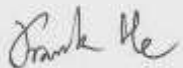
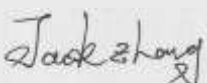




Test report No:  
2060819R-RF-US-P06V01

## FCC & ISED TEST REPORT

|                                             |                                                                                                                                                          |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name                                | LED Device                                                                                                                                               |
| Trademark                                   | PHILIPS                                                                                                                                                  |
| Model and /or type reference                | 9290024227, 9290024228, 9290024229                                                                                                                       |
| FCC ID                                      | 2AGBW9290024227X(9290024227)<br>2AGBW9290024228X(9290024228)<br>2AGBW9290024229X(9290024229)                                                             |
| IC                                          | 20812-4227X(9290024227)<br>20812-4228X(9290024228)<br>20812-4229X(9290024229)                                                                            |
| Applicant's name / address                  | Signify (China) Investment Co., Ltd<br>Building no.9, Lane 888, Tianlin Road, Minhang District, Shanghai,<br>200233, China                               |
| Test method requested, standard             | FCC CFR Title 47 Part 15 Subpart C Section 15.247<br>ANSI C63.10: 2013<br>KD558074 D01 15.247 Meas Guidance v05r02<br>RSS-Gen Issue 5<br>RSS-247 Issue 2 |
| Verdict Summary                             | IN COMPLIANCE                                                                                                                                            |
| Documented by (name / position & signature) | Kitty Li/Project Assistant<br>                                        |
| Reviewed by (name / position & signature)   | Frank He/ Technical Supervisor<br>                                    |
| Approved by (name / position & signature)   | Jack Zhang/ Supervisor<br>                                            |
| Date of issue                               | 2020-07-14                                                                                                                                               |
| Report template No                          | Template_FCC 15.247-RF-V1.0                                                                                                                              |

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## COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

**IMPORTANT:** No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

## GENERAL CONDITIONS

|                      |                                                                        |
|----------------------|------------------------------------------------------------------------|
| Test Location        | No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China |
| Date(receive sample) | Jun. 22, 2020                                                          |
| Date (start test)    | Jun. 22, 2020                                                          |
| Date (finish test)   | Jul. 14, 2020                                                          |

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

## ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

|                       |               |
|-----------------------|---------------|
| Ambient temperature   | 15 °C – 35 °C |
| Relative Humidity air | 30% - 60%     |

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

## POSSIBLE TEST CASE VERDICTS

|                                         |                 |
|-----------------------------------------|-----------------|
| Test case does not apply to test object | N/A             |
| Test object does meet requirement       | P (Pass) / PASS |
| Test object does not meet requirement   | F (Fail) / FAIL |
| Not measured                            | N/M             |

## ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

|       |                               |
|-------|-------------------------------|
| EUT   | : Equipment Under Test        |
| QP    | : Quasi-Peak                  |
| CAV   | : CISPR Average               |
| AV    | : Average                     |
| CDN   | : Coupling Decoupling Network |
| SAC   | : Semi-Anechoic Chamber       |
| OATS  | : Open Area Test Site         |
| BW    | : Bandwidth                   |
| AM    | : Amplitude Modulation        |
| PM    | : Pulse Modulation            |
| HCP   | : Horizontal Coupling Plane   |
| VCP   | : Vertical Coupling Plane     |
| $U_N$ | : Nominal voltage             |
| $T_x$ | : Transmitter                 |
| $R_x$ | : Receiver                    |
| N/A   | : Not Applicable              |
| N/M   | : Not Measured                |

## DOCUMENT HISTORY

| Report No.            | Version | Description              | Issued Date |
|-----------------------|---------|--------------------------|-------------|
| 2060819R-RF-US-P06V01 | V1.0    | Initial issue of report. | 2020-07-14  |
|                       |         |                          |             |
|                       |         |                          |             |
|                       |         |                          |             |
|                       |         |                          |             |
|                       |         |                          |             |
|                       |         |                          |             |
|                       |         |                          |             |
|                       |         |                          |             |

## REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C Paragraph 15.247, RSS-Gen Issue 5, RSS-247 Issue 2.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result, unless the specification, standard or customer have special requirements.
4. The test results presented in this report relate only to the object tested.
5. The test results relate only to the samples tested.
6. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
7. This report will not be used for social proof function in China market.

