# FCC - TEST REPORT

| | | | | |
|---|---|---|---|---|
| Report Number | : | **68.950.20.0307.01** | Date of Issue: | July 23, 2020 |
| Model | : | **AMW839R** | | |
| Product Type | : | Wireless receiver | | |
| Applicant | : | Targus International LLC | | |
| Address | : | 1211 North Miller Street Anaheim, California United States 92806 | | |
| Manufacturer | : | Shenzhen Wintop Electronics Co., Ltd. | | |
| | : | Room 402 Building 1 No.34 Xinhe Road, No 46 Xinhe Road, Floor | | |
| | : | 4 No.50 Xinhe Road ShangMuGu Community, PingHu Street, | | |
| Address | : | LongGang District, Shenzhen City, Guangdong Province, China. | | |
| Test Result | : | ■ **Positive** ☐ **Negative** | | |
| Total pages including Appendices | : | 25 | | |

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# 1 Table of Contents





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# 2 Details about the Test Laboratory

**Details about the Test Laboratory**

Test Site 1

| | |
|---|---|
| Company name: | TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch<br>Building 12&13, Zhiheng Wisdomland Business Park,<br>Nantou Checkpoint Road 2, Nanshan District,<br>Shenzhen City, 518052,<br>P. R. China |
| FCC Registration Number: | 514049 |
| FCC Designation Number: | CN5009 |
| Telephone: | 86 755 8828 6998 |
| Fax: | 86 755 8828 5299 |

# 3 Description of the Equipment Under Test

**Description of the Equipment Under Test**

| | |
|---|---|
| Product: | Wireless receiver |
| Model no.: | AMW839R |
| FCC ID: | OXM000115 |
| Options and accessories: | NIL |
| Ratings: | 5VDC (Supplied by USB Port) |
| RF Transmission Frequency: | 2405MHz-2475MHz |
| Modulation: | GFSK |
| Antenna Type: | Integrated Antenna |
| Antenna Gain: | 0dBi |
| Description of the EUT: | The product is a Wireless receiver that operated at 2.4GHz, The TX and RX range is 2405MHz-2475MHz |

Auxiliary Equipment Used during Test:

| DESCRIPTION | MANUFACTURER | RATINGS | MODEL NO. |
|---|---|---|---|
| -- | -- | -- | -- |


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# 4 Summary of Test Standards

| Test Standards | |
|---|---|
| FCC Part 15 Subpart C 10-1-2019 Edition | PART 15 - RADIO FREQUENCY DEVICES<br>Subpart C - Intentional Radiators |

All the test methods were according to ANSI C63.10-2013.


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# 5 Summary of Test Results

| Technical Requirements | | | | | |
|---|---|---|---|---|---|
| **FCC Part 15 Subpart C 15.249** | | | | | |
| Test Condition | Pages | Test Site | Test Result | | |
| | | | Pass | Fail | N/A |
| 15.207 & RSS-Gen A8.8<br>Conducted emission AC power port | 9 | Site 1 | ☒ | ☐ | ☐ |
| §15.205(a), §15.209(a), §15.249(a), §15.249(c)<br>Field strength of emissions and Restricted bands | 12 | Site 1 | ☒ | ☐ | ☐ |
| §15.249(d) Out of band emissions | 17 | Site 1 | ☒ | ☐ | ☐ |
| FCC §15.215(c) 20dB bandwidth<br>99% Occupied Bandwidth | 20 | Site 1 | ☒ | ☐ | ☐ |
| §15.203 Antenna requirement | See note 2 | | ☒ | ☐ | ☐ |

Remark 1: N/A- Not Applicable;
Note 1: The EUT is not intended to operate from the AC power lines;
Note 2: The EUT used an integral PCB antenna, which gain is 0dBi. According to §15.203, it is considered sufficiently to comply with the provisions of this section.


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# 6 General Remarks

**Remarks**
This submittal(s) (test report) is intended for FCC ID: OXM000115 complies with Sectio, 15.205, 15.209, 15.249 of the FCC Part 15, Subpart C Rules.

**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: | June 10, 2020 |
| Testing Start Date: | June 10, 2020 |
| Testing End Date: | July 21, 2020 |

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

| Reviewed by: | Prepared by: | Tested by: |
|---|---|---|
| John Zhi | Mark Chen | Tree Zhan |
| EMC Project Manager | EMC Project Engineer | EMC Test Engineer |


