

# FCC TEST REPORT

**Product** : XPS CONTROLLER  
**Trade mark** : N/A  
**Model/Type reference** : XPS CONTROLLER  
**Serial Number** : N/A  
**Report Number** : EED32J00066901  
**FCC ID** : XRZ2017XPS  
**Date of Issue** : May 25, 2017  
**Test Standards** : 47 CFR Part 15 Subpart C (2015)  
**Test result** : PASS

Prepared for:

**KIDSROCK LTD**

**Unit 08A, 25/F Gammon House, 12 Harcourt Road, Admiralty,  
Hong Kong, China.**

Prepared by:

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Date:

May 25, 2017

Check No.:2496577729



## Version

| Version No. | Date         | Description |
|-------------|--------------|-------------|
| 00          | May 25, 2017 | Original    |
|             |              |             |
|             |              |             |

## 2 Test Summary

| Test Item   | Test Requirement                                   | Test method      | Result |
|---|--|------------------|--------|
| Antenna Requirement   | 47 CFR Part 15 Subpart C Section 15.203            | ANSI C63.10-2013 | PASS   |
| AC Power Line Conducted Emission                                  | 47 CFR Part 15 Subpart C Section 15.207            | ANSI C63.10-2013 | N/A    |
| Field Strength of the Fundamental Signal                          | 47 CFR Part 15 Subpart C Section 15.249 (a)        | ANSI C63.10-2013 | PASS   |
| Spurious Emissions  | 47 CFR Part 15 Subpart C Section 15.249 (a)/15.209 | ANSI C63.10-2013 | PASS   |
| Restricted bands around fundamental frequency (Radiated Emission) | 47 CFR Part 15 Subpart C Section 15.249(a)/15.205  | ANSI C63.10-2013 | PASS   |
| 20dB Occupied Bandwidth   | 47 CFR Part 15 Subpart C Section 15.215 (c)        | ANSI C63.10-2013 | PASS   |

Remark:

The tested samples and the sample information are provided by the client.

N/A: In this whole report not application.

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## 4 General Information

### 4.1 Client Information

|                          |   |
|--------------------------|---|
| Applicant:               | KIDSRock LTD  |
| Address of Applicant:    | Unit 08A, 25/F Gammon House, 12 Harcourt Road, Admiralty, Hong Kong, China.         |
| Manufacturer:            | KIDSRock LTD  |
| Address of Manufacturer: | Unit 08A, 25/F Gammon House, 12 Harcourt Road, Admiralty, Hong Kong, China.         |
| Factory:                 | DONGGUAN DESHEN METAL & PLASTIC PRODUCTS CO., LTD                                   |
| Address of Factory:      | Xiasha, No.3 Industrial Zone, Shipai Town, Dongguan City, Guangdong Province, China |

### 4.2 General Description of EUT

|                                  |  |
|----------------------------------|--|
| Product Name:                    | XPS CONTROLLER   |
| Model No.:                       | XPS CONTROLLER   |
| Trade Mark:                      | N/A  |
| EUT Supports Radios application: | 2413MHz-2470MHz  |
| Power Supply:                    | 6V  (Supply with 4xAA 1.5V Alkaline Batteries) |

### 4.3 Product Specification subjective to this standard

|                       |                               |
|-----------------------|-------------------------------|
| Frequency Range:      | 2413MHz-2470MHz               |
| Modulation Type:      | GFSK                          |
| Number of Channels:   | 25 (declared by the client)   |
| Sample Type:          | Portable production           |
| Antenna Type:         | Integrate                     |
| Antenna Gain:         | 2.54dBi                       |
| Test voltage:         | DC 6V                         |
| Sample Received Date: | Apr. 14, 2017                 |
| Sample tested Date:   | Apr. 14, 2017 to May 18, 2017 |

### 4.4 Test Environment and Mode

|                               |  |
|-------------------------------|--|
| <b>Operating Environment:</b> |  |
| Temperature:                  | 24°C   |
| Humidity:                     | 55% RH   |
| Atmospheric Pressure:         | 1010 mbar  |
| <b>Test mode:</b>             |  |
| Transmitting mode:            | Keep the EUT transmitted the continuous modulation test signal at the specific channel(s). |



## 4.5 Description of Support Units

The EUT has been tested independently.

## Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

## 4.6 Test Facility

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

### **CNAS-Lab Code: L1910**

Centre Testing International Group Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories..

### **A2LA-Lab Cert. No. 3061.01**

Centre Testing International Group Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

### **FCC-Registration No.: 886427**

Centre Testing International Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 886427.

### **IC-Registration No.: 7408A-2**

The 3m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408A-2 .

### **IC-Registration No.: 7408B-1**

The 10m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408B-1.

### **NEMKO-Aut. No.: ELA503**

Centre Testing International Group Co., Ltd. has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

### **VCCI**

The Radiation 3 & 10 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-4096.

Main Ports Conducted Interference Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-4563.

Telecommunication Ports Conducted Disturbance Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-2146.

The Radiation 3 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-758

#### 4.7 Deviation from Standards

None.

#### 4.8 Abnormalities from Standard Conditions

None.

#### 4.9 Other Information Requested by the Customer

None.

#### 4.10 Measurement Uncertainty (95% confidence levels, k=2)

| No. | Item                            | Measurement Uncertainty |
|-----|---------------------------------|-------------------------|
| 1   | Radio Frequency                 | $7.9 \times 10^{-8}$    |
| 2   | RF power, conducted             | 0.31dB (30MHz-1GHz)     |
|     |                                 | 0.57dB (1GHz-18GHz)     |
| 3   | Radiated Spurious emission test | 4.5dB (30MHz-1GHz)      |
|     |                                 | 4.8dB (1GHz-12.75GHz)   |
| 4   | Conduction emission             | 3.6dB (9kHz to 150kHz)  |
|     |                                 | 3.2dB (150kHz to 30MHz) |
| 5   | Temperature test                | 0.64°C                  |
| 6   | Humidity test                   | 2.8%                    |
| 7   | DC power voltages               | 0.025%                  |

