



FCC - TEST REPORT

Report Number : **709502279701-01A** Date of Issue: May 18, 2023

Model : **Cra 3W**

Product Type : Cradle

FCC ID : 2AMG4-CRA3W

Applicant : SHINING 3D Tech Co., Ltd.

Address : No.1398, Xiangbin Road, Wenyan, Xiaoshan, Hangzhou,
Zhejiang, China

Manufacturer : SHINING 3D Tech Co., Ltd.

Address : No.1398, Xiangbin Road, Wenyan, Xiaoshan, Hangzhou,
Zhejiang, China

Test Result : **Positive** **Negative**

Total pages including
Appendices : 387

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1 Table of Contents

| | | |
|-----|---|----|
| 1 | Table of Contents..... | 2 |
| 2 | Details about the Test Laboratory | 3 |
| 3 | Description of the Equipment under Test | 4 |
| 4 | Summary of Test Standards..... | 6 |
| 5 | Summary of Test Results | 7 |
| 6 | General Remarks..... | 8 |
| 7 | Test Setups..... | 10 |
| 8 | Systems test configuration..... | 13 |
| 9 | Technical Requirement | 15 |
| 9.1 | Conducted Emission | 15 |
| 9.2 | Emission bandwidth | 18 |
| 9.3 | Maximum conducted output power | 20 |
| 9.4 | Maximum power spectral density | 23 |
| 9.5 | Frequencies Stability..... | 25 |
| 9.6 | Unwanted emissions..... | 26 |
| 10 | Test Equipment List | 34 |
| 11 | System Measurement Uncertainty..... | 35 |
| 12 | Photographs of Test Set-ups | 36 |
| 13 | Photographs of EUT | 37 |



2 Details about the Test Laboratory

Details about the Test Laboratory

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FCC Registration No.: 820234

FCC Designation CN1183
Number:

IC Registration No.: 25988

CAB identifier: CN0101

3 Description of the Equipment under Test

| | |
|----------------------------|--|
| Product: | Cradle |
| Model no.: | Cra 3W |
| FCC ID: | 2AMG4-CRA3W |
| Options and accessories: | NA |
| Rating: | 100-240V~, 50/60Hz |
| RF Transmission Frequency: | For 5G Wi-Fi For 802.11a/n/ac/ax: 5180~5240 MHz (U-NII-1) 5260~5320 MHz (U-NII-2A) 5500~5720 MHz (U-NII-2C) 5745~5825 MHz (U-NII-3) |
| No. of Operated Channel: | 5180~5240 MHz (U-NII-1) 5260~5320 MHz (U-NII-2A) 5500~5720 MHz (U-NII-2C) 5745~5825 MHz (U-NII-3) |
| Modulation: | Orthogonal Frequency Division Multiplexing (OFDM) for 802.11a/n/ac/ax |
| Hardware Version: | V1.0 |
| Software Version: | 3 |
| Data speed: | Wi-Fi: SISO: 11a 6 ~ 54Mbps, 11n HT20 6.5 ~ 72.2Mbps, 11n HT 40 13.5 ~ 150Mbps, 11ac VHT20 6.5 ~ 86.7Mbps, 11ac VHT40 13.5 ~ 200Mbps, 11ac VHT80 29.3 ~ 433.3Mbps 11ax HE20 7.313 ~ 143.382Mbps, 11ac HE40 14.625 ~ 286.765Mbps, 11ac HE80 30.625 ~ 600.490Mbps MIMO: 11a 6 ~ 54Mbps, 11n HT20 13 ~ 144.4Mbps, 11n HT 40 27 ~ 300Mbps, 11ac VHT20 13 ~ 173.3Mbps, 11ac VHT40 27 ~ 400Mbps, 11ac VHT80 58.5 ~ 866.7Mbps 11ax HE20 14.625 ~ 286.765Mbps, 11ac HE40 29.250 ~ 573.529Mbps, 11ac HE80 61.250 ~ 1200.980Mbps |
| Antenna Type: | FPC |
| Antenna Gain: | Antenna1: 1.59 dBi, Antenna2: 1.52 dBi |



Directional gain: For output power: 1.59 dBi
Max. gain +array gain
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$
For power spectral density: 4.60 dBi
 $G_{ANT} + \text{Array Gain}$
Array Gain = $10 \log(N_{ANT}/N_{ss})$ dB

Description of the EUT: The Equipment Under Test (EUT) is a Cradle with Wi-Fi Module. The EUT support Wi-Fi operated at 5GHz.

Test sample no.: SHA-724465-1

The sample's mentioned in this report is/are submitted/ supplied/ manufactured by client. The laboratory therefore assumes no responsibility for accuracy of information on the brand name, model number, origin of manufacture, consignment, antenna gain or any information supplied.



4 Summary of Test Standards

| Test Standards | |
|-------------------------------------|---|
| FCC Part 15 Subpart E, 2021 Edition | PART 15 - RADIO FREQUENCY DEVICES Subpart E - Unlicensed National Information Infrastructure Devices |

Test Method:

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

KDB 662911 D01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band

ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices

5 Summary of Test Results

| Technical Requirements | | | | | | |
|---|----------------------------------|------------|-------------|-------------------------------------|--------------------------|--------------------------|
| FCC Part 15 Subpart C | | | | | | |
| Test Condition | Pages | Test Site | Test Result | | | |
| | | | Pass | Fail | N/A | |
| §15.207 | Conducted emission AC power port | 15-17 | Site 1 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| §15.407(e) | Emission bandwidth | 18-19 | Site 1 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15.407(a)(i) | Maximum Conducted Output Power | 20-22 | Site 1 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15.407(a)(i) | Maximum Power Spectral Density | 23-24 | Site 1 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| §15.407(g) | Frequencies Stability | 25 | Site 1 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| §15.407(b)(1), 15.407(b)(2), 15.407(b)(3), 15.407(b)(4), 15.407(b)(5), 15.407(b)(6), 15.407(b)(7), 15.209 | Unwanted Emissions | 26-33 | Site 1 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| §15.203 | Antenna requirement | See note 1 | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Remark 1: The EUT only operation at 5G Wi-Fi UNII Band (5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5720MHz, 5745MHz-5825MHz). The EUT operate as Master Device.

Note 1: The EUT uses a FPC antenna, which gain is Antenna1: 1.59 dBi, Antenna2: 1.52 dBi. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.

15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.



6 General Remarks

Remarks

NOTICE: This report is a SUPPLEMENT OF PROJECT 709502279701-00A. So the report is not valid without the report of 709502279701-00A.

According to the client's declaration, the product adds 20M and 40M bandwidth at 5260~5320 MHz and 5500~5720 MHz which achieved through software.

So this report was based on the report 709502279701-00A for adding the following channels.

| Test Mode | Channel (MHz) | | |
|--|-----------------|-----------------|-----------------|
| 802.11a 802.11n HT20 802.11ac VHT20 802.11ax HE20 | 5G WIFI-Band 2 | | |
| | CH52 (5260MHz) | CH56 (5280MHz) | CH64 (5320MHz) |
| | 5G WIFI-Band 3 | | |
| | CH100 (5500MHz) | CH116 (5580MHz) | CH140 (5700MHz) |
| | CH144 (5720MHz) | | |

| Test Mode | Channel (MHz) | | |
|---|-----------------|-----------------|-----------------|
| 802.11n HT40 802.11ac VHT40 802.11ax HE40 | 5G WIFI-Band 2 | | |
| | CH54 (5270MHz) | CH62 (5310MHz) | |
| | 5G WIFI-Band 3 | | |
| | CH102 (5510MHz) | CH110 (5550MHz) | CH134 (5670MHz) |
| | CH142 (5710MHz) | | |

So in this test report we chose the above channels to perform all the tests except for Conducted emission AC power port and Unwanted Emissions (30M-1GHz).

