



## TEST REPORT

**Application No.:** SHEM2101000392CR  
**FCC ID:** 2APRA621181  
**Applicant:** PAI TECHNOLOGY LIMITED  
**Address of Applicant:** Room H, 18/F, Ning Jin Centre, 7 Cheng Yip Street, Kwun Tong, Kowloon, Hong Kong  
**Equipment Under Test (EUT):**  
**EUT Name:** Remote control  
**Model No.:** 621181  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.249  
**Date of Receipt:** 2021-01-12  
**Date of Test:** 2021-01-18 to 2021-01-29  
**Date of Issue:** 2021-02-02

|                     |              |
|---------------------|--------------|
| <b>Test Result:</b> | <b>Pass*</b> |
|---------------------|--------------|

\* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan

Parlam Zhan  
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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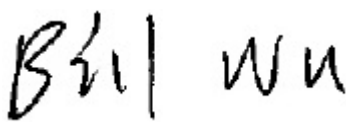
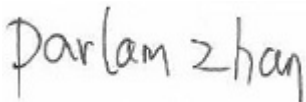
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| Revision Record |             |            |        |
|-----------------|-------------|------------|--------|
| Version         | Description | Date       | Remark |
| 00              | Original    | 2021-02-02 | /      |
|                 |             |            |        |
|                 |             |            |        |

|                          |  |                                                                                    |  |
|--------------------------|--|------------------------------------------------------------------------------------|--|
| Authorized for issue by: |  |                                                                                    |  |
|                          |  |   |  |
|                          |  | <hr/>                                                                              |  |
|                          |  | Bill Wu / Project Engineer                                                         |  |
|                          |  |  |  |
|                          |  | <hr/>                                                                              |  |
|                          |  | Parlam Zhan / Reviewer                                                             |  |





## 2 Test Summary

| Radio Spectrum Technical Requirement |                                  |        |                                  |                      |
|--------------------------------------|----------------------------------|--------|----------------------------------|----------------------|
| Item                                 | Standard                         | Method | Requirement                      | Result               |
| Antenna Requirement                  | 47 CFR Part 15, Subpart C 15.249 | N/A    | 47 CFR Part 15, Subpart C 15.203 | Customer Declaration |

| Radio Spectrum Matter Part                           |                                  |                                        |                                                       |        |
|------------------------------------------------------|----------------------------------|----------------------------------------|-------------------------------------------------------|--------|
| Item                                                 | Standard                         | Method                                 | Requirement                                           | Result |
| 20dB Bandwidth                                       | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.9         | 47 CFR Part 15, Subpart C 15.215                      | Pass   |
| Field Strength of the Fundamental Signal (15.249(a)) | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.5&6.6     | 47 CFR Part 15, Subpart C 15.249(a)                   | Pass   |
| Restricted Band Around Fundamental Frequency         | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.10        | 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209 | Pass   |
| Radiated Emissions                                   | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.4&6.5&6.6 | 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)     | Pass   |



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### 3 Contents

|                                                                | Page |
|----------------------------------------------------------------|------|
| 1 COVER PAGE.....                                              | 1    |
| 2 TEST SUMMARY.....                                            | 3    |
| 3 CONTENTS.....                                                | 4    |
| 4 GENERAL INFORMATION .....                                    | 5    |
| 4.1 DETAILS OF E.U.T.....                                      | 5    |
| 4.2 DESCRIPTION OF SUPPORT UNITS.....                          | 5    |
| 4.3 MEASUREMENT UNCERTAINTY .....                              | 5    |
| 4.4 TEST LOCATION .....                                        | 6    |
| 4.5 TEST FACILITY .....                                        | 6    |
| 4.6 DEVIATION FROM STANDARDS .....                             | 6    |
| 4.7 ABNORMALITIES FROM STANDARD CONDITIONS .....               | 6    |
| 5 EQUIPMENT LIST .....                                         | 7    |
| 6 RADIO SPECTRUM TECHNICAL REQUIREMENT .....                   | 8    |
| 6.1 ANTENNA REQUIREMENT .....                                  | 8    |
| 7 RADIO SPECTRUM MATTER TEST RESULTS .....                     | 9    |
| 7.1 20DB BANDWIDTH.....                                        | 9    |
| 7.2 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.249(A)) ..... | 12   |
| 7.3 RESTRICTED BAND AROUND FUNDAMENTAL FREQUENCY .....         | 15   |
| 7.4 RADIATED EMISSIONS .....                                   | 24   |
| 8 TEST SETUP PHOTOGRAPHS .....                                 | 35   |
| 9 EUT CONSTRUCTIONAL DETAILS .....                             | 35   |



## 4 General Information

### 4.1 Details of E.U.T.

|                     |                                                      |
|---------------------|------------------------------------------------------|
| Power supply:       | DC 3V By 2*AAA size batteries                        |
| Test voltage:       | DC 3V                                                |
| Modulation Type:    | GFSK                                                 |
| Number of Channels: | 6                                                    |
| Antenna Type:       | Integral Antenna                                     |
| Antenna Gain:       | 0dBi (Provided by the manufacturer)                  |
| Channel List:       | 2402MHz, 2419MHz, 2434MHz, 2449MHz, 2464MHz, 2480MHz |

### 4.2 Description of Support Units

The EUT has been tested as an independent unit.

### 4.3 Measurement Uncertainty

| No. | Item                            | Measurement Uncertainty |
|-----|---------------------------------|-------------------------|
| 1   | Occupied Bandwidth              | 3%                      |
| 2   | RF Radiated power               | 5.1dB (Below 1GHz)      |
|     |                                 | 5.9dB (Above 1GHz)      |
| 3   | Radiated Spurious emission test | 4.2dB (Below 30MHz)     |
|     |                                 | 4.5dB (30MHz-1GHz)      |
|     |                                 | 5.1dB (1GHz-6GHz)       |
|     |                                 | 5.4dB (6GHz-18GHz)      |
| 4   | Temperature test                | 1°C                     |
| 5   | Humidity test                   | 3%                      |
| 6   | Supply voltages                 | 1.5%                    |
| 7   | Time                            | 3%                      |

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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#### 4.4 Test Location

All tests were performed at:

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588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

#### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **NVLAP (LAB CODE: 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

- **FCC (Designation Number: CN5033)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None



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## 5 Equipment List

| Equipment                 | Manufacturer | Model No         | Inventory No          | Cal Date   | Cal Due Date |
|---------------------------|--------------|------------------|-----------------------|------------|--------------|
| <b>RF Radiated Test</b>   |              |                  |                       |            |              |
| EMI test Receiver         | R&S          | ESU40            | SHEM051-1             | 2020-12-20 | 2021-12-19   |
| Spectrum Analyzer         | R&S          | FSP-30           | SHEM002-1             | 2020-12-20 | 2021-12-19   |
| Loop Antenna (9kHz-30MHz) | Schwarzbeck  | FMZB1519         | SHEM135-1             | 2020-12-20 | 2021-12-19   |
| Antenna (25MHz-2GHz)      | Schwarzbeck  | VULB9168         | SHEM048-1             | 2019-10-14 | 2021-10-13   |
| Antenna (25MHz-2GHz)      | Schwarzbeck  | VULB9168         | SHEM202-1             | 2019-04-30 | 2021-04-29   |
| Horn Antenna (1-18GHz)    | Schwarzbeck  | HF906            | SHEM009-1             | 2018-10-24 | 2021-10-23   |
| Horn Antenna (1-18GHz)    | Schwarzbeck  | BBHA9120D        | SHEM050-1             | 2019-10-14 | 2021-10-13   |
| Horn Antenna (14-40GHz)   | Schwarzbeck  | BBHA 9170        | SHEM049-1             | 2018-10-31 | 2021-10-30   |
| Pre-amplifier (9kHz-2GHz) | CLAVIIO      | BDLNA-0001       | SHEM164-1             | 2020-08-13 | 2021-08-12   |
| Pre-amplifier (1-18GHz)   | CLAVIIO      | BDLNA-0118       | SHEM050-2             | 2020-08-13 | 2021-08-12   |
| High-amplifier (14-40GHz) | Schwarzbeck  | 10001            | SHEM049-2             | 2020-12-20 | 2021-12-19   |
| Signal Generator          | R&S          | SMR40            | SHEM058-1             | 2020-08-13 | 2021-08-12   |
| Band Filter               | LORCH        | 9BRX-875/X150    | SHEM156-1             | /          | /            |
| Band Filter               | LORCH        | 13BRX-1950/X500  | SHEM083-2             | /          | /            |
| Band Filter               | LORCH        | 5BRX-2400/X200   | SHEM155-1             | /          | /            |
| Band Filter               | LORCH        | 5BRX-5500/X1000  | SHEM157-2             | /          | /            |
| High pass Filter          | Wainwright   | WHK3.0/18G       | SHEM157-1             | /          | /            |
| High pass Filter          | Wainwright   | WHKS1700         | SHEM157-3             | /          | /            |
| Semi/Fully Anechoic       | ST           | 11*6*6M          | SHEM078-2             | 2020-05-25 | 2023-05-24   |
| RE test Cable             | /            | RE01, RE02, RE06 | /                     | 2020-12-20 | 2021-12-19   |
| Test software             | ESE          | E3               | Version:<br>6.111221a | /          | /            |



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## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

Limit:

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.

