# TEST REPORT

| | |
|---|---|
| **Report No.:** | 8234EU012110W1 |
| **Applicant:** | Shenzhen Gaoyi Electronic Co.,Ltd |
| **Address:** | Room 701 7th Floor, Building F, Huafeng Industrial Zone, Hangcheng Road Xixiang Town, Bao An District, Shenzhen, China |
| **Product Name:** | Wireless Car Charger |
| **Model No.:** | X34 (refer to clause 2.4) |
| **Trademark:** | N/A |
| **FCC ID:** | 2A6IU-X34 |
| **Test Standard(s):** | 47 CFR Part 15 Subpart C |
| **Date of Receipt:** | Oct. 21, 2024 |
| **Test Date:** | Oct. 21, 2024 – Nov. 06, 2024 |
| **Date of Issue:** | Nov. 11, 2024 |

**ISSUED BY:**

SHENZHEN EU TESTING LABORATORY LIMITED

SHENZHEN EU TESTING LABORATORY LIMITED APPROVED

| **Prepared by:** | **Reviewed and Approved by:** |
|---|---|
| Mikey Zhu/ Engineer | Sally Zhang/ Manager |

# Revision Record

| Report Version | Issued Date | Description | Status |
|---|---|---|---|
| V0 | Nov. 11, 2024 | Original | Valid |
| | | | |
| | | | |

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# 2 General Information

## 2.1 Applicant Information

| | |
|---|---|
| Applicant | Shenzhen Gaoyi Electronic Co.,Ltd |
| Address | Room 701 7th Floor, Building F, Huafeng Industrial Zone, Hangcheng Road Xixiang Town, Bao An District, Shenzhen, China |

## 2.2 Manufacturer Information

| | |
|---|---|
| Manufacturer | Dongguan Gaoyi Electronic Co.,Ltd |
| Address | No.4, Changsheng Street, Tianmei Village, Huangjiang Town, Dongguan City, Guangdong Province, China |

## 2.3 Factory Information

| | |
|---|---|
| Factory | Dongguan Gaoyi Electronic Co.,Ltd |
| Address | No.4, Changsheng Street, Tianmei Village, Huangjiang Town, Dongguan City, Guangdong Province, China |

## 2.4 General Description of E.U.T.

| | |
|---|---|
| Product Name | Wireless Car Charger |
| Model No. Under Test | X34 |
| List Model No. | X34C, X34-QI2, 34A, X34B, X34D, X34S |
| Description of Model differentiation | All models are same with electrical parameters and internal circuit structure, but only differ in appearance colors and model name.<br>(this information provided by the customer) |
| Rating(s) | Input: 5.0V⎓3.0A/9.0V⎓2.22A<br>Wireless Charger Output: 5W/7.5W/10W/15W |
| Product Type | ☒ Mobile<br>☐ Portable<br>☐ Fix Location |
| Test Sample No. | -1/2(Normal Sample), -2/2(Engineering Sample) |
| Hardware Version | N/A |
| Software Version | N/A |
| Remark | For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. |

## 2.5 Technical Information of E.U.T.

| | |
|---|---|
| Technology Used | Wireless Power Transfer |

The requirement for the following technical information of the EUT was tested in this report:

| | |
|---|---|
| Technology | **WPT** |
| Operating Frequency | 110.1-205KHz |
| Modulation Type | FSK |
| Antenna Type | Inductive Loop Antenna |
| Antenna Gain(Peak) | 0 dBi |
| Remark | The above information are declared by the applicant, EU-LAB is not responsible for the information accuracy provided by the applicant. |

# 3 Test Summary

## 3.1 Test Standard

The tests were performed according to following standards:

| No. | Identity | Document Title |
|---|---|---|
| 1 | 47 CFR Part 15, Subpart C | Intentional radiators of radio frequency equipment |
| 2 | ANSI C63.10-2020 | American National Standard for Testing Unlicensed Wireless Devices |

Remark:
Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

## 3.2 Test Verdict

| No. | Description | FCC Part No. | Verdict | Remark |
|---|---|---|---|---|
| 1 | Antenna Requirement | 15.203 | Pass | -- |
| 2 | Conducted Emission at AC Power Line | 15.207 | N/A | -- |
| 3 | Emissions Bandwidth | 15.215 | Pass | -- |
| 4 | Radiated Emissions | 15.209 /15.215(b) | Pass | -- |
| Note:<br>(1) “N/A” denotes test is not applicable in this Test Report. | | | | |

## 3.3 Test Laboratory

| | |
|---|---|
| Test Laboratory | Shenzhen EU Testing Laboratory Limited |
| Address | 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China |
| Designation Number | CN1368 |
| Test Firm Registration Number | 952583 |

# 4 Test Configuration

## 4.1 Test Environment

During the measurement, the normal environmental conditions were within the listed ranges:

| | | |
|---|---|---|
| Relative Humidity | 30% to 60% | |
| Atmospheric Pressure | 86 kPa to 106 kPa | |
| Temperature | NT (Normal Temperature) | +15℃ to +35℃ |
| Working Voltage of the EUT | NV (Normal Voltage) | 24 V |

## 4.2 Test Equipment

| Conducted Emission at AC power line | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Serial No** | **Cal Date** | **Cal Due Date** |
| L.I.S.N. Artificial Mains Network | Rohde & Schwarz | ENV216 | EE-004 | 2024/01/09 | 2025/01/08 |
| EMI Test Receiver | Rohde & Schwarz | ESCI | EE-005 | 2024/01/09 | 2025/01/08 |
| Test Software | Farad | EZ-EMC | EE-014 | N.C.R | N.C.R |