This submittal(s) (test report) is intended for FCC ID: 2AMG4-CRA3W complies with Section 15.207, 15.209, 15.407 of the FCC Part 15, Subpart E Rules.

This report is only for 5GHz Wi-Fi. The TX and RX range is 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5720MHz, 5745MHz-5825MHz.

SUMMARY:

All tests according to the regulations cited on page 6 were

- Performed

- **Not** Performed

The Equipment under Test



- - **Fulfills** the general approval requirements.
- - **Does not** fulfill the general approval requirements.

Sample Received Date: November 1, 2022

Testing Start Date: November 1, 2022

Testing End Date: May 17, 2023

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

Reviewed by:

Prepared by:

Tested by:

Handwritten signature of Hui Tong in blue ink.

Handwritten signature of Cheng Huali in blue ink.

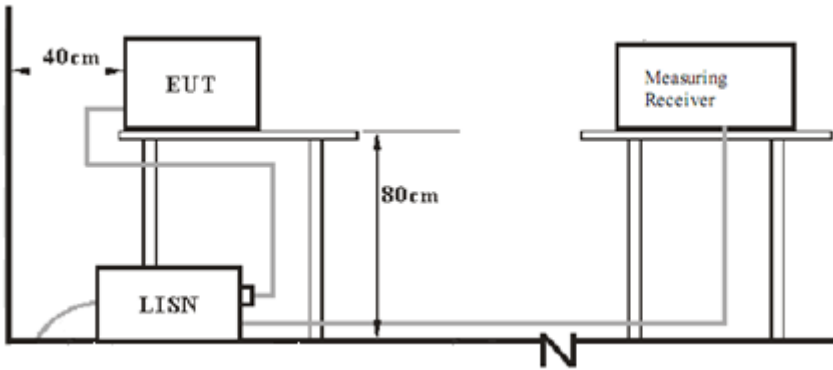
Hui TONG
Review Engineer

Wenqiang LU
Project Engineer

Huali CHENG
Test Engineer

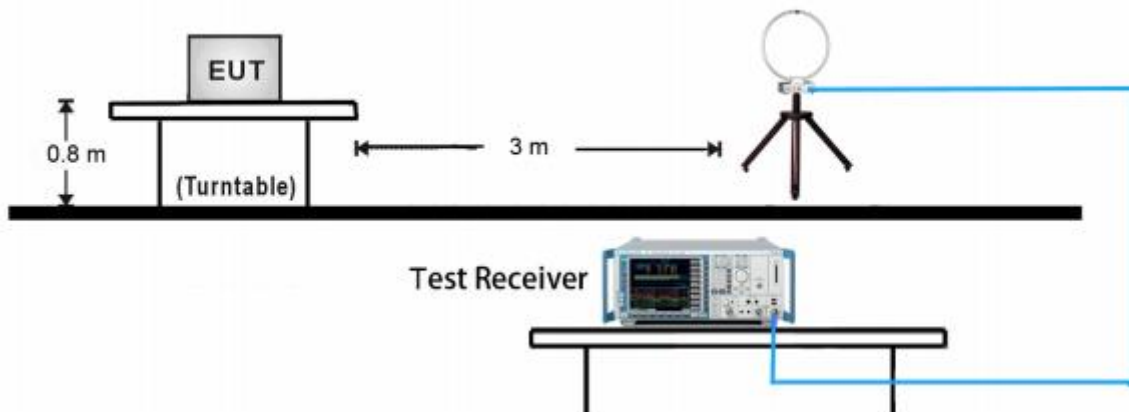
7 Test Setups

7.1 AC Power Line Conducted Emission test setups

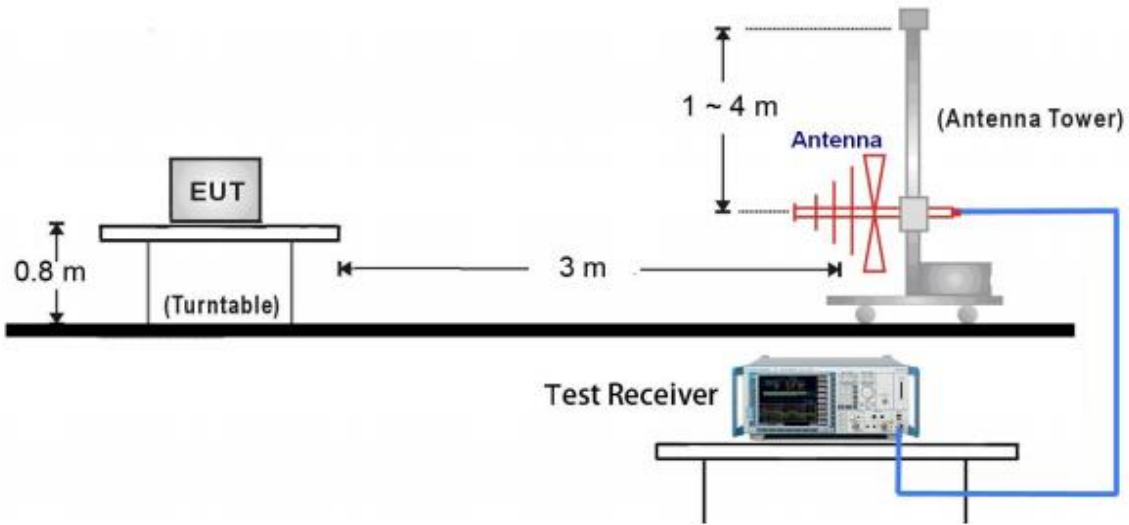


7.2 Radiated test setups

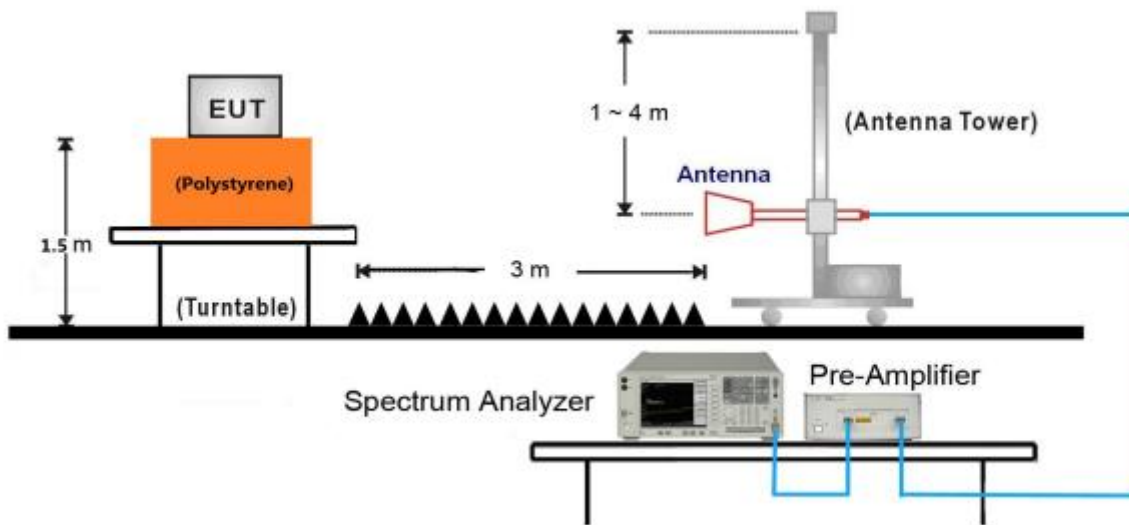
9kHz ~ 30MHz Test Setup:



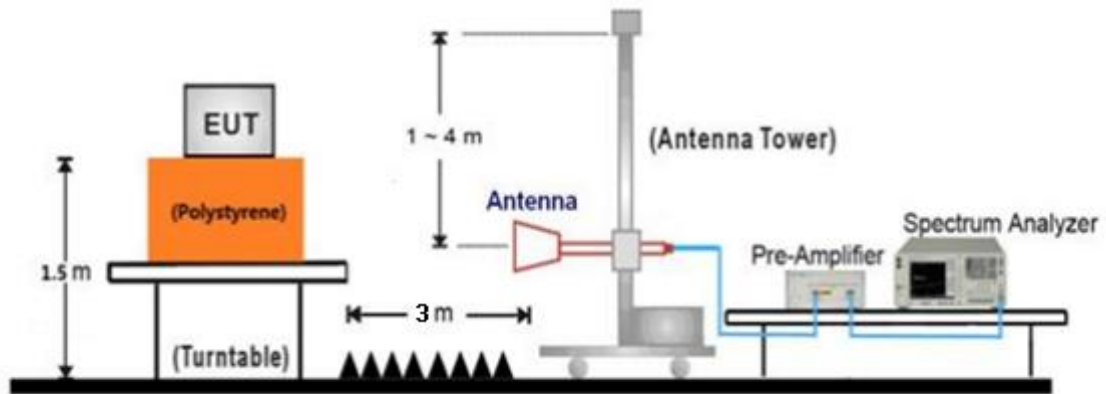
30MHz ~ 1GHz Test Setup:



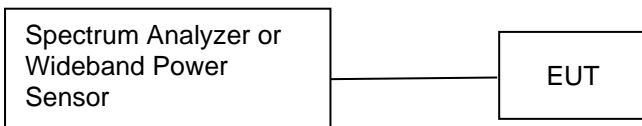
1GHz ~ 18GHz Test Setup:



18GHz ~ 40GHz Test Setup:



7.3 Conducted RF test setups





8 Systems test configuration

Auxiliary Equipment Used during Test:

| DESCRIPTION | MANUFACTURER | MODEL NO.(SHIELD) | S/N(LENGTH) |
|-------------|--------------|----------------------------|-------------|
| Notebook | MSI | Crossnair 15 R6E B12UEZ | -- |

Test software: QATool_Dbg.exe, which used to control the EUT in continues transmitting mode.
The system was configured to channel:

| Test Mode | Channel (MHz) | | |
|--|------------------|-----------------|-----------------|
| 802.11a 802.11n HT20 802.11ac VHT20 802.11ax HE20 | 5G WIFI-Band 1 | | |
| | CH36 (5180MHz) | CH40 (5200MHz) | CH48 (5240MHz) |
| | 5G WIFI-Band 2 | | |
| | CH52 (5260MHz) | CH56 (5280MHz) | CH64 (5320MHz) |
| | 5G WIFI-Band 3 | | |
| | CH100 (5500MHz) | CH116 (5580MHz) | CH140 (5700MHz) |
| | CH144 (5720MHz) | | |
| | 5G WIFI-Band 4 | | |
| | CH149 (5745MHz), | CH157 (5785MHz) | CH165 (5825MHz) |

| Test Mode | Channel (MHz) | | |
|---|-----------------|-----------------|-----------------|
| 802.11n HT40 802.11ac VHT40 802.11ax HE40 | 5G WIFI-Band 1 | | |
| | CH38 (5190MHz) | CH46 (5230MHz) | |
| | 5G WIFI-Band 2 | | |
| | CH54 (5270MHz) | CH62 (5310MHz) | |
| | 5G WIFI-Band 3 | | |
| | CH102 (5510MHz) | CH110 (5550MHz) | CH134 (5670MHz) |
| | CH142 (5710MHz) | | |
| | 5G WIFI-Band 4 | | |
| | CH151 (5755MHz) | CH159 (5795MHz) | |

| Test Mode | Channel (MHz) | | |
|---------------------------------|-----------------|-----------------|-----------------|
| 802.11ac VHT80 802.11ax HE80 | 5G WIFI-Band 1 | | |
| | CH42 (5210MHz) | | |
| | 5G WIFI-Band 2 | | |
| | CH58 (5290MHz) | | |
| | 5G WIFI-Band 3 | | |
| | CH106 (5530MHz) | CH123 (5610MHz) | CH138 (5690MHz) |
| | 5G WIFI-Band 4 | | |
| | CH155 (5775MHz) | | |



The pre-test has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

| | Modulation Type | Data Rate |
|-------------|------------------------|------------------|
| SISO | 802.11a OFDM | 6Mbps |
| | 802.11n (HT20): OFDM | MCS0 (6.5Mbps) |
| | 802.11n (HT40): OFDM | MCS0 (13.5Mbps) |
| | 802.11ac (VHT20): OFDM | 11ac 6.5Mbps |
| | 802.11ac (VHT40): OFDM | 11ac 13.5Mbps |
| | 802.11ac (VHT80): OFDM | 11ac 29.3Mbps |
| | 802.11ax (HE20): OFDM | 11ax 7.313Mbps |
| | 802.11ax (HE40): OFDM | 11ax 14.625Mbps |
| | 802.11ax (HE80): OFDM | 11ax 30.625Mbps |
| | Modulation Type | Data Rate |
| MIMO | 802.11a OFDM | 6Mbps |
| | 802.11n (HT20): OFDM | MCS0 (13Mbps) |
| | 802.11n (HT40): OFDM | MCS0 (27Mbps) |
| | 802.11ac (VHT20): OFDM | 11ac 13Mbps |
| | 802.11ac (VHT40): OFDM | 11ac 27Mbps |
| | 802.11ac (VHT80): OFDM | 11ac 58.5Mbps |
| | 802.11ax (HE20): OFDM | 11ax 14.625Mbps |
| | 802.11ax (HE40): OFDM | 11ax 29.250Mbps |
| | 802.11ax (HE80): OFDM | 11ax 61.250Mbps |