## USED EQUIPMENT

### AC Power Line Conducted Emission / TR1

| Instrument                 | Manufacturer | Model No. | Serial No. | Cal. Date  | Next Cal. Date |
|----------------------------|--------------|-----------|------------|------------|----------------|
| EMI Test Receiver          | R&S          | ESCI      | 100906     | 2020.04.20 | 2021.04.19     |
| Two-Line V-Network         | R&S          | ENV216    | 101190     | 2019.12.28 | 2020.12.27     |
| Two-Line V-Network         | R&S          | ENV216    | 101044     | 2019.12.28 | 2020.12.27     |
| Current Probe              | R&S          | EZ-17     | 100678     | 2020.03.12 | 2021.04.11     |
| 50ohm Termination          | SHX          | TF2       | 07081402   | 2019.09.02 | 2020.09.01     |
| 50ohm Termination          | SHX          | TF2       | 07081403   | 2019.09.02 | 2020.09.01     |
| 50ohm Coaxial Switch       | Anritsu      | MP59B     | 6200464462 | N/A        | N/A            |
| Temperature/Humidity Meter | RTS          | RTS-8S    | TR1-TH     | 2019.08.21 | 2020.08.20     |
| Coaxial Cable              | Suhner       | RG 223    | TR1-C1     | 2019.08.25 | 2020.08.24     |
| Coaxial Cable              | Suhner       | RG 223    | TR1-C2     | 2019.08.25 | 2020.08.24     |
| Dekra test software        | Dekra        | -         | -          | -          | -              |

### Emissions in non-restricted frequency bands/ Occupied Bandwidth/ Fundamental emission output power Power Spectral Density / TR8

| Instrument                | Manufacturer | Model No. | Serial No.     | Cal. Date  | Next Cal. Date |
|---------------------------|--------------|-----------|----------------|------------|----------------|
| Spectrum Analyzer         | Agilent      | N9010A    | MY48030494     | 2019.09.28 | 2020.09.27     |
| EXA Spectrum Analyzer     | Keysight     | N9010A    | MY55370495     | 2020.04.17 | 2021.04.16     |
| MXA Signal Analyzer       | Keysight     | N9020A    | MY56060147     | 2019.08.30 | 2020.08.29     |
| Wideband Peak Power Meter | Anritsu      | ML2495A   | 0905006        | 2019.08.12 | 2020.08.11     |
| Power Sensor              | Anritsu      | MA2411B   | 0846014        | 2019.08.12 | 2020.08.11     |
| Coaxial Cable             | Woken        | SFL402    | F02-150410-044 | 2020.01.01 | 2020.12.31     |
| Dekra test software       | Dekra        | -         | -              | -          | -              |

### Radiated Emission(30MHz-1GHz) / AC3

| Instrument                 | Manufacturer | Model No. | Serial No. | Cal. Date  | Next Cal. Date |
|----------------------------|--------------|-----------|------------|------------|----------------|
| EMI Test Receiver          | R&S          | ESCI      | 100573     | 2020.03.03 | 2021.03.02     |
| Bilog Antenna              | Teseq GmbH   | CBL6112D  | 27611      | 2019.09.23 | 2020.09.22     |
| Temperature/Humidity Meter | RTS          | RTS-8S    | AC2-TH     | 2019.09.02 | 2020.09.01     |
| Coaxial Cable              | Huber+Suhner | RG 214    | AC2-C      | 2020.04.13 | 2021.04.12     |
| Dekra test software        | Dekra        | -         | -          | -          | -              |