| Radiated Emission and RF Test | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Serial No** | **Cal Date** | **Cal Due Date** |
| EMI Test Receiver | ROHDE & SCHWARZ | ESPI | EE-006 | 2024/01/09 | 2025/01/08 |
| Bilog Broadband Antenna | SCHWARZBECK | VULB 9163 | EE-007 | 2023/01/14 | 2026/01/13 |
| Double Ridged Horn Antenna | A-INFOMW | LB-10180-NF | EE-008 | 2023/01/12 | 2026/01/11 |
| Pre-amplifier | Agilent | 8447D | EE-009 | 2024/01/09 | 2025/01/08 |
| Pre-amplifier | Agilent | 8449B | EE-010 | 2024/01/09 | 2025/01/08 |
| MXA Signal Analyzer | Agilent | N9020A | EE-011 | 2024/01/09 | 2025/01/08 |
| MXG RF Vector Signal Generator | Agilent | N5182A | EE-012 | 2024/01/09 | 2025/01/08 |
| Test Software | Farad | EZ-EMC | EE-015 | N.C.R | N.C.R |
| MIMO Power Measurement Module | TSTPASS | TSPS 2023R | EE-016 | 2024/01/09 | 2025/01/08 |
| RF Test Software | TSTPASS | TS32893 V2.0 | EE-017 | N.C.R | N.C.R |
| Wideband Radio Communication Tester | ROHDE & SCHWARZ | CMW500 | EE-402 | 2024/02/15 | 2025/02/14 |
| Loop Antenna | TESEQ | HLA6121 | EE-403 | 2024/02/15 | 2025/02/14 |
| MXG RF Analog Signal Generator | Agilent | N5181A | EE-406 | 2024/02/15 | 2025/02/14 |
| Constant Temperature Humidity Chamber | Guangxin | GXP-401 | ES-002 | 2024/07/30 | 2025/07/29 |

## 4.3 Description of Support Unit

| No. | Title | Manufacturer | Model No. | Serial No. |
|---|---|---|---|---|
| 1 | DC Power Source | QJE | QJ3020E | -- |
| 2 | Wireless Charging Load | YBZ | ID-ZWX | -- |
| 3 | Mobile Phone | OnePlus | ACE2 | -- |

## 4.4 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned bellow was evaluated respectively.

| No. | Description | Remark |
|---|---|---|
| TM1 | Wireless Output (5W) | |
| TM2 | Wireless Output (7.5W) | |
| TM3 | Wireless Output (10W) | |
| TM4 | Wireless Output (15W) | |
| TM5 | Standby | |
| Note:<br>1. All the conditions have been tested. It is found that TM4 is the worst mode, and the data in the report only reflects the worst mode. | | |

## 4.5 Description of Calculation

### 4.5.1. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

**FS (dBuV/m) = RA (dBuV) + AF (dB/m) + CL (dB) – AG (dB)**

| | | |
|---|---|---|
| Where | FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| | RA = Reading Amplitude | AG = Amplifier Gain |
| | AF = Antenna Factor | |

### 4.5.2. Disturbance Calculation

The AC mains conducted disturbance is calculated by adding the 10dB Pulse Limiter and Cable Factor and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

**CD (dBuV) = RA (dBuV) + PL (dB) + CL (dB)**

| | | |
|---|---|---|
| Where | CD = Conducted Disturbance | CL = Cable Attenuation Factor (Cable Loss) |
| | RA = Reading Amplitude | PL = 10 dB Pulse Limiter Factor |

## 4.6 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| Test Item | Measurement Uncertainty |
|---|---|
| Conducted Emission | 2.64 dB |
| Occupied Channel Bandwidth | 2.8 % |
| RF output power, conducted | 0.68 dB |
| Power Spectral Density, conducted | 1.37 dB |
| Unwanted Emissions, conducted | 1.84 dB |
| Radiated Emission (9kHz- 30MHz) | Ur = 2.50 dB |
| Radiated Emission (30MHz- 1GHz) | Ur = 2.70 dB (Horizontal) |
| | Ur = 2.70 dB (Vertical) |
| Radiated Emission (1GHz- 18GHz) | Ur = 3.50 dB (Horizontal) |
| | Ur = 3.50 dB (Vertical) |
| Radiated Emission (18GHz- 40GHz) | Ur = 5.15 dB (Horizontal) |
| | Ur = 5.24 dB (Vertical) |
| Temperature | 0.8°C |
| Humidity | 4% |

## 4.7 Deviation from Standards

None.

## 4.8 Abnormalities from Standard Condition

None.


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# 5 Test Items

## 5.1 Antenna requirement

### 5.1.1 Test Requirement

| | |
|---|---|
| Test Requirement | According to FCC §15.203, 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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.<br><br>If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule. |

### 5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

| Protected Method | Description |
|---|---|
| The antenna is embedded in the product. | The EUT has a permanently and irreplaceable inductive loop antenna. |

### 5.1.3 Antenna Gain

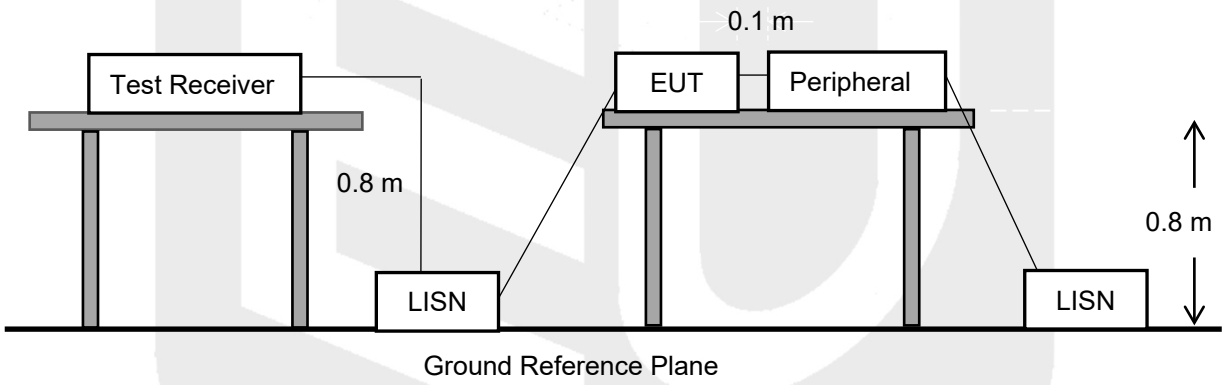
The antenna peak gain of EUT is less than 6 dBi.