## 5 Equipment List

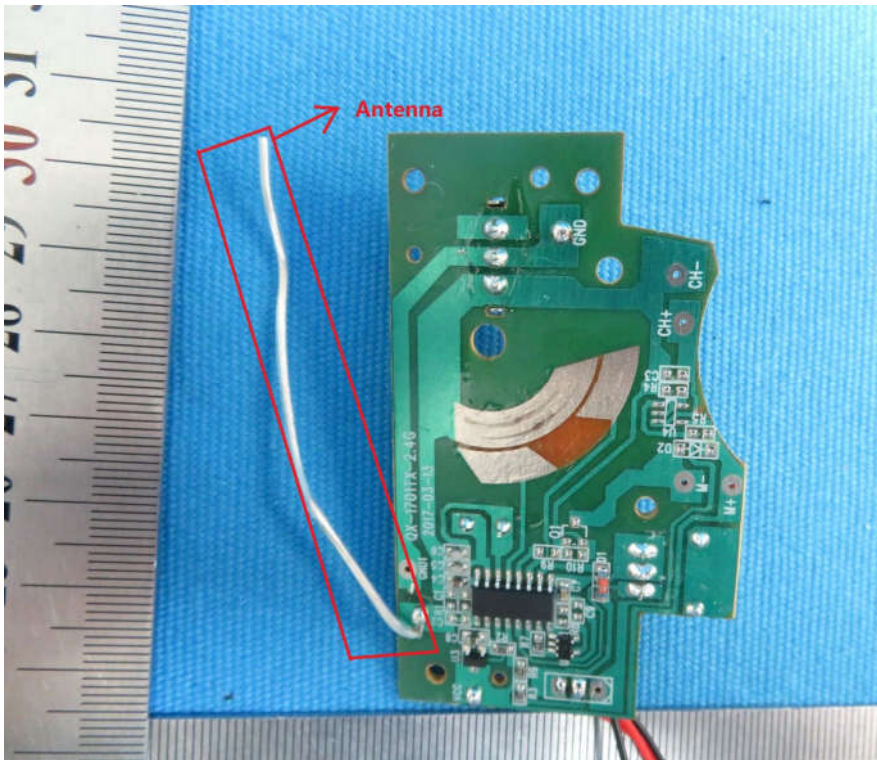
| 3M Semi/full-anechoic Chamber    |               |                              |               |                        |                            |
|----------------------------------|---------------|------------------------------|---------------|------------------------|----------------------------|
| Equipment                        | Manufacturer  | Model No.                    | Serial Number | Cal. date (mm-dd-yyyy) | Cal. Due date (mm-dd-yyyy) |
| 3M Chamber & Accessory Equipment | TDK           | SAC-3                        | ---           | 06-05-2016             | 06-05-2019                 |
| TRILOG Broadband Antenna         | SCHWARZBEC K  | VULB9163                     | 9163-484      | 05-22-2017             | 05-21-2018                 |
| Microwave Preamplifier           | Agilent       | 8449B                        | 3008A02425    | 02-16-2017             | 02-15-2018                 |
| Horn Antenna                     | ETS-LINDGREN  | 3117                         | 00057407      | 07-20-2015             | 07-18-2018                 |
| Loop Antenna                     | ETS           | 6502                         | 00071730      | 07-30-2015             | 07-28-2017                 |
| Spectrum Analyzer                | R&S           | FSP40                        | 100416        | 06-16-2016             | 06-15-2017                 |
| Receiver                         | R&S           | ESCI                         | 100435        | 06-16-2016             | 06-15-2017                 |
| Multi device Controller          | maturio       | NCD/070/10711<br>112         | ---           | 01-11-2017             | 01-10-2018                 |
| LISN                             | schwarzbeck   | NNBM8125                     | 81251547      | 06-16-2016             | 06-15-2017                 |
| LISN                             | schwarzbeck   | NNBM8125                     | 81251548      | 06-16-2016             | 06-15-2017                 |
| Signal Generator                 | Agilent       | E4438C                       | MY45095744    | 03-14-2017             | 03-13-2018                 |
| Signal Generator                 | Keysight      | E8257D                       | MY53401106    | 03-14-2017             | 03-13-2018                 |
| Temperature/ Humidity Indicator  | TAYLOR        | 1451                         | 1905          | 05-08-2017             | 05-07-2018                 |
| Cable line                       | Fulai(7M)     | SF106                        | 5219/6A       | 01-11-2017             | 01-10-2018                 |
| Cable line                       | Fulai(6M)     | SF106                        | 5220/6A       | 01-11-2017             | 01-10-2018                 |
| Cable line                       | Fulai(3M)     | SF106                        | 5216/6A       | 01-11-2017             | 01-10-2018                 |
| Cable line                       | Fulai(3M)     | SF106                        | 5217/6A       | 01-11-2017             | 01-10-2018                 |
| High-pass filter                 | Sinoscite     | FL3CX03WG18<br>NM12-0398-002 | ---           | 01-11-2017             | 01-10-2018                 |
| High-pass filter                 | MICRO-TRONICS | SPA-F-63029-4                | ---           | 01-11-2017             | 01-10-2018                 |
| band rejection filter            | Sinoscite     | FL5CX01CA09<br>CL12-0395-001 | ---           | 01-11-2017             | 01-10-2018                 |
| band rejection filter            | Sinoscite     | FL5CX01CA08<br>CL12-0393-001 | ---           | 01-11-2017             | 01-10-2018                 |
| band rejection filter            | Sinoscite     | FL5CX02CA04<br>CL12-0396-002 | ---           | 01-11-2017             | 01-10-2018                 |
| band rejection filter            | Sinoscite     | FL5CX02CA03<br>CL12-0394-001 | ---           | 01-11-2017             | 01-10-2018                 |



| RF Conducted test          |               |                              |               |                        |                            |
|----------------------------|---------------|------------------------------|---------------|------------------------|----------------------------|
| Equipment                  | Manufacturer  | Mode No.                     | Serial Number | Cal. date (mm-dd-yyyy) | Cal. Due date (mm-dd-yyyy) |
| Spectrum Analyzer          | R&S           | FSP40                        | 100416        | 06-16-2016             | 06-15-2017                 |
| Receiver                   | R&S           | ESCI                         | 100435        | 06-16-2016             | 06-15-2017                 |
| Signal Generator           | Agilent       | E4438C                       | MY45095744    | 03-14-2017             | 03-13-2018                 |
| Signal Generator           | Keysight      | E8257D                       | MY53401106    | 03-14-2017             | 03-13-2018                 |
| High-pass filter (3-18GHz) | Sinoscite     | FL3CX03WG18<br>NM12-0398-002 | ---           | 01-11-2017             | 01-10-2018                 |
| High-pass filter (6-18GHz) | MICRO-TRONICS | SPA-F-63029-4                | ---           | 01-11-2017             | 01-10-2018                 |
| band rejection filter      | Sinoscite     | FL5CX01CA09C<br>L12-0395-001 | ---           | 01-11-2017             | 01-10-2018                 |
| band rejection filter      | Sinoscite     | FL5CX01CA08C<br>L12-0393-001 | ---           | 01-11-2017             | 01-10-2018                 |
| band rejection filter      | Sinoscite     | FL5CX02CA04C<br>L12-0396-002 | ---           | 01-11-2017             | 01-10-2018                 |

## 6 Test results and Measurement Data

### 6.1 Antenna Requirement

|   |   |
|---|---|
| <b>Standard requirement:</b>  | 47 CFR Part 15C Section 15.203  |
| <p>15.203 requirement:<br/>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.</p> |   |
| <b>EUT Antenna:</b>   |  <p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.54dBi.</p> |

## 6.2 Radiated Spurious Emission

**Test Requirement:** 47 CFR Part 15C Section 15.249 and 15.209

**Test Method:** ANSI C63.10

**Test Site:** Measurement Distance: 3m (Semi-Anechoic Chamber)

**Receiver Setup:**

| Frequency         | Detector   | RBW    | VBW    | Remark     |
|-------------------|------------|--------|--------|------------|
| 0.009MHz-0.090MHz | Peak       | 10kHz  | 30KHz  | Peak       |
| 0.009MHz-0.090MHz | Average    | 10kHz  | 30KHz  | Average    |
| 0.090MHz-0.110MHz | Quasi-peak | 10kHz  | 30KHz  | Quasi-peak |
| 0.110MHz-0.490MHz | Peak       | 10kHz  | 30KHz  | Peak       |
| 0.110MHz-0.490MHz | Average    | 10kHz  | 30KHz  | Average    |
| 0.490MHz -30MHz   | Quasi-peak | 10kHz  | 30kHz  | Quasi-peak |
| 30MHz-1GHz        | Quasi-peak | 120kHz | 300KHz | Quasi-peak |
| Above 1GHz        | Peak       | 1MHz   | 3MHz   | Peak       |
|                   | Peak       | 1MHz   | 10Hz   | Average    |

