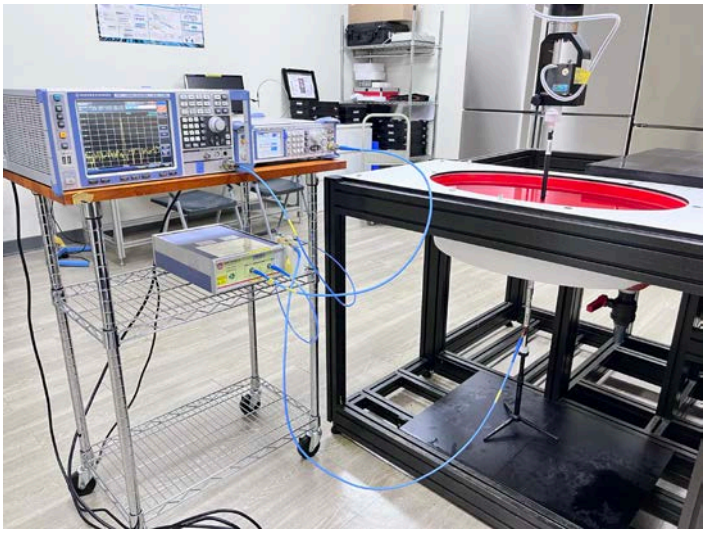
System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %).

System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.

**System Check Set-up**




**System Check photo**



## 5.2. DESCRIPTION OF SYSTEM CHECK

### System Check in Tissue Simulating Liquid

The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests.

| Date | System Dipole | | | Parameters | Target [W/kg] | Measured [W/kg] | Normalized to 1W [W/kg] | Deviation [%] | Limited [%] |
|---|---|---|---|---|---|---|---|---|---|
| | Type | Serial No. | Liquid | | | | | | |
| 2023/8/21 | D2450V2 | 973 | Head | 1g SAR | 52.5 | 12.10 | 48.4 | -7.81 | ± 10 |
| 2023/8/24 | D5GHzV2 (5.2GHz) | 1221 | Head | 1g SAR | 79.8 | 7.63 | 76.3 | -4.39 | ± 10 |
| 2023/8/24 | D5GHzV2 (5.3GHz) | 1221 | Head | 1g SAR | 81.9 | 8.04 | 80.4 | -1.83 | ± 10 |
| 2023/8/24 | D5GHzV2 (5.6GHz) | 1221 | Head | 1g SAR | 84.5 | 7.90 | 79.0 | -6.51 | ± 10 |
| 2023/8/24 | D5GHzV2 (5.8GHz) | 1221 | Head | 1g SAR | 81.7 | 7.92 | 79.2 | -3.06 | ± 10 |
| 2023/8/29 | D6.5GHzV2 (6.5GHz) | 1041 | Head | 1g SAR | 289.0 | 29.60 | 296.0 | 2.42 | ± 10 |

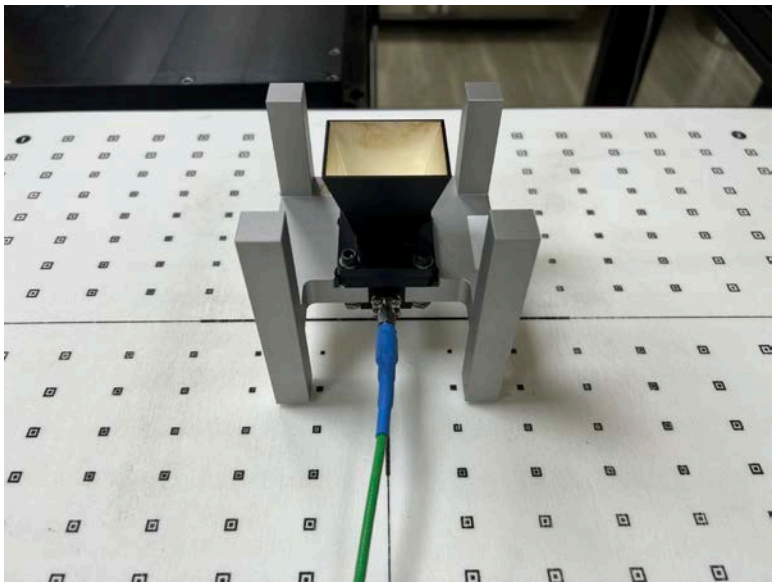
## 5.3. POWER DENSITY SYSTEM CHECK

System check provides a fast and reliable method to routinely verify that the measurementsystem is operational with no system component failures, including probe defects, drifts ordeviation from target performance requirements. A system check also verifies the repeatabilityof the measurement system before compliance testing.

The measurement of a verification source is started from 5G probe installed and the phantom taught.The verification source is placed on the 5G phantom.Due to the internal distance from thehorn to the outer surface of the verification source, the measurement distance set in the software should be offsetby -4.45 mm; e.g., for measurement of the verification source at 10 mm, the measurement distance set in thesoftware should be 5.55mm (10mm -4.45 mm).

The system check is a complete measurement using simple well-defined reference sources. According to the DASY6 specification in the user's manual and SPEAG's recommendation, the deviation threshold of ±0.66 dB represents the expanded standard uncertainty for system performance check.The system check is successful if the measured results are within±0.66 dB tolerancesto the target value shown in the calibration certificate of the verification source. The instrumentation and procedures usedfor system checkshould ensure the system is ready for performing compliance tests.

**Power Density System Check Photo**



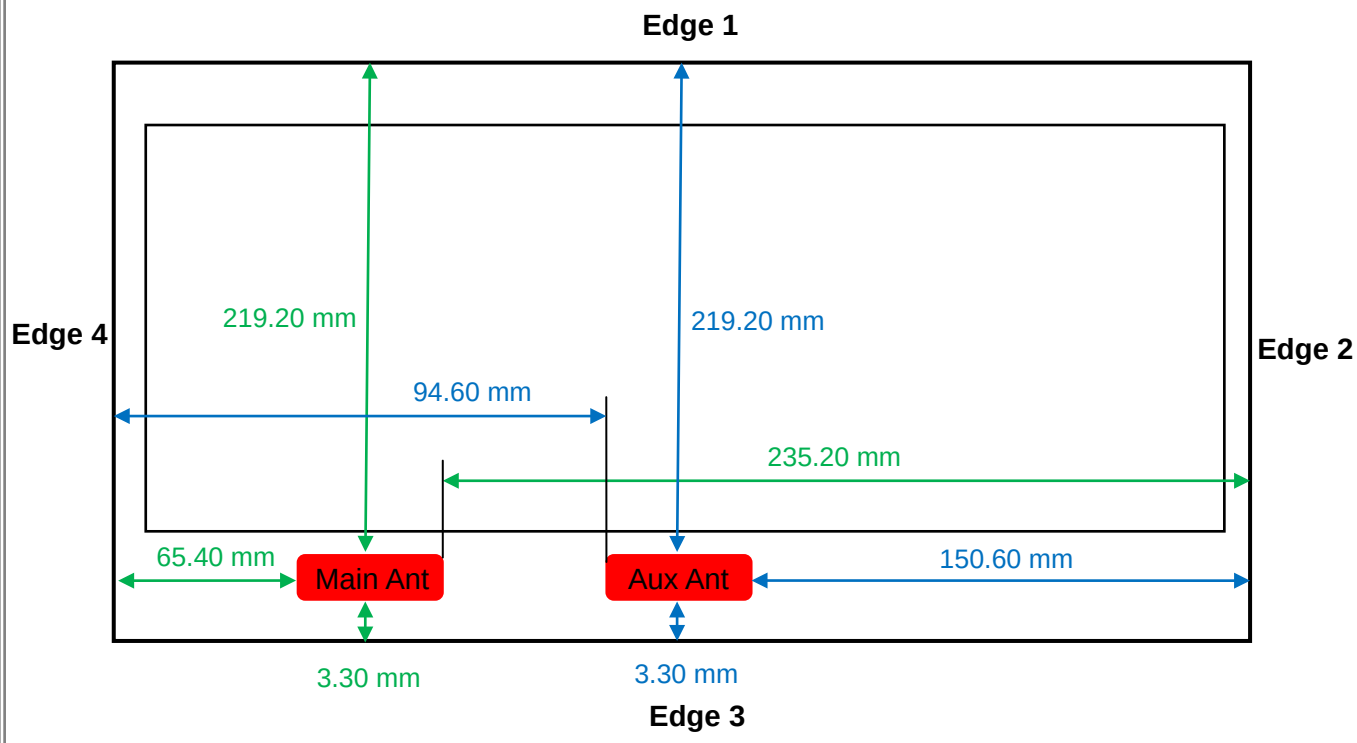
| Date | 5G Verification Souse | | | Parameters | Target [W/m^2] | Measured [W/m^2] | Deviation [dB] |
|---|---|---|---|---|---|---|---|
| | Type | Serial No. | Medium | | | | |
| 2023/9/5 | 10G | 2011 | Air | Avg Power Densuty 4cm^2 | 171.0 | 181.0 | 0.25 |
| 2023/10/25 | 10G | 2011 | Air | Avg Power Densuty 4cm^2 | 171.0 | 168.0 | -0.08 |

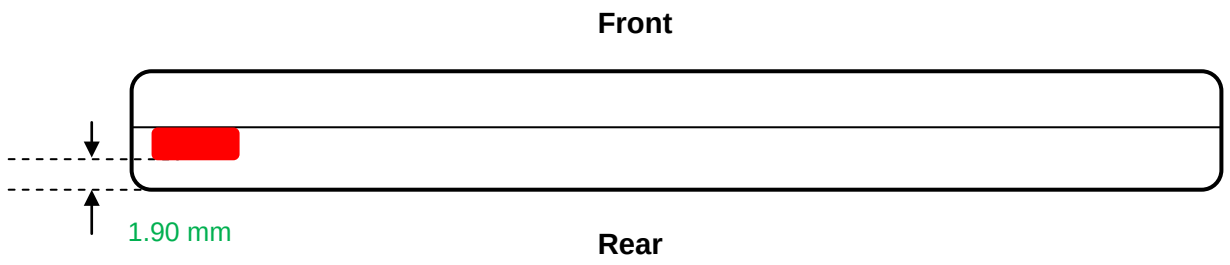
# 6. OPERATIONAL CONDITIONS DURING TEST

## 6.1. GENERAL DESCRIPTION OF TEST PROCEDURES

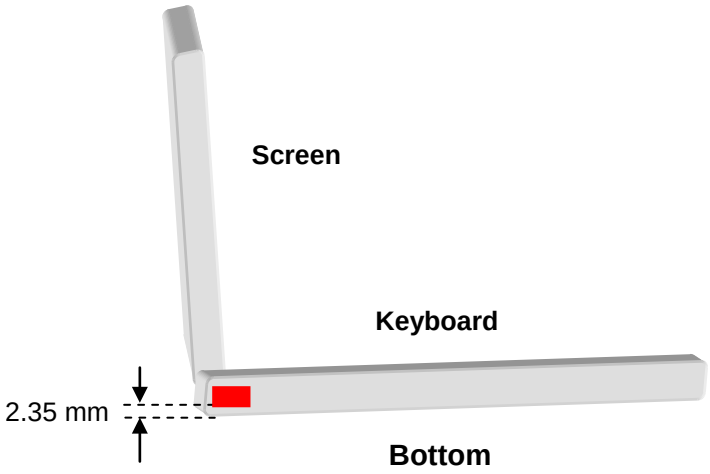
Connection to the EUT is established via air interface with base station An, and the EUT is Set to maximum output power by base station. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. The antenna connected to the output of the base station simulator shall be placed at least 50cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30dB.