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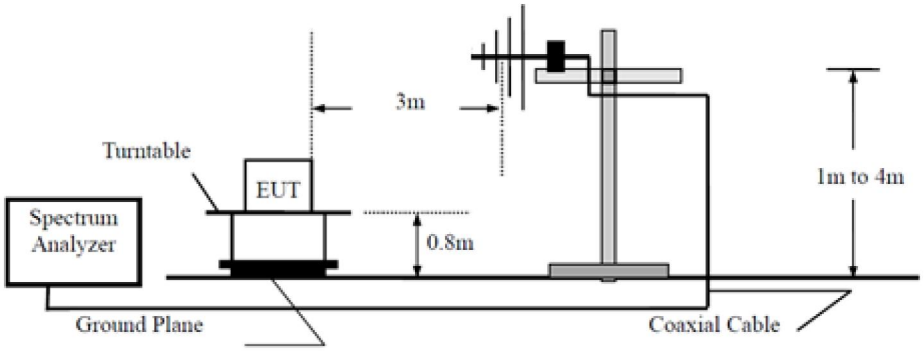
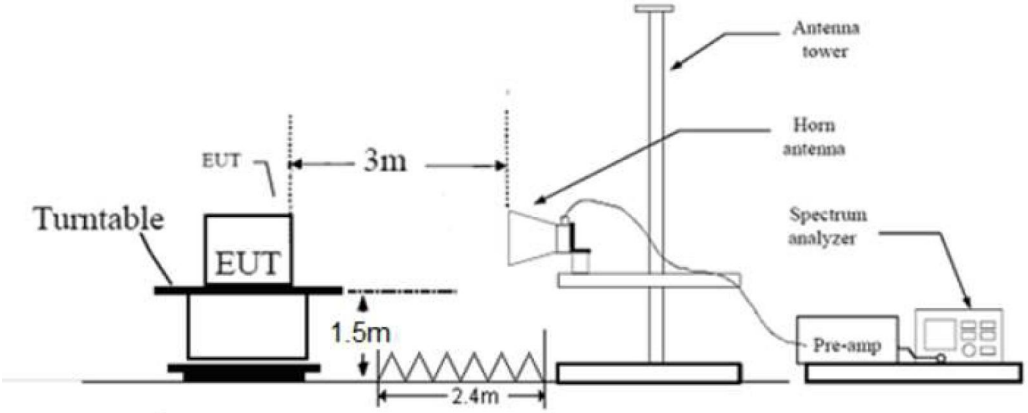
# 7 Test setups

## 7.1 Radiated test setups

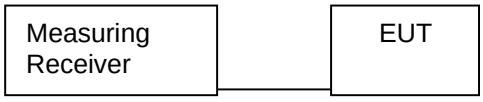
Below 1GHz



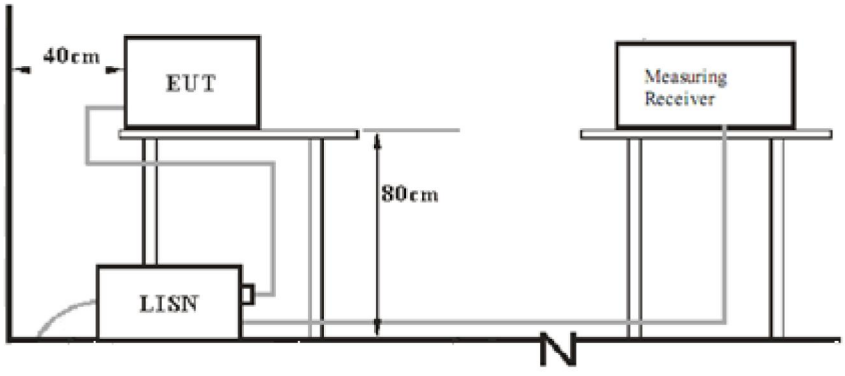

Above 1GHz




## 7.2 Conducted RF test setups




## 7.3 AC Power Line Conducted Emission test setups



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# 8 Technical Requirement

## 8.1 Conducted Emission

**Test Method**

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

**Limit**

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

*Decreasing linearly with logarithm of the frequency.


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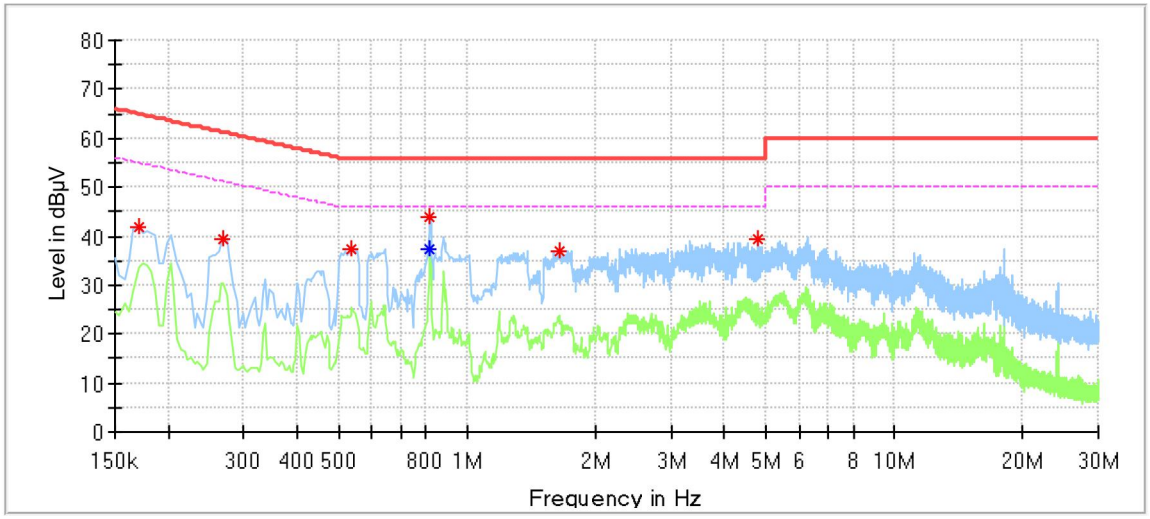
## Conducted Emission Test 0.15MHz – 30MHz

EUT: Wireless Receiver
M/N: AMW839R
Operating Condition: TX
Test Specification: Power Line, Live
Comment: 5VDC for Wireless receiver




# Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB/m) |
|---|---|---|---|---|---|---|
| 0.170000 | 41.96 | --- | 64.96 | 23.00 | L1 | 9.5 |
| 0.270000 | 39.41 | --- | 61.12 | 21.70 | L1 | 9.5 |
| 0.538000 | 37.50 | --- | 56.00 | 18.50 | L1 | 9.6 |
| 0.818000 | --- | 37.24 | 46.00 | 8.76 | L1 | 9.6 |
| 0.818000 | 43.83 | --- | 56.00 | 12.17 | L1 | 9.6 |
| 1.638000 | 37.07 | --- | 56.00 | 18.93 | L1 | 9.6 |
| 4.806000 | 39.25 | --- | 56.00 | 16.75 | L1 | 9.6 |