**Test Setup:**

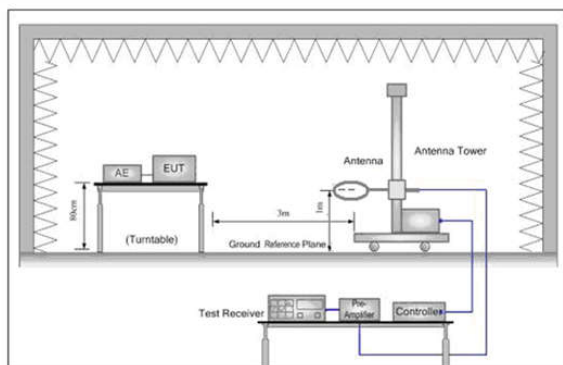


Figure 1. Below 30MHz

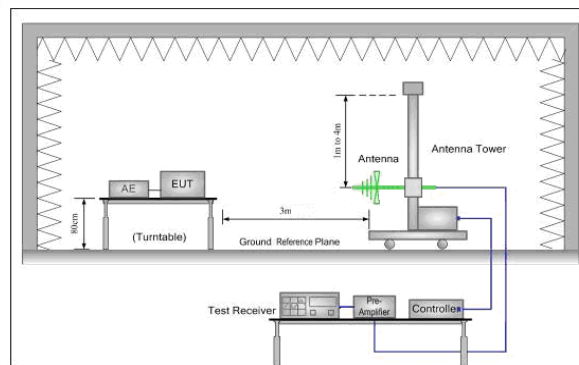


Figure 2. 30MHz to 1GHz

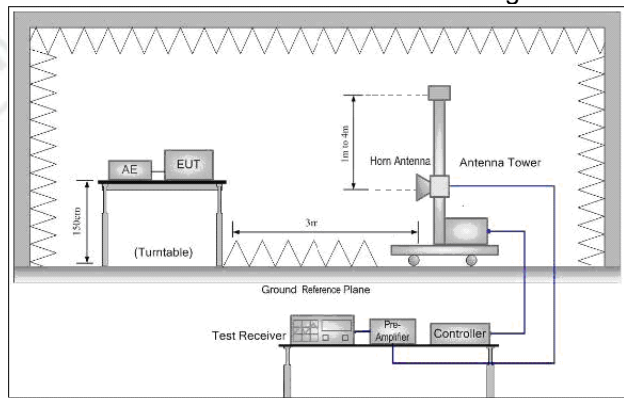


Figure 3. Above 1GHz

**Test Procedure:**

**Below 1GHz test procedure as below:**

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

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.

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 rotating table was turned from 0 degrees to 360 degrees to find the maximum reading.

The test-receiver system was set to Peak Detect Function and Specified Bandwidth with

Maximum Hold Mode.

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.

**Above 1GHz test procedure as below:**

Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter( Above 18GHz the distance is 1 meter and table is 1.5 meter).

Test the EUT in the lowest channel ,middle channel, the Highest channel

The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.

Repeat above procedures until all frequencies measured was complete.

**Limit:**  
(Spurious  
Emissions)

| Frequency         | Field strength<br>(microvolt/meter) | Limit<br>(dB $\mu$ V/m) | Remark     | Measurement<br>distance (m) |
|-------------------|-------------------------------------|-------------------------|------------|-----------------------------|
| 0.009MHz-0.490MHz | 2400/F(kHz)                         | -                       | -          | 300                         |
| 0.490MHz-1.705MHz | 24000/F(kHz)                        | -                       | -          | 30                          |
| 1.705MHz-30MHz    | 30                                  | -                       | -          | 30                          |
| 30MHz-88MHz       | 100                                 | 40.0                    | Quasi-peak | 3                           |
| 88MHz-216MHz      | 150                                 | 43.5                    | Quasi-peak | 3                           |
| 216MHz-960MHz     | 200                                 | 46.0                    | Quasi-peak | 3                           |
| 960MHz-1GHz       | 500                                 | 54.0                    | Quasi-peak | 3                           |
| Above 1GHz        | 500                                 | 54.0                    | Average    | 3                           |

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

**Limit:**  
(Field strength of  
the fundamental  
signal)

| Frequency         | Limit (dB $\mu$ V/m @3m) | Remark        |
|-------------------|--------------------------|---------------|
| 2400MHz-2483.5MHz | 94.0                     | Average Value |
|                   | 114.0                    | Peak Value    |

**Test Mode:** Transmitting mode

**Instruments Used:** Refer to section 6 for details

**Test Results:** Pass



## Measurement Data

### Field Strength Of The Fundamental Signal

Peak value:

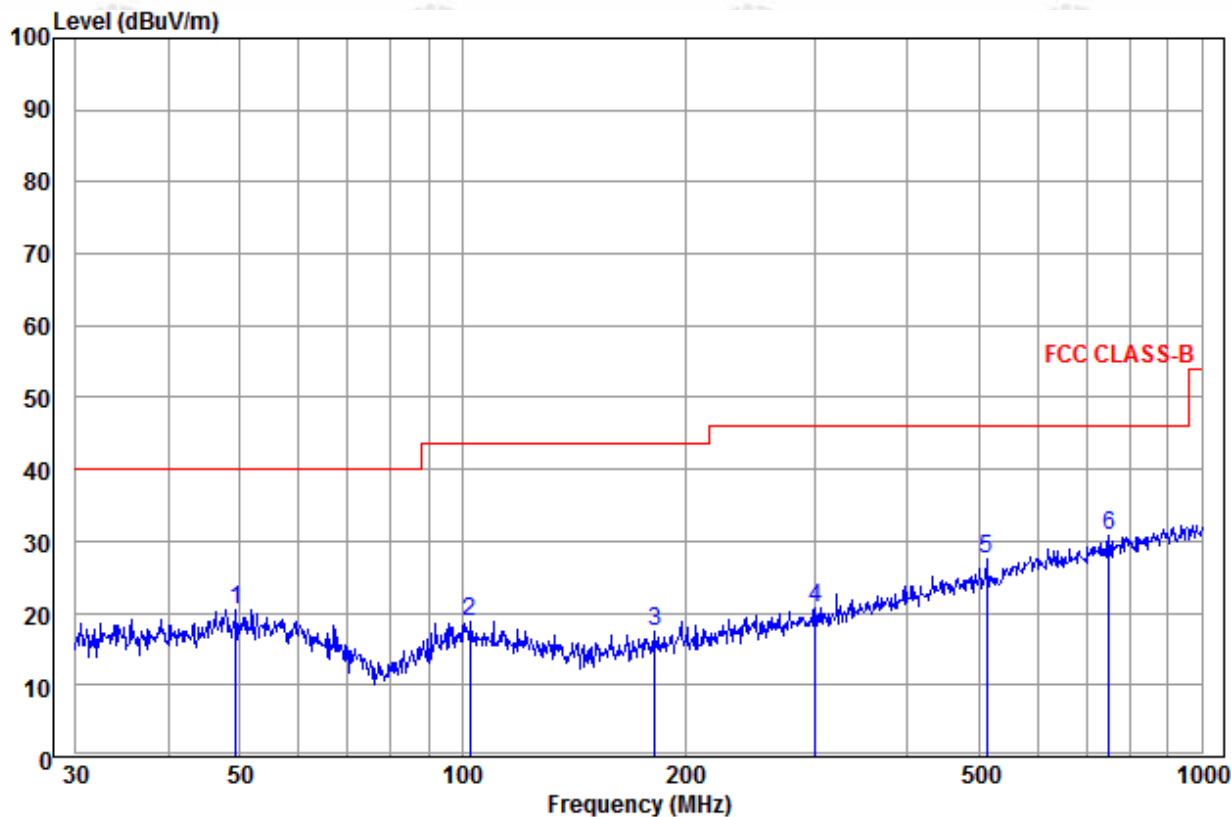
| Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Gain (dB) | Read Level (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Result | Antenna Polaxis |
|-----------------|-----------------------|-----------------|------------------------|-------------------|----------------|----------------|-----------------|--------|-----------------|
| 2413            | 32.58                 | 4.34            | 34.39                  | 82.51             | 85.04          | 94.0           | -8.96           | Pass   | H               |
| 2413            | 32.58                 | 4.34            | 34.39                  | 82.34             | 84.87          | 94.0           | -9.13           | Pass   | V               |
| 2443            | 32.64                 | 4.41            | 34.40                  | 83.34             | 85.80          | 94.0           | -8.20           | Pass   | H               |
| 2443            | 32.64                 | 4.41            | 34.40                  | 81.49             | 83.95          | 94.0           | -10.05          | Pass   | V               |
| 2470            | 32.69                 | 4.47            | 34.40                  | 81.98             | 84.74          | 94.0           | -9.26           | Pass   | H               |
| 2470            | 32.69                 | 4.47            | 34.40                  | 82.39             | 85.15          | 94.0           | -8.85           | Pass   | V               |