## Radiated Emission / AC5(1GHz-40GHz)

| Instrument                 | Manufacturer | Model No.       | Serial No.  | Cal. Date  | Next Cal. Date |
|----------------------------|--------------|-----------------|-------------|------------|----------------|
| Spectrum Analyzer          | Agilent      | E4446A          | MY45300103  | 2020.05.08 | 2021.05.07     |
| Preamplifier               | Miteq        | NSP1800-25      | 1364185     | 2020.05.06 | 2021.05.05     |
| Preamplifier               | QuieTek      | AP-040G         | CHM-0906001 | 2020.05.06 | 2021.05.05     |
| DRG Horn                   | ETS-Lindgren | 3117            | 00123988    | 2020.01.22 | 2021.01.21     |
| Temperature/Humidity Meter | Zhichen      | ZC1-2           | AC5-TH      | 2019.09.02 | 2020.09.01     |
| Coaxial Cable              | Huber+Suhner | SUCOFLEX<br>106 | AC5-C1      | 2020.04.13 | 2021.04.12     |
| Coaxial Cable              | Huber+Suhner | SUCOFLEX<br>106 | AC5-C2      | 2020.04.13 | 2021.04.12     |
| Coaxial Cable              | Huber+Suhner | SUCOFLEX<br>102 | AC5-C3      | 2020.04.13 | 2021.04.12     |
| Dekra test software        | Dekra        | -               | -           | -          | -              |

## UNCERTAINTY

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%. The Uncertainties comply with standard required as below.

| Test item                        | Uncertainty                                                                                                          |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------|
| AC Power Line Conducted Emission | 9kHz~150kHz: 2.80 dB<br>150kHz~30MHz: 2.40 dB                                                                        |
| Peak Power Output                | $\pm 1.27$ dB                                                                                                        |
| Radiated Emission(30MHz~1GHz)    | Horizontal: 30MHz~200MHz: 3.50 dB<br>300MHz~1GHz: 3.60 dB<br>Vertical: 30MHz~200MHz: 3.60 dB<br>300MHz~1GHz: 3.50 dB |
| Radiated Emission(1GHz~26.5GHz)  | Horizontal: 1GHz~18GHz: 5.00 dB<br>Vertical: 1GHz~18GHz: 4.80 dB                                                     |
| RF antenna conducted test        | $\pm 1.27$ dB                                                                                                        |
| Radiated Emission Band Edge      | $\pm 3.9$ dB                                                                                                         |
| DTS Bandwidth                    | $\pm 150$ Hz                                                                                                         |
| Occupied Bandwidth               | $\pm 1$ kHz                                                                                                          |
| Power Density                    | $\pm 1.27$ dB                                                                                                        |

## 1 GENERAL INFORMATION

### 1.1 General Description of the Item(s)

|                             |                                                                                              |
|-----------------------------|----------------------------------------------------------------------------------------------|
| Product Name..... :         | LED Device                                                                                   |
| Model No. .... :            | 9290024227, 9290024228, 9290024229                                                           |
| FCC ID ..... :              | 2AGBW9290024227X(9290024227)<br>2AGBW9290024228X(9290024228)<br>2AGBW9290024229X(9290024229) |
| IC..... :                   | 20812-4227X(9290024227)<br>20812-4228X(9290024228)<br>20812-4229X(9290024229)                |
| Manufacturer..... :         | Signify (China) Investment Co., Ltd                                                          |
| Manufacturer Address..... : | Building no.9, Lane 888, Tianlin Road, Minhang District, Shanghai, 200233, China             |

|                               |                |
|-------------------------------|----------------|
| Wireless specification..... : | Zigbee         |
| Operating frequency range(s)  | 2400~2483.5MHz |
| Type of Modulation..... :     | DSSS-OQPSK     |
| Number of channel..... :      | 16             |
| Date Rate ..... :             | 250kbps        |

|                          |                                     |                                |
|--------------------------|-------------------------------------|--------------------------------|
| Rated power supply ..... | Voltage and Frequency               |                                |
|                          | <input type="checkbox"/>            | AC: 220 – 240 V, 50/60 Hz      |
|                          | <input checked="" type="checkbox"/> | AC: 100 – 240 V, 50/60 Hz      |
|                          | <input type="checkbox"/>            | DC: 3.2~4.2 Vdc                |
|                          | <input type="checkbox"/>            | Battery: .....                 |
| Mounting position..... : | <input type="checkbox"/>            | Table top equipment            |
|                          | <input checked="" type="checkbox"/> | Wall/Ceiling mounted equipment |
|                          | <input type="checkbox"/>            | Floor standing equipment       |
|                          | <input type="checkbox"/>            | Head-mounted equipment         |
|                          | <input type="checkbox"/>            | Other: RF module               |