## 5.2 Conducted Emission at AC Power Line

### 5.2.1 Test Requirement

| | |
|---|---|
| Test Requirement: | Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). |
| Test Limit | Frequency of emission (MHz) / Conducted limit (dBμV): Quasi-peak / Average<br>0.15-0.5: 66 to 56* / 56 to 46*<br>0.5-5: 56 / 46<br>5-30: 60 / 50<br>*Decreases with the logarithm of the frequency. |
| Test Method | Refer to ANSI C63.10-2020 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices. |

### 5.2.2 Test Setup Diagram




### 5.2.3 Test Procedure

The EUT is put on the plane 0.8 m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipment. Both sides of AC line are investigated to find out the maximum conducted emission according to the test standard regulations during conducted emission measurement.
The bandwidth of the field strength meter (R&S Test Receiver ESCI) is set at 9kHz in 150kHz~30MHz.
The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.
Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

### 5.2.4 Test Data

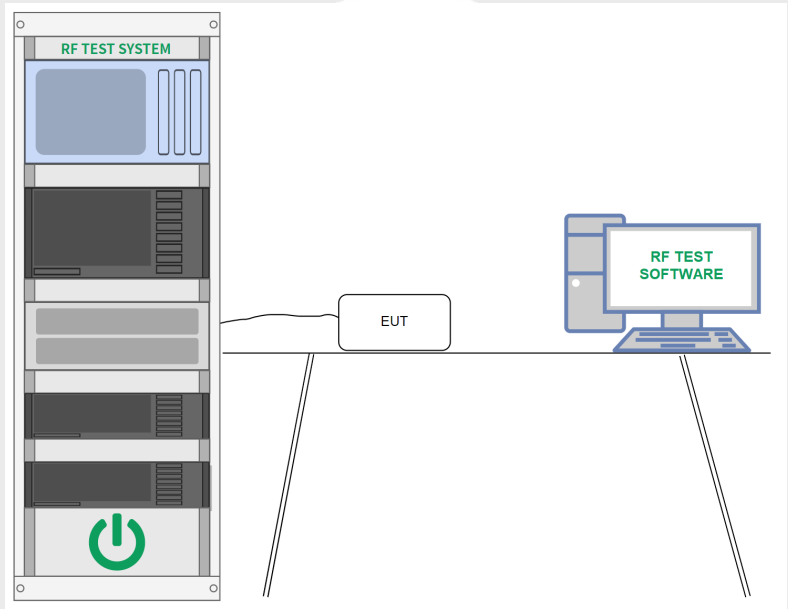
**Not applicable.**
The EUT can't be connected to AC power line, so there is no need to conduct this test item.

## 5.3 Emissions Bandwidth

### 5.3.1 Test Requirement

| | |
|---|---|
| Test Requirement | 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. |
| Test Method | ANSI C63.10-2020, section 6.9.2<br>Occupied bandwidth—relative measurement procedure |

### 5.3.2 Test Setup Diagram



### 5.3.3 Test Procedure

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.
d) Steps a) through c) might require iteration to adjust within the specified tolerances.
e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "−xx dB down" requirement; that is, if the requirement calls for measuring the −20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the
reference value.
f) Set detection mode to peak and trace mode to max hold.
g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
h) Determine the "−xx dB down amplitude" using [(reference value) − xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.
i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j).
j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "-xx dB down amplitude" determined in step h). If a marker is below this "−xx dB down amplitude" value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the "-xx dB down amplitude" determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.
k)The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

### 5.3.4 Test Data

**PASS.**

Please refer to the following pages.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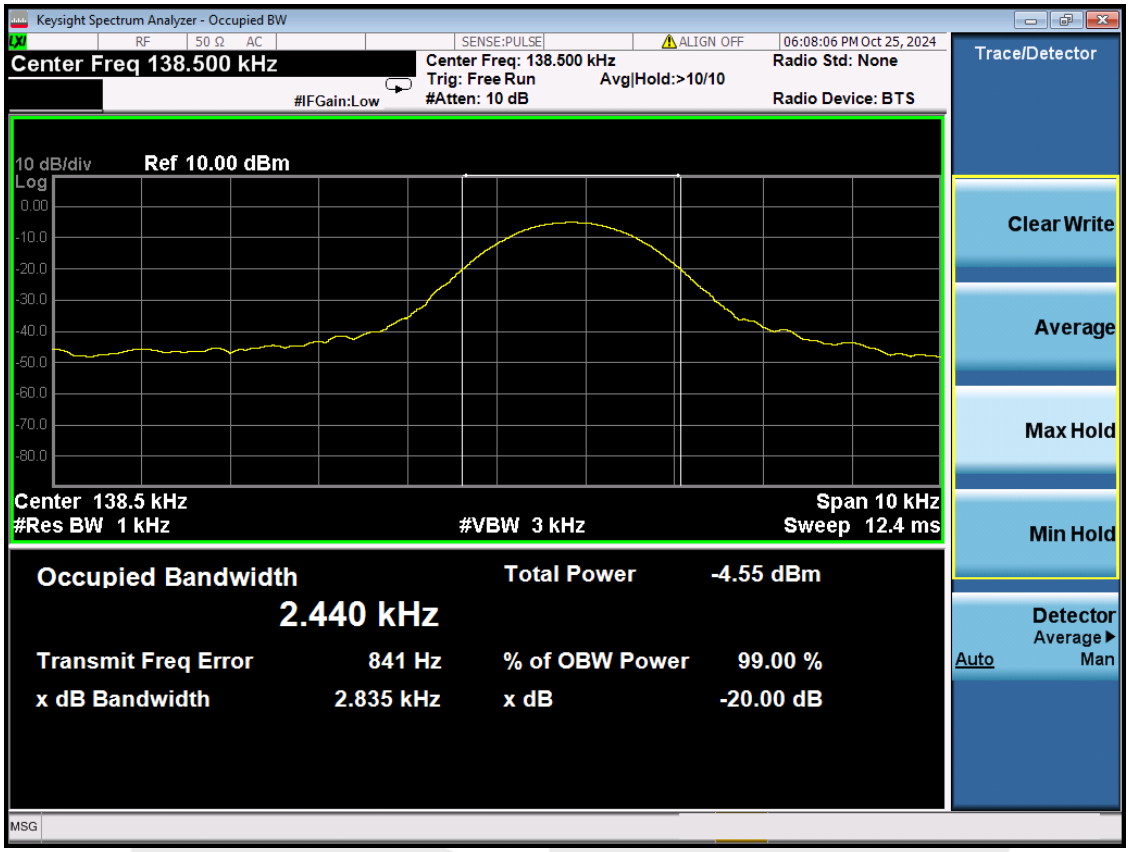
| Frequency (KHz) | 20dB bandwidth (kHz) | 99% bandwidth (kHz) | Result |
|---|---|---|---|
| 138.5 | 2.835 | 2.440 | Pass |