**Remark:** As shown in this section, for field strength of the fundamental signal measurements, RBW and VBW set 10MHz, 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. So, only the peak measurements were shown in the report.

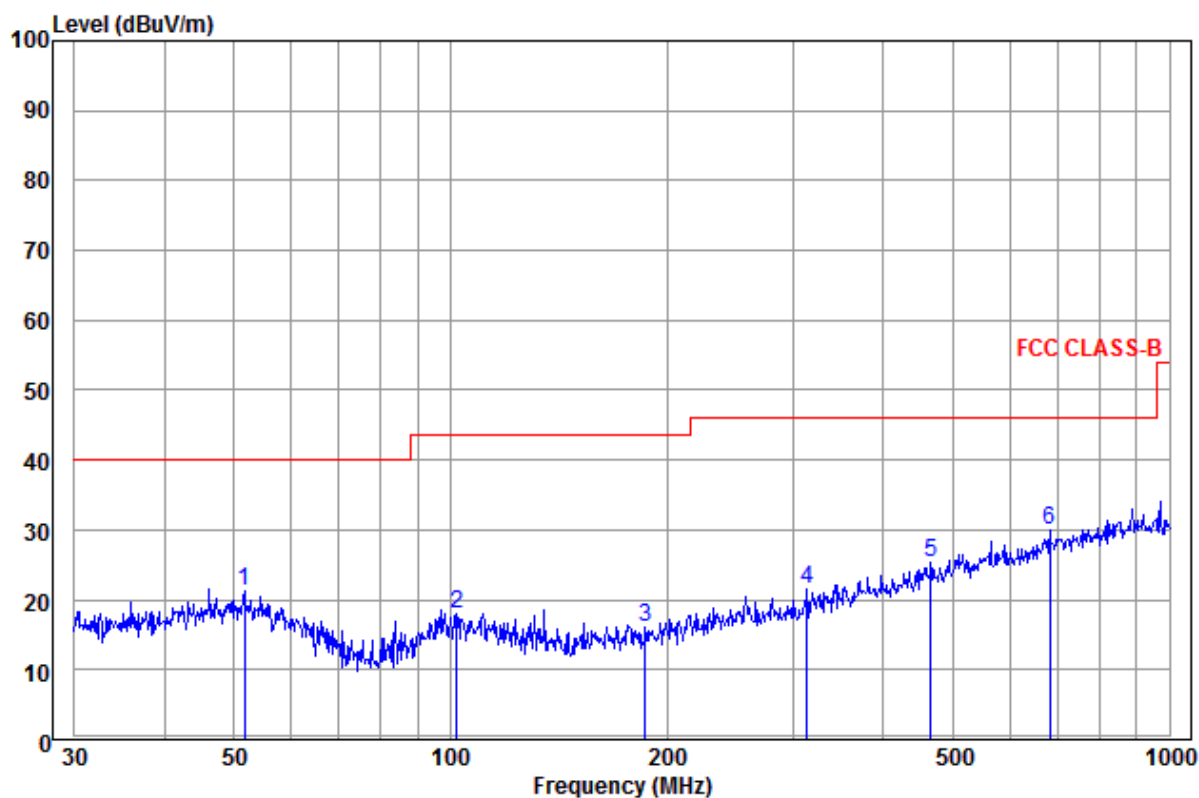


**Spurious Emissions**

**30MHz~1GHz**



|      | Freq    | Ant Factor | Cable Loss | Read Level | Level  | Limit Line | Over Limit | Pol/Phase  | Remark |
|------|---------|------------|------------|------------|--------|------------|------------|------------|--------|
|      | MHz     | dB/m       | dB         | dBuV       | dBuV/m | dBuV/m     | dB         |            |        |
| 1    | 49.359  | 15.05      | 1.35       | 4.14       | 20.54  | 40.00      | -19.46     | Horizontal |        |
| 2    | 102.360 | 13.00      | 1.57       | 4.11       | 18.68  | 43.50      | -24.82     | Horizontal |        |
| 3    | 181.920 | 10.97      | 2.00       | 4.44       | 17.41  | 43.50      | -26.09     | Horizontal |        |
| 4    | 300.367 | 13.51      | 2.38       | 4.81       | 20.70  | 46.00      | -25.30     | Horizontal |        |
| 5    | 511.835 | 18.45      | 3.15       | 5.86       | 27.46  | 46.00      | -18.54     | Horizontal |        |
| 6 pp | 750.108 | 21.00      | 4.01       | 5.72       | 30.73  | 46.00      | -15.27     | Horizontal |        |



|      | Ant<br>Freq | Cable<br>Factor | Read<br>Level | Limit<br>Level | Over<br>Line | Over<br>Limit | Pol/Phase | Remark   |
|------|-------------|-----------------|---------------|----------------|--------------|---------------|-----------|----------|
|      | MHz         | dB/m            | dB            | dBuV           | dBuV/m       | dB            |           |          |
| 1    | 51.662      | 14.87           | 1.41          | 5.01           | 21.29        | 40.00         | -18.71    | Vertical |
| 2    | 102.001     | 13.03           | 1.57          | 3.46           | 18.06        | 43.50         | -25.44    | Vertical |
| 3    | 186.441     | 11.14           | 2.06          | 2.96           | 16.16        | 43.50         | -27.34    | Vertical |
| 4    | 313.276     | 13.87           | 2.47          | 5.24           | 21.58        | 46.00         | -24.42    | Vertical |
| 5    | 465.599     | 17.52           | 3.04          | 4.80           | 25.36        | 46.00         | -20.64    | Vertical |
| 6 pp | 682.348     | 20.32           | 3.78          | 5.93           | 30.03        | 46.00         | -15.97    | Vertical |