## 6.2. TEST POSITION ANTENNA LOCATION



NB mode




## 6.3. TEST POSITION OF PORTABLE DEVICES

| Minimum Separation Distance | | | | |
|---|---|---|---|---|
| **Mode** | **Antenna** | **Position** | **Distance (mm)** | **Evaluation Test** |
| **WiFi** | Main | Edge1 | 219.20 | No |
| | | Edge2 | 235.20 | No |
| | | Edge3 | 3.30 | Yes |
| | | Edge4 | 65.40 | No |
| | | Rear | 1.90 | Yes |
| | | Bottom | 2.35 | Yes |
| | Aux | Edge1 | 219.20 | No |
| | | Edge2 | 150.60 | No |
| | | Edge3 | 3.30 | Yes |
| | | Edge4 | 94.60 | No |
| | | Rear | 1.90 | Yes |
| | | Bottom | 2.35 | Yes |

## 6.4. TEST POSITION

### 6.4.1. BODY TEST CONFIGURATION

The SAR Exclusion Threshold in KDB 447498 D04 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an EUT edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned adjacent the phantom and the edge containing the antenna positioned perpendicular to the phantom.

**SAR test reduction and exclusion guidance**

(1)The SAR exclusion threshold for is defined by the following equation:

$$P_{\text{th}}\ (\text{mW}) = \begin{cases} ERP_{20\ \text{cm}}(d/20\ \text{cm})^x & d \le 20\ \text{cm} \\ ERP_{20\ \text{cm}} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases} \qquad \text{(B.2)}$$

where

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

and $f$ is in GHz, $d$ is the separation distance (cm), and $ERP_{20\text{cm}}$ is per Formula (B.1).

Example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

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

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| Bluetooth | Aux | Edge1 | 219.20 | 2480 | 9.50 | 8.91 | 219 | No |
| Bluetooth | Aux | Edge2 | 150.60 | 2480 | 9.50 | 8.91 | 219 | No |
| Bluetooth | Aux | Edge3 | 3.30 | 2480 | 9.50 | 8.91 | 3 | Yes |
| Bluetooth | Aux | Edge4 | 94.60 | 2480 | 9.50 | 8.91 | 219 | No |
| Bluetooth | Aux | Rear | 1.90 | 2480 | 9.50 | 8.91 | 3 | Yes |
| Bluetooth | Aux | Bottom | 2.35 | 2480 | 9.50 | 8.91 | 3 | Yes |

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| 2.4GHz | Main | Edge1 | 219.20 | 2437 | 14.00 | 25.12 | 219 | No |
| 2.4GHz | Main | Edge2 | 235.20 | 2437 | 14.00 | 25.12 | 219 | No |
| 2.4GHz | Main | Edge3 | 3.30 | 2437 | 14.00 | 25.12 | 3 | Yes |
| 2.4GHz | Main | Edge4 | 65.40 | 2437 | 14.00 | 25.12 | 219 | No |
| 2.4GHz | Main | Rear | 1.90 | 2437 | 14.00 | 25.12 | 3 | Yes |
| 2.4GHz | Main | Bottom | 2.35 | 2437 | 19.00 | 79.43 | 3 | Yes |
| 2.4GHz | Aux | Edge1 | 219.20 | 2437 | 14.00 | 25.12 | 219 | No |
| 2.4GHz | Aux | Edge2 | 150.60 | 2437 | 14.00 | 25.12 | 219 | No |
| 2.4GHz | Aux | Edge3 | 3.30 | 2437 | 14.00 | 25.12 | 3 | Yes |
| 2.4GHz | Aux | Edge4 | 94.60 | 2437 | 14.00 | 25.12 | 219 | No |
| 2.4GHz | Aux | Rear | 1.90 | 2437 | 14.00 | 25.12 | 3 | Yes |
| 2.4GHz | Aux | Bottom | 2.35 | 2437 | 19.00 | 79.43 | 3 | Yes |

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| 5.2GHz | Main | Edge1 | 219.20 | 5210 | 11.50 | 14.13 | 169 | No |
| 5.2GHz | Main | Edge2 | 235.20 | 5210 | 11.50 | 14.13 | 169 | No |
| 5.2GHz | Main | Edge3 | 3.30 | 5210 | 11.50 | 14.13 | 1 | Yes |
| 5.2GHz | Main | Edge4 | 65.40 | 5210 | 11.50 | 14.13 | 169 | No |
| 5.2GHz | Main | Rear | 1.90 | 5210 | 11.50 | 14.13 | 1 | Yes |
| 5.2GHz | Main | Bottom | 2.35 | 5210 | 11.00 | 12.59 | 1 | Yes |
| 5.2GHz | Aux | Edge1 | 219.20 | 5210 | 11.50 | 14.13 | 169 | No |
| 5.2GHz | Aux | Edge2 | 150.60 | 5210 | 11.50 | 14.13 | 169 | No |
| 5.2GHz | Aux | Edge3 | 3.30 | 5210 | 11.50 | 14.13 | 1 | Yes |
| 5.2GHz | Aux | Edge4 | 94.60 | 5210 | 11.50 | 14.13 | 169 | No |
| 5.2GHz | Aux | Rear | 1.90 | 5210 | 11.50 | 14.13 | 1 | Yes |
| 5.2GHz | Aux | Bottom | 2.35 | 5210 | 11.00 | 12.59 | 1 | Yes |

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| 5.3GHz | Main | Edge1 | 219.20 | 5250 | 11.50 | 14.13 | 169 | No |
| 5.3GHz | Main | Edge2 | 235.20 | 5250 | 11.50 | 14.13 | 169 | No |
| 5.3GHz | Main | Edge3 | 3.30 | 5250 | 11.50 | 14.13 | 1 | Yes |
| 5.3GHz | Main | Edge4 | 65.40 | 5250 | 11.50 | 14.13 | 169 | No |
| 5.3GHz | Main | Rear | 1.90 | 5250 | 11.50 | 14.13 | 1 | Yes |
| 5.3GHz | Main | Bottom | 2.35 | 5250 | 11.00 | 12.59 | 1 | Yes |
| 5.3GHz | Aux | Edge1 | 219.20 | 5250 | 11.50 | 14.13 | 169 | No |
| 5.3GHz | Aux | Edge2 | 150.60 | 5250 | 11.50 | 14.13 | 169 | No |
| 5.3GHz | Aux | Edge3 | 3.30 | 5250 | 11.50 | 14.13 | 1 | Yes |
| 5.3GHz | Aux | Edge4 | 94.60 | 5250 | 11.50 | 14.13 | 169 | No |
| 5.3GHz | Aux | Rear | 1.90 | 5250 | 11.50 | 14.13 | 1 | Yes |
| 5.3GHz | Aux | Bottom | 2.35 | 5250 | 11.00 | 12.59 | 1 | Yes |

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| 5.6GHz | Main | Edge1 | 219.20 | 5570 | 11.50 | 14.13 | 169 | No |
| 5.6GHz | Main | Edge2 | 235.20 | 5570 | 11.50 | 14.13 | 169 | No |
| 5.6GHz | Main | Edge3 | 3.30 | 5570 | 11.50 | 14.13 | 1 | Yes |
| 5.6GHz | Main | Edge4 | 65.40 | 5570 | 11.50 | 14.13 | 169 | No |
| 5.6GHz | Main | Rear | 1.90 | 5570 | 11.50 | 14.13 | 1 | Yes |
| 5.6GHz | Main | Bottom | 2.35 | 5570 | 11.00 | 12.59 | 1 | Yes |
| 5.6GHz | Aux | Edge1 | 219.20 | 5570 | 11.50 | 14.13 | 169 | No |
| 5.6GHz | Aux | Edge2 | 150.60 | 5570 | 11.50 | 14.13 | 169 | No |
| 5.6GHz | Aux | Edge3 | 3.30 | 5570 | 11.50 | 14.13 | 1 | Yes |
| 5.6GHz | Aux | Edge4 | 94.60 | 5570 | 11.50 | 14.13 | 169 | No |
| 5.6GHz | Aux | Rear | 1.90 | 5570 | 11.50 | 14.13 | 1 | Yes |
| 5.6GHz | Aux | Bottom | 2.35 | 5570 | 11.00 | 12.59 | 1 | Yes |

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| 5.8GHz | Main | Edge1 | 219.20 | 5775 | 11.50 | 14.13 | 169 | No |
| 5.8GHz | Main | Edge2 | 235.20 | 5775 | 11.50 | 14.13 | 169 | No |
| 5.8GHz | Main | Edge3 | 3.30 | 5775 | 11.50 | 14.13 | 1 | Yes |
| 5.8GHz | Main | Edge4 | 65.40 | 5775 | 11.50 | 14.13 | 169 | No |
| 5.8GHz | Main | Rear | 1.90 | 5775 | 11.50 | 14.13 | 1 | Yes |
| 5.8GHz | Main | Bottom | 2.35 | 5775 | 11.00 | 12.59 | 1 | Yes |
| 5.8GHz | Aux | Edge1 | 219.20 | 5775 | 11.50 | 14.13 | 169 | No |
| 5.8GHz | Aux | Edge2 | 150.60 | 5775 | 11.50 | 14.13 | 169 | No |
| 5.8GHz | Aux | Edge3 | 3.30 | 5775 | 11.50 | 14.13 | 1 | Yes |
| 5.8GHz | Aux | Edge4 | 94.60 | 5775 | 11.50 | 14.13 | 169 | No |
| 5.8GHz | Aux | Rear | 1.90 | 5775 | 11.50 | 14.13 | 1 | Yes |
| 5.8GHz | Aux | Bottom | 2.35 | 5775 | 11.00 | 12.59 | 1 | Yes |

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| 5.9GHz | Main | Edge1 | 219.20 | 5815 | 11.50 | 14.13 | 169 | No |
| 5.9GHz | Main | Edge2 | 235.20 | 5815 | 11.50 | 14.13 | 169 | No |
| 5.9GHz | Main | Edge3 | 3.30 | 5815 | 11.50 | 14.13 | 1 | Yes |
| 5.9GHz | Main | Edge4 | 65.40 | 5815 | 11.50 | 14.13 | 169 | No |
| 5.9GHz | Main | Rear | 1.90 | 5815 | 11.50 | 14.13 | 1 | Yes |
| 5.9GHz | Main | Bottom | 2.35 | 5815 | 11.00 | 12.59 | 1 | Yes |
| 5.9GHz | Aux | Edge1 | 219.20 | 5815 | 11.50 | 14.13 | 169 | No |
| 5.9GHz | Aux | Edge2 | 150.60 | 5815 | 11.50 | 14.13 | 169 | No |
| 5.9GHz | Aux | Edge3 | 3.30 | 5815 | 11.50 | 14.13 | 1 | Yes |
| 5.9GHz | Aux | Edge4 | 94.60 | 5815 | 11.50 | 14.13 | 169 | No |
| 5.9GHz | Aux | Rear | 1.90 | 5815 | 11.50 | 14.13 | 1 | Yes |
| 5.9GHz | Aux | Bottom | 2.35 | 5815 | 11.00 | 12.59 | 1 | Yes |