Remark:
Level=Reading Level + Correction Factor
Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)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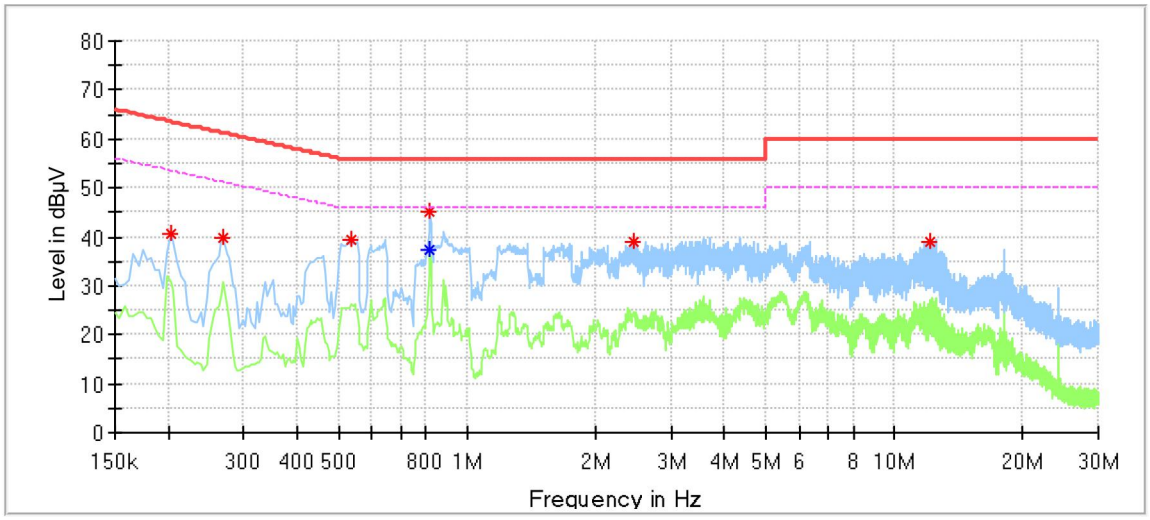
## Conducted Emission Test 0.15MHz – 30MHz

EUT: Wireless Receiver
M/N: AMW839R
Operating Condition: TX
Test Specification: Power Line, Neutral
Comment: 5VDC for Wireless receiver




# Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB/m) |
|---|---|---|---|---|---|---|
| 0.202000 | 40.43 | --- | 63.53 | 23.10 | N | 9.5 |
| 0.270000 | 39.66 | --- | 61.12 | 21.46 | N | 9.6 |
| 0.538000 | 39.21 | --- | 56.00 | 16.79 | N | 9.6 |
| 0.818000 | --- | 37.45 | 46.00 | 8.55 | N | 9.6 |
| 0.818000 | 45.31 | --- | 56.00 | 10.69 | N | 9.6 |
| 2.466000 | 39.12 | --- | 56.00 | 16.88 | N | 9.6 |
| 12.102000 | 39.03 | --- | 60.00 | 20.97 | N | 9.7 |

Remark:
Level=Reading Level + Correction Factor
Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)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## 8.2 Field strength of emissions and Restricted bands

**Test Method**

1: The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3-meter 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 from 0 degrees to 360 degrees to find the maximum reading.
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≥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≥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: Modify the unit for continuous operation: use the settings shown above, then correct the reading by subcontracting the peak to average duty cycle correction factor 20log (duty cycle), derived from the appropriate duty cycle calculation.


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# Field strength of emissions and Restricted bands

**Limits**

According to §15.249 (a) & RSS-210 A2.9(a) , the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|---|---|---|
| 902–928 MHz | 50 | 500 |
| 2400–2483.5 MHz | 50 | 500 |
| 5725–5875 MHz | 50 | 500 |
| 24.0–24.25 GHz | 250 | 2500 |

According to §15.249 (c), Field strength limits are specified at a distance of 3 meters.
According to §15.249 (d), Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.
According to §15.205 Unwanted emissions falling into restricted bands in §15.205 (a) shall comply with the limits specified in §15.209.

| Frequency MHz | Field Strength uV/m | Field Strength dBµV/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 |


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## Field strength of emissions and Restricted bands

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.

### Fundamental test result as below:

Low channel 2405MHz Test Result

| Radiated Emission | | | | | | | |
|---|---|---|---|---|---|---|---|
| Value | Emissions Frequency **MHz** | E-Field Polarity | Reading Level **dBµV/m** | Limit **dBµV/m** | Margin **dBm** | Correct factor **(dB/m)** | **Result** |
| PK | 2405 | H | 79.54 | 114.00 | 34.46 | -3.9 | Pass |
| AV | 2405 | H | 79.54 | 94.00 | 14.46 | -3.9 | Pass |
| PK | 2405 | V | 79.80 | 114.00 | 34.20 | -3.9 | Pass |
| AV | 2405 | V | 79.80 | 94.00 | 14.20 | -3.9 | Pass |