**Above 1GHz**

| Test mode:      |                       | Transmitting    |                        | Test channel:     |                | Lowest(2413MHz)     |                 |        |                 |
|-----------------|-----------------------|-----------------|------------------------|-------------------|----------------|---------------------|-----------------|--------|-----------------|
| Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Gain (dB) | Read Level (dBμV) | Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Result | Antenna Polaxis |
| 1461.238        | 30.79                 | 2.79            | 34.71                  | 46.56             | 45.43          | 74                  | -28.57          | Pass   | H               |
| 1889.633        | 31.54                 | 3.15            | 34.37                  | 45.23             | 45.55          | 74                  | -28.45          | Pass   | H               |
| 3350.560        | 33.29                 | 5.55            | 34.54                  | 44.17             | 48.47          | 74                  | -25.53          | Pass   | H               |
| 4826.000        | 34.75                 | 5.10            | 34.35                  | 43.89             | 49.39          | 74                  | -24.61          | Pass   | H               |
| 7239.000        | 35.90                 | 7.43            | 34.30                  | 39.46             | 48.49          | 74                  | -25.51          | Pass   | H               |
| 9652.000        | 37.09                 | 8.11            | 35.15                  | 37.09             | 47.14          | 74                  | -26.86          | Pass   | H               |
| 1668.044        | 31.18                 | 2.98            | 34.54                  | 46.34             | 45.96          | 74                  | -28.04          | Pass   | V               |
| 2832.394        | 33.33                 | 5.28            | 34.47                  | 44.28             | 48.42          | 74                  | -25.58          | Pass   | V               |
| 3588.939        | 33.10                 | 5.51            | 34.56                  | 43.13             | 47.18          | 74                  | -26.82          | Pass   | V               |
| 4826.000        | 34.86                 | 5.08            | 34.33                  | 43.98             | 49.59          | 74                  | -24.41          | Pass   | V               |
| 7239.000        | 36.44                 | 6.78            | 34.90                  | 41.46             | 49.78          | 74                  | -24.22          | Pass   | V               |
| 9652.000        | 38.37                 | 7.42            | 34.94                  | 37.39             | 48.24          | 74                  | -25.76          | Pass   | V               |

| Test mode:      |                       | Transmitting    |                        | Test channel:     |                | Middle (2443MHz)    |                 |        |                 |
|-----------------|-----------------------|-----------------|------------------------|-------------------|----------------|---------------------|-----------------|--------|-----------------|
| Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Gain (dB) | Read Level (dBμV) | Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Result | Antenna Polaxis |
| 1319.777        | 30.50                 | 2.65            | 34.84                  | 46.41             | 44.72          | 74                  | -29.28          | Pass   | H               |
| 1668.044        | 31.18                 | 2.98            | 34.54                  | 46.33             | 45.95          | 74                  | -28.05          | Pass   | H               |
| 3249.760        | 33.38                 | 5.57            | 34.53                  | 45.04             | 49.46          | 74                  | -24.54          | Pass   | H               |
| 4886.000        | 34.86                 | 5.08            | 34.33                  | 44.93             | 50.54          | 74                  | -23.46          | Pass   | H               |
| 7329.000        | 35.90                 | 7.43            | 34.30                  | 41.11             | 50.14          | 74                  | -23.86          | Pass   | H               |
| 9772.000        | 36.44                 | 6.78            | 34.90                  | 41.24             | 49.56          | 74                  | -24.44          | Pass   | H               |
| 1668.044        | 31.18                 | 2.98            | 34.54                  | 46.34             | 45.96          | 74                  | -28.04          | Pass   | V               |
| 2832.394        | 33.33                 | 5.28            | 34.47                  | 44.28             | 48.42          | 74                  | -25.58          | Pass   | V               |
| 3588.939        | 33.10                 | 5.51            | 34.56                  | 43.13             | 47.18          | 74                  | -26.82          | Pass   | V               |
| 4886.000        | 34.86                 | 5.08            | 34.33                  | 43.98             | 49.59          | 74                  | -24.41          | Pass   | V               |
| 7329.000        | 36.44                 | 6.78            | 34.90                  | 41.46             | 49.78          | 74                  | -24.22          | Pass   | V               |
| 9772.000        | 38.37                 | 7.42            | 34.94                  | 37.39             | 48.24          | 74                  | -25.76          | Pass   | V               |

| Test mode:      |                       | Transmitting    |                  | Test channel:     |                | Highest(2470MHz)    |                 |        |                 |
|-----------------|-----------------------|-----------------|------------------|-------------------|----------------|---------------------|-----------------|--------|-----------------|
| Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Gain (dB) | Read Level (dBμV) | Level (dBμV/m) | Limit Line (dBμV/m) | Over Limit (dB) | Result | Antenna Polaxis |
| 1719.783        | 31.26                 | 3.02            | 34.50            | 45.49             | 45.27          | 74                  | -28.73          | Pass   | H               |
| 2935.153        | 33.50                 | 5.49            | 34.49            | 43.77             | 48.27          | 74                  | -25.73          | Pass   | H               |
| 3215.314        | 32.98                 | 5.48            | 34.58            | 43.10             | 46.98          | 74                  | -27.02          | Pass   | H               |
| 4940.000        | 34.99                 | 5.06            | 34.31            | 47.50             | 53.24          | 74                  | -20.76          | Pass   | H               |
| 7410.000        | 36.07                 | 7.11            | 34.50            | 40.40             | 49.08          | 74                  | -24.92          | Pass   | H               |
| 9880.000        | 36.58                 | 7.46            | 34.93            | 37.87             | 46.98          | 74                  | -27.02          | Pass   | H               |
| 1668.044        | 31.18                 | 2.98            | 34.54            | 46.10             | 45.72          | 74                  | -28.28          | Pass   | V               |
| 3104.217        | 33.51                 | 5.60            | 34.51            | 44.40             | 49.00          | 74                  | -25.00          | Pass   | V               |
| 4223.524        | 34.99                 | 5.06            | 34.31            | 44.44             | 50.18          | 74                  | -23.82          | Pass   | V               |
| 4940.000        | 35.73                 | 6.93            | 34.30            | 40.58             | 48.94          | 74                  | -25.06          | Pass   | V               |
| 7410.000        | 36.44                 | 6.85            | 34.90            | 42.15             | 50.54          | 74                  | -23.46          | Pass   | V               |
| 9880.000        | 37.89                 | 7.73            | 35.08            | 38.23             | 48.77          | 74                  | -25.23          | Pass   | V               |

Remark:

- 1) 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 - Correct Factor  
Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor
- 2) Scan from the test data, The average value is lower than limit, and The below the limit need not be reported, so only the peak value had been displayed. the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

3)

### 6.3 Restricted bands around fundamental frequency

**Test Requirement:** 47 CFR Part 15C Section 15.209 and 15.205  
**Test Method:** ANSI C63.10  
**Test Site:** Measurement Distance: 3m (Semi-Anechoic Chamber)  
**Limit(Band Edge):** 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 Section 15.209, whichever is the lesser attenuation.

| Frequency     | Limit (dB $\mu$ V/m @3m) | Remark           |
|---------------|--------------------------|------------------|
| 30MHz-88MHz   | 40.0                     | Quasi-peak Value |
| 88MHz-216MHz  | 43.5                     | Quasi-peak Value |
| 216MHz-960MHz | 46.0                     | Quasi-peak Value |
| 960MHz-1GHz   | 54.0                     | Quasi-peak Value |
| Above 1GHz    | 54.0                     | Average Value    |
|               | 74.0                     | Peak Value       |