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| 6.2GHz | Main | Edge1 | 219.20 | 6185 | 13.50 | 22.39 | 169 | No |
| 6.2GHz | Main | Edge2 | 235.20 | 6185 | 13.50 | 22.39 | 169 | No |
| 6.2GHz | Main | Edge3 | 3.30 | 6185 | 13.50 | 22.39 | 1 | Yes |
| 6.2GHz | Main | Edge4 | 65.40 | 6185 | 13.50 | 22.39 | 169 | No |
| 6.2GHz | Main | Rear | 1.90 | 6185 | 13.50 | 22.39 | 1 | Yes |
| 6.2GHz | Main | Bottom | 2.35 | 6185 | 13.50 | 22.39 | 1 | Yes |
| 6.2GHz | Aux | Edge1 | 219.20 | 6185 | 13.50 | 22.39 | 169 | No |
| 6.2GHz | Aux | Edge2 | 150.60 | 6185 | 13.50 | 22.39 | 169 | No |
| 6.2GHz | Aux | Edge3 | 3.30 | 6185 | 13.50 | 22.39 | 1 | Yes |
| 6.2GHz | Aux | Edge4 | 94.60 | 6185 | 13.50 | 22.39 | 169 | No |
| 6.2GHz | Aux | Rear | 1.90 | 6185 | 13.50 | 22.39 | 1 | Yes |
| 6.2GHz | Aux | Bottom | 2.35 | 6185 | 13.50 | 22.39 | 1 | Yes |

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| 6.5GHz | Main | Edge1 | 219.20 | 6505 | 13.50 | 22.39 | 169 | No |
| 6.5GHz | Main | Edge2 | 235.20 | 6505 | 13.50 | 22.39 | 169 | No |
| 6.5GHz | Main | Edge3 | 3.30 | 6505 | 13.50 | 22.39 | 1 | Yes |
| 6.5GHz | Main | Edge4 | 65.40 | 6505 | 13.50 | 22.39 | 169 | No |
| 6.5GHz | Main | Rear | 1.90 | 6505 | 13.50 | 22.39 | 1 | Yes |
| 6.5GHz | Main | Bottom | 2.35 | 6505 | 13.50 | 22.39 | 1 | Yes |
| 6.5GHz | Aux | Edge1 | 219.20 | 6505 | 13.50 | 22.39 | 169 | No |
| 6.5GHz | Aux | Edge2 | 150.60 | 6505 | 13.50 | 22.39 | 169 | No |
| 6.5GHz | Aux | Edge3 | 3.30 | 6505 | 13.50 | 22.39 | 1 | Yes |
| 6.5GHz | Aux | Edge4 | 94.60 | 6505 | 13.50 | 22.39 | 169 | No |
| 6.5GHz | Aux | Rear | 1.90 | 6505 | 13.50 | 22.39 | 1 | Yes |
| 6.5GHz | Aux | Bottom | 2.35 | 6505 | 13.50 | 22.39 | 1 | Yes |

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| 6.7GHz | Main | Edge1 | 219.20 | 6665 | 12.75 | 18.84 | 169 | No |
| 6.7GHz | Main | Edge2 | 235.20 | 6665 | 12.75 | 18.84 | 169 | No |
| 6.7GHz | Main | Edge3 | 3.30 | 6665 | 12.75 | 18.84 | 1 | Yes |
| 6.7GHz | Main | Edge4 | 65.40 | 6665 | 12.75 | 18.84 | 169 | No |
| 6.7GHz | Main | Rear | 1.90 | 6665 | 12.75 | 18.84 | 1 | Yes |
| 6.7GHz | Main | Bottom | 2.35 | 6665 | 12.75 | 18.84 | 1 | Yes |
| 6.7GHz | Aux | Edge1 | 219.20 | 6665 | 12.75 | 18.84 | 169 | No |
| 6.7GHz | Aux | Edge2 | 150.60 | 6665 | 12.75 | 18.84 | 169 | No |
| 6.7GHz | Aux | Edge3 | 3.30 | 6665 | 12.75 | 18.84 | 1 | Yes |
| 6.7GHz | Aux | Edge4 | 94.60 | 6665 | 12.75 | 18.84 | 169 | No |
| 6.7GHz | Aux | Rear | 1.90 | 6665 | 12.75 | 18.84 | 1 | Yes |
| 6.7GHz | Aux | Bottom | 2.35 | 6665 | 12.75 | 18.84 | 1 | Yes |

| Mode | Ant | Position | Distance (mm) | f (MHz) | Max Power(dBm) | Max Power(mW) | SAR Exclusion threshold(mW) | Test required |
|---|---|---|---|---|---|---|---|---|
| 7.0GHz | Main | Edge1 | 219.20 | 6985 | 12.75 | 18.84 | 169 | No |
| 7.0GHz | Main | Edge2 | 235.20 | 6985 | 12.75 | 18.84 | 169 | No |
| 7.0GHz | Main | Edge3 | 3.30 | 6985 | 12.75 | 18.84 | 1 | Yes |
| 7.0GHz | Main | Edge4 | 65.40 | 6985 | 12.75 | 18.84 | 169 | No |
| 7.0GHz | Main | Rear | 1.90 | 6985 | 12.75 | 18.84 | 1 | Yes |
| 7.0GHz | Main | Bottom | 2.35 | 6985 | 12.75 | 18.84 | 1 | Yes |
| 7.0GHz | Aux | Edge1 | 219.20 | 6985 | 12.75 | 18.84 | 169 | No |
| 7.0GHz | Aux | Edge2 | 150.60 | 6985 | 12.75 | 18.84 | 169 | No |
| 7.0GHz | Aux | Edge3 | 3.30 | 6985 | 12.75 | 18.84 | 1 | Yes |
| 7.0GHz | Aux | Edge4 | 94.60 | 6985 | 12.75 | 18.84 | 169 | No |
| 7.0GHz | Aux | Rear | 1.90 | 6985 | 12.75 | 18.84 | 1 | Yes |
| 7.0GHz | Aux | Bottom | 2.35 | 6985 | 12.75 | 18.84 | 1 | Yes |

# 7. SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

## 7.1. SAR MEASUREMENT VARIABILITY

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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.

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

The detailed repeated measurement results are shown in Section 9.

## 7.2. EUT CONFIGURATION AND SETTING

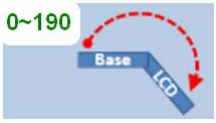
**Considerations Related to Operation of Gravity-sensor**
The device supports WLAN and Bluetooth capabilities. It is designed with a G-sensor which can trigger WLAN power reduction for SAR compliance. The power levels for all wireless technologies and the power reduction please refer to section 8 of this report and operational description by manufacturer.

**Gravity-Sensor**
In accordance with the guidance, it applied to laptops/tablets that use Hall Effect or gravity sensors to detect lid angle for the purpose of power reduction, the steps of verifying the power level and its power reduction when LCD

**Power table**

| Project mode | Power mode | Frequency band | Main Ant | Aux Ant |
|---|---|---|---|---|
| NB | Power Table 1 | 2.4GHz | 19 | 19 |
| | | 5GHz | 11 | 11 |
| TB | Power Table 2 | 2.4GHz | 14 | 14 |
| | | 5GHz | 11.5 | 11.5 |

**G-Sensor**

| DUT operating mode | | View Angle | Power Table | Virtual KeyPad | Power Button | Display Rotation | KeyBoard | Touchpad |
|---|---|---|---|---|---|---|---|---|
| Clamshell Mode |  | **0~190** degree | Power Table 1 | Disable | Enable | Enable | Enable | Enable |
| Tablet Mode | | **191~360** degree | Power Table 2 | Enable | Disable | Enable | Disable | Disable |

## 7.3. TEST CONFIGURATION

### 7.3.1. WIFI Test Configuration

For WLAN SAR testing, WLAN engineering testing software installed on the DUT can provide continuous transmitting RF signal.

**Wi-Fi 2.4GHz Band**

| Mode | 802.11b | 802.11g | 802.11n20 | 802.11n40 | 802.11ax20 | 802.11ax40 |
|---|---|---|---|---|---|---|
| Duty cycle | 100% | | | | | |
| Crest factor | 1 | | | | | |

**Wi-Fi 5GHz Band**

| Mode | 802.11a | 802.11n20 | 802.11n40 | 802.11 ac80 | 802.11 ac160 |
|---|---|---|---|---|---|
| | 802.11 ax20 | 802.11ax40 | 802.11 ax80 | 802.11ax160 | |
| Duty cycle | 100% | | | | |
| Crest factor | 1 | | | | |

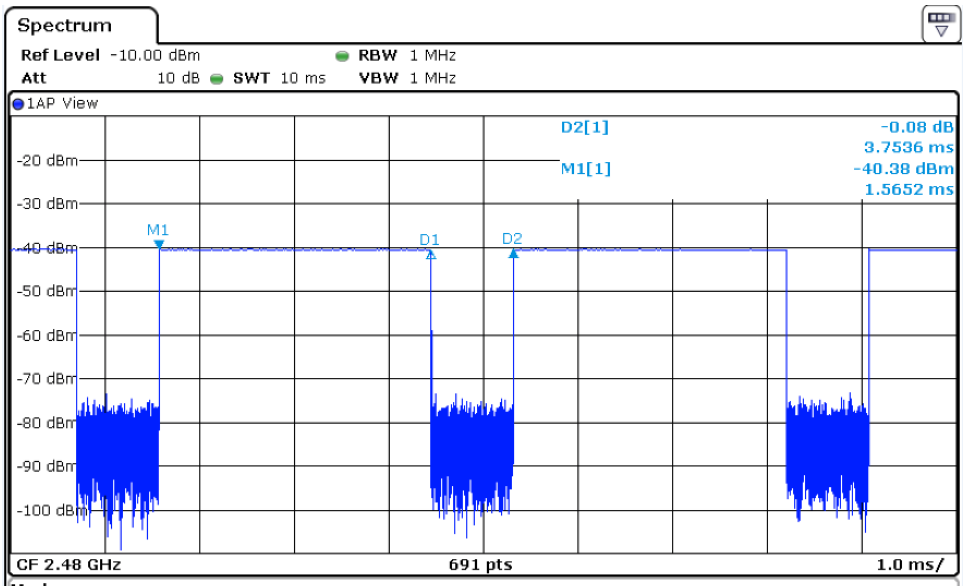
**Wi-Fi 6GHz Band**

| Mode | 802.11 ax20 | 802.11 ax40 | 802.11 ax80 | 802.11 ax160 |
|---|---|---|---|---|
| Duty cycle | 100% | | | |
| Crest factor | 1 | | | |

For WiFi SAR testing, a communication link is set up with the test mode software for WiFi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The RF signal utilized in SAR measurement has 100% duty cycle and its crest factor is 1. The test procedures in KDB 248227 D01 are applied.