Middle channel 2451MHz Test Result

| Radiated Emission | | | | | | | |
|---|---|---|---|---|---|---|---|
| Value | Emissions Frequency **MHz** | E-Field Polarity | Reading Level **dBµV/m** | Limit **dBµV/m** | Margin **dBm** | Correct factor **(dB/m)** | **Result** |
| PK | 2451 | H | 77.15 | 114.00 | 36.85 | -3.8 | Pass |
| AV | 2451 | H | 77.15 | 94.00 | 16.85 | -3.8 | Pass |
| PK | 2451 | V | 78.31 | 114.00 | 35.69 | -3.8 | Pass |
| AV | 2451 | V | 78.31 | 94.00 | 15.69 | -3.8 | Pass |

High channel 2475MHz Test Result

| Radiated Emission | | | | | | | |
|---|---|---|---|---|---|---|---|
| Value | Emissions Frequency **MHz** | E-Field Polarity | Reading Level **dBµV/m** | Limit **dBµV/m** | Margin **dBm** | Correct factor **(dB/m)** | **Result** |
| PK | 2475 | H | 86.95 | 114.00 | 27.05 | -3.7 | Pass |
| AV | 2475 | H | 86.95 | 94.00 | 7.05 | -3.7 | Pass |
| PK | 2475 | V | 81.36 | 114.00 | 32.64 | -3.7 | Pass |
| AV | 2475 | V | 81.36 | 94.00 | 12.64 | -3.7 | Pass |


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**Transmitting spurious emission test result as below:**

Low channel 2405MHz Test Result

| Frequency Band | Frequency | Emission Level | Polarization | Limit | Detector | Margin | Correct factor | Result |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | | dBμV/m | | dBuV/m | (dB/m) | |
| 30-1000MHz | 965.40 | 39.60 | H | 46 | QP | 14.40 | 26.2 | Pass |
| | 296.91 | 36.88 | V | 46 | QP | 9.12 | 14.9 | Pass |
| 1000-25000MHz | 4901.5 | 59.01 | H | 74 | PK | 14.99 | 2.6 | Pass |
| | 4901.5 | 50.31 | H | 54 | AV | 3.69 | 2.6 | Pass |
| | 4903.5 | 55.53 | V | 74 | PK | 18.47 | 2.5 | Pass |
| | 4903.5 | 50.53 | V | 54 | AV | 3.47 | 2.5 | Pass |

Middle channel 2451MHz Test Result

| Frequency Band | Frequency | Emission Level | Polarization | Limit | Detector | Margin | Correct factor | Result |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | | dBμV/m | | dBuV/m | (dB/m) | |
| 30-1000MHz | -- | -- | H | 43.5 | QP | -- | -- | Pass |
| | -- | -- | H | 46 | QP | -- | -- | Pass |
| 1000-25000MHz | 4903.5 | 59.13 | H | 74 | PK | 14.87 | 2.5 | Pass |
| | 4903.5 | 50.02 | H | 54 | AV | 3.98 | 2.5 | Pass |
| | 4901.5 | 57.65 | V | 74 | PK | 16.35 | 2.6 | Pass |
| | 4901.5 | 50.01 | V | 54 | AV | 3.99 | 2.6 | Pass |

High channel 2475MHz Test Result

| Frequency Band | Frequency | Emission Level | Polarization | Limit | Detector | Margin | Correct factor | Result |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | | dBμV/m | | dBuV/m | (dB/m) | |
| 30-1000MHz | -- | -- | H | 43.5 | QP | -- | -- | Pass |
| | -- | -- | H | 46 | QP | -- | -- | Pass |
| 1000-25000MHz | 4949.5 | 58.62 | H | 74 | PK | 15.38 | 1.6 | Pass |
| | 4949.5 | 50.26 | H | 54 | AV | 3.74 | 1.6 | Pass |
| | 4951.5 | 55.33 | V | 74 | PK | 18.67 | 1.5 | Pass |
| | 4951.5 | 50.11 | V | 54 | AV | 3.89 | 1.5 | Pass |


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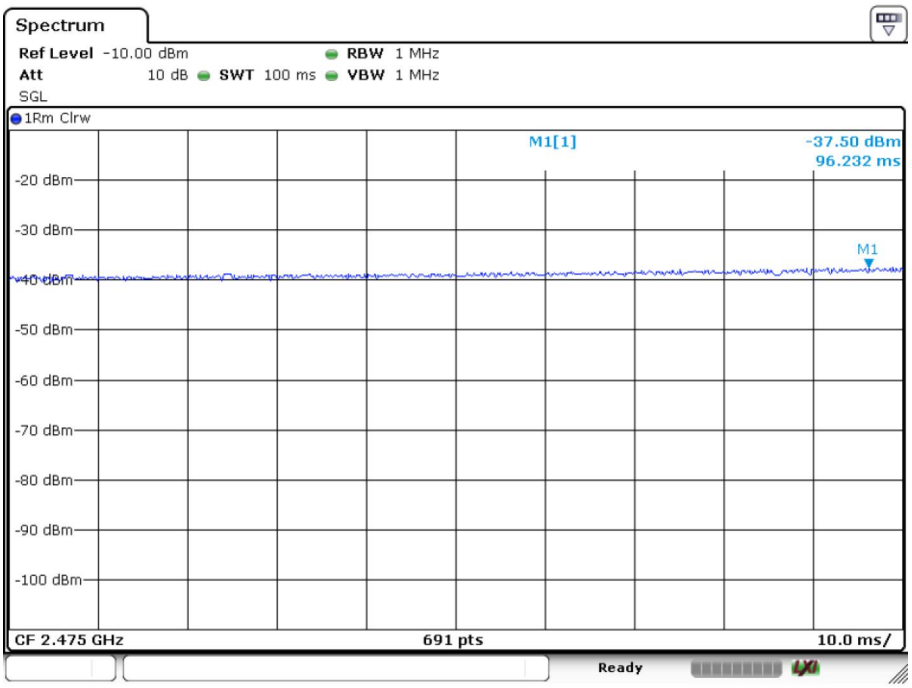
Duty cycle=100%
Peak to average duty cycle correction factor =20log(duty cycle)=0




Remark:

(1) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(2) Corrected Amplitude= Read level + Corrector factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Pre-amplifier
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

(3) AV Emission = Average Reading Level + Correction Factor (for duty cycle≥98%)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## 8.3 Out of Band Emissions

**Test Method**

1 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≥RBW, Sweep = auto, Detector function = peak, Trace = max hold.
2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
3 The level displayed must comply with the limit specified in this Section.