#### Test Setup:

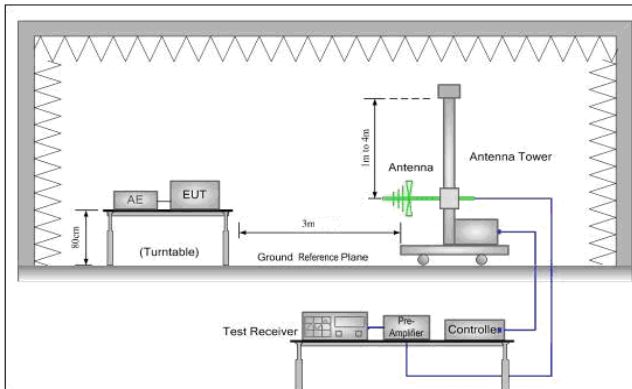


Figure 1. 30MHz to 1GHz

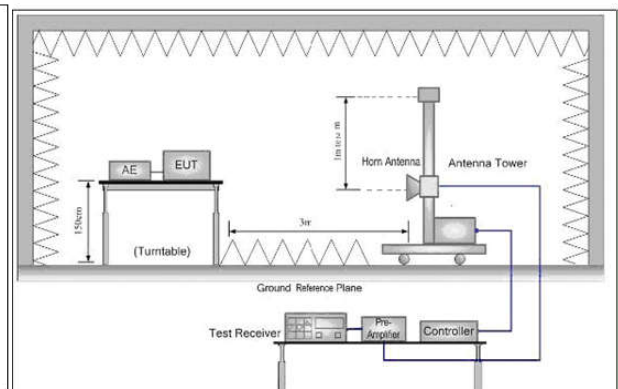


Figure 2. Above 1 GHz

#### Test Procedure:

##### Below 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.

##### Above 1GHz test procedure as below:

- Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre( Above 18GHz the distance is 1 meter and table is 1.5 metre).
- Test the EUT in the lowest channel , the Highest channel
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.



j. Repeat above procedures until all frequencies measured was complete.  
**Instruments Used:** Refer to section 6 for details  
**Test Mode:** Transmitting mode  
**Test Results:** Pass

**Test plot as follows:**

| Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Premap Factor (dB) | Read Level (dBμV) | Level (dBμV/m) | Limit (dBμV/m) | Over Limit (dB) | Antenna Polaxis | Remark | Test channel |
|-----------------|-----------------------|-----------------|--------------------|-------------------|----------------|----------------|-----------------|-----------------|--------|--------------|
| 2390.00         | 32.53                 | 4.28            | 34.39              | 43.19             | 45.61          | 74             | -28.39          | H               | PK     | Lowest       |
| 2390.00         | 32.53                 | 4.28            | 34.39              | 44.00             | 46.42          | 74             | -27.58          | V               | PK     | Lowest       |
| 2400.00         | 32.55                 | 4.30            | 34.39              | 43.82             | 46.28          | 74             | -27.72          | H               | PK     | Lowest       |
| 2400.00         | 32.55                 | 4.30            | 34.39              | 44.72             | 47.18          | 74             | -26.82          | V               | PK     | Lowest       |
| 2483.50         | 32.71                 | 4.51            | 34.41              | 43.57             | 46.38          | 74             | -27.62          | H               | PK     | Highest      |
| 2483.50         | 32.71                 | 4.51            | 34.41              | 43.05             | 45.86          | 74             | -28.14          | V               | PK     | Highest      |

**Note:**

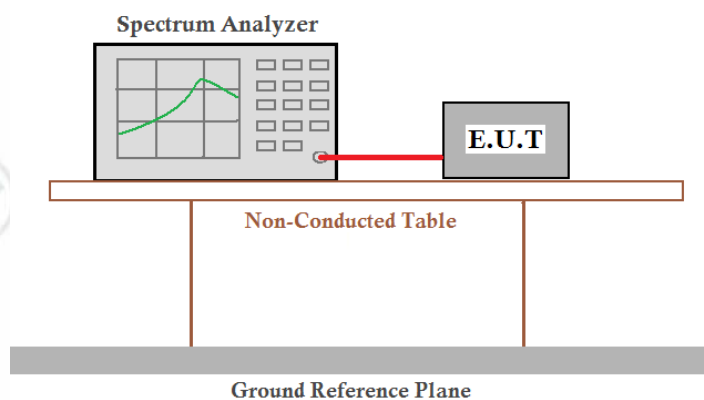
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

## 6.4 20dB Bandwidth

**Test Requirement:** 47 CFR Part 15C Section 15.215  
**Test Method:** ANSI C63.10  
**Test Setup:**



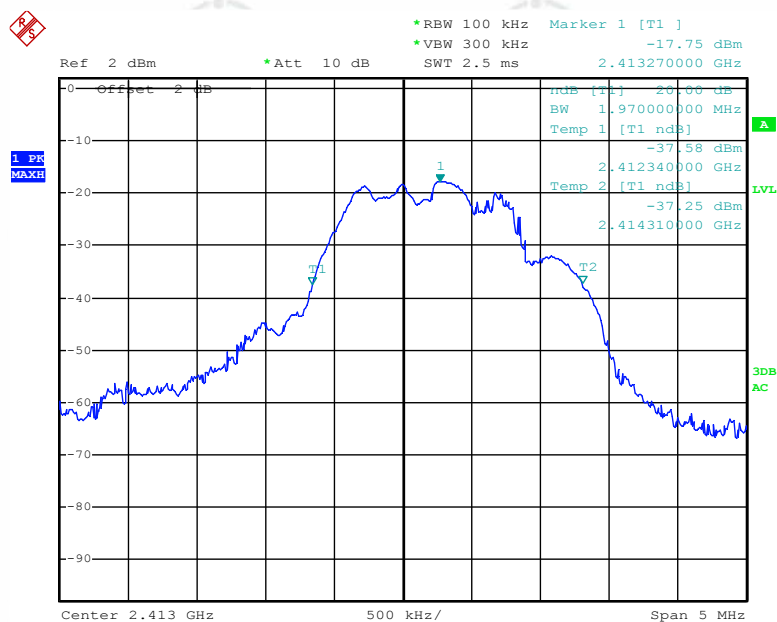
**Test Mode:** Transmitter mode  
**Limit:** N/A  
**Instruments Used:** Refer to section 6 for details  
**Test Results:** Pass

### Measurement Data

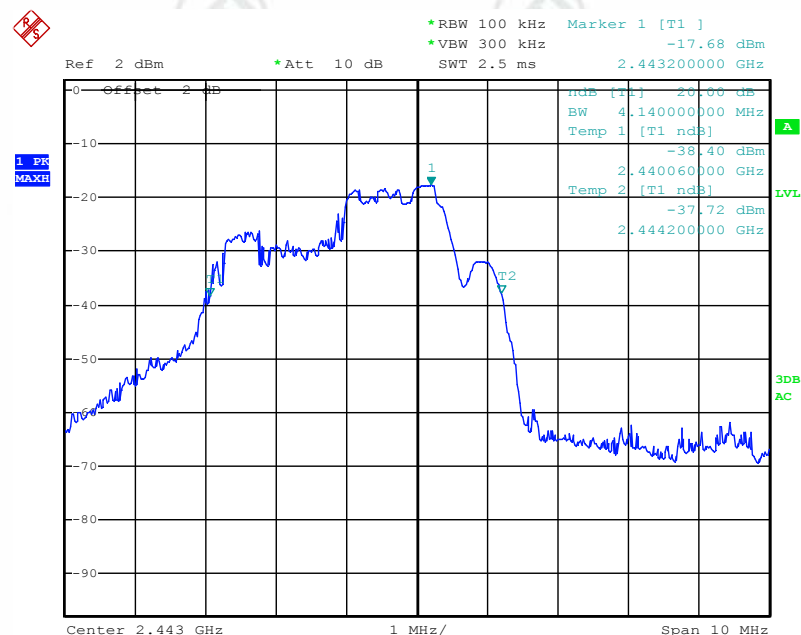
| Test Channel | 20dB bandwidth (MHz) | Results |
|--------------|----------------------|---------|
| Lowest       | 1.97                 | Pass    |
| Middle       | 4.14                 | Pass    |
| Highest      | 2.72                 | Pass    |