**Bluetooth**

| Mode | Bluetooth DH5 | Bluetooth EDR | BLE 1M | BLE 2M |
|---|---|---|---|---|
| Duty cycle | 76.84% | 77.22% | 81.40% | 57.23% |
| Crest factor | 1.30 | 1.30 | 1.23 | 1.75 |




Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 1.5652 ms | -40.38 dBm | | |
| D1 | M1 | 1 | 2.8841 ms | -0.26 dB | | |
| D2 | M1 | 1 | 3.7536 ms | -0.08 dB | | |

## 7.3.2. WLAN 2.4G SAR Test Requirements

**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 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.

**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 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.

**SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. 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.

### 7.3.3. WLAN 5G SAR TEST REQUIREMENTS

**U-NII-1 and U-NII-2A Band**
For devices that operate in both U-NII-1 and U-NII-2A bands, 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, both bands are tested independently for SAR. 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, both bands are tested independently for SAR.

**U-NII-2C, U-NII-3 Bands**
The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification.
Unless band gap channels are permanently disabled, they must be considered for SAR testing.
To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels.11 When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

### 7.3.4. OFDM TRANSMISSION MODE AND SAR TEST CHANNEL SELECTION

For the 2.4GHz and 5GHz bands, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations(for example 802.11a,802.11n and 802.11ac,or 802.11g and 802.11n,with the same channel bandwidth, modulation, and data rate, etc.), the lower order 802.11 mode(i.e.802.11a then 802.11n and 802.11ac,or 802.11g then 802.11n) is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

### 7.3.5. INITIAL TEST CONFIGURATION PROCEDURE

For OFDM, in both 2.4G and 5GHz bands, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. If the average RF output powers of the highest identical transmission modes are within 0.25 dB of each other, mid channel of the transmission mode with highest average RF output powers is the initial test channel. Otherwise, the channel of the transmission mode with the highest average RF output power will be the initial test configuration. When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurement.

# 8. CONDUCTED POWER RESULTS

## 8.1. CONDUCTED POWER MEASUREMENTS OF BLUETOOTH

| Band | Mode | Channel | Frequency (MHz) | Max Power (dBm) | AVG Power (dBm) |
|---|---|---|---|---|---|
| DH5 | DH5 | 0 | 2402 | 9.50 | 9.48 |
| | | 39 | 2441 | 9.50 | 9.47 |
| | | 78 | 2480 | 9.50 | 9.49 |
| EDR | 2DH5 | 0 | 2402 | 5.50 | Not Require |
| | | 39 | 2441 | 5.50 | |
| | | 78 | 2480 | 5.50 | |
| | 3DH5 | 0 | 2402 | 5.50 | |
| | | 39 | 2441 | 5.50 | |
| | | 78 | 2480 | 5.50 | |
| BLE | 1M | 0 | 2402 | 5.50 | |
| | | 19 | 2440 | 5.50 | |
| | | 39 | 2480 | 5.50 | |
| | 2M | 0 | 2402 | 5.50 | |
| | | 19 | 2440 | 5.50 | |
| | | 39 | 2480 | 5.50 | |

## 8.2. CONDUCTED POWER MEASUREMENTS OF WI-FI 2.4GHZ BAND

### NB mode

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 2.4G | 802.11 b | 1 | 2412 | 1 | 19.00 | 18.93 | |
| | | 6 | 2437 | 1 | 19.00 | **18.97** | |
| | | 11 | 2462 | 1 | 19.00 | 18.93 | |
| | | 12 | 2467 | 1 | 14.00 | 13.79 | |
| | | 13 | 2472 | 1 | 12.50 | 12.47 | |
| | 802.11g | 1-13 | 2412-2472 | 6 | 19.00 | Not Required | |
| | 802.11n20 | 1-13 | 2412-2472 | HT0 | 19.00 | | |
| | 802.11n40 | 3-11 | 2422-2462 | HT0 | 17.00 | | |
| | 802.11ax20 | 1-13 | 2412-2472 | HE0 | 19.00 | | |
| | 802.11ax40 | 3-11 | 2422-2462 | HE0 | 17.00 | | |
| | 802.11b | 1 | 2412 | 1 | 19.00 | | 18.89 |
| | | 6 | 2437 | 1 | 19.00 | | **18.99** |
| | | 11 | 2462 | 1 | 19.00 | | 18.76 |
| | | 12 | 2467 | 1 | 14.00 | | 13.98 |
| | | 13 | 2472 | 1 | 12.50 | | 12.48 |
| | 802.11g | 1-13 | 2412-2472 | 6 | 19.00 | Not Required | |
| | 802.11n20 | 1-13 | 2412-2472 | HT0 | 19.00 | | |
| | 802.11n40 | 3-11 | 2422-2462 | HT0 | 17.00 | | |
| | 802.11ax20 | 1-13 | 2412-2472 | HE0 | 19.00 | | |
| | 802.11ax40 | 3-11 | 2422-2462 | HE0 | 17.00 | | |

### TB mode

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 2.4G | 802.11 b | 1 | 2412 | 1 | 14.00 | **13.92** | |
| | | 6 | 2437 | 1 | 14.00 | **13.96** | |
| | | 11 | 2462 | 1 | 14.00 | **13.90** | |
| | | 12 | 2467 | 1 | 14.00 | **13.88** | |
| | | 13 | 2472 | 1 | 12.50 | **12.45** | |
| | 802.11g | 1-13 | 2412-2472 | 6 | 14.00 | Not Required | |
| | 802.11n20 | 1-13 | 2412-2472 | HT0 | 14.00 | | |
| | 802.11n40 | 3-11 | 2422-2462 | HT0 | 14.00 | | |
| | 802.11ax20 | 1-13 | 2412-2472 | HE0 | 14.00 | | |
| | 802.11ax40 | 3-11 | 2422-2462 | HE0 | 14.00 | | |
| | 802.11b | 1 | 2412 | 1 | 14.00 | | **13.95** |
| | | 6 | 2437 | 1 | 14.00 | | **13.97** |
| | | 11 | 2462 | 1 | 14.00 | | **13.93** |
| | | 12 | 2467 | 1 | 14.00 | | **13.92** |
| | | 13 | 2472 | 1 | 12.50 | | **12.47** |
| | 802.11g | 1-13 | 2412-2472 | 6 | 14.00 | Not Required | |
| | 802.11n20 | 1-13 | 2412-2472 | HT0 | 14.00 | | |
| | 802.11n40 | 3-11 | 2422-2462 | HT0 | 14.00 | | |
| | 802.11ax20 | 1-13 | 2412-2472 | HE0 | 14.00 | | |
| | 802.11ax40 | 3-11 | 2422-2462 | HE0 | 14.00 | | |

Note:

1. As per FCC OET KDB 248227 D01, conducted output power and SAR testing are not required for 802.11g/n20 channels 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 ≤ 1.2W/kg.

## 8.3. CONDUCTED POWER MEASUREMENTS OF 5G UNII_1

**NB mode**

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 5.2G UNII_1 | 802.11a | 36-48 | 5180-5240 | 6 | 11.00 | Not Required | |
| | 802.11 n20 | 36-48 | 5180-5240 | HT0 | 11.00 | | |
| | 802.11 n40 | 38-46 | 5190-5230 | HT0 | 11.00 | | |
| | 802.11 ax20 | 36-48 | 5180-5240 | HE0 | 11.00 | | |
| | 802.11 ax40 | 38-46 | 5190-5230 | HE0 | 11.00 | | |
| | 802.11 ac80 | 42 | 5210 | VHT0 | 11.00 | | |
| | 802.11 ax80 | 42 | 5210 | HE0 | 11.00 | | |
| 5.2G UNII_1 | 802.11a | 36-48 | 5180-5240 | 6 | 11.00 | | |
| | 802.11 n20 | 36-48 | 5180-5240 | HT0 | 11.00 | | |
| | 802.11 n40 | 38-46 | 5190-5230 | HT0 | 11.00 | | |
| | 802.11 ax20 | 36-48 | 5180-5240 | HE0 | 11.00 | | |
| | 802.11 ax40 | 38-46 | 5190-5230 | HE0 | 11.00 | | |
| | 802.11 ac80 | 42 | 5210 | VHT0 | 11.00 | | |
| | 802.11 ax80 | 42 | 5210 | HE0 | 11.00 | | |

**TB mode**

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 5.2G UNII_1 | 802.11a | 36-48 | 5180-5240 | 6 | 11.50 | Not Required | |
| | 802.11 n20 | 36-48 | 5180-5240 | HT0 | 11.50 | | |
| | 802.11 n40 | 38-46 | 5190-5230 | HT0 | 11.50 | | |
| | 802.11 ax20 | 36-48 | 5180-5240 | HE0 | 11.50 | | |
| | 802.11 ax40 | 38-46 | 5190-5230 | HE0 | 11.50 | | |
| | 802.11 ac80 | 42 | 5210 | VHT0 | 11.50 | | |
| | 802.11 ax80 | 42 | 5210 | HE0 | 11.50 | | |
| 5.2G UNII_1 | 802.11a | 36-48 | 5180-5240 | 6 | 11.50 | | |
| | 802.11 n20 | 36-48 | 5180-5240 | HT0 | 11.50 | | |
| | 802.11 n40 | 38-46 | 5190-5230 | HT0 | 11.50 | | |
| | 802.11 ax20 | 36-48 | 5180-5240 | HE0 | 11.50 | | |
| | 802.11 ax40 | 38-46 | 5190-5230 | HE0 | 11.50 | | |
| | 802.11 ac80 | 42 | 5210 | VHT0 | 11.50 | | |
| | 802.11 ax80 | 42 | 5210 | HE0 | 11.50 | | |

Note:
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 (see §B.5.2 in this document).
2. 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 transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, lowest order 802.11 mode is selected (i.e. a, g, n, ac).