9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

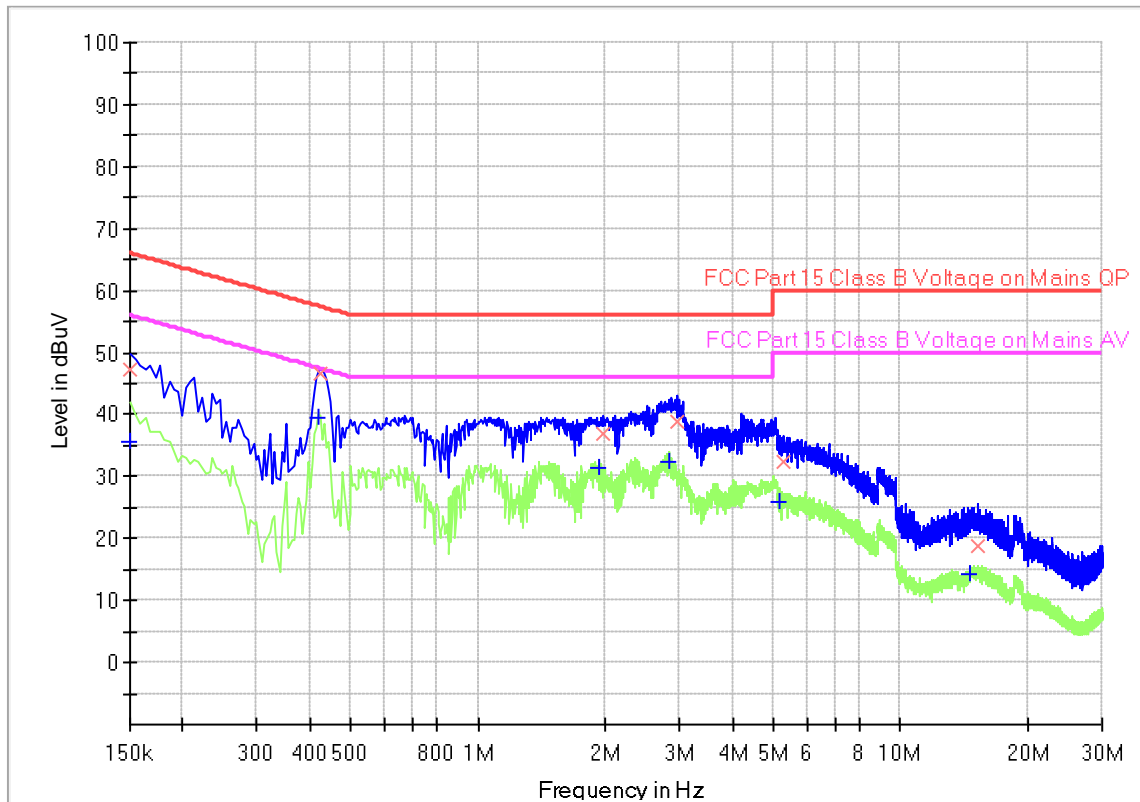
Limit

| Frequency MHz | QP Limit dB μ V | AV Limit dB μ V |
|------------------|------------------------|------------------------|
| 0.150-0.500 | 66-56* | 56-46* |
| 0.500-5 | 56 | 46 |
| 5-30 | 60 | 50 |

Decreasing linearly with logarithm of the frequency

Conducted Emission

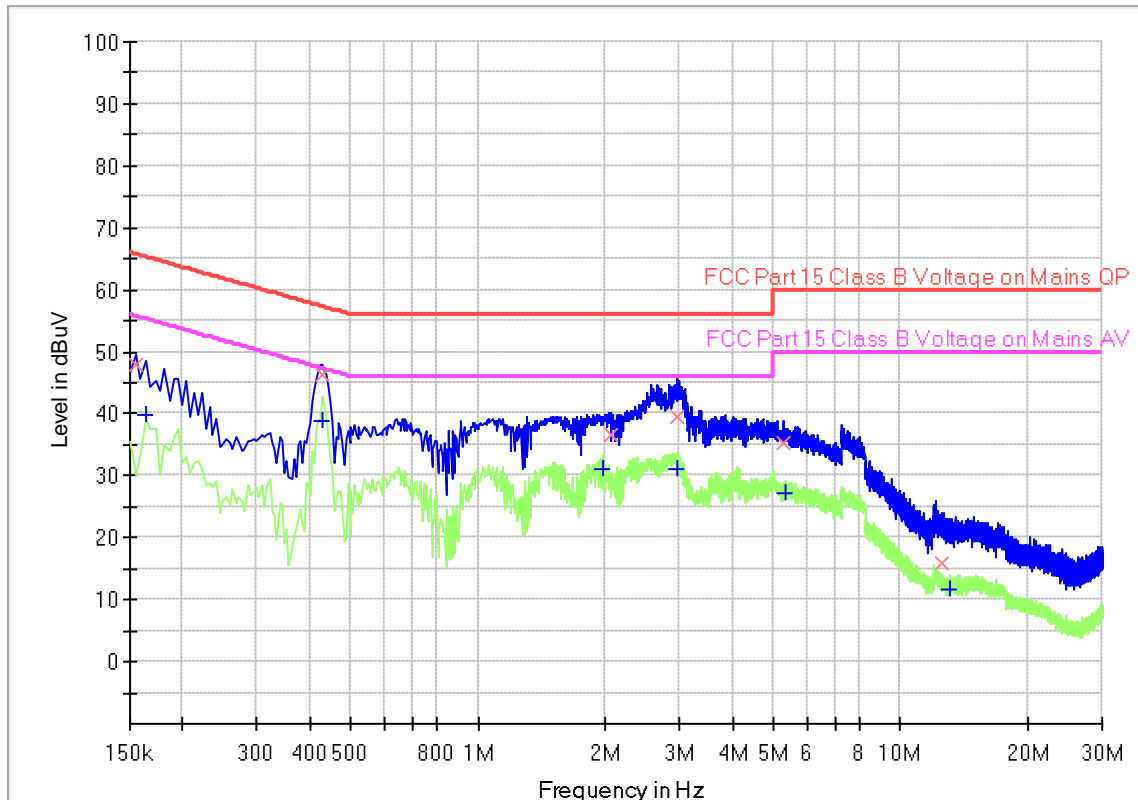
Product Type : Cradle
 M/N : Cra 3W
 Operating Condition : Mode 1: Tx_802.11 a, 5320MHz MIMO
 Test Specification : L-Line
 Comment : AC 120V/60Hz for adaptor



Final Result

| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.150000 | --- | 35.73 | 56.00 | 20.27 | 1000.0 | 9.000 | L1 | 19.6 |
| 0.150000 | 47.31 | --- | 66.00 | 18.69 | 1000.0 | 9.000 | L1 | 19.6 |
| 0.420000 | --- | 39.56 | 47.45 | 7.89 | 1000.0 | 9.000 | L1 | 19.6 |
| 0.424500 | 46.46 | --- | 57.36 | 10.90 | 1000.0 | 9.000 | L1 | 19.6 |
| 1.941000 | --- | 31.35 | 46.00 | 14.65 | 1000.0 | 9.000 | L1 | 19.6 |
| 1.986000 | 36.86 | --- | 56.00 | 19.14 | 1000.0 | 9.000 | L1 | 19.6 |
| 2.832000 | --- | 32.41 | 46.00 | 13.59 | 1000.0 | 9.000 | L1 | 19.6 |
| 2.962500 | 38.76 | --- | 56.00 | 17.24 | 1000.0 | 9.000 | L1 | 19.6 |
| 5.185500 | --- | 26.00 | 50.00 | 24.00 | 1000.0 | 9.000 | L1 | 19.6 |
| 5.307000 | 32.49 | --- | 60.00 | 27.51 | 1000.0 | 9.000 | L1 | 19.6 |
| 14.563500 | --- | 14.30 | 50.00 | 35.70 | 1000.0 | 9.000 | L1 | 19.8 |
| 15.198000 | 18.86 | --- | 60.00 | 41.14 | 1000.0 | 9.000 | L1 | 19.8 |

Product Type : Cradle
 M/N : Cra 3W
 Operating Condition : Mode 1: Tx_802.11 a, 5320MHz MIMO
 Test Specification : N-Line
 Comment : AC 120V/60Hz for adaptor



Final Result

| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.154500 | 47.81 | --- | 65.75 | 17.94 | 1000.0 | 9.000 | N | 19.6 |
| 0.163500 | --- | 39.76 | 55.28 | 15.52 | 1000.0 | 9.000 | N | 19.6 |
| 0.429000 | --- | 38.99 | 47.27 | 8.28 | 1000.0 | 9.000 | N | 19.6 |
| 0.429000 | 46.21 | --- | 57.27 | 11.06 | 1000.0 | 9.000 | N | 19.6 |
| 1.972500 | --- | 30.95 | 46.00 | 15.05 | 1000.0 | 9.000 | N | 19.6 |
| 2.058000 | 36.68 | --- | 56.00 | 19.32 | 1000.0 | 9.000 | N | 19.6 |
| 2.949000 | 39.63 | --- | 56.00 | 16.37 | 1000.0 | 9.000 | N | 19.6 |
| 2.949000 | --- | 31.01 | 46.00 | 14.99 | 1000.0 | 9.000 | N | 19.6 |
| 5.302500 | 35.37 | --- | 60.00 | 24.63 | 1000.0 | 9.000 | N | 19.7 |
| 5.320500 | --- | 27.28 | 50.00 | 22.72 | 1000.0 | 9.000 | N | 19.7 |
| 12.498000 | 16.02 | --- | 60.00 | 43.98 | 1000.0 | 9.000 | N | 19.9 |
| 13.033500 | --- | 11.69 | 50.00 | 38.31 | 1000.0 | 9.000 | N | 19.9 |

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)
 Factor (dB) = Cable Loss (dB) + LISN Factor (dB) + 10dB Attenuator

9.2 Emission bandwidth

1、 Test Method of 26dB Bandwidth

According to KDB789033 D02

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Limit: No limit

2、 Test Method of 6dB Bandwidth

According to KDB789033 D02

- a) Set RBW = 100KHz
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Limit: ≥ 500 KHz

3、 Test Method of 99% Bandwidth

According to KDB789033 D02

- a) Set center frequency to the nominal EUT channel center frequency
- b) Set span = 1.5 times to 5.0 times the OBW.
- c) Set RBW = 1 % to 5 % of the OBW
- d) Set VBW $\geq 3 \cdot$ RBW
- e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- f) Use the 99 % power bandwidth function of the instrument (if available).
- g) If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

Limit: No limit



26dB Bandwidth Test Result:

Test data should be referred to Appendix A for 709502279701-01A.