Note: Models 9290024227, 9290024228, 9290024229 only differs on the length of the LED device, three models has been pretested and DEKRA has found that model 9290024227 is the worst case. Test results for Model 9290024227, included in this report, are valid and representative for the three models 9290024227, 9290024228, 9290024229.

## 1.2 Antenna Information

|                                   |                                     |           |                                     |                        |
|-----------------------------------|-------------------------------------|-----------|-------------------------------------|------------------------|
| Antenna model / type number ..... | N/A                                 |           |                                     |                        |
| Antenna serial number .....       | N/A                                 |           |                                     |                        |
| Antenna Delivery .....            | <input checked="" type="checkbox"/> | 1TX + 1RX |                                     |                        |
|                                   | <input type="checkbox"/>            | 2TX + 2RX |                                     |                        |
| Antenna technology .....          | <input checked="" type="checkbox"/> | SISO      |                                     |                        |
|                                   | <input type="checkbox"/>            | MIMO      | <input type="checkbox"/>            | CDD                    |
|                                   |                                     |           | <input type="checkbox"/>            | Beam-forming           |
| Antenna Type .....                | <input type="checkbox"/>            | External  | <input type="checkbox"/>            | Dipole                 |
|                                   |                                     |           | <input type="checkbox"/>            | Sectorized             |
|                                   | <input checked="" type="checkbox"/> | Internal  | <input checked="" type="checkbox"/> | PIFA                   |
|                                   |                                     |           | <input type="checkbox"/>            | PCB                    |
|                                   |                                     |           | <input type="checkbox"/>            | Metal Monopole Antenna |
|                                   |                                     |           | <input type="checkbox"/>            | Others.....            |
| Antenna Gain.....                 | 2.08 dBi                            |           |                                     |                        |

### 1.3 Channel List

| Working Frequency of Each Channel: For Zigbee |           |         |           |         |           |         |           |
|-----------------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel                                       | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 11                                            | 2405 MHz  | 12      | 2410 MHz  | 13      | 2415 MHz  | 14      | 2420 MHz  |
| 15                                            | 2425 MHz  | 16      | 2430 MHz  | 17      | 2435 MHz  | 18      | 2440 MHz  |
| 19                                            | 2445 MHz  | 20      | 2450 MHz  | 21      | 2455 MHz  | 22      | 2460 MHz  |
| 23                                            | 2465 MHz  | 24      | 2470 MHz  | 25      | 2475 MHz  | 26      | 2480 MHz  |