## 8.4. CONDUCTED POWER MEASUREMENTS OF 5G UNII_2A

### NB mode

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 5.3G UNII_2a | 802.11a | 52-64 | 5260-5320 | 6 | 11.00 | Not Required | |
| | 802.11 n20 | 52-64 | 5260-5320 | HT0 | 11.00 | | |
| | 802.11 n40 | 54-62 | 5270-5310 | HT0 | 11.00 | | |
| | 802.11 ac80 | 58 | 5290 | VHT0 | 11.00 | | |
| | 802.11 ac160 | 50 | 5250 | VHT0 | 11.00 | **10.96** | |
| | 802.11 ax20 | 52-64 | 5260-5320 | HE0 | 11.00 | Not Required | |
| | 802.11 ax40 | 54-62 | 5270-5310 | HE0 | 11.00 | | |
| | 802.11 ax80 | 58 | 5290 | HE0 | 11.00 | | |
| | 802.11 ax160 | 50 | 5250 | HE0 | 11.00 | | |
| 5.3G UNII_2a | 802.11a | 52-64 | 5260-5320 | 6 | 11.00 | Not Required | |
| | 802.11 n20 | 52-64 | 5260-5320 | HT0 | 11.00 | | |
| | 802.11 n40 | 54-62 | 5270-5310 | HT0 | 11.00 | | |
| | 802.11 ac80 | 58 | 5290 | VHT0 | 11.00 | | |
| | 802.11 ac160 | 50 | 5250 | VHT0 | 11.00 | | **10.94** |
| | 802.11 ax20 | 52-64 | 5260-5320 | HE0 | 11.00 | Not Required | |
| | 802.11 ax40 | 54-62 | 5270-5310 | HE0 | 11.00 | | |
| | 802.11 ax80 | 58 | 5290 | HE0 | 11.00 | | |
| | 802.11 ax160 | 50 | 5250 | HE0 | 11.00 | | |

### TB mode

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 5.3G UNII_2a | 802.11a | 52-64 | 5260-5320 | 6 | 11.50 | Not Required | |
| | 802.11 n20 | 52-64 | 5260-5320 | HT0 | 11.50 | | |
| | 802.11 n40 | 54-62 | 5270-5310 | HT0 | 11.50 | | |
| | 802.11 ac80 | 58 | 5290 | VHT0 | 11.50 | | |
| | 802.11 ac160 | 50 | 5250 | VHT0 | 11.50 | **11.45** | |
| | 802.11 ax20 | 52-64 | 5260-5320 | HE0 | 11.50 | Not Required | |
| | 802.11 ax40 | 54-62 | 5270-5310 | HE0 | 11.50 | | |
| | 802.11 ax80 | 58 | 5290 | HE0 | 11.50 | | |
| | 802.11 ax160 | 50 | 5250 | HE0 | 11.50 | | |
| 5.3G UNII_2a | 802.11a | 52-64 | 5260-5320 | 6 | 11.50 | Not Required | |
| | 802.11 n20 | 52-64 | 5260-5320 | HT0 | 11.50 | | |
| | 802.11 n40 | 54 | 5270-5310 | HT0 | 11.50 | | |
| | 802.11 ac80 | 58 | 5290 | VHT0 | 11.50 | | |
| | 802.11 ac160 | 50 | 5250 | VHT0 | 11.50 | | **11.48** |
| | 802.11 ax20 | 52-64 | 5260-5320 | HE0 | 11.50 | Not Required | |
| | 802.11 ax40 | 54-62 | 5270-5310 | HE0 | 11.50 | | |
| | 802.11 ax80 | 58 | 5290 | HE0 | 11.50 | | |
| | 802.11 ax160 | 50 | 5250 | HE0 | 11.50 | | |

Note:

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 (see §B.5.2 in this document).
2. 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 transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, lowest order 802.11 mode is selected (i.e. a, g, n, ac).
3. Largest channel bandwidth is worse than lowest order modulation.

## 8.5. CONDUCTED POWER MEASUREMENTS OF 5G UNII_2C

### NB mode

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 5.6G UNII_2c | 802.11a | 100-140 | 5500-5700 | 6 | 11.00 | Not Required | |
| | 802.11 n20 | 100-140 | 5500-5700 | HT0 | 11.00 | | |
| | 802.11 n40 | 102-134 | 5510-5670 | HT0 | 11.00 | | |
| | 802.11 ac80 | 106-138 | 5530-5690 | VHT0 | 11.00 | | |
| | 802.11 ac160 | 114 | 5570 | VHT0 | 11.00 | **10.95** | |
| | 802.11 ax20 | 100-140 | 5500-5700 | HE0 | 11.00 | Not Required | |
| | 802.11 ax40 | 102-134 | 5510-5670 | HE0 | 11.00 | | |
| | 802.11 ax80 | 106-138 | 5530-5690 | HE0 | 11.00 | | |
| | 802.11 ax160 | 114 | 5570 | HE0 | 11.00 | | |
| 5.6G UNII_2c | 802.11a | 100-140 | 5500-5700 | 6 | 11.00 | Not Required | |
| | 802.11 n20 | 100-140 | 5500-5700 | HT0 | 11.00 | | |
| | 802.11 n40 | 102-134 | 5510-5670 | HT0 | 11.00 | | |
| | 802.11 ac80 | 106-138 | 5530-5690 | VHT0 | 11.00 | | |
| | 802.11 ac160 | 114 | 5570 | VHT0 | 11.00 | | **10.97** |
| | 802.11 ax20 | 100-140 | 5500-5700 | HE0 | 11.00 | Not Required | |
| | 802.11 ax40 | 102-134 | 5510-5670 | HE0 | 11.00 | | |
| | 802.11 ax80 | 106-138 | 5530-5690 | HE0 | 11.00 | | |
| | 802.11 ax160 | 114 | 5570 | HE0 | 11.00 | | |

### TB mode

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 5.6G UNII_2c | 802.11a | 100-140 | 5500-5700 | 6 | 11.50 | Not Required | |
| | 802.11 n20 | 100-140 | 5500-5700 | HT0 | 11.50 | | |
| | 802.11 n40 | 102-134 | 5510-5670 | HT0 | 11.50 | | |
| | 802.11 ac80 | 106-138 | 5530-5690 | VHT0 | 11.50 | | |
| | 802.11 ac160 | 114 | 5570 | VHT0 | 11.50 | **11.43** | |
| | 802.11 ax20 | 100-140 | 5500-5700 | HE0 | 11.50 | Not Required | |
| | 802.11 ax40 | 102-134 | 5510-5670 | HE0 | 11.50 | | |
| | 802.11 ax80 | 106-138 | 5530-5690 | HE0 | 11.50 | | |
| | 802.11 ax160 | 114 | 5570 | HE0 | 11.50 | | |
| 5.6G UNII_2c | 802.11a | 100-140 | 5500-5700 | 6 | 11.50 | Not Required | |
| | 802.11 n20 | 100-140 | 5500-5700 | HT0 | 11.50 | | |
| | 802.11 n40 | 102-134 | 5510-5670 | HT0 | 11.50 | | |
| | 802.11 ac80 | 106-138 | 5530-5690 | VHT0 | 11.50 | | |
| | 802.11 ac160 | 114 | 5570 | VHT0 | 11.50 | | **11.42** |
| | 802.11 ax20 | 100-140 | 5500-5700 | HE0 | 11.50 | Not Required | |
| | 802.11 ax40 | 102-134 | 5510-5670 | HE0 | 11.50 | | |
| | 802.11 ax80 | 106-138 | 5530-5690 | HE0 | 11.50 | | |
| | 802.11 ax160 | 114 | 5570 | HE0 | 11.50 | | |

Note:
1. 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 transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, lowest order 802.11 mode is selected (i.e. a, g, n, ac).
2. Largest channel bandwidth is worse than lowest order modulation.

## 8.6. CONDUCTED POWER MEASUREMENTS OF 5G UNII_3

### NB mode

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 5.8G UNII_3 | 802.11a | 149-165 | 5745-5825 | 6 | 11.00 | Not Required | |
| | 802.11 n20 | 149-165 | 5745-5825 | HT0 | 11.00 | | |
| | 802.11 n40 | 151-159 | 5755-5795 | HT0 | 11.00 | | |
| | 802.11 ac80 | 155 | 5775 | VHT0 | 11.00 | **10.93** | |
| | 802.11 ax20 | 149-165 | 5745-5825 | HE0 | 11.00 | Not Required | |
| | 802.11 ax40 | 151-159 | 5755-5795 | HE0 | 11.00 | | |
| | 802.11 ax80 | 155 | 5775 | HE0 | 11.00 | | |
| 5.8G UNII_3 | 802.11a | 149-165 | 5745-5825 | 6 | 11.00 | | |
| | 802.11 n20 | 149-165 | 5745-5825 | HT0 | 11.00 | | |
| | 802.11 n40 | 151-159 | 5755-5795 | HT0 | 11.00 | | |
| | 802.11 ac80 | 155 | 5775 | VHT0 | 11.00 | | **10.95** |
| | 802.11 ax20 | 149-165 | 5745-5825 | HE0 | 11.00 | Not Required | |
| | 802.11 ax40 | 151-159 | 5755-5795 | HE0 | 11.00 | | |
| | 802.11 ax80 | 155 | 5775 | HE0 | 11.00 | | |

### TB mode

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 5.8G UNII_3 | 802.11a | 149-165 | 5745-5825 | 6 | 11.50 | Not Required | |
| | 802.11 n20 | 149-165 | 5745-5825 | HT0 | 11.50 | | |
| | 802.11 n40 | 151-159 | 5755-5795 | HT0 | 11.50 | | |
| | 802.11 ac80 | 155 | 5775 | VHT0 | 11.50 | **11.42** | |
| | 802.11 ax20 | 149-165 | 5745-5825 | HE0 | 11.50 | Not Required | |
| | 802.11 ax40 | 151-159 | 5755-5795 | HE0 | 11.50 | | |
| | 802.11 ax80 | 155 | 5775 | HE0 | 11.50 | | |
| 5.8G UNII_3 | 802.11a | 149-165 | 5745-5825 | 6 | 11.50 | | |
| | 802.11 n20 | 149-165 | 5745-5825 | HT0 | 11.50 | | |
| | 802.11 n40 | 151-159 | 5755-5795 | HT0 | 11.50 | | |
| | 802.11 ac80 | 155 | 5775 | VHT0 | 11.50 | | **11.45** |
| | 802.11 ax20 | 149-165 | 5745-5825 | HE0 | 11.50 | Not Required | |
| | 802.11 ax40 | 151-159 | 5755-5795 | HE0 | 11.50 | | |
| | 802.11 ax80 | 155 | 5775 | HE0 | 11.50 | | |

Note:
1. 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 transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, lowest order 802.11 mode is selected (i.e. a, g, n, ac).
2. Largest channel bandwidth is worse than lowest order modulation.