**Test plot as follows:**

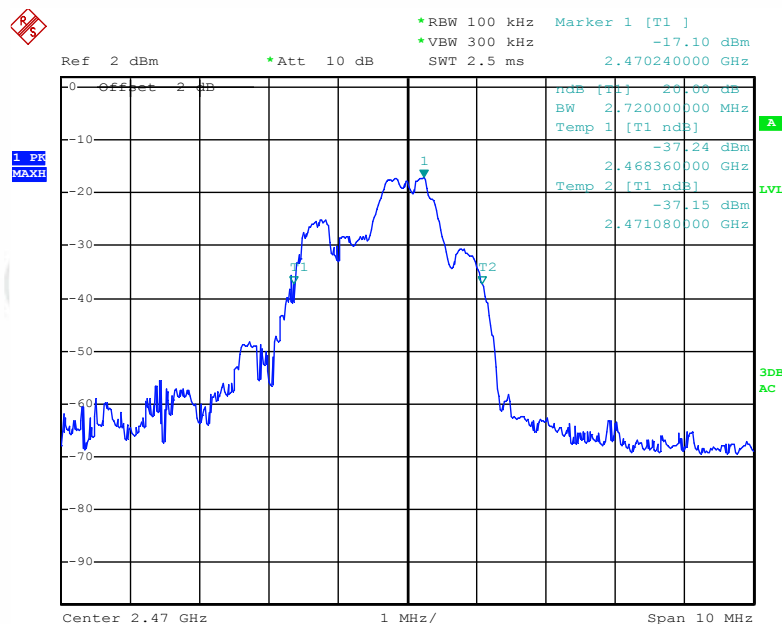
2413Mz



2443MHz

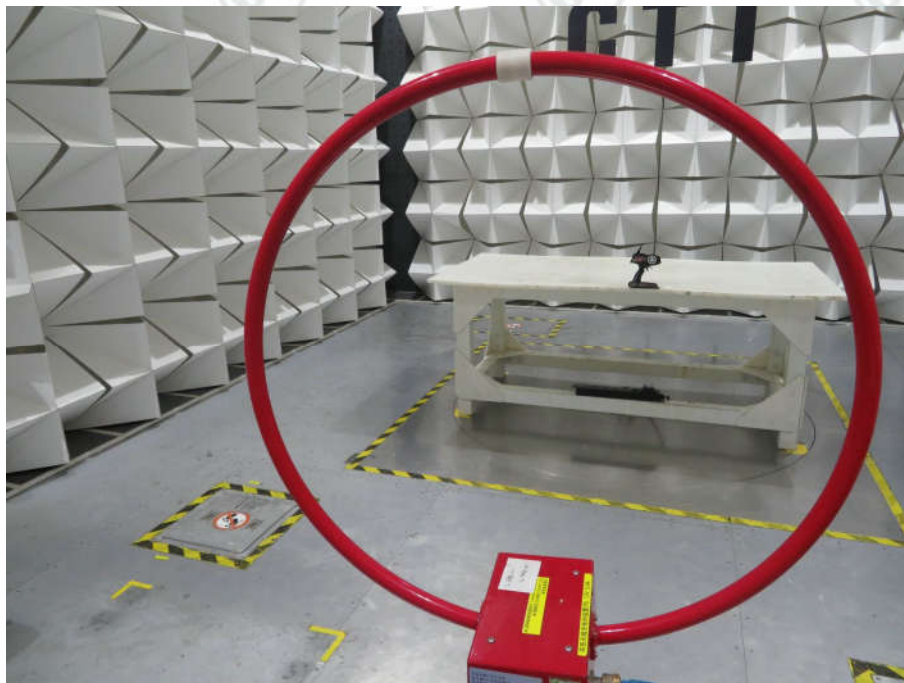


2470MHz

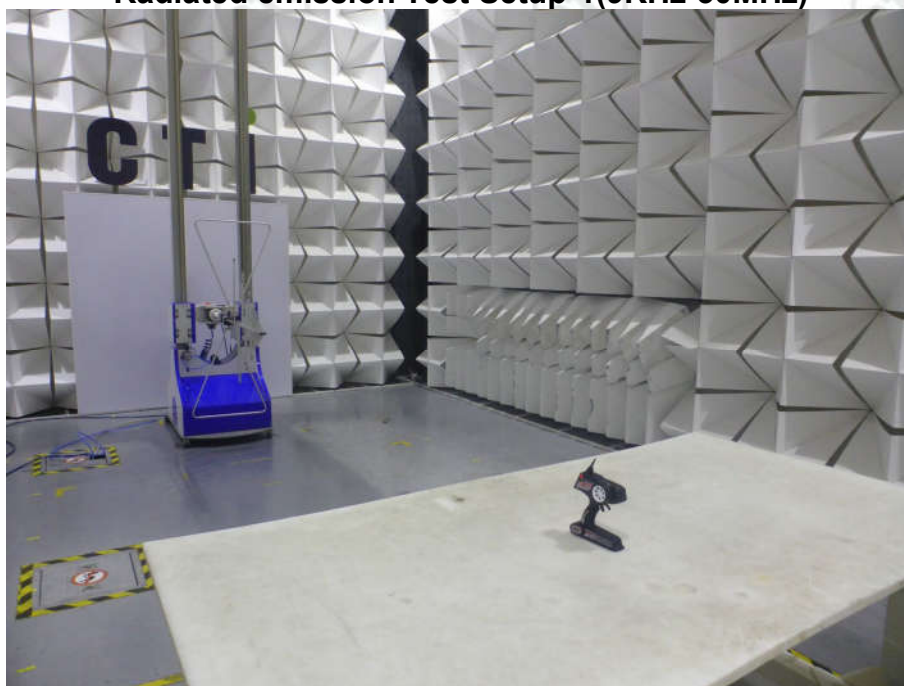


## APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Test Model No.: XPS CONTROLLER

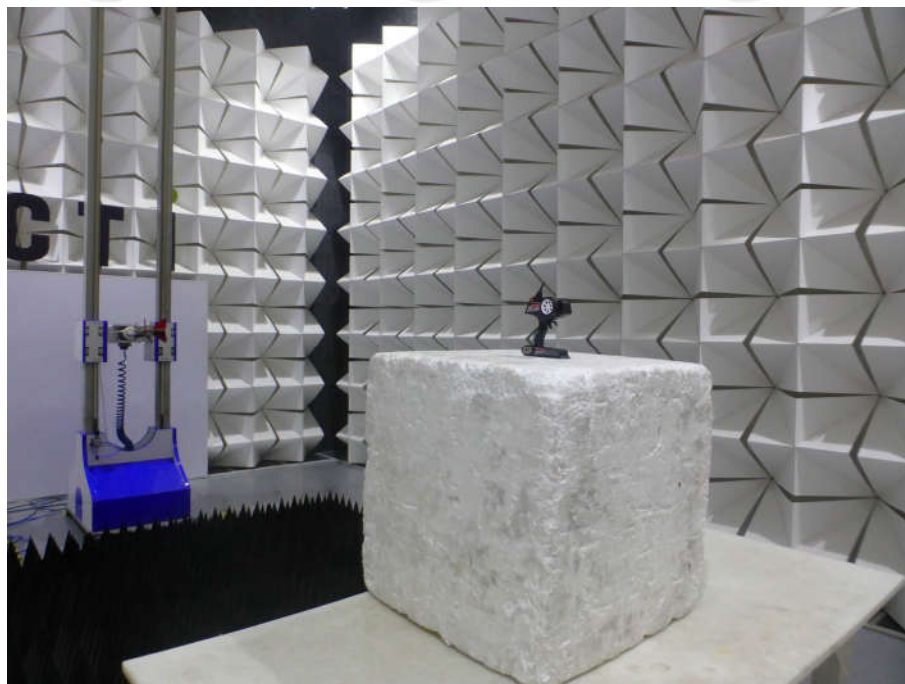


**Radiated emission Test Setup-1(9KHz-30MHz)**



**Radiated emission Test Setup-2(30MHz~1GHz)**





**Radiated spurious emission Test Setup-3(Above 1GHz)**

## APPENDIX 2 PHOTOGRAPHS OF EUT

Test mode No.: XPS CONTROLLER