## 2 DESCRIPTION OF TEST SETUP

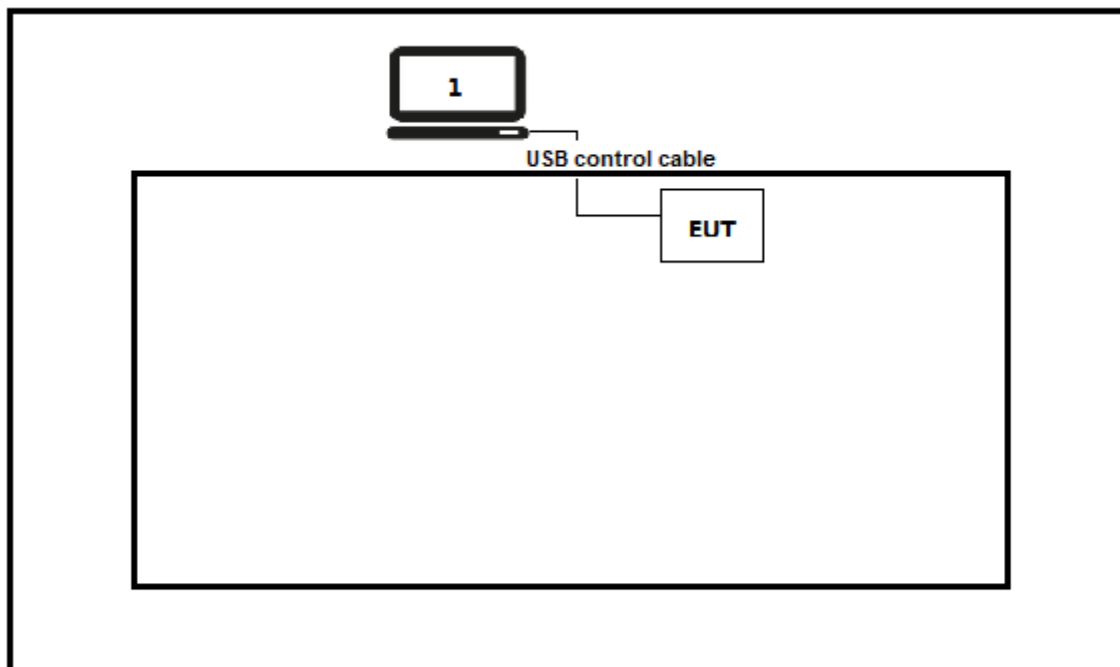
### 2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

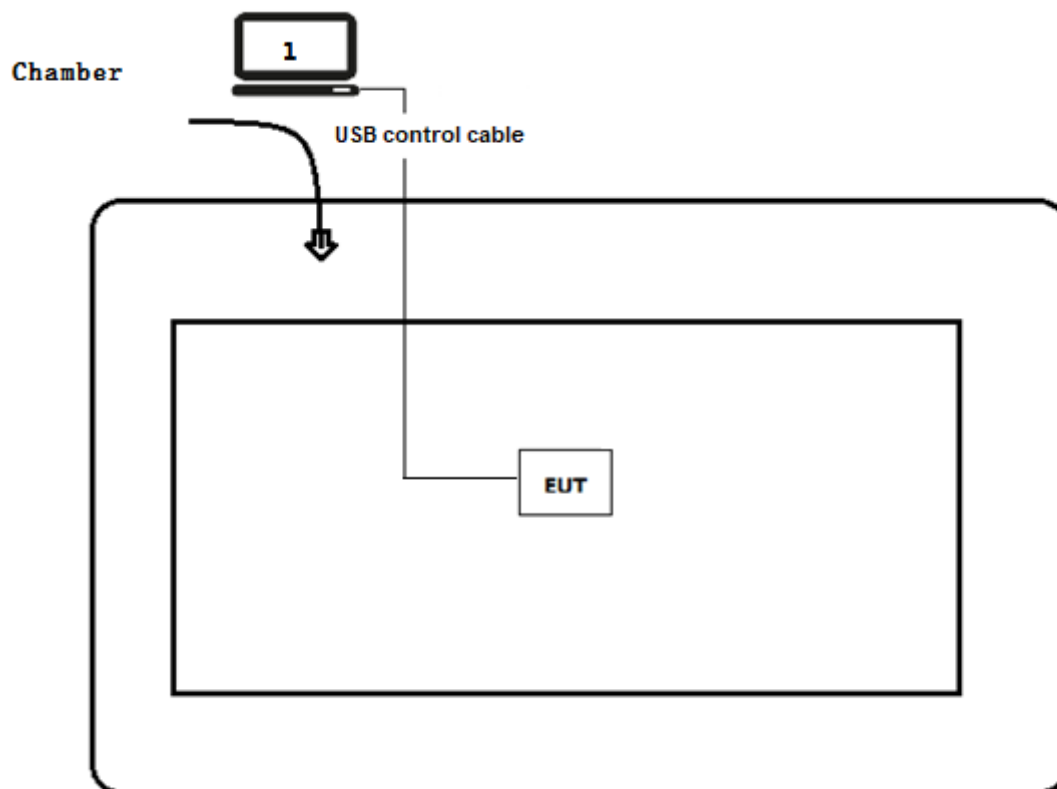
|                         |                           |
|-------------------------|---------------------------|
| Test Mode For Bluetooth | Mode1: Transmit by Zigbee |
|-------------------------|---------------------------|