99% Bandwidth Test Result

Test data should be referred to Appendix A for 709502279701-01A.

9.3 Maximum conducted output power

Test Method

According to C63.10, the EUT was placed on a 0.8m height table, the RF output of EUT was connected to the test power meter by RF cable. The path loss was compensated to the results for each measurement.

(1) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:

The EUT is configured to transmit continuously or to transmit with a constant duty cycle.

At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.

The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

(2) If the transmitter does not transmit continuously, measure the duty cycle, x , of the transmitter output signal as described in II.B.

(3) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

(4) Adjust the measurement in dBm by adding $10 \log (1/x)$ where x is the duty cycle (e.g., $10 \log (1/0.25)$ if the duty cycle is 25%).

Limits:

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26dB emission bandwidth in megahertz.

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

Maximum conducted output power Test Result:

IEEE 802.11a modulation Test Result

| Band | Channel | Frequency (MHz) | Max Conducted Power (dBm) | | | Max Conducted Power Limit(dBm) |
|-----------|---------|-----------------|---------------------------|-------|-------|--------------------------------|
| | | | Ant1 | Ant2 | Sum | |
| 5.2G Band | Low | 5260 | 14.31 | 14.49 | 17.41 | 24 |
| | Middle | 5300 | 14.95 | 14.37 | 17.68 | 24 |
| | High | 5320 | 15.25 | 14.67 | 17.98 | 24 |
| 5.5G Band | Low | 5500 | 13.90 | 12.66 | 16.33 | 24 |
| | Middle | 5600 | 14.31 | 14.37 | 17.35 | 24 |
| | High | 5700 | 14.87 | 13.46 | 17.23 | 24 |
| | High | 5720 | 14.35 | 14.16 | 17.27 | 24 |

IEEE 802.11n HT20_MIMO modulation Test Result

| Band | Channel | Frequency (MHz) | Max Conducted Power (dBm) | | | Max Conducted Power Limit(dBm) |
|-----------|---------|-----------------|---------------------------|-------|-------|--------------------------------|
| | | | Ant1 | Ant2 | Sum | |
| 5.2G Band | Low | 5260 | 13.67 | 14.7 | 17.23 | 24 |
| | Middle | 5300 | 14.62 | 14.91 | 17.78 | 24 |
| | High | 5320 | 14.28 | 14.16 | 17.23 | 24 |
| 5.5G Band | Low | 5500 | 12.95 | 12.90 | 15.94 | 24 |
| | Middle | 5600 | 13.37 | 13.17 | 16.28 | 24 |
| | High | 5700 | 14.43 | 13.90 | 17.18 | 24 |
| | High | 5720 | 14.52 | 13.63 | 17.11 | 24 |

IEEE 802.11n HT40_MIMO modulation Test Result

| Band | Channel | Frequency (MHz) | Max Conducted Power (dBm) | | | Max Conducted Power Limit(dBm) |
|-----------|---------|-----------------|---------------------------|-------|-------|--------------------------------|
| | | | Ant1 | Ant2 | Sum | |
| 5.2G Band | Low | 5270 | 13.51 | 14.01 | 16.78 | 24 |
| | High | 5310 | 14.49 | 14.31 | 17.41 | 24 |
| 5.5G Band | Low | 5510 | 12.50 | 11.63 | 17.11 | 24 |
| | Middle | 5590 | 13.80 | 12.87 | 16.37 | 24 |
| | High | 5670 | 14.79 | 13.58 | 17.24 | 24 |
| | High | 5710 | 14.16 | 13.90 | 17.04 | 24 |

IEEE 802.11ac-VHT20_MIMO modulation Test Result

| Band | Channel | Frequency (MHz) | Max Conducted Power (dBm) | | | Max Conducted Power Limit(dBm) |
|-----------|---------|-----------------|---------------------------|-------|-------|--------------------------------|
| | | | Ant1 | Ant2 | Sum | |
| 5.2G Band | Low | 5260 | 13.82 | 13.32 | 16.59 | 24 |
| | Middle | 5300 | 14.90 | 14.73 | 17.83 | 24 |
| | High | 5320 | 14.68 | 14.85 | 17.78 | 24 |
| 5.5G Band | Low | 5500 | 12.50 | 11.97 | 15.25 | 24 |
| | Middle | 5600 | 13.63 | 13.27 | 16.46 | 24 |
| | High | 5700 | 14.73 | 13.59 | 17.21 | 24 |
| | High | 5720 | 14.30 | 13.56 | 16.96 | 24 |

IEEE 802.11ac-VHT40_MIMO modulation Test Result

| Band | Channel | Frequency (MHz) | Max Conducted Power (dBm) | | | Max Conducted Power Limit(dBm) |
|-----------|---------|-----------------|---------------------------|-------|-------|--------------------------------|
| | | | Ant1 | Ant2 | Sum | |
| 5.2G Band | Low | 5270 | 13.36 | 13.73 | 16.56 | 24 |
| | High | 5310 | 14.27 | 14.09 | 17.19 | 24 |
| 5.5G Band | Low | 5510 | 12.63 | 11.30 | 15.03 | 24 |
| | Middle | 5590 | 12.56 | 12.78 | 15.68 | 24 |
| | High | 5670 | 14.35 | 13.47 | 16.94 | 24 |
| | High | 5710 | 13.83 | 13.57 | 16.71 | 24 |

IEEE 802.11ax-HE20_MIMO modulation Test Result

| Band | Channel | Frequency (MHz) | Max Conducted Power (dBm) | | | Max Conducted Power Limit(dBm) |
|-----------|---------|-----------------|---------------------------|-------|-------|--------------------------------|
| | | | Ant1 | Ant2 | Sum | |
| 5.2G Band | Low | 5260 | 13.48 | 14.42 | 16.99 | 24 |
| | Middle | 5300 | 14.37 | 14.28 | 17.34 | 24 |
| | High | 5320 | 14.92 | 14.80 | 17.87 | 24 |
| 5.5G Band | Low | 5500 | 12.70 | 11.60 | 15.20 | 24 |
| | Middle | 5600 | 14.07 | 13.65 | 16.88 | 24 |
| | High | 5700 | 15.01 | 13.52 | 17.34 | 24 |
| | High | 5720 | 14.58 | 13.38 | 17.03 | 24 |

IEEE 802.11ax-HE40_MIMO modulation Test Result

| Band | Channel | Frequency (MHz) | Max Conducted Power (dBm) | | | Max Conducted Power Limit(dBm) |
|-----------|---------|-----------------|---------------------------|-------|-------|--------------------------------|
| | | | Ant1 | Ant2 | Sum | |
| 5.2G Band | Low | 5270 | 13.46 | 13.85 | 16.67 | 24 |
| | High | 5310 | 14.49 | 13.93 | 17.23 | 24 |
| 5.5G Band | Low | 5510 | 12.51 | 11.41 | 15.01 | 24 |
| | Middle | 5590 | 12.73 | 12.88 | 15.82 | 24 |
| | High | 5670 | 14.38 | 13.47 | 16.96 | 24 |
| | High | 5710 | 14.20 | 13.53 | 16.89 | 24 |

9.4 Maximum power spectral density

Test Method

According to C63.10, the EUT was placed on 0.8m height table, the RF output of EUT was connected to the test power meter by RF cable. The path loss was compensated to the results for each measurement.