## 5.4 Field Strength of Fundamental Emissions and Radiated Emission

### 5.4.1 Test Requirement

<table>
<tr><td>Test Requirement</td><td>FCC §15.225; FCC §15.209</td></tr>
<tr><td>Test Limit</td><td>According to FCC section 15.225, for <30 MHz, Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmit at the highest output power. The EUT was set 10 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10 kHz. (Note: During testing the receive antenna was rotated about its axis to maximize the emission from the EUT)<br>There was no detected Restricted bands and Radiated spurious emission below 30MHz. The 30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows;<br>3 m Limit(dBμV/m) = 20log(X)+40log(30/3)= 20log(15848)+40log(30/3) = 124dBμV<br>Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Field Strength@30m</td><td>Field Strength@3m</td></tr>
<tr><td>μV/m</td><td>dBμV/m</td><td>dBμV/m</td></tr>
<tr><td>Below 13.110</td><td>30</td><td>29.5</td><td>69.5</td></tr>
<tr><td>13.110 ~ 13.410</td><td>106</td><td>40.5</td><td>80.5</td></tr>
<tr><td>13.410 ~ 13.553</td><td>334</td><td>50.5</td><td>90.5</td></tr>
<tr><td>13.553 ~13.567</td><td>15848</td><td>84</td><td>124</td></tr>
<tr><td>13.567 ~ 13.710</td><td>334</td><td>50.5</td><td>90.5</td></tr>
<tr><td>13.710 ~14.010</td><td>106</td><td>40.5</td><td>80.5</td></tr>
<tr><td>Above 14.010</td><td>30</td><td>29.5</td><td>69.5</td></tr>
</table>
NOTE:<br>1. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].<br>2. In the emission tables above, the tighter limit applies at the band edges.<br><br>FCC §15.225(d)<br>According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:
<table>
<tr><td>Frequency (MHz)</td><td>Field strength (microvolts/meter)</td><td>Measurement distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.<br>NOTE:<br>1. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].<br>2. In the emission tables above, the tighter limit applies at the band edges.</td></tr>
<tr><td>Test Method</td><td>ANSI C63.10-2020 section 6.6.4<br>Radiated emissions tests</td></tr>
</table>

### 5.4.2 Test Setup Diagram

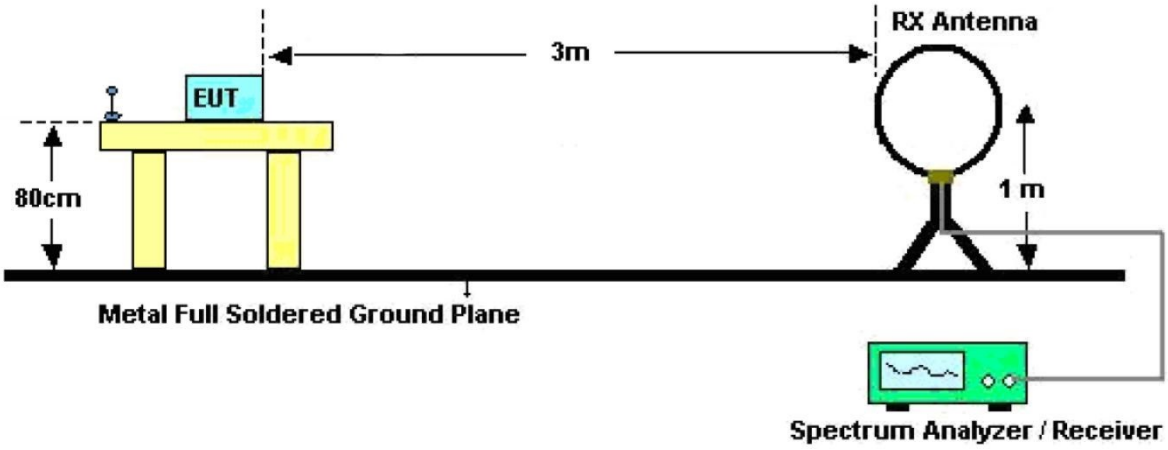



Figure 1. Below 30MHz

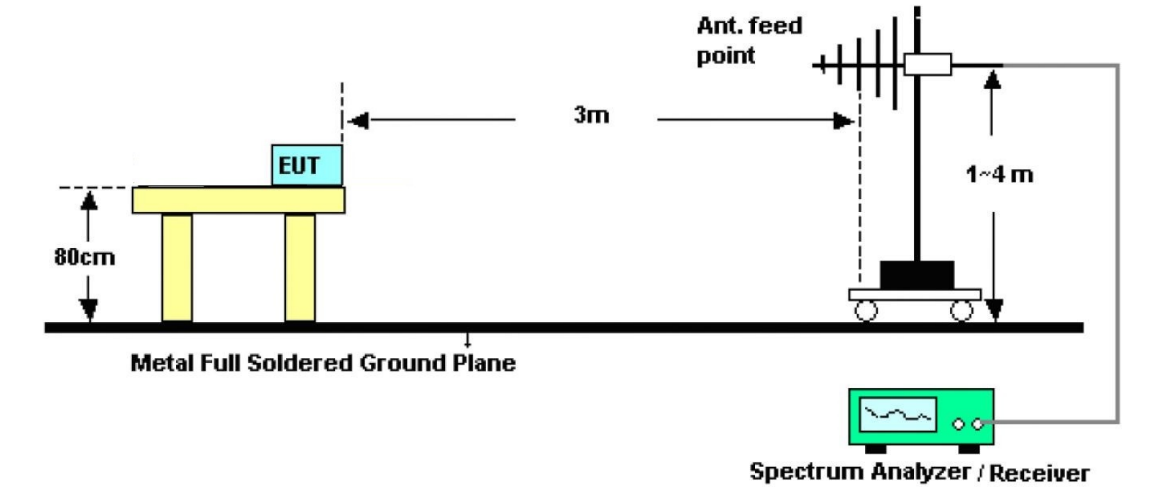



Figure 2. 30MHz to 1GHz

### 5.4.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power.
The power of the EUT transmitting frequency should be ignored.
All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.
Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured
For 9kHz to 150kHz, Set the spectrum analyzer as:
RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:
RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:
RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz,Set the spectrum analyzer as:
RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.
RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