#### 6.1.2 Conclusion

Standard 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.

EUT Antenna:

The antenna is integral antenna and no consideration of replacement.

Antenna location: Refer to Appendix (Internal Photos)



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## 7 Radio Spectrum Matter Test Results

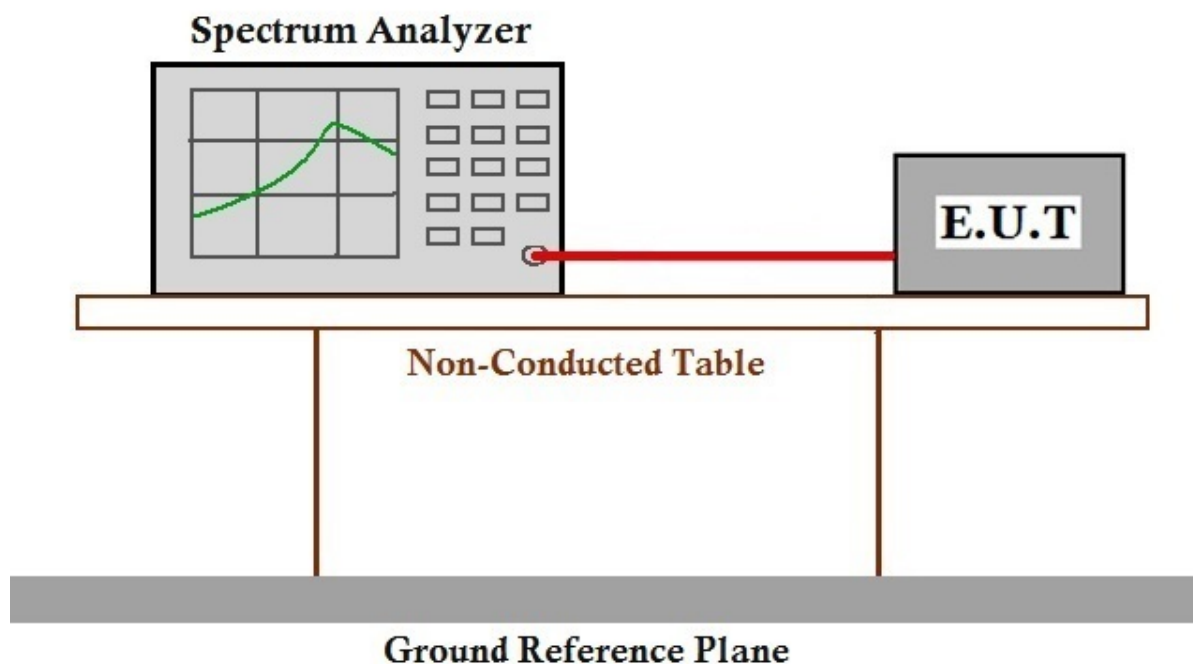
### 7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215  
Test Method: ANSI C63.10 (2013) Section 6.9

#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
Test mode a:TX mode\_Keep the EUT in transmitting with modulation mode.



#### 7.1.2 Measurement Procedure and Data

1. Place the EUT on the table and set it in Engineering mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = approximately 1 % to 5 % of the OBW, VBW =3\* RBW, Sweep=auto
4. Mark the peak frequency and -20dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured was complete.



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**Test Data:**

| CH   | Frequency (MHz) | Bandwidth (MHz) | Result |
|------|-----------------|-----------------|--------|
| Low  | 2402            | 3.02            | PASS   |
| Mid  | 2449            | 2.01            | PASS   |
| High | 2480            | 1.56            | PASS   |

**Test plot as follows:**

**Channel: Lowest**



Date: 26.JAN.2021 13:14:13



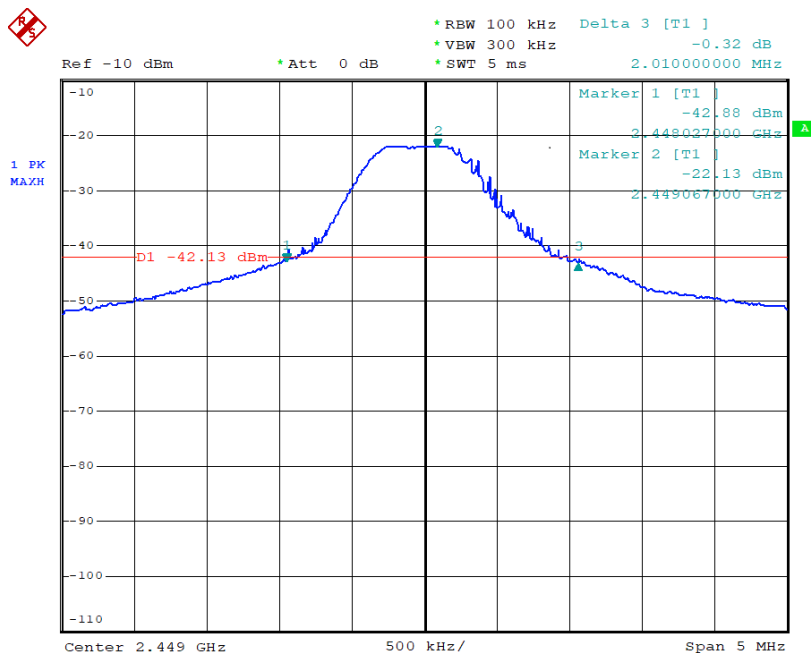
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**Channel: Middle**



Date: 26.JAN.2021 13:45:23

**Channel: High**



Date: 26.JAN.2021 13:55:41



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## 7.2 Field Strength of the Fundamental Signal (15.249(a))

Test Requirement: 47 CFR Part 15, Subpart C 15.249(a)  
Test Method: ANSI C63.10 (2013) Section 6.5&6.6

**Test Site:** Measurement Distance: 3m

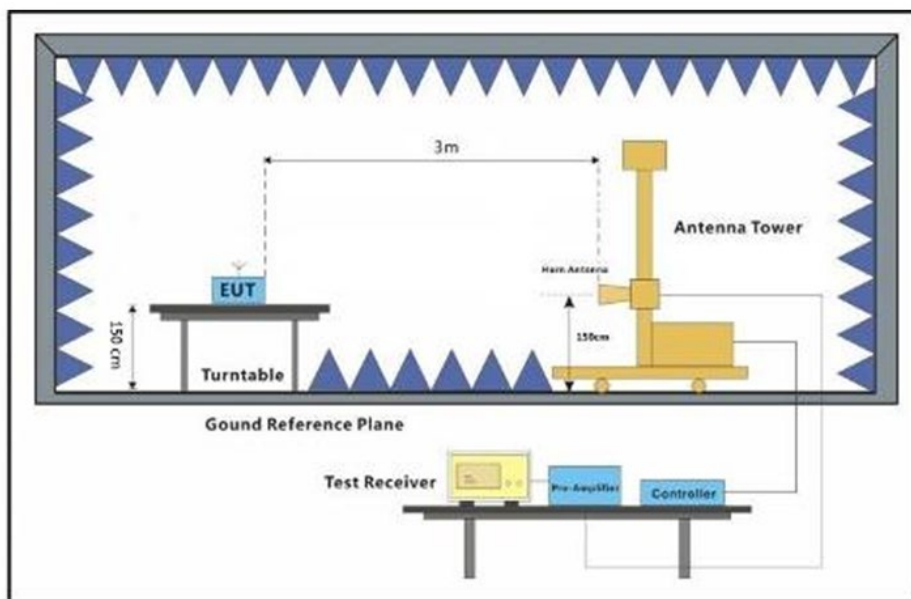
**Receiver Setup:**

| Frequency  | Detector | RBW  | VBW  | Remark  |
|------------|----------|------|------|---------|
| Above 1GHz | Peak     | 1MHz | 3MHz | Peak    |
|            | Peak     | 1MHz | 10Hz | Average |

**Limit:**

| Frequency       | Limit (dBuV/m) | Remark        |
|-----------------|----------------|---------------|
| 2400~2483.5 MHz | 114            | Peak Value    |
|                 | 94             | Average Value |

**Test Setup:**





### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:TX mode\_Keep the EUT in transmitting with modulation mode.