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power..." (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
3. Make the following adjustments to the peak value of the spectrum, if applicable:
 - a) If Method SA-2 or SA-2 Alternative was used, add $10 \log (1/x)$, where x is the duty cycle, to the peak of the spectrum.
 - b) If Method SA-3 Alternative was used and the linear mode was used in II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
4. The result is the Maximum PSD over 1 MHz reference bandwidth.
5. For devices operating in the bands 5.15–5.25 GHz, 5.25–5.35 GHz, and 5.47–5.725 GHz, the preceding procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in Section 15.407(a)(5). For devices operating in the band 5.725–5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:
 - a) Set $RBW \geq 1/T$, where T is defined in II.B.1.a).
 - b) Set $VBW \geq 3 RBW$.
 - c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500 \text{ kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ kHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
 - d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log (1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.
 - e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the II.F.5.c) and II.F.5.d), since $RBW=100 \text{ kHz}$ is available on nearly all spectrum analyzers.



Limit: The maximum power spectral density shall not exceed 11dBm for the 5.15-5.25GHz, 5.25-5.35GHz, 5.47-5.725 GHz Band in any 1 megahertz band.
For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30dBm in any 1 500kHz band.

Test Result:

Test data should be referred to Appendix A for 709502279701-01A.



9.5 Frequencies Stability

Test Method

1. Connect the UUT to the spectrum analyzer
2. Set Centre Frequency of the channel under test.
3. Set Detector PEAK
4. Set RBW: 10KHz, VBW: 3RBW
5. Set Span: Encompass the entire emissions bandwidth (EBW) of the signal.
6. Allow the trace to stabilize, find the peak value of the power envelope and record the frequency, then calculated the frequency drift.

The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

User manual temperature is 10 to 40 °C.

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

Limit: 20ppm

Test Results (All conditions and all modes were performed, only list Worst-Case in the report)

Remark: NV is normal Voltage: 120V~, 60Hz, HV is High Voltage: 240V~, 50Hz, LV is Low Voltage: 100V~, 60Hz, NT is normal Temperature: +20 °C.

Test Result:

Test data should be referred to Appendix A for 709502279701-01A.

9.6 Unwanted emissions

Transmitting spurious emission test result as below:

Test Method

Radiated Mode:

1. The EUT was placed on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned
5. Use the following spectrum analyzer settings According to C63.10:
For Above 1GHz
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 1MHz, VBW \geq RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.
For Below 1GHz
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 KHz, VBW \geq RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.

Limit

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

According to part 15.407(b), the radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

| Frequency MHz | Field Strength uV/m | Field Strength dB μ V/m | Detector |
|------------------|------------------------|--------------------------------|----------|
| 30-88 | 100 | 40 | QP |
| 88-216 | 150 | 43.5 | QP |
| 216-960 | 200 | 46 | QP |
| 960-1000 | 500 | 54 | QP |
| Above 1000 | 500 | 54 | AV |
| Above 1000 | 5000 | 74 | PK |

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

The only worse case (which is subject to the maximum EIRP, 802.11ax 20 mode listed in the report.

Transmitting spurious emission worse case test result:

Transmitting spurious emission test result as below:

| 802.11ax 20 Modulation 5260MHz MIMO | | | | | | | |
|-------------------------------------|---------------|----------------------|---------------------|----------|-------------|-------------|--------|
| Frequency Range MHz | Frequency MHz | Antenna Polarization | Emission Level(dBm) | Detector | Limit (dBm) | Margin (dB) | Result |
| 1000-7000 | -- | Horizontal | -- | PK | 74 | -- | Pass |
| 1000-7000 | -- | Vertical | -- | PK | 74 | -- | Pass |
| 7000-40000 | 10520 | Horizontal | 48.64 | PK | 68.2 | 19.56 | Pass |
| 7000-40000 | 10520 | Vertical | 51.49 | PK | 68.2 | 16.71 | Pass |

| 802.11ax 20 Modulation 5300MHz MIMO | | | | | | | |
|-------------------------------------|---------------|----------------------|---------------------|----------|-------------|-------------|--------|
| Frequency Range MHz | Frequency MHz | Antenna Polarization | Emission Level(dBm) | Detector | Limit (dBm) | Margin (dB) | Result |
| 1000-7000 | -- | Horizontal | -- | PK | 74 | -- | Pass |
| 1000-7000 | -- | Vertical | -- | PK | 74 | -- | Pass |
| 7000-40000 | 10600 | Horizontal | 49.25 | PK | 68.2 | 18.95 | Pass |
| 7000-40000 | 10600 | Vertical | 52.32 | PK | 68.2 | 15.88 | Pass |

| 802.11ax 20 Modulation 5320MHz MIMO | | | | | | | |
|-------------------------------------|---------------|----------------------|---------------------|----------|-------------|-------------|--------|
| Frequency Range MHz | Frequency MHz | Antenna Polarization | Emission Level(dBm) | Detector | Limit (dBm) | Margin (dB) | Result |
| 1000-7000 | -- | Horizontal | -- | PK | 74 | -- | Pass |
| 1000-7000 | -- | Vertical | -- | PK | 74 | -- | Pass |
| 7000-40000 | 10640 | Horizontal | 49.8 | PK | 74 | 24.2 | Pass |
| 7000-40000 | 10640 | Vertical | 51.65 | PK | 74 | 22.35 | Pass |

| 802.11ax 20 Modulation 5500MHz MIMO | | | | | | | |
|-------------------------------------|---------------|----------------------|---------------------|----------|-------------|-------------|--------|
| Frequency Range MHz | Frequency MHz | Antenna Polarization | Emission Level(dBm) | Detector | Limit (dBm) | Margin (dB) | Result |
| 1000-7000 | -- | Horizontal | -- | PK | 74 | -- | Pass |
| 1000-7000 | -- | Vertical | -- | PK | 74 | -- | Pass |
| 7000-40000 | 11000 | Horizontal | 53.1 | PK | 74 | 20.9 | Pass |
| 7000-40000 | 11000 | Horizontal | 48.4 | AV | 54 | 5.6 | Pass |
| 7000-40000 | 11000 | Vertical | 48.68 | PK | 74 | 25.32 | Pass |
| 7000-40000 | 11000 | Vertical | 50 | AV | 54 | 4 | Pass |

| 802.11ax 20 Modulation 5600MHz MIMO | | | | | | | |
|-------------------------------------|---------------|----------------------|---------------------|----------|-------------|-------------|--------|
| Frequency Range MHz | Frequency MHz | Antenna Polarization | Emission Level(dBm) | Detector | Limit (dBm) | Margin (dB) | Result |
| 1000-7000 | -- | Horizontal | -- | PK | 74 | -- | Pass |
| 1000-7000 | -- | Vertical | -- | PK | 74 | -- | Pass |
| 7000-40000 | 11200 | Horizontal | 53.43 | PK | 74 | 20.57 | Pass |
| 7000-40000 | 11200 | Horizontal | 48.1 | AV | 54 | 5.9 | Pass |
| 7000-40000 | 11200 | Vertical | 54.65 | PK | 74 | 19.35 | Pass |
| 7000-40000 | 11200 | Vertical | 49.8 | AV | 54 | 4.2 | Pass |