### 5.4.4 Test Data

**PASS.**

Please refer to the following pages.
The frequency range from 9KHz to 1000MHz is checked.
Only the worst case data was showed in the report, please to see the following pages.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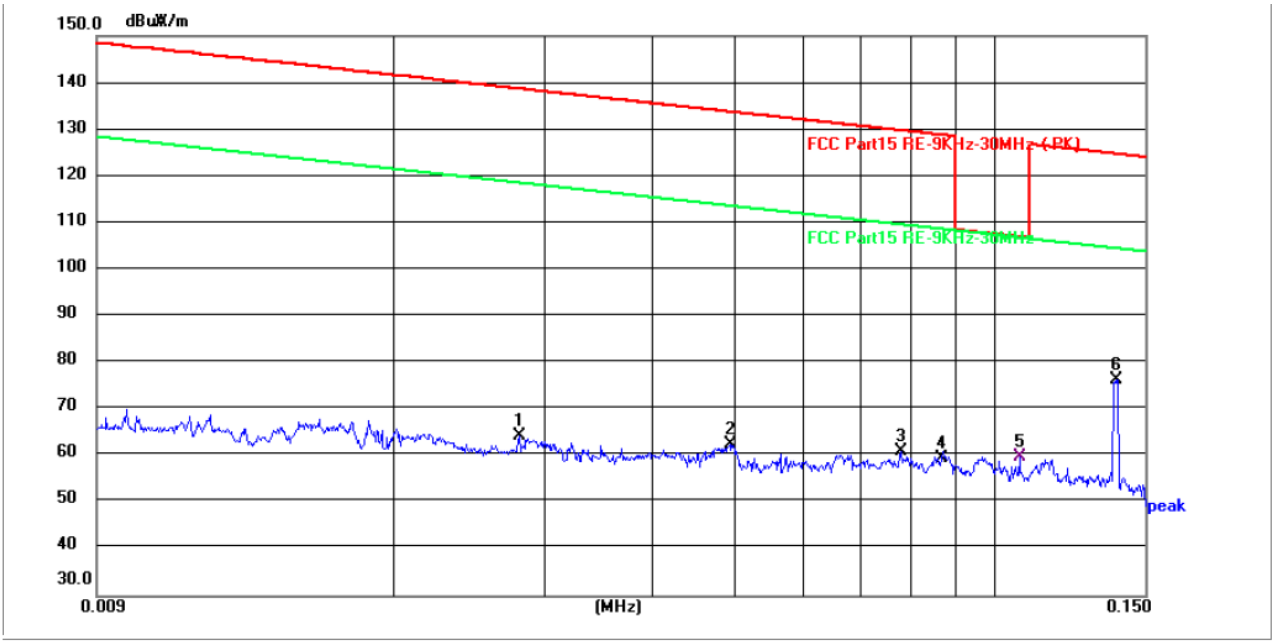
**Radiated Emission Test Data (9kHz -150kHz)**

| | | | |
|---|---|---|---|
| **Test item:** | **966 Chamber #1** | **Polarization:** | **Coaxial** |
| **Distance:** | **3m** | **Test Mode:** | **TM4** |

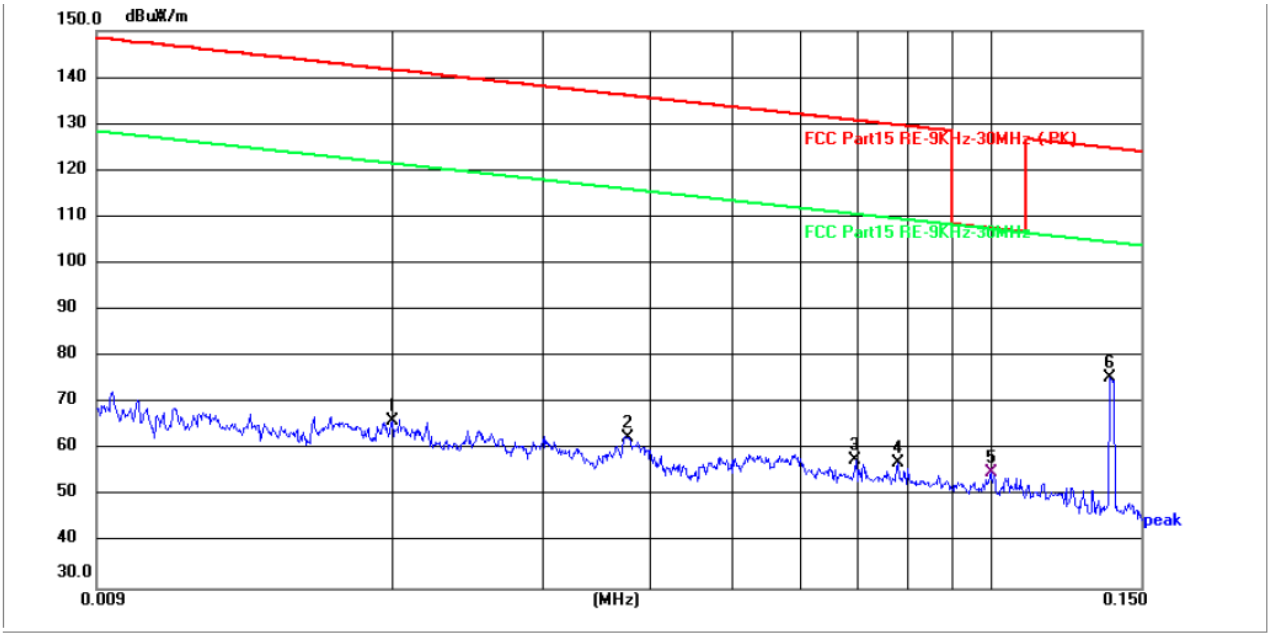



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0280 | 44.55 | 19.81 | 64.36 | 138.66 | -74.30 | peak | P | |
| 2 | 0.0492 | 42.54 | 19.93 | 62.47 | 133.77 | -71.30 | peak | P | |
| 3 | 0.0777 | 41.11 | 19.94 | 61.05 | 129.80 | -68.75 | peak | P | |
| 4 | 0.0870 | 39.64 | 19.94 | 59.58 | 128.81 | -69.23 | peak | P | |
| 5 * | 0.1070 | 39.69 | 20.03 | 59.72 | 107.02 | -47.30 | QP | P | |
| 6 | 0.1386 | 56.46 | 20.00 | 76.46 | 124.77 | -48.31 | peak | P | |

**Note: Level = Reading + Factor Margin =Level - Limit**

**Radiated Emission Test Data (9kHz -150kHz)**

| | | | |
|---|---|---|---|
| **Test item:** | **966 Chamber #1** | **Polarization:** | **Coplanar** |
| **Distance:** | **3m** | **Test Mode:** | **TM4** |