## 8.7. CONDUCTED POWER MEASUREMENTS OF 5G UNII_4

### NB mode

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 5.9G UNII_4 | 802.11a | 169-177 | 5845-5885 | 6 | 11.00 | Not Required | |
| | 802.11 n20 | 169-177 | 5845-5885 | HT0 | 11.00 | | |
| | 802.11 n40 | 167-175 | 5835-5875 | HT0 | 11.00 | | |
| | 802.11 ac80 | 171 | 5855 | VHT0 | 11.00 | | |
| | 802.11 ac160 | 163 | 5815 | VHT0 | 11.00 | **10.92** | |
| | 802.11 ax20 | 169-177 | 5845-5885 | HE0 | 11.00 | Not Required | |
| | 802.11 ax40 | 167-175 | 5835-5875 | HE0 | 11.00 | | |
| | 802.11 ax80 | 171 | 5855 | HE0 | 11.00 | | |
| | 802.11 ax160 | 163 | 5815 | HE0 | 11.00 | | |
| 5.9G UNII_4 | 802.11a | 169-177 | 5845-5885 | 6 | 11.00 | Not Required | |
| | 802.11 n20 | 169-177 | 5845-5885 | HT0 | 11.00 | | |
| | 802.11 n40 | 167-175 | 5835-5875 | HT0 | 11.00 | | |
| | 802.11 ac80 | 171 | 5855 | VHT0 | 11.00 | | |
| | 802.11 ac160 | 163 | 5815 | VHT0 | 11.00 | | **10.96** |
| | 802.11 ax20 | 169-177 | 5845-5885 | HE0 | 11.00 | Not Required | |
| | 802.11 ax40 | 167-175 | 5835-5875 | HE0 | 11.00 | | |
| | 802.11 ax80 | 171 | 5855 | HE0 | 11.00 | | |
| | 802.11 ax160 | 163 | 5815 | HE0 | 11.00 | | |

### TB mode

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 5.9G UNII_4 | 802.11a | 169-177 | 5845-5885 | 6 | 11.50 | Not Required | |
| | 802.11 n20 | 169-177 | 5845-5885 | HT0 | 11.50 | | |
| | 802.11 n40 | 167-175 | 5835-5875 | HT0 | 11.50 | | |
| | 802.11 ac80 | 171 | 5855 | VHT0 | 11.50 | | |
| | 802.11 ac160 | 163 | 5815 | VHT0 | 11.50 | **11.43** | |
| | 802.11 ax20 | 169-177 | 5845-5885 | HE0 | 11.50 | Not Required | |
| | 802.11 ax40 | 167-175 | 5835-5875 | HE0 | 11.50 | | |
| | 802.11 ax80 | 171 | 5855 | HE0 | 11.50 | | |
| | 802.11 ax160 | 163 | 5815 | HE0 | 11.50 | | |
| 5.9G UNII_4 | 802.11a | 169-177 | 5845-5885 | 6 | 11.50 | Not Required | |
| | 802.11 n20 | 169-177 | 5845-5885 | HT0 | 11.50 | | |
| | 802.11 n40 | 167-175 | 5835-5875 | HT0 | 11.50 | | |
| | 802.11 ac80 | 171 | 5855 | VHT0 | 11.50 | | |
| | 802.11 ac160 | 163 | 5815 | VHT0 | 11.50 | | **11.41** |
| | 802.11 ax20 | 169-177 | 5845-5885 | HE0 | 11.50 | Not Required | |
| | 802.11 ax40 | 167-175 | 5835-5875 | HE0 | 11.50 | | |
| | 802.11 ax80 | 171 | 5855 | HE0 | 11.50 | | |
| | 802.11 ax160 | 163 | 5815 | HE0 | 11.50 | | |

Note:
1. 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 transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, lowest order 802.11 mode is selected (i.e. a, g, n, ac).
2. Largest channel bandwidth is worse than lowest order modulation.

## 8.8. CONDUCTED POWER MEASUREMENTS OF 6E UNII_5

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 6.2G UNII_5 | 802.11 ax20 | 1-93 | 5955-6415 | HE0 | 5.00 | Not Required | |
| | 802.11 ax40 | 3-91 | 5965-6405 | HE0 | 8.25 | | |
| | 802.11 ax80 | 7-87 | 5985-6385 | HE0 | 10.75 | | |
| | 802.11 ax160 | 15 | 6025 | HE0 | 13.50 | **13.45** | |
| | 802.11 ax160 | 47 | 6185 | HE0 | 13.50 | **13.48** | |
| | 802.11 ax160 | 79 | 6345 | HE0 | 13.50 | **13.46** | |
| | 802.11 ax20 | 1-93 | 5955-6415 | HE0 | 5.00 | Not Required | |
| | 802.11 ax40 | 3-91 | 5965-6405 | HE0 | 8.25 | | |
| | 802.11 ax80 | 7-87 | 5985-6385 | HE0 | 10.75 | | |
| | 802.11 ax160 | 15 | 6025 | HE0 | 13.50 | | **13.43** |
| | 802.11 ax160 | 47 | 6185 | HE0 | 13.50 | | **13.46** |
| | 802.11 ax160 | 79 | 6345 | HE0 | 13.50 | | **13.41** |

## 8.9. CONDUCTED POWER MEASUREMENTS OF 6E UNII_6

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 6.5G UNII 6 | 802.11 ax20 | 97-117 | 6435-6535 | HE0 | 5.00 | Not Required | |
| | 802.11 ax40 | 99-115 | 6445-6525 | HE0 | 8.00 | | |
| | 802.11 ax80 | 103-119 | 6465-6545 | HE0 | 10.75 | | |
| | 802.11 ax160 | 111 | 6505 | HE0 | 13.50 | **13.43** | |
| | 802.11 ax20 | 97-117 | 6435-6535 | HE0 | 5.00 | Not Required | |
| | 802.11 ax40 | 99-115 | 6445-6525 | HE0 | 8.00 | | |
| | 802.11 ax80 | 103-119 | 6465-6545 | HE0 | 10.75 | | |
| | 802.11 ax160 | 111 | 6505 | HE0 | 13.50 | | **13.45** |

## 8.10. CONDUCTED POWER MEASUREMENTS OF 6E UNII_7

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 6.7G UNII 7 | 802.11 ax20 | 121-185 | 6555-6875 | HE0 | 4.25 | Not Required | |
| | 802.11 ax40 | 123-187 | 6565-6885 | HE0 | 7.50 | | |
| | 802.11 ax80 | 135-183 | 6625-6865 | HE0 | 10.00 | | |
| | 802.11 ax160 | 143 | 6665 | HE0 | 12.75 | **12.70** | |
| | 802.11 ax160 | 175 | 6825 | HE0 | 12.75 | **12.66** | |
| | 802.11 ax20 | 121-185 | 6555-6875 | HE0 | 4.25 | Not Required | |
| | 802.11 ax40 | 123-187 | 6565-6885 | HE0 | 7.50 | | |
| | 802.11 ax80 | 135-183 | 6625-6865 | HE0 | 10.00 | | |
| | 802.11 ax160 | 143 | 6665 | HE0 | 12.75 | | **12.73** |
| | 802.11 ax160 | 175 | 6825 | HE0 | 12.75 | | **12.68** |

## 8.11. CONDUCTED POWER MEASUREMENTS OF 6E UNII_8

| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max Tune-Up Power (dBm) | AVG Power (dBm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Aux |
| 7.0G UNII 8 | 802.11 ax20 | 189-233 | 6895-7115 | HE0 | 4.25 | Not Required | |
| | 802.11 ax40 | 195-227 | 6925-7085 | HE0 | 7.50 | | |
| | 802.11 ax80 | 199-215 | 6945-7025 | HE0 | 10.00 | | |
| | 802.11 ax160 | 207 | 6985 | HE0 | 12.75 | **12.67** | |
| | 802.11 ax20 | 189-233 | 6895-7115 | HE0 | 4.25 | Not Required | |
| | 802.11 ax40 | 195-227 | 6925-7085 | HE0 | 7.50 | | |
| | 802.11 ax80 | 199-215 | 6945-7025 | HE0 | 10.00 | | |
| | 802.11 ax160 | 207 | 6985 | HE0 | 12.75 | | **12.71** |

## 8.12. SAR TEST RESULTS

**General Notes:**

1. Per KDB447498 D04, all measurement SAR results are scaled to the maximum tune-up tolerance limit to demonstrate compliant.
2. Per KDB447498 D04, 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. 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.
3. Per KDB865664 D01,for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg; if the deviation among the repeated measurement is ≤20%,and the measured SAR <1.45W/kg, only one repeated measurement is required.

**WLAN Notes:**

1. For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated(peak) SAR is used as the initial test position. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 for 2.4GHz WIFI single transmission chain operations, the highest measured maximum output power Channel for DSSS was selected for SAR measurement. SAR for OFDM modes(2.4GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section7.1.4 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 for 5GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed power. Other transmission mode was not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than1.2W/kg. See Section 7.1.4 for more information.

**WLAN PD Note:**

1. The manufacturer has confirmed that the devices tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
2. Absorbed power density (APD) using a 4cm2 averaging area is reported based on SAR measurements.
3. Power density was calculated by repeated E-field measurements on two measurement planes separated by λ/4.
4. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools.
5. Per FCC guidance and equipment manufacturer guidance, power density results were scaled according to IEC 62479:2010 for the portion of the measurement uncertainty > 30%. Total expanded uncertainty of 2.68 dB (85.4%) was used to determine the psPD measurement scaling factor.
6. The measurement procedure consists of measuring the PDinc at two different distances: 2 mm (compliance distance) and λ/5. The grid extents should be large enough to fully capture the transmitted energy. The grid step should be fine enough to demonstrate that the integrated Power Density iPDn fulfill the criterion described below. Since iPD ratio between the two distances is ≥ -1dB, the grid step (0.0625) was sufficient for determining compliance at d=2mm.

$$10 \cdot log_{10} \frac{iPD_n(2mm)}{iPD_n(\lambda/5)} \geq -1$$

# 9. SAR TEST RESULTS

## 9.1. BODY SAR TEST RESULTS

### SAR test results of Bluetooth

SAR test results of Bluetooth separation distance=0 mm

| Mode | Channel | Test Position | Ant | Ant Vendor | Max Tune-up (dBm) | AVG Power (dBm) | SAR 1g | Duty Cycel % | Duty Factor | Reported SAR 1g | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bluetooth_DH5 | 78 | Bottom | Aux | Pulse | 9.50 | 9.49 | 0.078 | 76.84% | 1.30 | 0.102 | |
| | 78 | Rear | Aux | Pulse | 9.50 | 9.49 | 0.125 | 76.84% | 1.30 | 0.163 | |
| | 78 | Edge 3 | Aux | Pulse | 9.50 | 9.49 | 0.329 | 76.84% | 1.30 | **0.429** | |
| | 0 | Edge 3 | Aux | Pulse | 9.50 | 9.48 | 0.302 | 76.84% | 1.30 | 0.395 | |
| | 39 | Edge 3 | Aux | Pulse | 9.50 | 9.47 | 0.305 | 76.84% | 1.30 | 0.400 | |
| | 78 | Edge 3 | Aux | CHILISIN | 9.50 | 9.49 | 0.318 | 76.84% | 1.30 | 0.415 | 1 |

Note:
1. The result used an other antenna to spot check for worst channel of the original antenna that the SAR result can be meet and compliant.