**Limits**

According to §15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.


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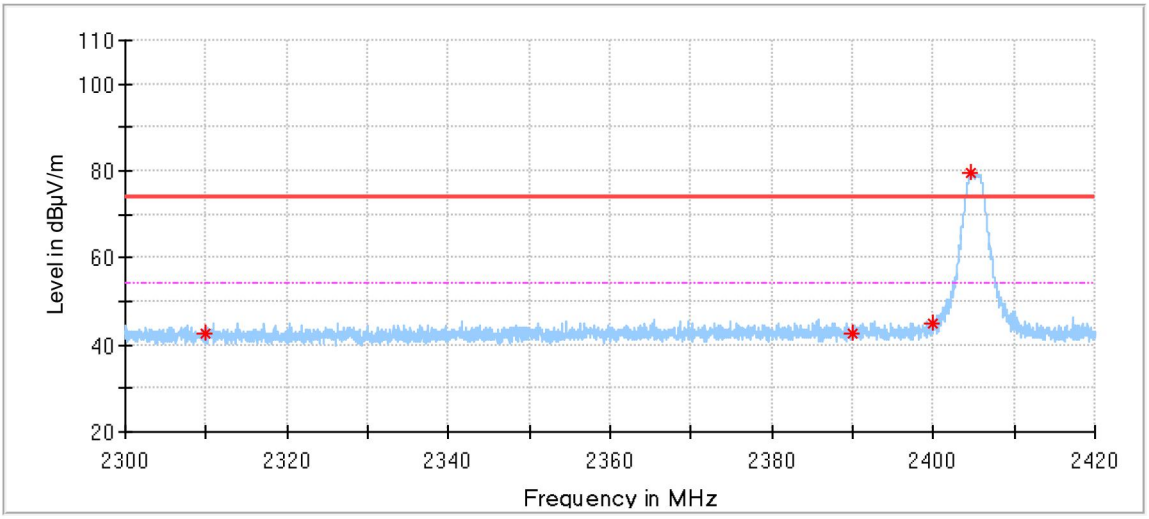
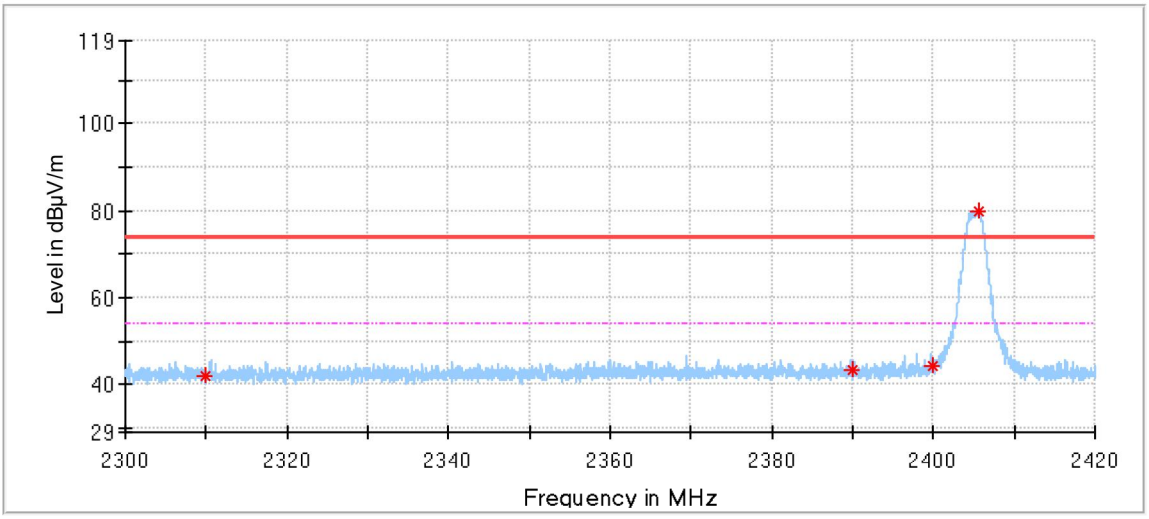
## Out of Band Emissions