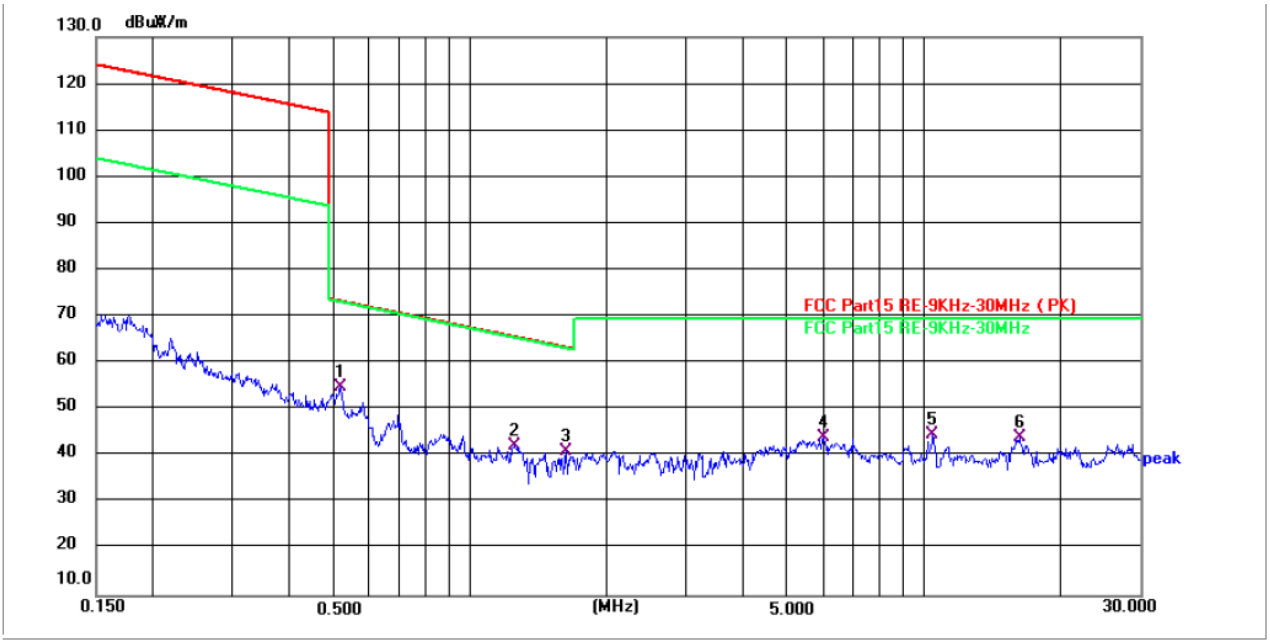



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0200 | 46.39 | 19.71 | 66.10 | 141.58 | -75.48 | peak | P | |
| 2 | 0.0376 | 42.78 | 19.87 | 62.65 | 136.10 | -73.45 | peak | P | |
| 3 | 0.0694 | 37.92 | 19.94 | 57.86 | 130.78 | -72.92 | peak | P | |
| 4 | 0.0777 | 37.11 | 19.94 | 57.05 | 129.80 | -72.75 | peak | P | |
| 5 | 0.1000 | 34.93 | 19.99 | 54.92 | 107.61 | -52.69 | QP | P | |
| 6 * | 0.1378 | 55.34 | 20.00 | 75.34 | 124.82 | -49.48 | peak | P | |

**Note: Level = Reading + Factor Margin =Level - Limit**

**Radiated Emission Test Data (150kHz - 30MHz)**

| | | | |
|---|---|---|---|
| **Test item:** | **966 Chamber #1** | **Polarization:** | **Coaxial** |
| **Distance:** | **3m** | **Test Mode:** | **TM4** |

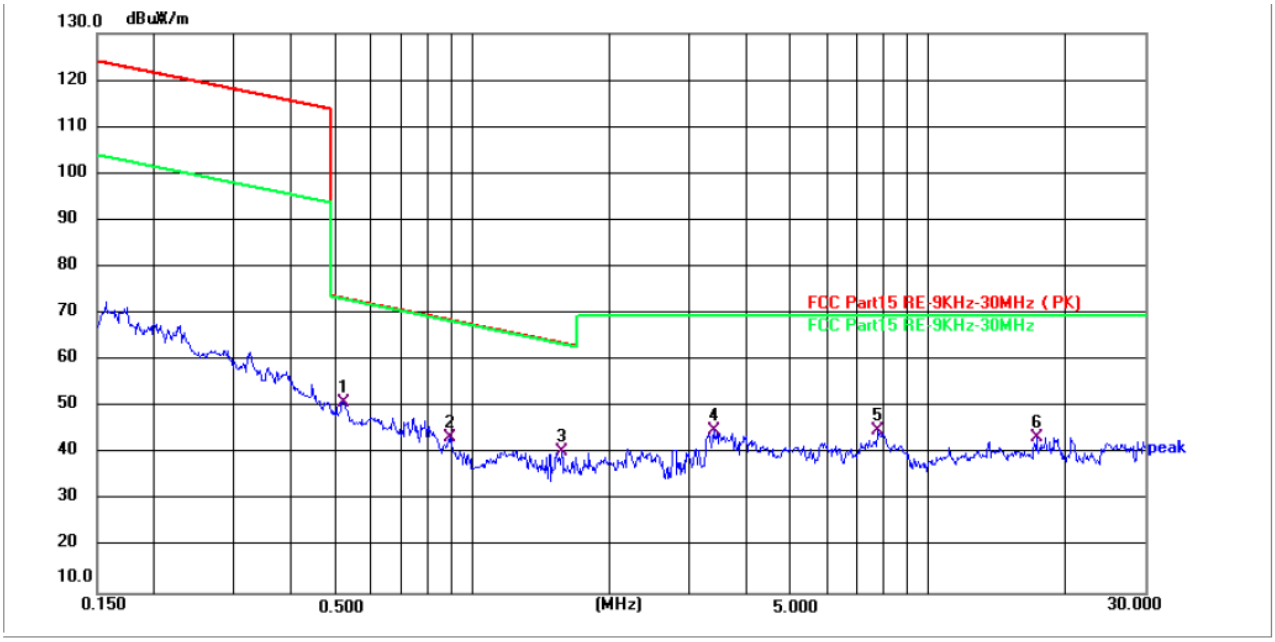



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 * | 0.5181 | 34.74 | 20.08 | 54.82 | 73.32 | -18.50 | QP | P | |
| 2 | 1.2554 | 22.24 | 20.11 | 42.35 | 65.63 | -23.28 | QP | P | |
| 3 | 1.6270 | 21.04 | 20.10 | 41.14 | 63.38 | -22.24 | QP | P | |
| 4 | 5.9923 | 24.15 | 19.99 | 44.14 | 69.54 | -25.40 | QP | P | |
| 5 | 10.4524 | 24.84 | 19.73 | 44.57 | 69.54 | -24.97 | QP | P | |
| 6 | 16.2256 | 24.46 | 19.46 | 43.92 | 69.54 | -25.62 | QP | P | |