### 7.2.2 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height 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.
- e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.



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## Measurement Data

Peak value:

| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Detector | Polarization |
|-----------------|-------------------|---------------|----------------|---------------------|-----------------|----------|--------------|
| 2402            | 97.62             | -6.67         | 90.95          | 94.00               | -3.05           | Peak     | Horizontal   |
|                 | 87.01             | -6.67         | 80.34          | 94.00               | -13.66          | Peak     | Vertical     |

| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Detector | Polarization |
|-----------------|-------------------|---------------|----------------|---------------------|-----------------|----------|--------------|
| 2449            | 98.52             | -6.36         | 92.16          | 94.00               | -1.84           | Peak     | Horizontal   |
|                 | 90.20             | -6.36         | 83.84          | 94.00               | -10.16          | Peak     | Vertical     |

| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Detector | Polarization |
|-----------------|-------------------|---------------|----------------|---------------------|-----------------|----------|--------------|
| 2480            | 97.64             | -6.27         | 91.37          | 94.00               | -2.63           | Peak     | Horizontal   |
|                 | 90.26             | -6.27         | 83.99          | 94.00               | -10.01          | Peak     | Vertical     |

Remark:

- 1) The basic equation with a sample calculation is as follows: Level = Read Level + Factor.  
**(The Factor is calculated by adding the Antenna Factor, Cable Loss and Preamp Factor)**
- 2) If the Peak value below the Average Limit, the Average test doesn't perform for this submission.



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### 7.3 Restricted Band Around Fundamental Frequency

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.10

Limit:

| Frequency(MHz) | Field strength(microvolts/meter) | Measurement distance(meters) |
|----------------|----------------------------------|------------------------------|
| 0.009-0.490    | 2400/F(kHz)                      | 300                          |
| 0.490-1.705    | 24000/F(kHz)                     | 30                           |
| 1.705-30.0     | 30                               | 30                           |
| 30-88          | 100                              | 3                            |
| 88-216         | 150                              | 3                            |
| 216-960        | 200                              | 3                            |
| Above 960      | 500                              | 3                            |

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:TX mode\_Keep the EUT in transmitting with modulation mode.



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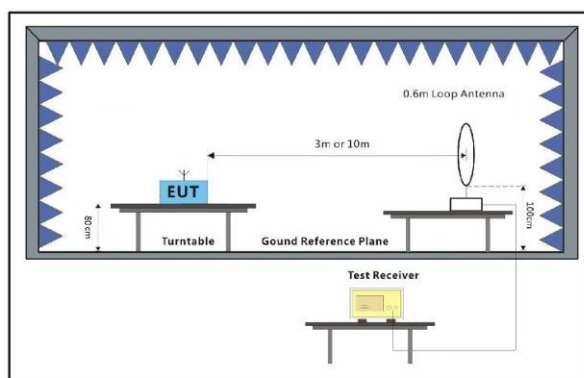
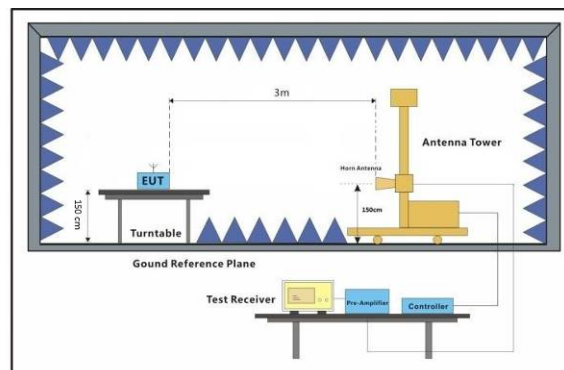
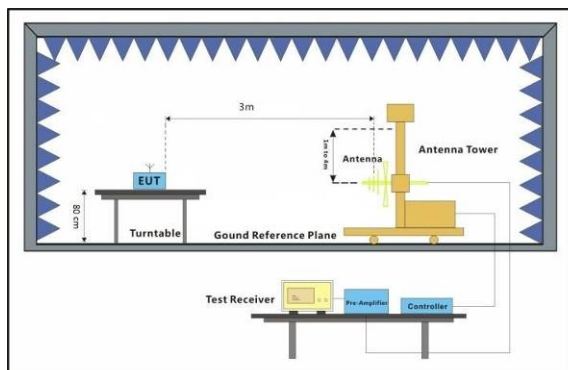
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### 7.3.2 Test Setup Diagram



### 7.3.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
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- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



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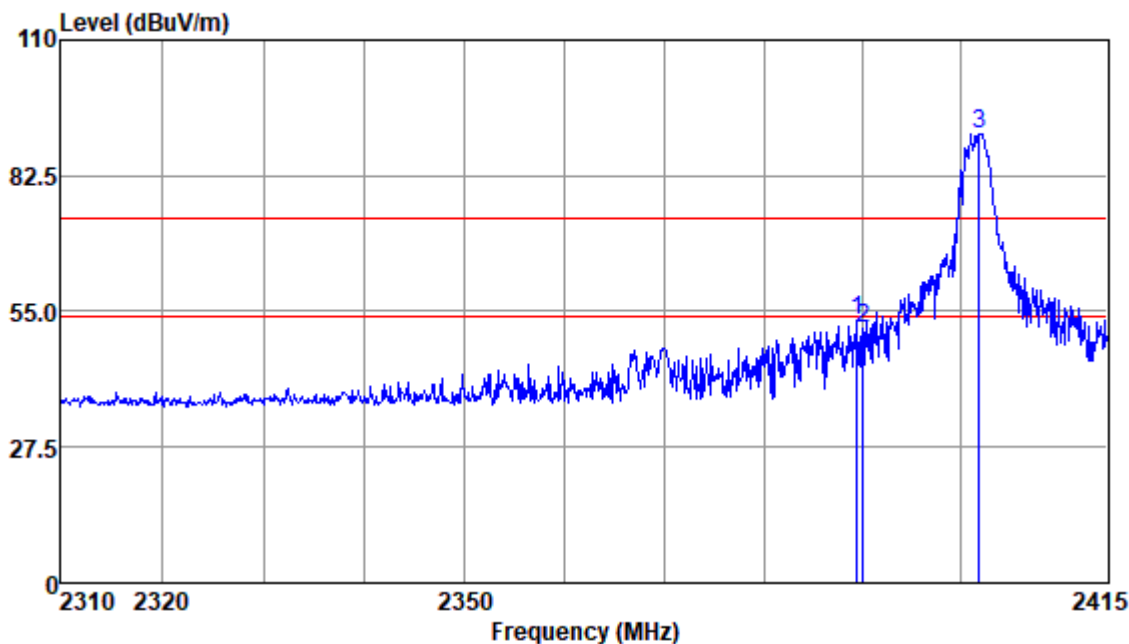
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2402MHz



Antenna Polarity :HORIZONTAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz     | dBuv       | dB/m           | dB         | dB            | dBuV/m         | dBuV/m     | dB         |        |
| 2389.48 | 59.81      | 27.23          | 8.46       | 42.37         | 53.13          | 74.00      | -20.87     | Peak   |
| 2390.00 | 58.26      | 27.23          | 8.46       | 42.37         | 51.58          | 74.00      | -22.42     | Peak   |
| 2401.83 | 97.64      | 27.27          | 8.46       | 42.40         | 90.97          | 74.00      | 16.97      | Peak   |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