### SAR test results of 2.4G WiFi

SAR test results of 2.4G WiFi separation distance=0 mm

| Mode | Channel | Test Position | Ant | Ant Vendor | Max Tune-up (dBm) | AVG Power (dBm) | SAR 1g | Reported SAR 1g | Note |
|---|---|---|---|---|---|---|---|---|---|
| 802.11b | 6 | Bottom | Main | Pulse | 19.00 | 18.97 | 0.718 | 0.723 | |
| | 6 | Rear | Main | Pulse | 14.00 | 13.96 | 0.508 | 0.513 | |
| | 6 | Edge 3 | Main | Pulse | 14.00 | 13.96 | 1.010 | 1.019 | |
| | 1 | Edge 3 | Main | Pulse | 14.00 | 13.92 | 0.888 | 0.905 | 1 |
| | 11 | Edge 3 | Main | Pulse | 14.00 | 13.90 | 1.020 | 1.044 | 1 |
| | 12 | Edge 3 | Main | Pulse | 14.00 | 13.88 | 1.020 | **1.049** | 1 |
| | 13 | Edge 3 | Main | Pulse | 12.50 | 12.45 | 0.758 | 0.767 | 1 |
| 802.11b | 6 | Bottom | Aux | Pulse | 19.00 | 18.99 | 0.512 | 0.513 | |
| | 6 | Rear | Aux | Pulse | 14.00 | 13.97 | 0.425 | 0.428 | |
| | 6 | Edge 3 | Aux | Pulse | 14.00 | 13.97 | 1.020 | 1.027 | |
| | 1 | Edge 3 | Aux | Pulse | 14.00 | 13.95 | 1.040 | 1.052 | 1 |
| | 11 | Edge 3 | Aux | Pulse | 14.00 | 13.93 | 1.040 | 1.057 | 1 |
| | 12 | Edge 3 | Aux | Pulse | 14.00 | 13.92 | 1.050 | **1.070** | 1 |
| | 13 | Edge 3 | Aux | Pulse | 12.50 | 12.47 | 0.740 | 0.745 | 1 |
| | 12 | Edge 3 | Aux | Pulse | 14.00 | 13.92 | 0.988 | 1.006 | 2 |
| | 12 | Edge 3 | Aux | CHILISIN | 14.00 | 13.92 | 0.962 | 0.980 | 3 |

Note:
1. Highest reported SAR is > 0.8 W/kg. Added second highest power channel for this test position
2. Repeated measurements are required only when the measured SAR is ≥0.80 W/kg. If the measured SAR values are < 1.45 W/kg with ≤20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. (Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04)
   Original SAR = 1.05 W/kg, therefore second times repeat SAR is required.
   Repeat SAR = 0.988 W/kg < 1.45W/kg
   SAR variation= -5.90% < 20%
3. The result used an other antenna to spot check for worst channel of the original antenna that the SAR result can be meet and compliant.

## SAR test results of 5G WiFi

SAR test results of 5G WiFi separation distance=0 mm

| Band | Mode | Channel | Test Position | Ant | Ant Vendor | Max Tune-up (dBm) | AVG Power (dBm) | SAR 1g | Reported SAR 1g | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| 5G UNII 1&2a | 802.11 ac160 | 50 | Bottom | Main | Pulse | 11.00 | 10.96 | 0.601 | **0.607** | |
| | | 50 | Rear | Main | Pulse | 11.50 | 11.45 | 0.204 | 0.206 | |
| | | 50 | Edge 3 | Main | Pulse | 11.50 | 11.45 | 0.312 | 0.316 | |
| | 802.11 ac160 | 50 | Bottom | Aux | Pulse | 11.00 | 10.94 | 0.607 | **0.615** | |
| | | 50 | Rear | Aux | Pulse | 11.50 | 11.48 | 0.157 | 0.158 | |
| | | 50 | Edge 3 | Aux | Pulse | 11.50 | 11.48 | 0.284 | 0.285 | |
| 5G UNII 2C | 802.11 ac160 | 114 | Bottom | Main | Pulse | 11.00 | 10.95 | 0.573 | **0.580** | |
| | | 114 | Rear | Main | Pulse | 11.50 | 11.43 | 0.413 | 0.420 | |
| | | 114 | Edge 3 | Main | Pulse | 11.50 | 11.43 | 0.536 | 0.545 | |
| | 802.11 ac160 | 114 | Bottom | Aux | Pulse | 11.00 | 10.97 | 0.502 | 0.505 | |
| | | 114 | Rear | Aux | Pulse | 11.50 | 11.42 | 0.210 | 0.214 | |
| | | 114 | Edge 3 | Aux | Pulse | 11.50 | 11.42 | 0.609 | **0.620** | |
| 5G UNII 3 | 802.11 ac80 | 155 | Bottom | Main | Pulse | 11.00 | 10.93 | 0.513 | 0.521 | |
| | | 155 | Rear | Main | Pulse | 11.50 | 11.42 | 0.463 | 0.468 | |
| | | 155 | Edge 3 | Main | Pulse | 11.50 | 11.42 | 0.662 | **0.669** | |
| | 802.11 ac80 | 155 | Bottom | Aux | Pulse | 11.00 | 10.95 | 0.468 | 0.473 | |
| | | 155 | Rear | Aux | Pulse | 11.50 | 11.45 | 0.261 | 0.264 | |
| | | 155 | Edge 3 | Aux | Pulse | 11.50 | 11.45 | 0.641 | **0.648** | |
| 5G UNII 4 | 802.11 ac160 | 163 | Bottom | Main | Pulse | 11.00 | 10.92 | 0.549 | 0.559 | |
| | | 163 | Rear | Main | Pulse | 11.50 | 11.43 | 0.475 | 0.483 | |
| | | 163 | Edge 3 | Main | Pulse | 11.50 | 11.43 | 0.625 | **0.635** | |
| | 802.11 ac160 | 163 | Bottom | Aux | Pulse | 11.00 | 10.96 | 0.406 | 0.410 | |
| | | 163 | Rear | Aux | Pulse | 11.50 | 11.41 | 0.215 | 0.220 | |
| | | 163 | Edge 3 | Aux | Pulse | 11.50 | 11.41 | 0.584 | **0.596** | |
| 5G UNII 3 | 802.11 ac80 | 155 | Edge 3 | Main | CHILISIN | 11.50 | 11.42 | 0.637 | 0.643 | 1 |

Note:

1. The result used an other antenna to spot check for worst channel of the original antenna that the SAR result can be meet and compliant.

## SAR test results of 6E WiFi

SAR test results of 6E WiFi separation distance=0 mm

| Band | Mode | Channel | Test Position | Ant | Ant Vendor | Max une-up (dBm) | AVG Power (dBm) | SAR 1g | Reported SAR 1g | 4cm^2 APD (W/m^2) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6E UNII 5 | 802.11 ax160 | 47 | Bottom | Main | Pulse | 13.50 | 13.48 | 0.437 | 0.439 | 2.71 | |
| | | 15 | Bottom | Main | Pulse | 13.50 | 13.45 | 0.502 | **0.508** | **3.06** | |
| | | 79 | Bottom | Main | Pulse | 13.50 | 13.46 | 0.413 | 0.417 | 2.60 | |
| | | 47 | Rear | Main | Pulse | 13.50 | 13.48 | 0.126 | 0.127 | 0.547 | |
| | | 47 | Edge 3 | Main | Pulse | 13.50 | 13.48 | 0.226 | 0.227 | 1.27 | |
| | 802.11 ax160 | 47 | Bottom | Aux | Pulse | 13.50 | 13.46 | 0.503 | 0.508 | 2.88 | |
| | | 15 | Bottom | Aux | Pulse | 13.50 | 13.43 | 0.530 | **0.539** | **3.06** | |
| | | 79 | Bottom | Aux | Pulse | 13.50 | 13.41 | 0.509 | 0.520 | 2.97 | |
| | | 47 | Rear | Aux | Pulse | 13.50 | 13.46 | 0.024 | 0.024 | 0.142 | |
| | | 47 | Edge 3 | Aux | Pulse | 13.50 | 13.46 | 0.293 | 0.296 | 1.30 | |
| 6E UNII 6 | 802.11 ax160 | 111 | Bottom | Main | Pulse | 13.50 | 13.43 | 0.408 | **0.415** | **2.64** | |
| | | 111 | Rear | Main | Pulse | 13.50 | 13.43 | 0.086 | 0.087 | 0.383 | |
| | | 111 | Edge 3 | Main | Pulse | 13.50 | 13.43 | 0.288 | 0.293 | 1.59 | |
| | 802.11 ax160 | 111 | Bottom | Aux | Pulse | 13.50 | 13.45 | 0.601 | **0.608** | **3.57** | |
| | | 111 | Rear | Aux | Pulse | 13.50 | 13.45 | 0.053 | 0.054 | 0.226 | |
| | | 111 | Edge 3 | Aux | Pulse | 13.50 | 13.45 | 0.330 | 0.334 | 1.46 | |
| 6E UNII 7 | 802.11 ax160 | 143 | Bottom | Main | Pulse | 12.75 | 12.70 | 0.400 | 0.405 | 2.44 | |
| | | 175 | Bottom | Main | Pulse | 12.75 | 12.66 | 0.474 | **0.484** | **2.83** | |
| | | 143 | Rear | Main | Pulse | 12.75 | 12.70 | 0.058 | 0.059 | 0.262 | |
| | | 143 | Edge 3 | Main | Pulse | 12.75 | 12.70 | 0.287 | 0.290 | 1.61 | |
| | 802.11 ax160 | 143 | Bottom | Aux | Pulse | 12.75 | 12.73 | 0.662 | 0.665 | 4.02 | |
| | | 175 | Bottom | Aux | Pulse | 12.75 | 12.68 | 0.681 | **0.692** | **4.08** | |
| | | 143 | Rear | Aux | Pulse | 12.75 | 12.73 | 0.056 | 0.056 | 0.294 | |
| | | 143 | Edge 3 | Aux | Pulse | 12.75 | 12.73 | 0.305 | 0.306 | 1.30 | |
| 6E UNII 8 | 802.11 ax160 | 207 | Bottom | Main | Pulse | 12.75 | 12.67 | 0.407 | **0.415** | **2.80** | |
| | | 207 | Rear | Main | Pulse | 12.75 | 12.67 | 0.050 | 0.051 | 0.192 | |
| | | 207 | Edge 3 | Main | Pulse | 12.75 | 12.67 | 0.239 | 0.243 | 1.41 | |
| | 802.11 ax160 | 207 | Bottom | Aux | Pulse | 12.75 | 12.71 | 0.583 | **0.588** | **3.52** | |
| | | 207 | Rear | Aux | Pulse | 12.75 | 12.71 | 0.057 | 0.058 | 0.312 | |
| | | 207 | Edge 3 | Aux | Pulse | 12.75 | 12.71 | 0.311 | 0.314 | 1.42 | |
| 6E UNII 7 | 802.11 ax160 | 175 | Bottom | Aux | CHILISIN | 12.75 | 12.68 | 0.598 | 0.608 | 3.61 | 1 |

Note:

1. The result used an other antenna to spot check for worst channel of the original antenna that the SAR result can be meet and compliant.