**Note: Level = Reading + Factor Margin =Level - Limit**

**Radiated Emission Test Data (150kHz - 30MHz)**

| | | | |
|---|---|---|---|
| **Test item:** | **966 Chamber #1** | **Polarization:** | **Coplanar** |
| **Distance:** | **3m** | **Test Mode:** | **TM4** |

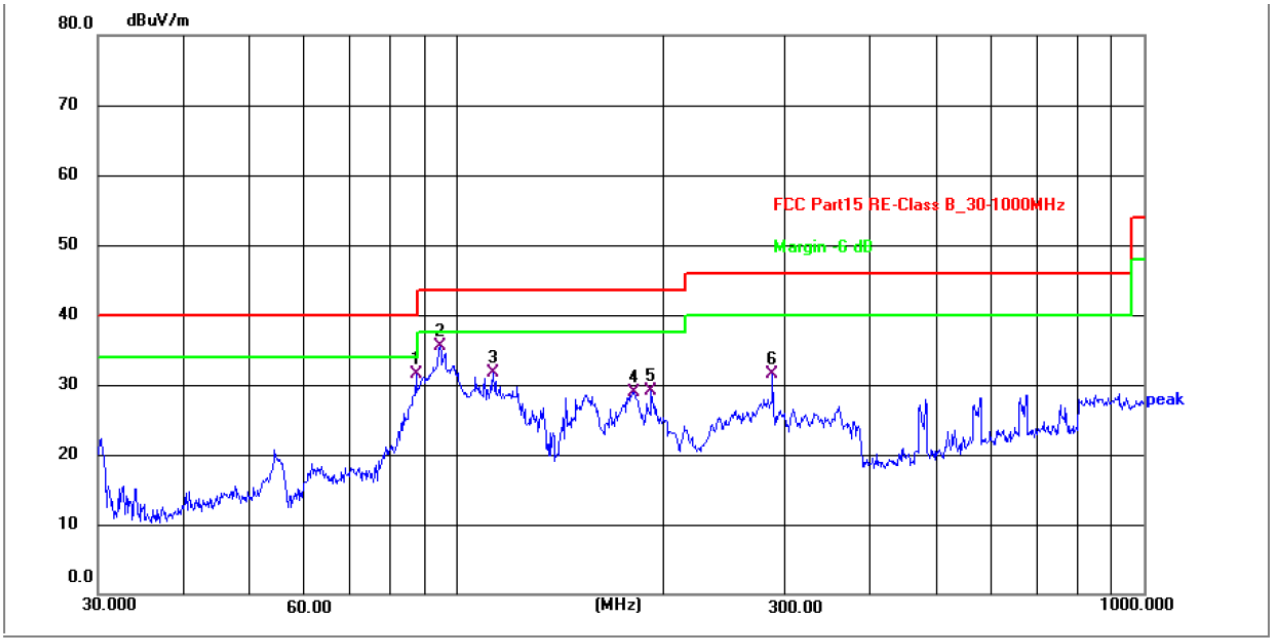



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 * | 0.5210 | 30.85 | 20.08 | 50.93 | 73.27 | -22.34 | QP | P | |
| 2 | 0.8941 | 23.30 | 20.11 | 43.41 | 68.58 | -25.17 | QP | P | |
| 3 | 1.5683 | 20.31 | 20.10 | 40.41 | 63.70 | -23.29 | QP | P | |
| 4 | 3.3814 | 24.93 | 20.08 | 45.01 | 69.54 | -24.53 | QP | P | |
| 5 | 7.7686 | 24.97 | 19.85 | 44.82 | 69.54 | -24.72 | QP | P | |
| 6 | 17.2907 | 24.14 | 19.40 | 43.54 | 69.54 | -26.00 | QP | P | |

**Note: Level = Reading + Factor Margin =Level - Limit**

**Radiated Emission Test Data (30-1000MHz)**

| | | | |
|---|---|---|---|
| **Test item:** | **966 Chamber #1** | **Polarization:** | **Horizontal** |
| **Distance:** | **3m** | **Test Mode:** | **TM4** |