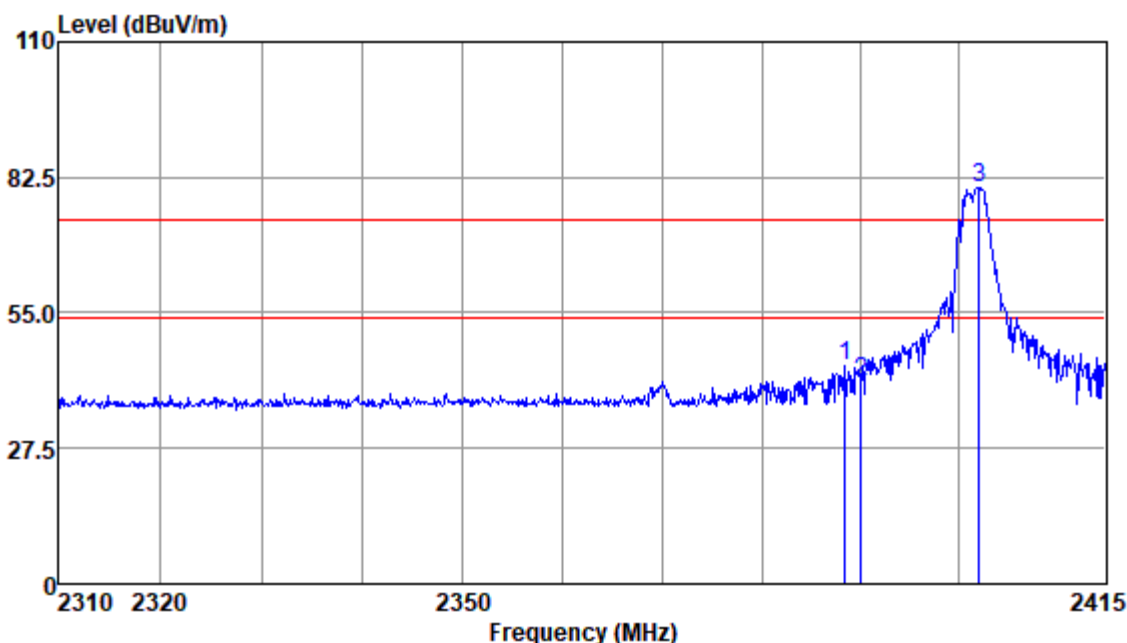
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Antenna Polarity :VERTICAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz     | dBuv       | dB/m           | dB         | dB            | dBuv/m         | dBuv/m     | dB         |        |
| 2388.42 | 51.04      | 27.23          | 8.46       | 42.37         | 44.36          | 74.00      | -29.64     | Peak   |
| 2390.00 | 47.66      | 27.23          | 8.46       | 42.37         | 40.98          | 74.00      | -33.02     | Peak   |
| 2402.05 | 87.23      | 27.27          | 8.46       | 42.40         | 80.56          | 74.00      | 6.56       | Peak   |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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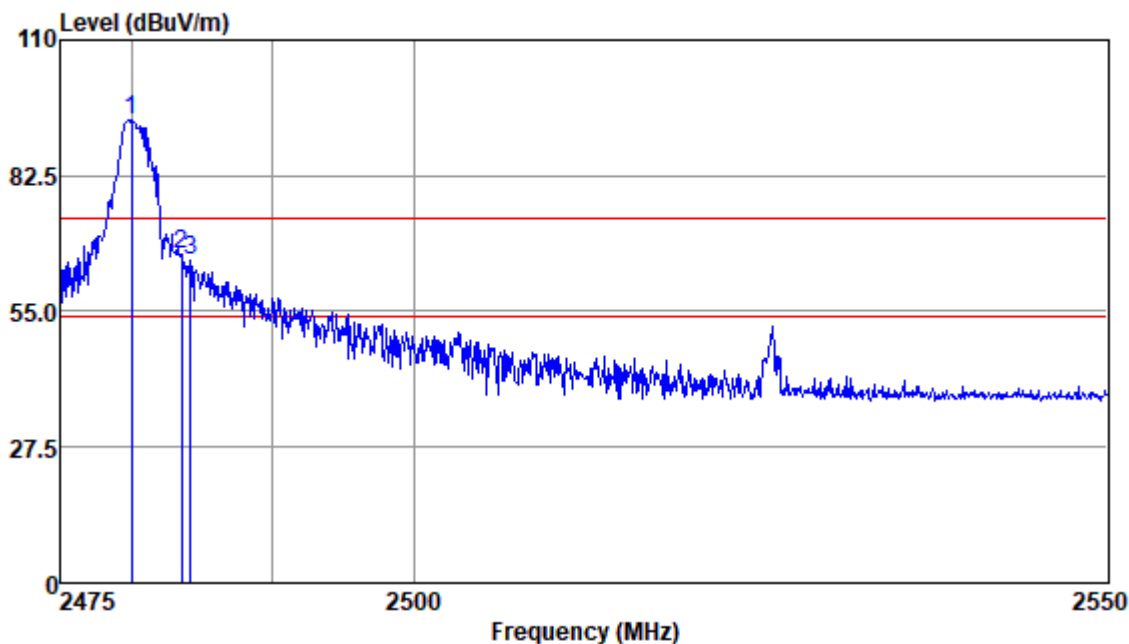
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2480MHz



Antenna Polarity :HORIZONTAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamplifier Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------------|----------------|------------|------------|--------|
| MHz     | dBuV       | dB/m           | dB         | dB                  | dBuV/m         | dBuV/m     | dB         |        |
| 2479.96 | 99.88      | 27.53          | 8.60       | 42.40               | 93.61          | 74.00      | 19.61      | Peak   |
| 2483.50 | 72.78      | 27.55          | 8.60       | 42.40               | 66.53          | 74.00      | -7.47      | Peak   |
| 2484.18 | 71.36      | 27.55          | 8.67       | 42.40               | 65.18          | 74.00      | -8.82      | Peak   |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor



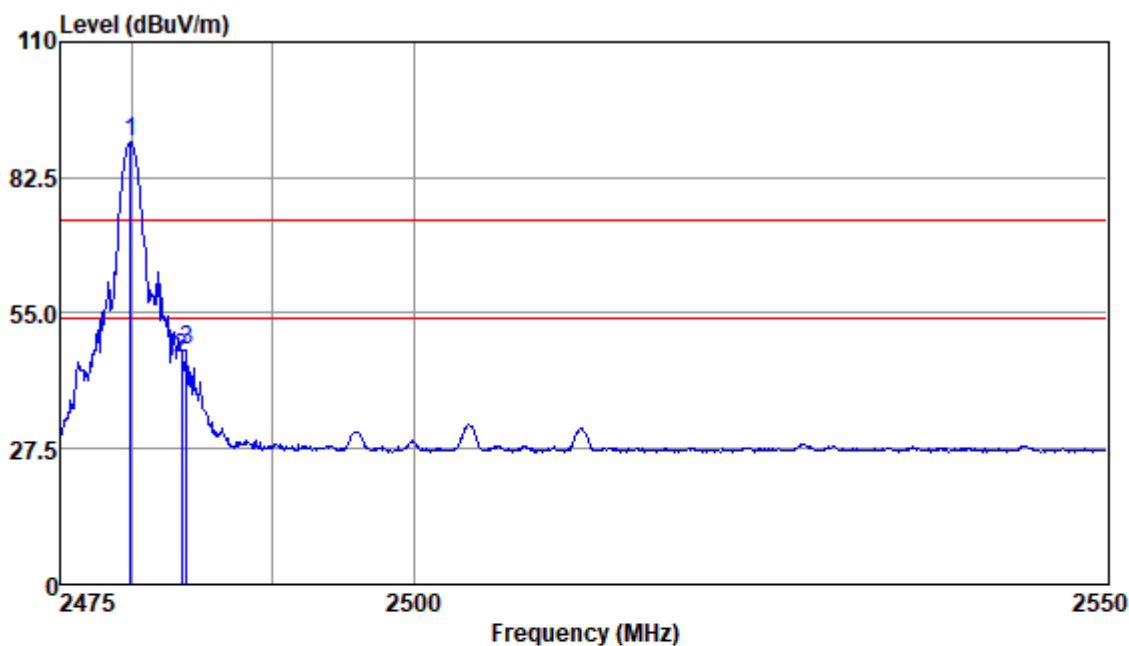
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Antenna Polarity :HORIZONTAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark  |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|---------|
| MHz     | dBuv       | dB/m           | dB         | dB            | dBuv/m         | dBuv/m     | dB         |         |
| 2479.88 | 95.94      | 27.53          | 8.60       | 42.40         | 89.67          | 54.00      | 35.67      | Average |
| 2483.50 | 52.19      | 27.55          | 8.60       | 42.40         | 45.94          | 54.00      | -8.06      | Average |
| 2483.88 | 53.83      | 27.55          | 8.60       | 42.40         | 47.58          | 54.00      | -6.42      | Average |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