| 802.11ax 20 Modulation 5700MHz MIMO | | | | | | | |
|-------------------------------------|---------------|----------------------|---------------------|----------|-------------|-------------|--------|
| Frequency Range MHz | Frequency MHz | Antenna Polarization | Emission Level(dBm) | Detector | Limit (dBm) | Margin (dB) | Result |
| 1000-7000 | -- | Horizontal | -- | PK | 74 | -- | Pass |
| 1000-7000 | -- | Vertical | -- | PK | 74 | -- | Pass |
| 7000-40000 | 11400 | Horizontal | 53.72 | PK | 74 | 20.28 | Pass |
| 7000-40000 | 11400 | Horizontal | 49 | AV | 54 | 5 | Pass |
| 7000-40000 | 11400 | Vertical | 60.21 | PK | 74 | 13.79 | Pass |
| 7000-40000 | 11400 | Vertical | 52.9 | AV | 54 | 1.1 | Pass |

| 802.11ax 20 Modulation 5720MHz MIMO | | | | | | | |
|-------------------------------------|---------------|----------------------|---------------------|----------|-------------|-------------|--------|
| Frequency Range MHz | Frequency MHz | Antenna Polarization | Emission Level(dBm) | Detector | Limit (dBm) | Margin (dB) | Result |
| 1000-7000 | -- | Horizontal | -- | PK | 74 | -- | Pass |
| 1000-7000 | -- | Vertical | -- | PK | 74 | -- | Pass |
| 7000-40000 | 11440 | Horizontal | 54.61 | PK | 74 | 19.39 | Pass |
| 7000-40000 | 11440 | Horizontal | 49.2 | AV | 54 | 4.8 | Pass |
| 7000-40000 | 11440 | Vertical | 59.39 | PK | 74 | 14.61 | Pass |
| 7000-40000 | 11440 | Vertical | 53 | AV | 54 | 1 | Pass |

Remark:

- (1) Above 1GHz Corrector factor= Antenna Factor +Cable Loss - Amp. Factor.
- (2) Below 1GHz Corrector factor= Antenna Factor +Cable Loss.
- (3) "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.
- (4) We test all modes and only the worst case for each bandwidth recorded in the report.



China

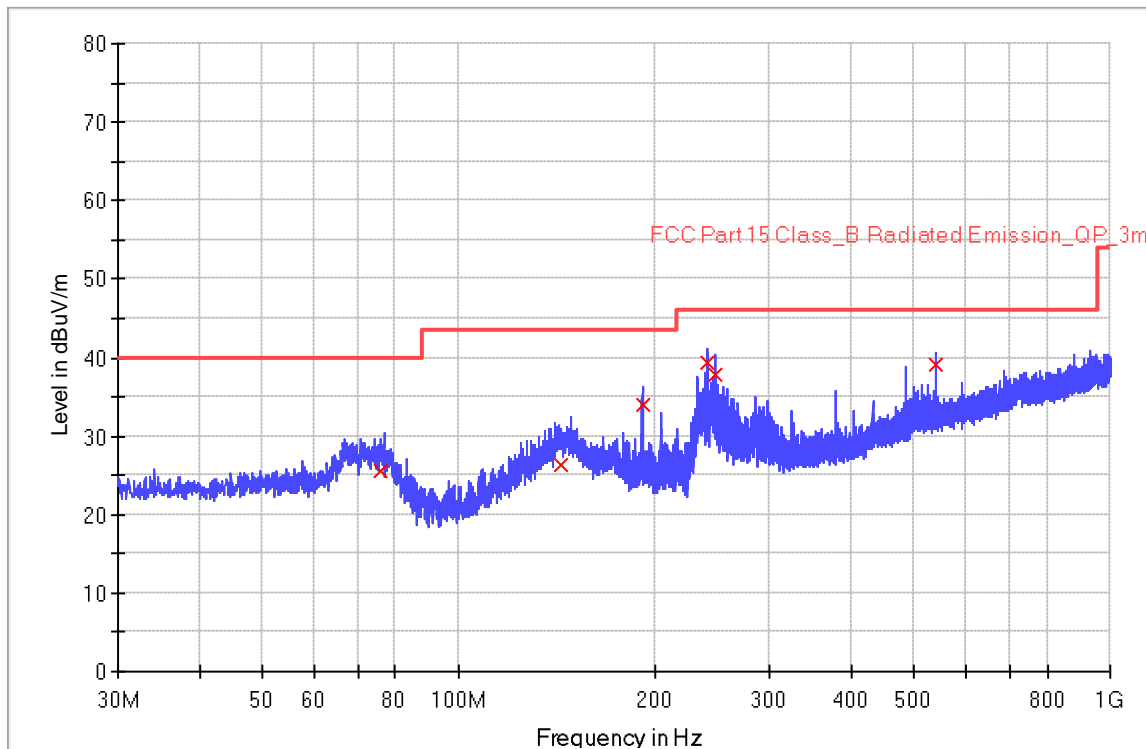
- (5) Testing is carried out with frequency rang 30MHz to 40GHz, which data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) The Low frequency, which start from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Transmitting spurious emission test result as below:

The worst case of Radiated Emission below 1GHz:

| | |
|---|---------------------------------|
| Site: 3 meter chamber | Time: 2023/05/16 - 11:12 |
| Limit: FCC_Part15.209_RE(3m)_ClassB | Engineer: Wenqiang LU |
| Probe: VULB9168 | Polarity: Horizontal |
| EUT: Cradle, Model no: Cra 3W | Power: 120VAC, 60Hz for adaptor |
| Note: Transmit by at 802.11a channel 5320MHz MIMO. | |
| Note: Pre-scan with three orthogonal axis and the worst case as X axis. | |