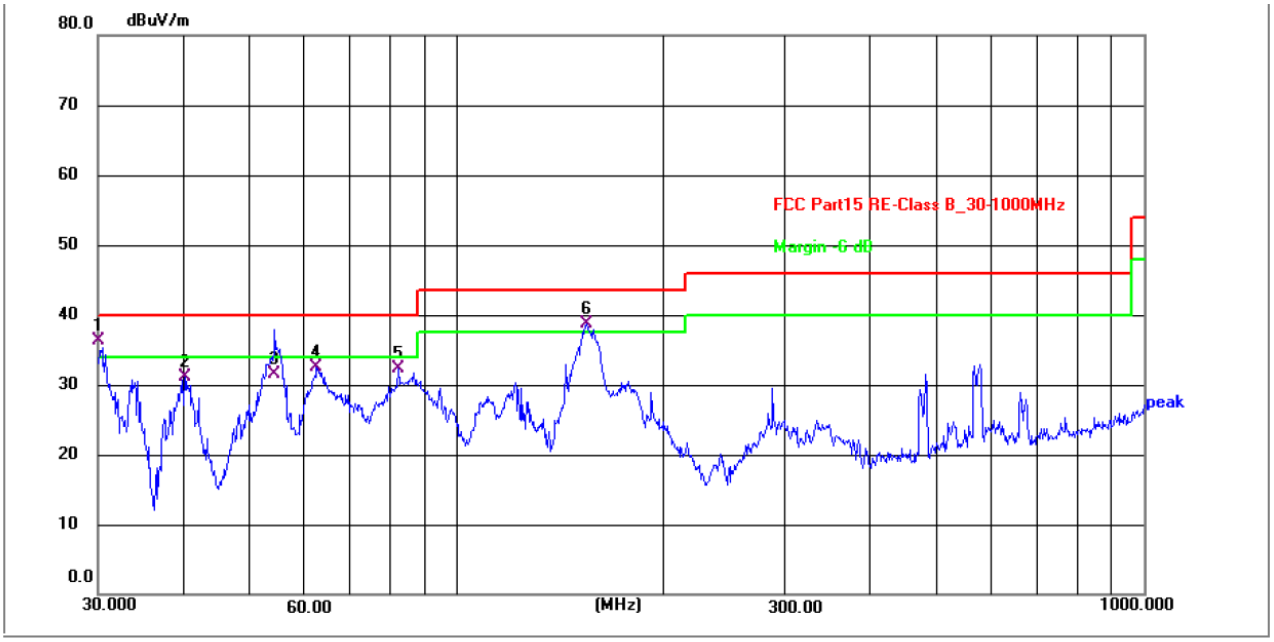



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 87.1117 | 49.66 | -18.18 | 31.48 | 40.00 | -8.52 | QP | P | |
| 2 * | 94.4284 | 52.35 | -16.79 | 35.56 | 43.50 | -7.94 | QP | P | |
| 3 | 112.9196 | 48.25 | -16.50 | 31.75 | 43.50 | -11.75 | QP | P | |
| 4 | 181.2834 | 45.39 | -16.42 | 28.97 | 43.50 | -14.53 | QP | P | |
| 5 | 191.7450 | 44.67 | -15.66 | 29.01 | 43.50 | -14.49 | QP | P | |
| 6 | 287.9904 | 43.86 | -12.31 | 31.55 | 46.00 | -14.45 | QP | P | |

**Note: Level = Reading + Factor Margin =Level - Limit**

**Radiated Emission Test Data (30-1000MHz)**

| | | | |
|---|---|---|---|
| **Test item:** | **966 Chamber #1** | **Polarization:** | **Vertical** |
| **Distance:** | **3m** | **Test Mode:** | **TM4** |




| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 * | 30.0000 | 53.17 | -16.94 | 36.23 | 40.00 | -3.77 | QP | P | |
| 2 | 40.1347 | 46.37 | -15.19 | 31.18 | 40.00 | -8.82 | QP | P | |
| 3 | 54.2610 | 46.06 | -14.46 | 31.60 | 40.00 | -8.40 | QP | P | |
| 4 | 62.4314 | 48.23 | -15.81 | 32.42 | 40.00 | -7.58 | QP | P | |
| 5 | 82.0706 | 51.61 | -19.29 | 32.32 | 40.00 | -7.68 | QP | P | |
| 6 ! | 154.2786 | 57.06 | -18.38 | 38.68 | 43.50 | -4.82 | QP | P | |

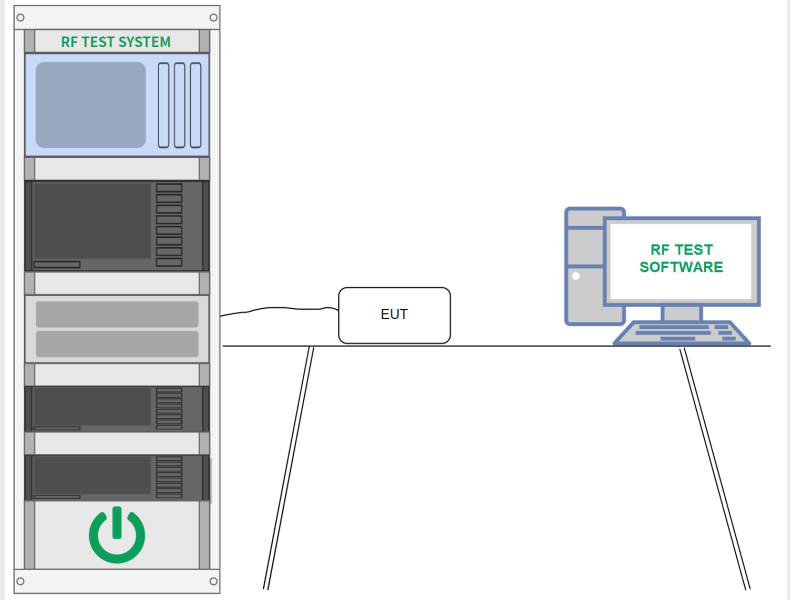
**Note: Level = Reading + Factor Margin =Level - Limit**

## 5.5 Frequency Stability

### 5.5.1 Test Requirement

| | |
|---|---|
| Test Requirement | FCC §15.225(e)<br>The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery. |
| Test Method | ANSI C63.10-2020, section 6.8<br>Frequency Stability Test |

### 5.5.2 Test Setup Diagram



### 5.5.3 Test Procedure

✧ **Frequency stability with respect to ambient temperature**

a) Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load shall be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, then the EUT shall be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Turn ON the EUT and tune it to one of the number of frequencies.

b) Couple the unlicensed wireless device output to the measuring instrument by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away), or by connecting a dummy load to the measuring instrument through an attenuator if necessary.

NOTE-An instrument that has an adequate level of accuracy as specified by the procuring or regulatory agency is the recommended measuring instrument.

c) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

d) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters energize only the heater circuit.

e) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.

f) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 min, 5 min, and 10 min after the EUT is energized. Four measurements in total are made.

g) Measure the frequency at each of frequencies.

h) Switch OFF the EUT but do not switch OFF the oscillator heater.

i) Lower the chamber temperature by not more than 10 ℃, and allow the temperature inside the chamber to stabilize.

j) Repeat step f through step i) down to the lowest specified temperature.

✧ **Frequency stability when varying supply voltage**

Unless otherwise specified, these tests shall be made at ambient room temperature (+15 °C to +25 °C).

a) An antenna shall be connected to the antenna output terminals of the EUT if possible. If the EUT is equipped with or uses an adjustable-length antenna, then it shall be fully extended.

Supply the EUT with nominal voltage or install a new or fully charged battery in the EUT. Turn ON the EUT and couple its output to a frequency counter or other frequency measuring instrument.

NOTE An instrument that has an adequate level of accuracy as specified by the procuring or regulatory agency is the recommended measuring instrument.

b) Tune the EUT to one of the number of frequencies. Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

c) Measure the frequency at each of the frequencies.

d) Repeat the above procedure at 85% and 115% of the nominal supply voltage.

### 5.5.4 Test Data

**Not Applicable.**

## ANNEX A TEST SETUP PHOTOS

Please refer to the document “8234EU012110W-AA.PDF”

## ANNEX B EXTERNAL PHOTOS

Please refer to the document “8234EU012110W-AB.PDF”

## ANNEX C INTERNAL PHOTOS

Please refer to the document “8234EU012110W-AC.PDF”

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