2405MHz




## Critical_Freqs

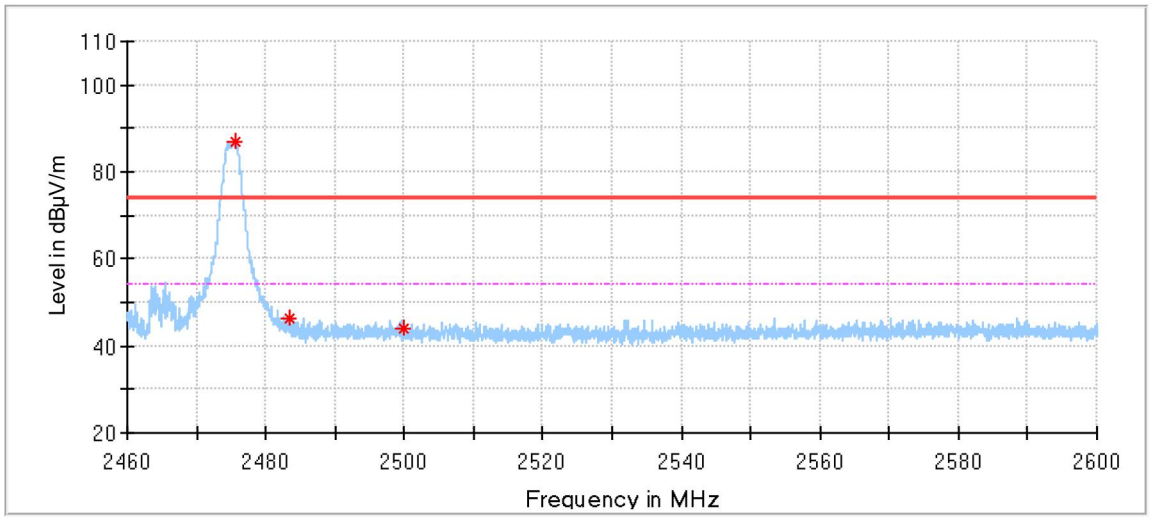
| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2309.990000 | 42.55 | 74.00 | 31.45 | 150.0 | H | 256.0 | -4.2 |
| 2390.000000 | 42.76 | 74.00 | 31.24 | 150.0 | H | 262.0 | -3.9 |
| 2400.020000 | 44.93 | 74.00 | 29.07 | 150.0 | H | 280.0 | -3.9 |
| 2404.670000 | 79.54 | 74.00 | -5.54 | 150.0 | H | 223.0 | -3.9 |




## Critical_Freqs

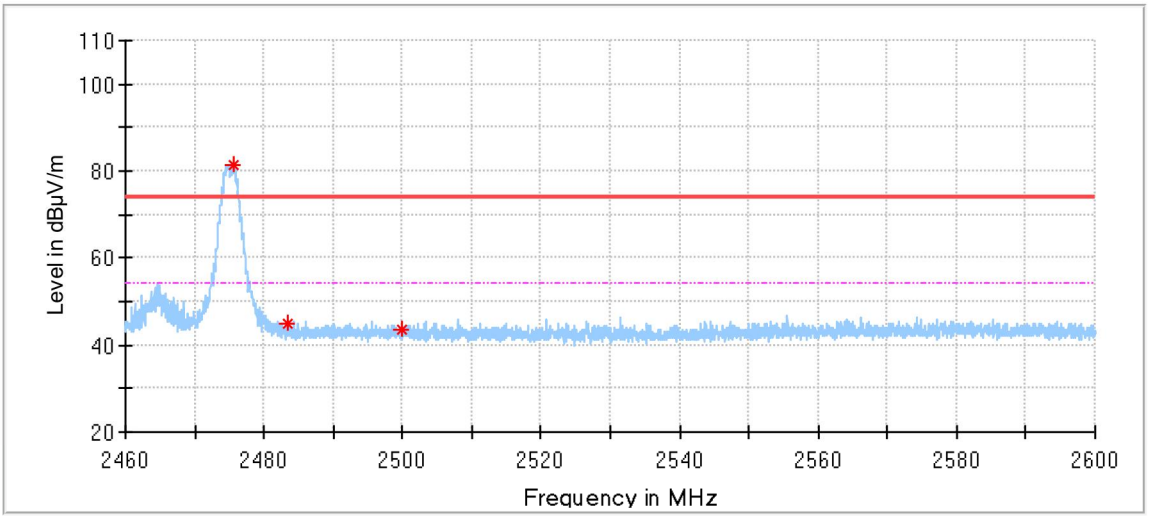
| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2309.990000 | 42.02 | 74.00 | 31.98 | 150.0 | V | 288.0 | -4.2 |
| 2390.000000 | 43.35 | 74.00 | 30.65 | 150.0 | V | 149.0 | -3.9 |
| 2399.990000 | 44.32 | 74.00 | 29.68 | 150.0 | V | 356.0 | -3.9 |
| 2405.630000 | 79.80 | 74.00 | -5.80 | 150.0 | V | 317.0 | -3.9 |

2475MHz




## Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2475.505000 | 86.95 | 74.00 | -12.95 | 150.0 | H | 43.0 | -3.7 |
| 2483.485000 | 46.42 | 74.00 | 27.58 | 150.0 | H | 148.0 | -3.7 |
| 2499.970000 | 43.85 | 74.00 | 30.15 | 150.0 | H | 82.0 | -3.7 |




## Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2475.645000 | 81.36 | 74.00 | -7.36 | 150.0 | V | 208.0 | -3.7 |
| 2483.450000 | 44.75 | 74.00 | 29.25 | 150.0 | V | 247.0 | -3.7 |
| 2499.970000 | 43.53 | 74.00 | 30.47 | 150.0 | V | 269.0 | -3.7 |



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## 8.4 20dB Bandwidth & 99% Occupied Bandwidth

**Test Method**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to spectrum analyser. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20dB/99% from the reference level. Record the frequency difference as the emission bandwidth.

**Limits:**

According to 15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.