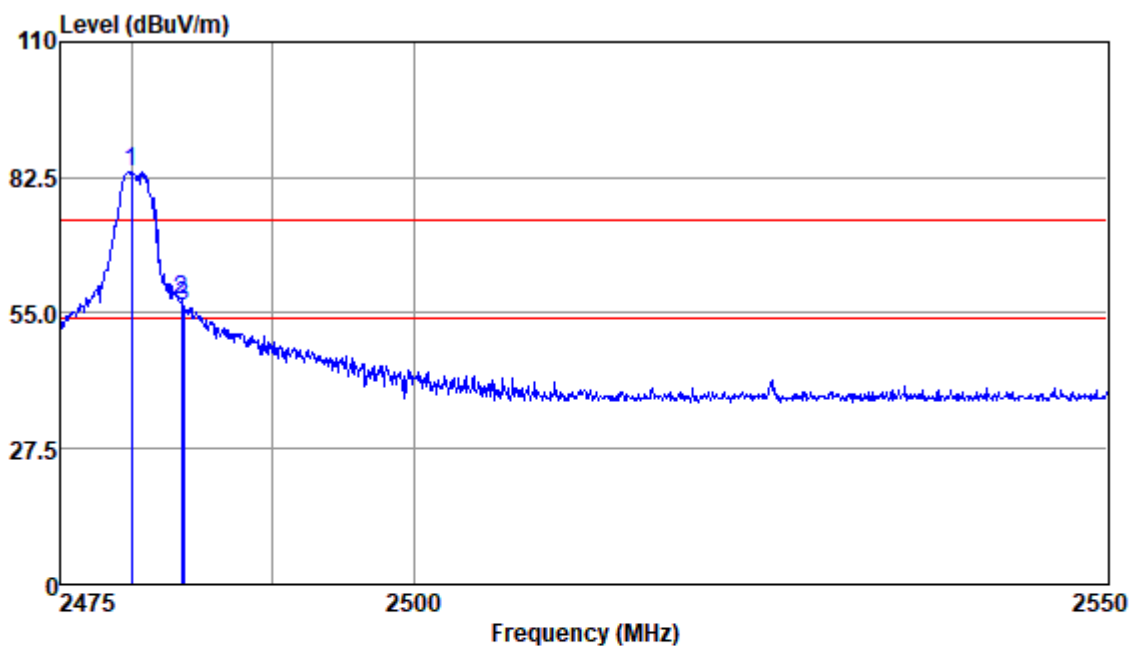
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Antenna Polarity :VERTICAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz     | dBuv       | dB/m           | dB         | dB            | dBuv/m         | dBuv/m     | dB         |        |
| 2479.96 | 89.75      | 27.53          | 8.60       | 42.40         | 83.48          | 74.00      | 9.48       | Peak   |
| 2483.50 | 63.79      | 27.55          | 8.60       | 42.40         | 57.54          | 74.00      | -16.46     | Peak   |
| 2483.66 | 62.75      | 27.55          | 8.60       | 42.40         | 56.50          | 74.00      | -17.50     | Peak   |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



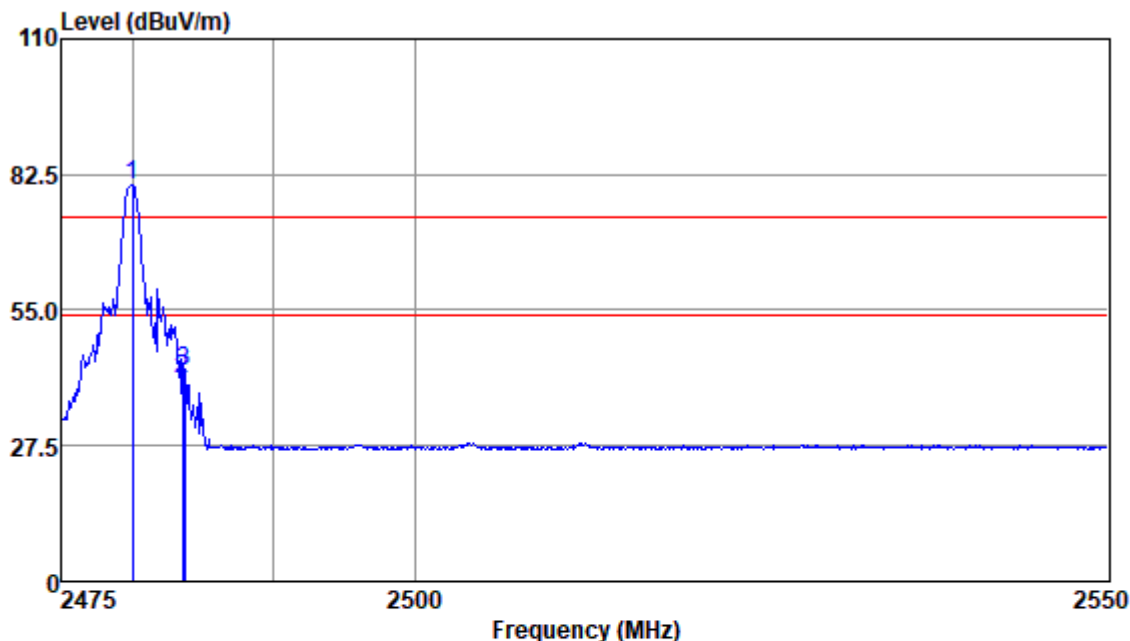
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Antenna Polarity :VERTICAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark  |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|---------|
| MHz     | dBuv       | dB/m           | dB         | dB            | dBuv/m         | dBuv/m     | dB         |         |
| 2479.96 | 86.77      | 27.53          | 8.60       | 42.40         | 80.50          | 54.00      | 26.50      | Average |
| 2483.50 | 47.43      | 27.55          | 8.60       | 42.40         | 41.18          | 54.00      | -12.82     | Average |
| 2483.66 | 49.01      | 27.55          | 8.60       | 42.40         | 42.76          | 54.00      | -11.24     | Average |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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## 7.4 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)  
Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6  
Limit:

| Frequency(MHz) | Field strength(microvolts/meter) | Measurement distance(meters) |
|----------------|----------------------------------|------------------------------|
| 0.009-0.490    | 2400/F(kHz)                      | 300                          |
| 0.490-1.705    | 24000/F(kHz)                     | 30                           |
| 1.705-30.0     | 30                               | 30                           |
| 30-88          | 100                              | 3                            |
| 88-216         | 150                              | 3                            |
| 216-960        | 200                              | 3                            |
| Above 960      | 500                              | 3                            |

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar  
Test mode a:TX mode\_Keep the EUT in transmitting with modulation mode.