View of Product-1



View of Product-2



View of Product-3



View of Product-4





View of Product-5



View of Product-6

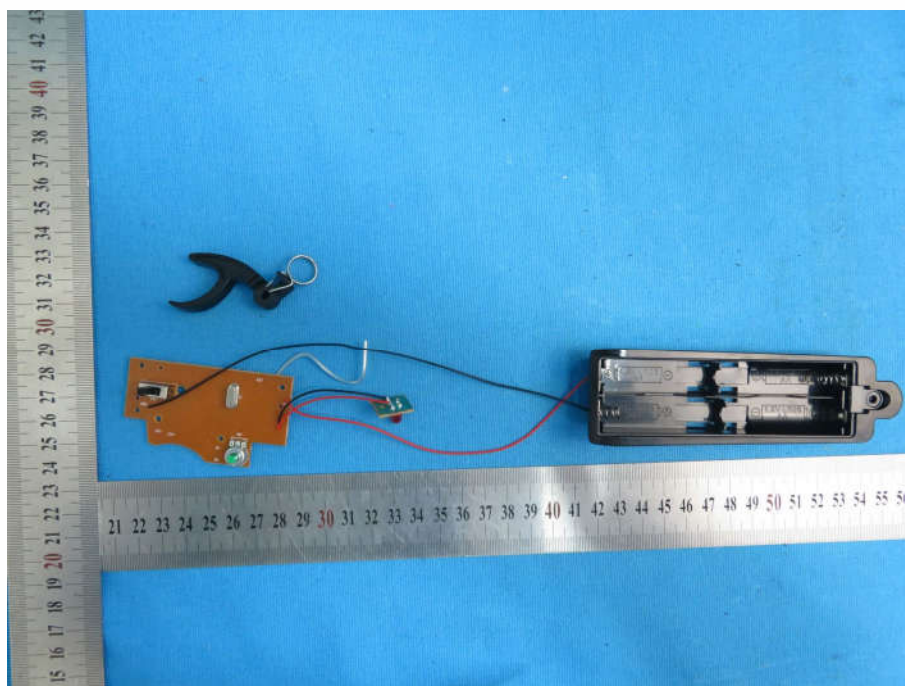


View of Product-7

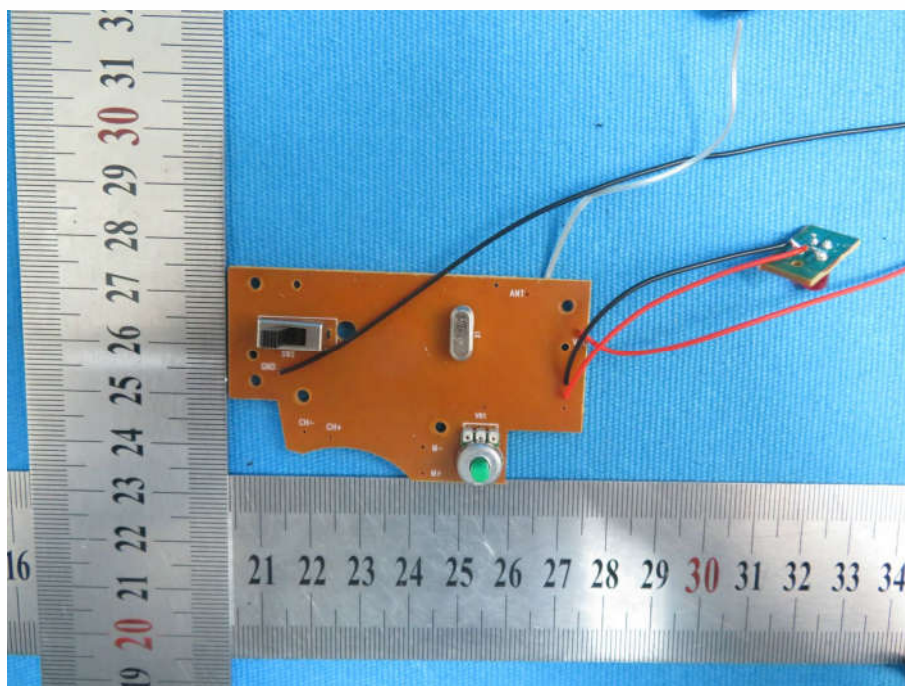


View of Product-8

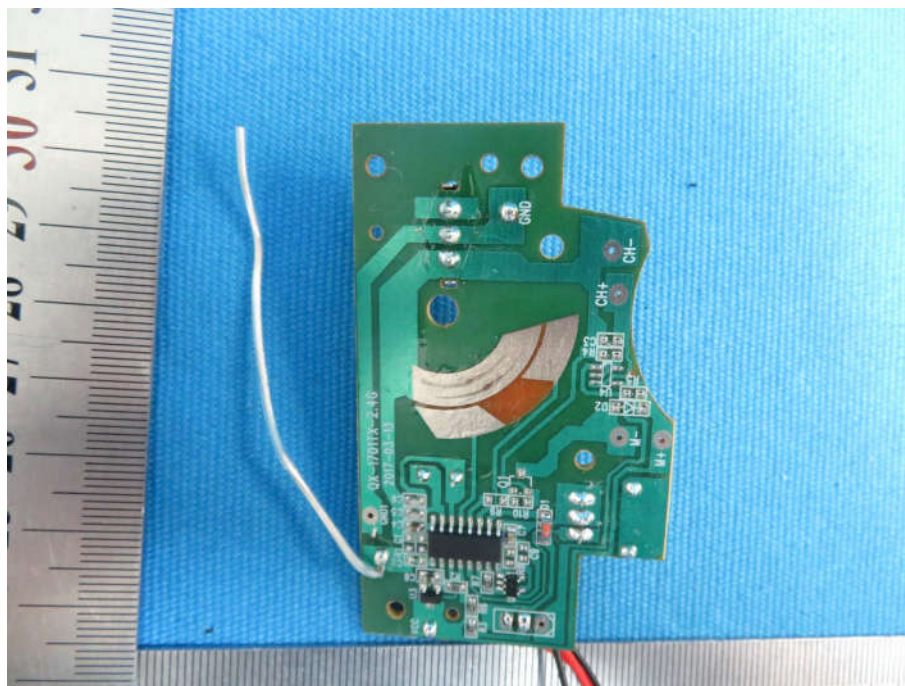




View of Product-9



View of Product-10



View of Product-11

\*\*\* End of Report \*\*\*

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