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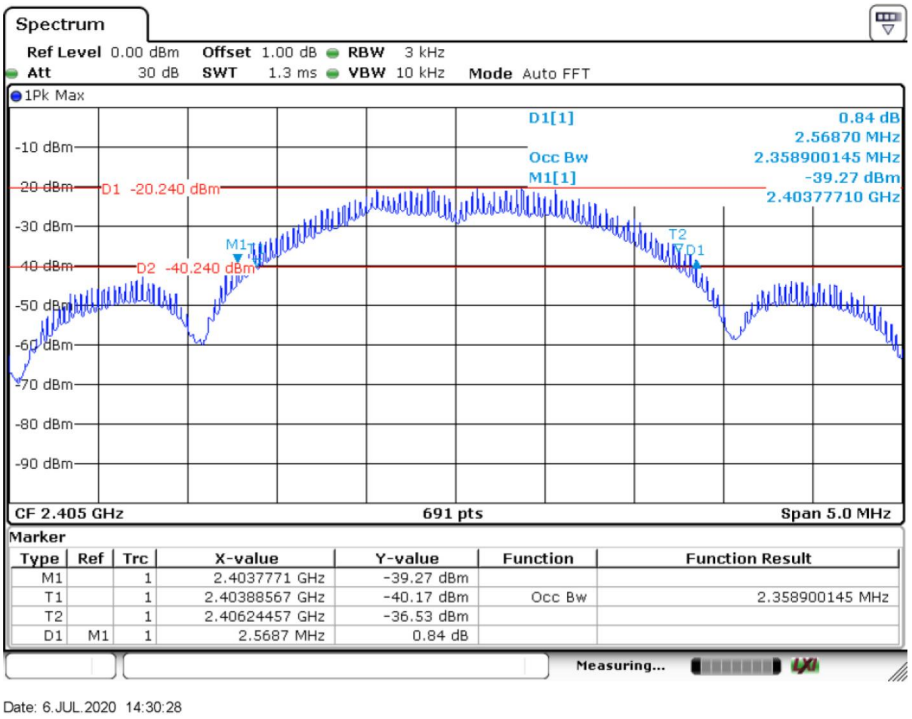
## 20dB Bandwidth & 99% Occupied Bandwidth

| Frequency | 20dB Bandwidth | 99% Bandwidth | Limit |
|---|---|---|---|
| MHz | MHz | MHz | MHz |
| 2405 | 2.569 | 2.359 | -- |




2405MHz



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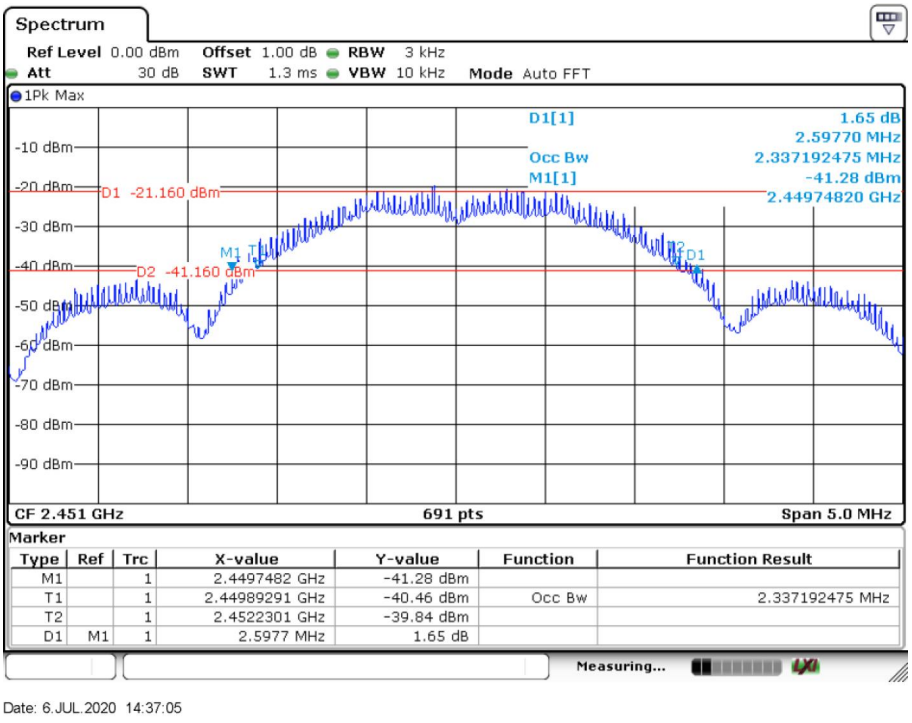
## 20dB Bandwidth & 99% Occupied Bandwidth

| Frequency | 20dB Bandwidth | 99% Bandwidth | Limit |
|---|---|---|---|
| MHz | MHz | MHz | MHz |
| 2451 | 2.598 | 2.337 | -- |