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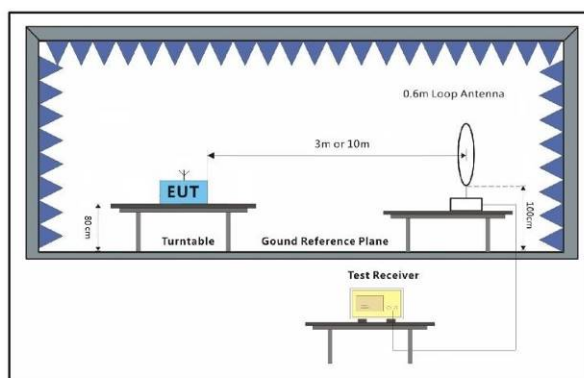
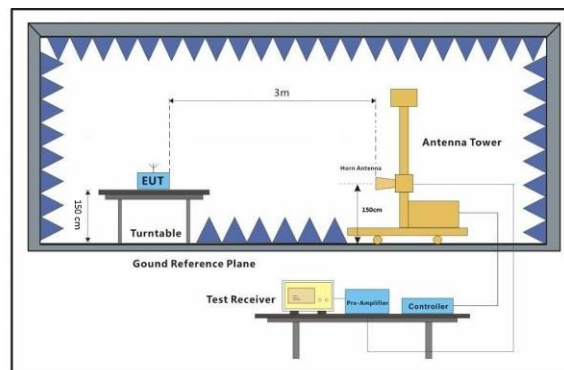
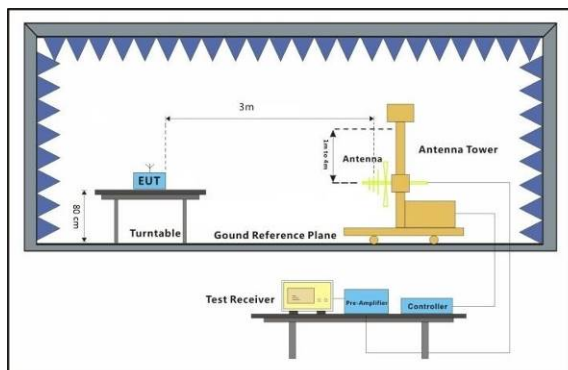
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#### 7.4.2 Test Setup Diagram



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#### 7.4.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height 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.
- e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

#### Remark:

1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown



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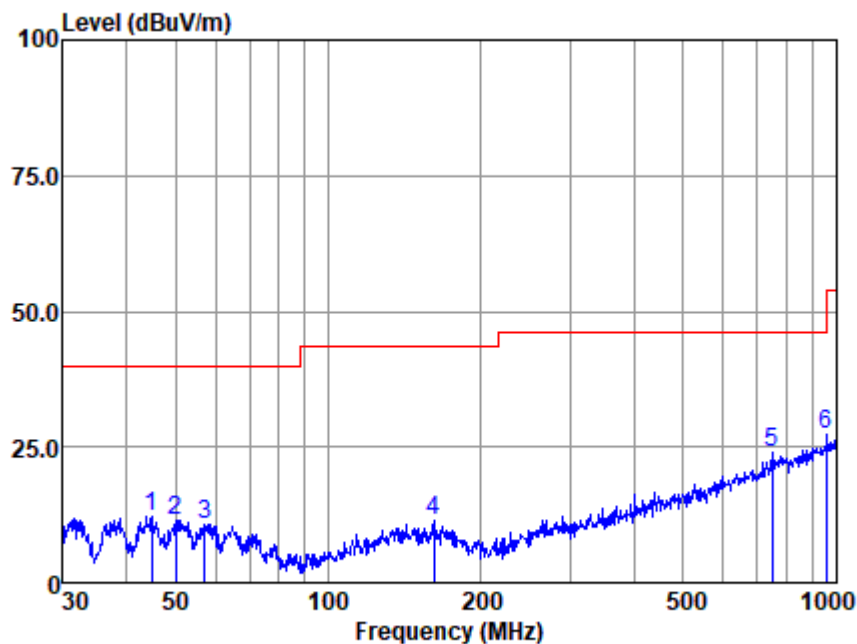
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30MHz-1GHz:

Mode:a; Polarization:Horizontal



Antenna Polarity :HORIZONTAL  
EUT/Project :0392CR  
Test mode :a

|   | Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
|   | MHz     | dBuV       | dB/m           | dB         | dB            | dBuV/m         | dBuV/m     | dB         |        |
| 1 | 44.901  | 40.18      | 13.49          | 0.95       | 42.30         | 12.32          | 40.00      | -27.68     | QP     |
| 2 | 50.057  | 39.11      | 13.70          | 1.00       | 42.30         | 11.51          | 40.00      | -28.49     | QP     |
| 3 | 57.191  | 38.75      | 13.26          | 1.09       | 42.30         | 10.80          | 40.00      | -29.20     | QP     |
| 4 | 161.474 | 38.45      | 13.13          | 1.93       | 42.20         | 11.31          | 43.50      | -32.19     | QP     |
| 5 | 747.483 | 39.46      | 22.03          | 4.37       | 42.00         | 23.86          | 46.00      | -22.14     | QP     |
| 6 | 958.794 | 39.63      | 24.00          | 4.96       | 41.40         | 27.19          | 46.00      | -18.81     | QP     |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

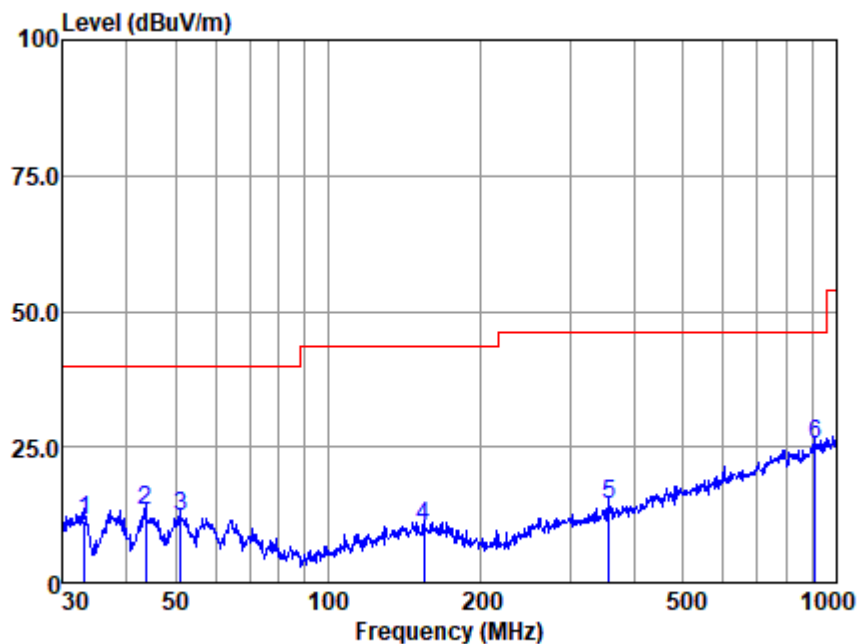


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Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL  
EUT/Project :0392CR  
Test mode :a

|   | Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
|   | MHz     | dBuV       | dB/m           | dB         | dB            | dBuV/m         | dBuV/m     | dB         |        |
| 1 | 33.095  | 40.69      | 12.33          | 0.81       | 42.36         | 11.47          | 40.00      | -28.53     | QP     |
| 2 | 43.659  | 41.36      | 13.42          | 0.93       | 42.30         | 13.41          | 40.00      | -26.59     | QP     |
| 3 | 51.121  | 39.88      | 13.63          | 1.02       | 42.30         | 12.23          | 40.00      | -27.77     | QP     |
| 4 | 154.279 | 37.73      | 13.03          | 1.89       | 42.20         | 10.45          | 43.50      | -33.05     | QP     |
| 5 | 357.929 | 38.72      | 14.52          | 3.01       | 41.90         | 14.35          | 46.00      | -31.65     | QP     |
| 6 | 909.667 | 38.79      | 23.52          | 4.81       | 41.64         | 25.48          | 46.00      | -20.52     | QP     |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



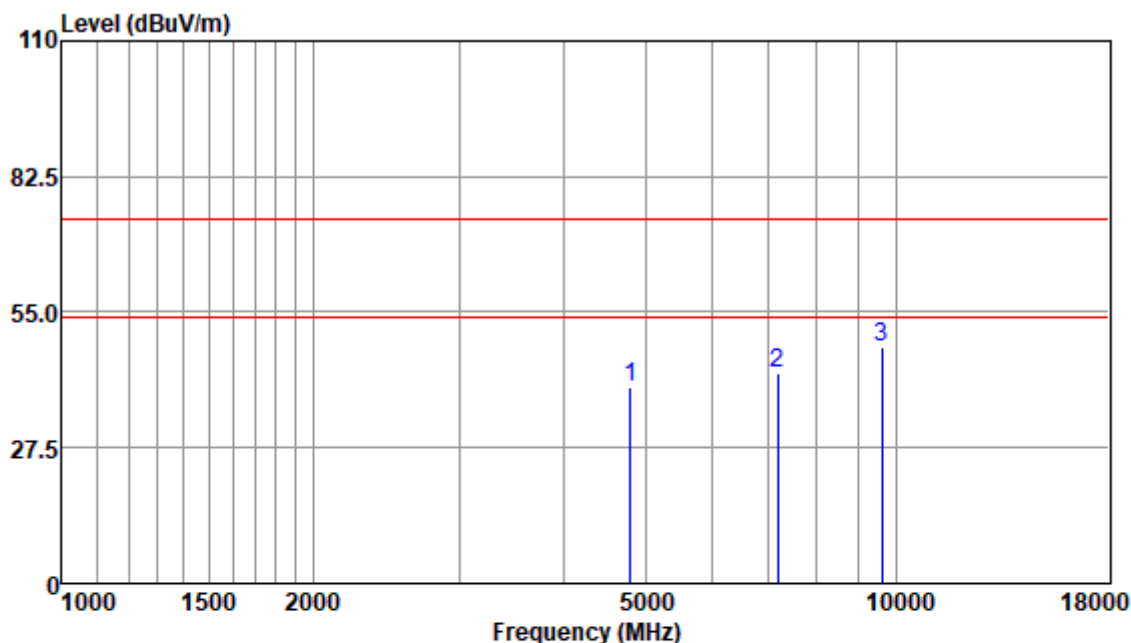
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Above 1GHz:

2402MHz:

Horizontal



Antenna Polarity :HORIZONTAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamplifier Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------------|----------------|------------|------------|--------|
| MHz     | dBuV       | dB/m           | dB         | dB                  | dBuV/m         | dBuV/m     | dB         |        |
| 4804.00 | 39.87      | 33.72          | 5.09       | 38.71               | 39.97          | 74.00      | -34.03     | Peak   |
| 7206.00 | 37.66      | 36.28          | 5.75       | 37.18               | 42.51          | 74.00      | -31.49     | Peak   |
| 9608.00 | 37.59      | 37.70          | 6.78       | 34.18               | 47.89          | 74.00      | -26.11     | Peak   |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

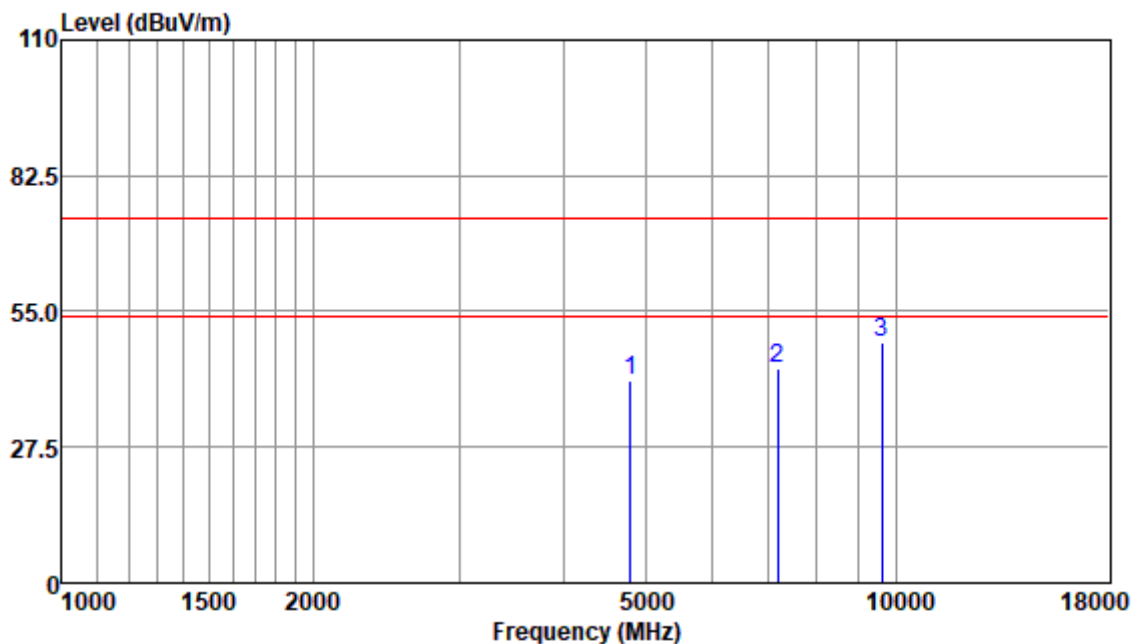


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Vertical



Antenna Polarity :VERTICAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz     | dBuv       | dB/m           | dB         | dB            | dBuv/m         | dBuv/m     | dB         |        |
| 4804.00 | 40.96      | 33.72          | 5.09       | 38.71         | 41.06          | 74.00      | -32.94     | Peak   |
| 7206.00 | 38.44      | 36.28          | 5.75       | 37.18         | 43.29          | 74.00      | -30.71     | Peak   |
| 9608.00 | 38.41      | 37.70          | 6.78       | 34.18         | 48.71          | 74.00      | -25.29     | Peak   |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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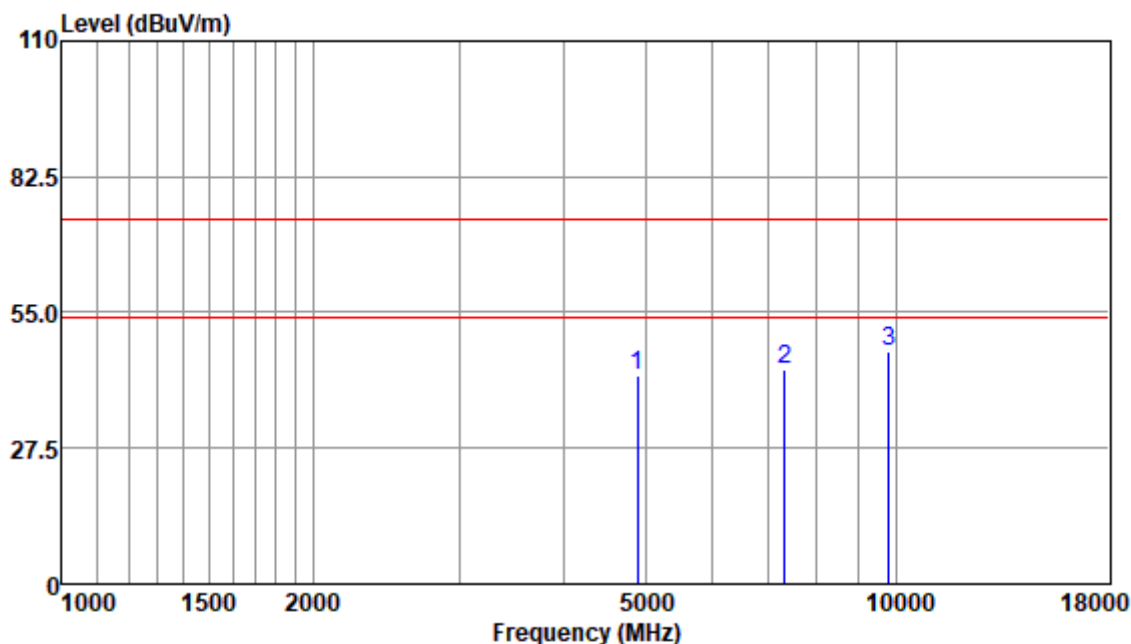
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2449MHz:  
Horizontal