## Power Density results of 6E WiFi

| Band | Mode | Channel | Test Position | Gap (mm) | Ant | Ant Vendor | Max une-up (dBm) | AVG Power (dBm) | Grid Step | iPDn | iPD ratio (≥ -1) | Averaging Area cm^2 | Avg-Total Power Density W/m^2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6E UNII5 | 802.11 ax160 | 15 | Bottom | 2mm | Aux | Pulse | 13.50 | 13.43 | 0.0625 | 0.89 | -0.88036491 | 4.000 | 1.670 |
| 6E UNII5 | 802.11 ax160 | 15 | Bottom | 10mm | Aux | Pulse | 13.50 | 13.43 | 0.25 | 1.09 | | 4.000 | 0.410 |
| 6E UNII8 | 802.11 ax160 | 207 | Bottom | 2mm | Aux | Pulse | 12.75 | 12.71 | 0.0625 | 1.20 | -0.28028723 | 4.000 | 1.970 |
| 6E UNII8 | 802.11 ax160 | 207 | Bottom | 8.6mm | Aux | Pulse | 12.75 | 12.71 | 0.25 | 1.28 | | 4.000 | 0.933 |

| Band | Mode | Channel | Test Position | Gap (mm) | Ant | Ant Vendor | Max une-up (dBm) | AVG Power (dBm) | Grid Step | Scaling Factor for Measurement Uncertainty | Averaging Area cm^2 | Avg-Total Power Density W/m^2 | Scaling Total Power Density | PD Limit W/m^2 | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6E UNII 5 | 802.11 ax160 | 15 | Bottom | 2mm | Aux | Pulse | 13.50 | 13.43 | 0.0625 | 1.5535 | 4.000 | 1.670 | **2.636** | 10 | |
| 6E UNII 6 | 802.11 ax160 | 111 | Bottom | 2mm | Aux | Pulse | 13.50 | 13.45 | 0.0625 | 1.5535 | 4.000 | 1.740 | **2.734** | 10 | |
| 6E UNII 7 | 802.11 ax160 | 143 | Bottom | 2mm | Aux | Pulse | 12.75 | 12.73 | 0.0625 | 1.5535 | 4.000 | 2.220 | **3.465** | 10 | |
| 6E UNII 7 | 802.11 ax160 | 175 | Bottom | 2mm | Aux | Pulse | 12.75 | 12.68 | 0.0625 | 1.5535 | 4.000 | 1.750 | **2.763** | 10 | |
| 6E UNII 8 | 802.11 ax160 | 207 | Bottom | 2mm | Aux | Pulse | 12.75 | 12.71 | 0.0625 | 1.5535 | 4.000 | 1.970 | **3.089** | 10 | |
| 6E UNII 5 | 802.11 ax160 | 15 | Bottom | 2mm | Main | Pulse | 13.50 | 13.45 | 0.0625 | 1.5535 | 4.000 | 1.630 | **2.562** | 10 | |
| 6E UNII 5 | 802.11 ax160 | 47 | Rear | 2mm | Main | Pulse | 13.50 | 13.48 | 0.0625 | 1.5535 | 4.000 | 0.853 | **1.331** | 10 | |
| 6E UNII 6 | 802.11 ax160 | 111 | Rear | 2mm | Main | Pulse | 13.50 | 13.43 | 0.0625 | 1.5535 | 4.000 | 0.285 | **0.450** | 10 | |
| 6E UNII 7 | 802.11 ax160 | 143 | Rear | 2mm | Main | Pulse | 12.75 | 12.70 | 0.0625 | 1.5535 | 4.000 | 0.125 | **0.196** | 10 | |
| 6E UNII 7 | 802.11 ax160 | 143 | Rear | 2mm | Aux | Pulse | 12.75 | 12.73 | 0.0625 | 1.5535 | 4.000 | 0.480 | **0.749** | 10 | |
| 6E UNII 8 | 802.11 ax160 | 207 | Rear | 2mm | Aux | Pulse | 12.75 | 12.71 | 0.0625 | 1.5535 | 4.000 | 0.514 | **0.806** | 10 | |
| 6E UNII 5 | 802.11 ax160 | 47 | Edge 3 | 2mm | Aux | Pulse | 13.50 | 13.46 | 0.0625 | 1.5535 | 4.000 | 0.906 | **1.420** | 10 | |
| 6E UNII 6 | 802.11 ax160 | 111 | Edge 3 | 2mm | Aux | Pulse | 13.50 | 13.45 | 0.0625 | 1.5535 | 4.000 | 1.000 | **1.571** | 10 | |
| 6E UNII 7 | 802.11 ax160 | 143 | Edge 3 | 2mm | Aux | Pulse | 12.75 | 12.73 | 0.0625 | 1.5535 | 4.000 | 1.350 | **2.107** | 10 | |
| 6E UNII 6 | 802.11 ax160 | 111 | Edge 3 | 2mm | Main | Pulse | 13.50 | 13.43 | 0.0625 | 1.5535 | 4.000 | 0.533 | **0.841** | 10 | |
| 6E UNII 8 | 802.11 ax160 | 207 | Edge 3 | 2mm | Aux | Pulse | 12.75 | 12.71 | 0.0625 | 1.5535 | 4.000 | 1.710 | **2.681** | 10 | |
| 6E UNII 7 | 802.11 ax160 | 143 | Bottom | 2mm | Aux | CHILISIN | 12.75 | 12.68 | 0.0625 | 1.5535 | 4.000 | 2.100 | 3.315 | 10 | 1 |

Note:

1. The result used an other antenna to spot check for worst channel of the original antenna that the SAR result can be meet and compliant.

# 10. SIMULTANEOUS TRANSMISSION CONDITIONS

## 10.1. STAND-ALONE SAR TEST EXCLUSION

SAR compliance for simultaneous transmission must be considered when the maximum duration of overlapping transmissions, including network hand-offs, is greater than 30 seconds. This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis.

The Simultaneous Transmission Possibilities of this device are as below:

| No. | Configuration |
|---|---|
| 1 | WLAN 2.4G(Main)+BT |
| 2 | RLAN 5G(Main)+BT |
| 3 | WLAN 6G(Main)+BT |
| 4 | WLAN 2.4G(Main)+ WLAN 2.4G(Aux) |
| 5 | RLAN 5G(Main)+ RLAN 5G(Aux) |
| 6 | WLAN 6G(Main)+ WLAN 6G(Aux) |

## 10.2. SIMULTANEOUS TRANSMISSION CONDITIONS

KDB 447498 D04 Interim General RF Exposure Guidance v01, introduces a new formula for calculating the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$SPLSR = (SAR_1 + SAR_2)^{1.5} / R_i$
Where:

***$SAR_1$*** is the highest Reported or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

***$SAR_2$*** is the highest Reported or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

***$R_i$*** is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$

A new threshold of 0.04 is also introduced in the KDB. Thus, in order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:
$(SAR_1 + SAR_2)^{1.5} / R_i \leq 0.04$

## 10.3. ABOUT BT/WIFI

| Test Position / SAR1g(W/kg) | Bottom | Rear | Edge 3 |
|---|---|---|---|
| WLAN 2.4G WiFi_Main | 0.723 | 0.513 | 1.049 |
| WLAN 2.4G WiFi_Aux | 0.513 | 0.428 | 1.070 |
| UNII_1 & 2a WiFi_Main | 0.607 | 0.206 | 0.316 |
| UNII_1 & 2a WiFi_Aux | 0.615 | 0.158 | 0.285 |
| UNII_2c WiFi_Main | 0.580 | 0.420 | 0.545 |
| UNII_2c WiFi_Aux | 0.505 | 0.214 | 0.620 |
| UNII_3 WiFi_Main | 0.521 | 0.468 | 0.669 |
| UNII_3 WiFi_Aux | 0.473 | 0.264 | 0.648 |
| UNII_4 WiFi_Main | 0.559 | 0.483 | 0.635 |
| UNII_4 WiFi_Aux | 0.410 | 0.220 | 0.596 |
| UNII_5 WiFi_Main | 0.508 | 0.127 | 0.227 |
| UNII_5 WiFi_Aux | 0.539 | 0.024 | 0.296 |
| UNII_6 WiFi_Main | 0.415 | 0.087 | 0.293 |
| UNII_6 WiFi_Aux | 0.608 | 0.054 | 0.334 |
| UNII_7 WiFi_Main | 0.484 | 0.055 | 0.290 |
| UNII_7 WiFi_Aux | 0.692 | 0.056 | 0.306 |
| UNII_8 WiFi_Main | 0.415 | 0.051 | 0.243 |
| UNII_8 WiFi_Aux | 0.588 | 0.058 | 0.314 |
| Bluetooth_DH5 | 0.102 | 0.163 | 0.429 |
| WLAN2.4G_Main+WLAN 2.4G_Aux MAX∑SAR1g | 1.236 | 0.941 | 2.119 |
| WLAN_Main+BT_Aux MAX∑SAR1g | 0.825 | 0.676 | 1.478 |
| RLAN 5G_Main+ RLAN 5G_Aux MAX∑SAR1g | 1.222 | 0.747 | 1.317 |
| Wi-Fi 6E_Main+ Wi-Fi 6E_Aux MAX∑SAR1g | 1.200 | 0.185 | 0.627 |

Note:
1. MAX. $\Sigma SAR_{1g}$ = 2.119 W/Kg>1.6 W/Kg, so Peak location SAR are required.
2. Peak location SAR are 0.04 that refer Appendix E.

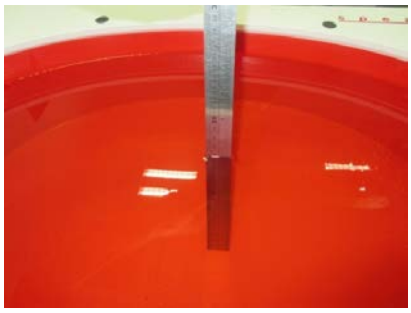
# 11. TEST LAYOUT

**Specific Absorption Rate Test Layout**

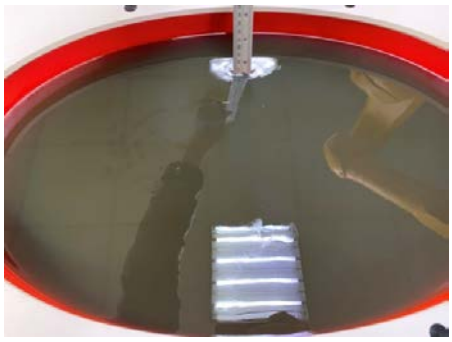
**Liquid depth in the flat Phantom (≥15cm depth)**

HSL(2450MHz)

HSL(5GHz)



HSL(6.5GHz)



## Appendix A. SAR Plots of System Verification

**(Pls See BTL-FCC SAR-1-2308T045_Appendix A.)**

## Appendix B. SAR Plots of SAR Measurement

**(Pls See BTL-FCC SAR-1-2308T045_Appendix B.)**

## Appendix C. Calibration Certificate

**(Pls See BTL-FCC SAR-1-2308T045_Appendix C.)**

## Appendix D. Photographs of the Test Set-Up

**(Pls See BTL-FCC SAR-1-2308T045_Appendix D.)**

## Appendix E. SAR SPLSR

**(Pls See BTL-FCC SAR-1-2308T045_Appendix E.)**

**End of Test Report**