2451MHz



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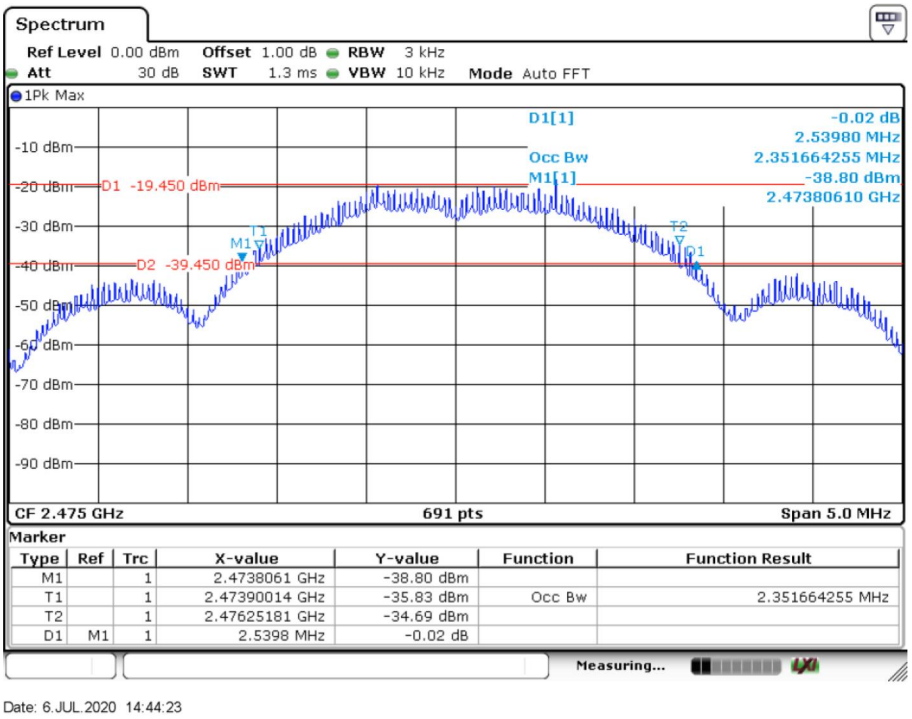
## 20dB Bandwidth & 99% Occupied Bandwidth

| Frequency | 20dB Bandwidth | 99% Bandwidth | Limit |
|---|---|---|---|
| MHz | MHz | MHz | MHz |
| 2475 | 2.540 | 2.352 | -- |




2475MHz



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# 9 Test equipment lists

## List of Test Instruments

### Radiated Spurious Emission Test

| Description | Manufacturer | Model no. | Equipment ID | Serial no. | cal interval (year) | cal. due date |
|---|---|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESR 7 | 68-4-74-19-001 | 102176 | 1 | 2021-6-29 |
| Trilog Super Broadband Test Antenna | Schwarzbeck | VULB 9163 | 68-4-80-14-002 | 707 | 1 | 2021-8-4 |
| Horn Antenna | Rohde & Schwarz | HF907 | 68-4-80-14-005 | 102294 | 1 | 2021-7-14 |
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 68-4-80-14-006 | 100398 | 1 | 2021-7-7 |
| Pre-amplifier | Rohde & Schwarz | SCU 18 | 68-4-29-14-001 | 102230 | 1 | 2021-6-21 |
| Attenuator | Agilent | 8491A | 68-4-81-16-001 | MY39264334 | 1 | 2021-6-21 |
| 3m Semi-anechoic chamber | TDK | 9X6X6 | 68-4-90-14-001 | ---- | 3 | 2022-10-28 |
| Test software | Rohde & Schwarz | EMC32 | 68-4-90-14-001-A10 | Version10.35.02 | N/A | N/A |

### Conducted Emission Test

| Description | Manufacturer | Model no. | Equipment ID | Serial no. | cal interval (year) | cal. due date |
|---|---|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESR 3 | 68-4-74-14-001 | 101782 | 1 | 2021-6-29 |
| LISN | Rohde & Schwarz | ENV4200 | 68-4-87-14-001 | 100249 | 1 | 2021-6-12 |
| LISN | Rohde & Schwarz | ENV432 | 68-4-87-16-001 | 101318 | 1 | 2021-6-12 |
| LISN | Rohde & Schwarz | ENV216 | 68-4-87-14-002 | 100326 | 1 | 2021-6-12 |
| LISN | Rohde & Schwarz | ENV216 | 68-4-87-19-001 | 102472 | 1 | 2021-6-12 |
| ISN | Rohde & Schwarz | ENY81 | 68-4-87-14-003 | 100177 | 1 | 2021-6-12 |
| ISN | Rohde & Schwarz | ENY81-CA6 | 68-4-87-14-004 | 101664 | 1 | 2021-6-12 |
| High Voltage Probe | Schwarzbeck | TK9420(VT9420) | 68-4-27-14-001 | 9420-584 | 1 | 2021-6-23 |
| RF Current Probe | Rohde & Schwarz | EZ-17 | 68-4-27-14-002 | 100816 | 1 | 2021-6-28 |
| Attenuator | Shanghai Huaxiang | TS2-26-3 | 68-4-81-16-003 | 080928189 | 1 | 2021-6-21 |
| Test software | Rohde & Schwarz | EMC32 | 68-4-90-14-003-A10 | Version9.15.00 | N/A | N/A |
| Shielding Room | TDK | CSR #1 | 68-4-90-19-004 | ---- | 1 | 2020-11-07 |

### RF Conducted Test

| Description | Manufacturer | Model no. | Equipment ID | Serial no. | cal interval (year) | cal. due date |
|---|---|---|---|---|---|---|
| Signal Analyzer | Rohde & Schwarz | FSV40 | 68-4-74-14-004 | 101030 | 1 | 2021-6-21 |


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# 10 System Measurement Uncertainty

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

| System Measurement Uncertainty | |
|---|---|
| Test Items | Extended Uncertainty |
| Uncertainty for Conducted Emission 150kHz-30MHz (for test using AMN ENV432 or ENV4200) | 3.21dB |
| Uncertainty for Radiated Emission in 3m chamber (68-4-90-14-001) 30MHz-1000MHz | Horizontal: 5.12dB;<br>Vertical: 5.10dB; |
| Uncertainty for Radiated Emission in 3m chamber (68-4-90-14-001) 1000MHz-18000MHz | Horizontal: 5.01dB;<br>Vertical: 5.00dB; |
| Uncertainty for Conducted RF test with TS 8997 | RF Power Conducted: 1.16dB<br>Frequency test involved:<br>$0.6\times10^{-7}$ or 1% |



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