Antenna Polarity :HORIZONTAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz     | dBuv       | dB/m           | dB         | dB            | dBuv/m         | dBuv/m     | dB         |        |
| 4898.00 | 42.63      | 33.97          | 4.30       | 38.80         | 42.10          | 74.00      | -31.90     | Peak   |
| 7347.00 | 37.76      | 36.47          | 6.17       | 37.09         | 43.31          | 74.00      | -30.69     | Peak   |
| 9796.00 | 37.02      | 37.55          | 6.50       | 34.14         | 46.93          | 74.00      | -27.07     | Peak   |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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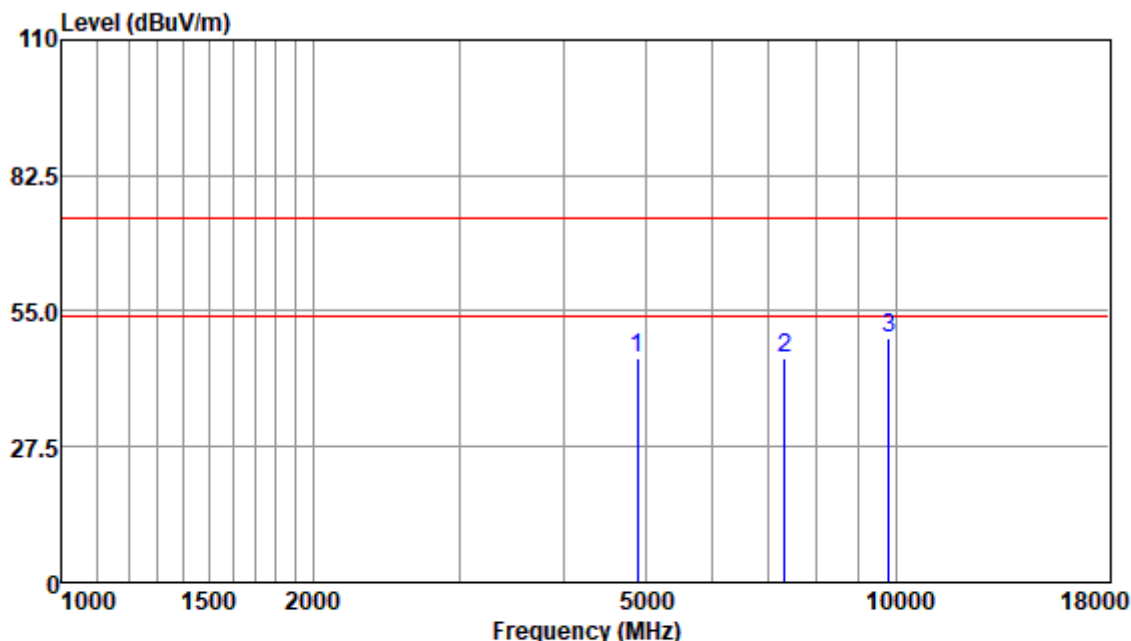
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Testing Center EMC Lab

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Vertical



Antenna Polarity :VERTICAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz     | dBuv       | dB/m           | dB         | dB            | dBuv/m         | dBuv/m     | dB         |        |
| 4898.00 | 45.85      | 33.97          | 4.30       | 38.80         | 45.32          | 74.00      | -28.68     | Peak   |
| 7347.00 | 39.90      | 36.47          | 6.17       | 37.09         | 45.45          | 74.00      | -28.55     | Peak   |
| 9796.00 | 39.51      | 37.55          | 6.50       | 34.14         | 49.42          | 74.00      | -24.58     | Peak   |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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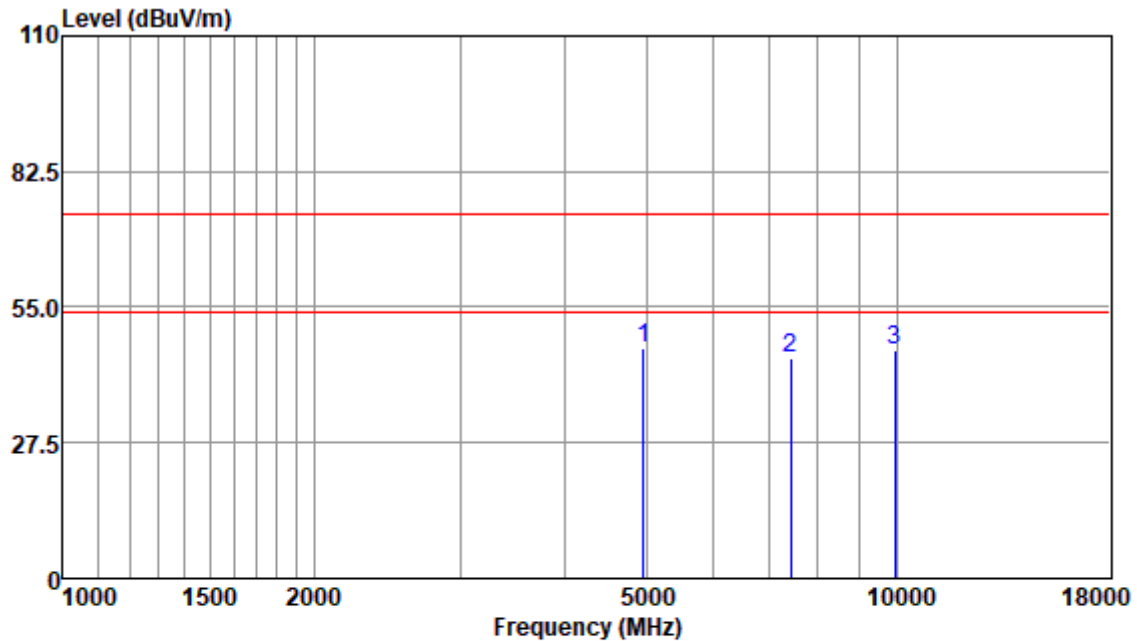
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2480MHz:  
Horizontal



Antenna Polarity :HORIZONTAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz     | dBuv       | dB/m           | dB         | dB            | dBuv/m         | dBuv/m     | dB         |        |
| 4960.00 | 46.45      | 33.98          | 5.04       | 38.87         | 46.60          | 74.00      | -27.40     | Peak   |
| 7440.00 | 39.22      | 36.40          | 6.09       | 37.03         | 44.68          | 74.00      | -29.32     | Peak   |
| 9920.00 | 35.86      | 37.81          | 6.53       | 34.11         | 46.09          | 74.00      | -27.91     | Peak   |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

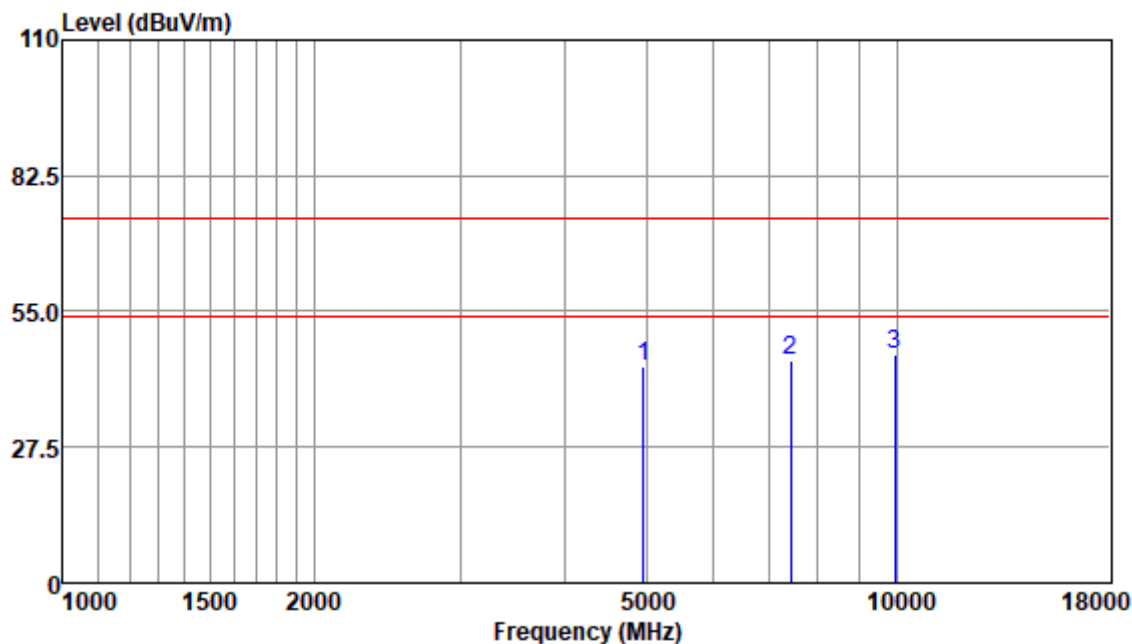


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Vertical



Antenna Polarity :VERTICAL

| Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz     | dBuv       | dB/m           | dB         | dB            | dBuv/m         | dBuv/m     | dB         |        |
| 4960.00 | 43.74      | 33.98          | 5.04       | 38.87         | 43.89          | 74.00      | -30.11     | Peak   |
| 7440.00 | 39.44      | 36.40          | 6.09       | 37.03         | 44.90          | 74.00      | -29.10     | Peak   |
| 9920.00 | 35.89      | 37.81          | 6.53       | 34.11         | 46.12          | 74.00      | -27.88     | Peak   |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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## 8 Test Setup Photographs

Refer to the < Test Setup photos-FCC>.

## 9 EUT Constructional Details

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

**- End of the Report -**