RE_VULB9168_pre_Cont_30-1000



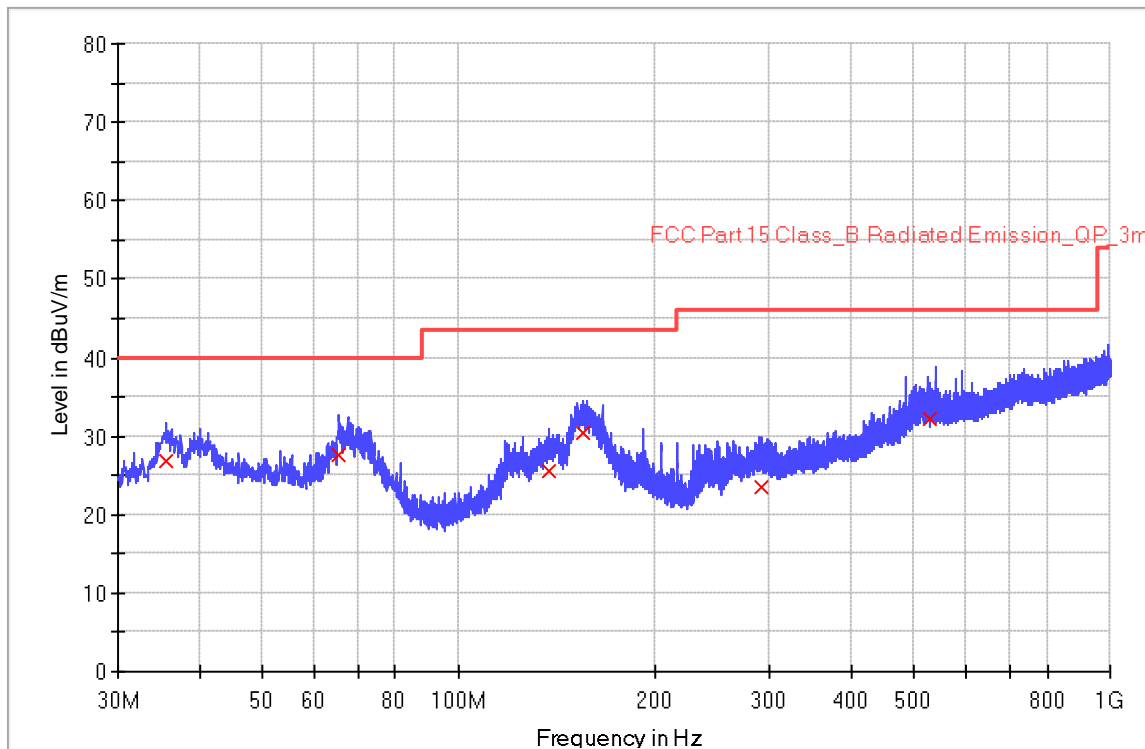
Limit and Margin

| Frequency (MHz) | QuasiPeak (dBuV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) | Margin - QPK (dB) | Limit - QPK (dBuV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|-----|---------------|------------|-------------------|----------------------|
| 75.920000 | 25.6 | 1000.0 | 120.000 | 200.0 | H | 105.0 | 17.3 | 14.5 | 40.0 |
| 143.120000 | 26.3 | 1000.0 | 120.000 | 200.0 | H | 314.0 | 20.6 | 17.2 | 43.5 |
| 191.320000 | 33.9 | 1000.0 | 120.000 | 184.0 | H | 238.0 | 18.4 | 9.6 | 43.5 |
| 240.000000 | 39.3 | 1000.0 | 120.000 | 100.0 | H | 143.0 | 19.6 | 6.7 | 46.0 |
| 247.520000 | 37.8 | 1000.0 | 120.000 | 100.0 | H | 21.0 | 19.9 | 8.2 | 46.0 |
| 539.960000 | 39.2 | 1000.0 | 120.000 | 100.0 | H | 74.0 | 27.2 | 6.8 | 46.0 |

The worst case of Radiated Emission below 1GHz:

| | |
|---|---------------------------------|
| Site: 3 meter chamber | Time: 2023/05/16 - 13:47 |
| Limit: FCC_Part15.209_RE(3m)_ClassB | Engineer: Wenqiang LU |
| Probe: VULB9168 | Polarity: Vertical |
| EUT: Cradle, Model no: Cra 3W | Power: 120VAC, 60Hz for adaptor |
| Note: Transmit by at 802.11a channel 5320MHz MIMO. | |
| Note: Pre-scan with three orthogonal axis and the worst case as X axis. | |

RE_VULB9168_pre_Cont_30-1000



Limit and Margin

| Frequency (MHz) | QuasiPeak (dBuV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) | Margin - QPK (dB) | Limit - QPK (dBuV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|-----|---------------|------------|-------------------|----------------------|
| 35.560000 | 26.8 | 1000.0 | 120.000 | 100.0 | V | 125.0 | 19.6 | 13.2 | 40.0 |
| 65.560000 | 27.7 | 1000.0 | 120.000 | 100.0 | V | 73.0 | 19.3 | 12.3 | 40.0 |
| 137.440000 | 25.4 | 1000.0 | 120.000 | 100.0 | V | 241.0 | 20.1 | 18.1 | 43.5 |
| 155.280000 | 30.3 | 1000.0 | 120.000 | 100.0 | V | 12.0 | 21.0 | 13.2 | 43.5 |
| 292.480000 | 23.6 | 1000.0 | 120.000 | 200.0 | V | 306.0 | 21.3 | 22.4 | 46.0 |
| 528.080000 | 32.3 | 1000.0 | 120.000 | 100.0 | V | 190.0 | 27.0 | 13.7 | 46.0 |

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

Conducted Spurious Emission Test Method:

According to KDB789033 D02

1. The EUT was placed on 0.8m height table, the RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.
2. For transmitters with operation frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5359 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.
 - a) Set RBW \geq between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth)
 - b) Set VBW \geq 3 RBW.

Limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Conducted Spurious Emission

Test data should be referred to Appendix A for 709502279701-01A.

Band edge measurements

Test data should be referred to Appendix A for 709502279701-01A.

10 Test Equipment List

List of Test Instruments Test Site1

| | DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | CAL. DATE | CAL. DUE DATE |
|----|---|-----------------|------------|------------------|------------|---------------|
| C | Wideband Radio Communication Tester | R&S | CMW500 | S2110416b-YQ-EMC | 2021-11-24 | 2023-11-23 |
| | Vector signal generator | Agilent | N5182A | S2110417b-YQ-EMC | 2021-11-24 | 2023-11-23 |
| | RF automatic control unit | MWRFtest | MW100-RFCB | S2110418b-YQ-EMC | 2022-9-30 | 2023-9-29 |
| | Temperature Chamber | Shanghai HUCAN | HTT-100AP | S2201430b-YQ-EMC | 2022-3-3 | 2024-3-2 |
| | Signal Analyzer | R & S | FSV40 | S1503003-YQ-EMC | 2022-8-1 | 2023-7-31 |
| RE | EMI Test Receiver | Rohde & Schwarz | ESR3 | 101906 | 2022-8-1 | 2023-7-31 |
| | Signal Analyzer | Rohde & Schwarz | FSV40 | 101091 | 2022-8-1 | 2023-7-31 |
| | Trilog Super Broadband Test Antenna | Schwarzbeck | VULB 9168 | 961 | 2021-9-23 | 2024-9-22 |
| | Horn Antenna | Rohde & Schwarz | HF907 | 102393 | 2021-4-13 | 2024-4-12 |
| | Pre-amplifier | Rohde & Schwarz | SCU-18D | 19006451 | 2022-8-1 | 2023-7-31 |
| | Loop antenna | Rohde & Schwarz | HFH2-Z2 | 100443 | 2022-6-13 | 2023-6-12 |
| | DOUBLE-RIDGED WAVEGUIDE HORN WITH PRE-AMPLIFIER (18 GHZ - 40 GHZ) | ETS-Lindgren | 3116C-PA | 002222727 | 2020-9-23 | 2023-9-22 |
| | 3m Semi-anechoic chamber | TDK | 9X6X6 | ---- | 2021-5-8 | 2024-5-7 |
| CE | EMI Test Receiver | Rohde & Schwarz | ESR3 | 101907 | 2022-8-1 | 2023-7-31 |
| | LISN | Rohde & Schwarz | ENV216 | 101924 | 2022-8-1 | 2023-7-31 |

| Measurement Software Information | | | |
|----------------------------------|----------|-----------------|-----------|
| Test Item | Software | Manufacturer | Version |
| C | MTS 8310 | MWRFtest | 2.0.0.0 |
| RE | EMC 32 | Rohde & Schwarz | V10.50.40 |
| CE | EMC 32 | Rohde & Schwarz | V10.50.40 |

C - Conducted RF tests

- Conducted peak output power
- 6dB Occupied Bandwidth
- Power spectral density*
- Conducted Band Edge and Out-of-Band Emissions



11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

| Items | Extended Uncertainty |
|--|---|
| Conducted Disturbance at Mains Terminals | 150kHz to 30MHz, LISN, ± 3.16 dB |
| Radiated Disturbance | 30MHz to 1GHz, ± 5.03 dB (Horizontal) |
| | ± 5.12 dB (Vertical) |
| | 1GHz to 18GHz, ± 5.15 dB (Horizontal) |
| | ± 5.12 dB (Vertical) |
| | 18GHz to 25GHz, ± 4.76 dB |

Measurement Uncertainty Decision Rule:

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2021, clause 4.4.3 and 4.5.1.



12 Photographs of Test Set-ups

Refer to the < Test Setup photos >.



13 Photographs of EUT

Refer to the < External Photos > & < Internal Photos >.

THE END