## 2.2 Test Configuration / Block diagram used for tests

Test setup Diagram- AC Line Conducted Emission Test



Test setup Diagram- Radiated Emission



## 2.3 Testing process

|   |                                                               |
|---|---------------------------------------------------------------|
| 1 | Setup the EUT as shown in Section 2.2.                        |
| 2 | Execute Switch channel by repeating power on.                 |
| 3 | Configure the test mode, the test channel, and the data rate. |
| 4 | Verify that the EUT works properly.                           |

### 3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

#### 3.1 Standards

| Standard                                          | Year | Description                                                                                                                  |
|---------------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------|
| FCC CFR Title 47 Part 15 Subpart C Section 15.247 | 2019 | Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.                                                  |
| ANSI C63.10                                       | 2013 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices                               |
| KDB 558074 D01 v05r02                             | 2019 | Guidance for performing compliance measurements on Digital Transmission System (DTS) operating under section 15.247          |
| RSS-Gen Issue 5 Amendment 1                       | 2019 | General Requirements for Compliance of Radio Apparatus                                                                       |
| RSS-247 Issue 2                                   | 2017 | Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices |

#### 3.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards: N/A.

*(Please define the deviations from the standard(s) if applicable)*

### 3.3 Overview of results

#### For FCC

| Requirement – Test case                     | Basic standard(s)         | Verdict | Remark |
|---------------------------------------------|---------------------------|---------|--------|
| AC Power Line Conducted Emission            | FCC 15.207                | PASS    | ---    |
| Emissions in restricted frequency bands     | FCC 15.247(b)(3)          | PASS    | ---    |
| Duty cycle                                  | ANSI C63.10:2013          | PASS    | ---    |
| Emissions in non-restricted frequency bands | FCC 15.247(d), FCC 15.209 | PASS    | ---    |
| Radiated Emission Band Edge                 | FCC 15.247(d)             | PASS    | ---    |
| Fundamental emission output power           | FCC 15.247(d), FCC 15.209 | PASS    | ---    |
| DTS Bandwidth                               | FCC 15.247(a)(2)          | PASS    | ---    |
| Power Spectral Density                      | FCC 15.247(e)             | PASS    | ---    |
| Antenna Requirement                         | FCC 15.203                | PASS    | ---    |

#### For ISED

| Requirement – Test case                     | Basic standard(s)              | Verdict | Remark |
|---------------------------------------------|--------------------------------|---------|--------|
| AC Power Line Conducted Emission            | RSS-Gen Issue 5 Section 8.8    | PASS    | ---    |
| Emissions in restricted frequency bands     | RSS-Gen Issue 5 Section 8.9    | PASS    | ---    |
| Duty cycle                                  | ANSI C63.10:2013               | PASS    | ---    |
| Emissions in non-restricted frequency bands | RSS-247 Issue 2 Section 5.5    | PASS    | ---    |
| Radiated Emission Band Edge                 | RSS-Gen Issue 5 Section 8.10   | PASS    | ---    |
| Fundamental emission output power           | RSS-247 Issue 2 Section 5.4(d) | PASS    | ---    |
| DTS Bandwidth                               | RSS-Gen Issue 5 Section 6.7    | PASS    | ---    |
| Power Spectral Density                      | RSS-247 Issue 2 Section 5.2(b) | PASS    | ---    |
| Antenna Requirement                         | RSS-Gen Issue 5 Section 6.8    | PASS    | ---    |

---

### 3.4 Test Facility

|     |   |                                |
|-----|---|--------------------------------|
| USA | : | FCC Designation Number: CN1199 |
| CA  | : | ISED CAB identifier: CN0040    |

## 4 TEST RESULTS

### 4.1 AC Power Line Conducted Emission

**VERDICT: PASS**

#### 4.1.1 Limit

| Standard              | FCC Part 15 Subpart C Paragraph 15.207 |                                   |
|-----------------------|----------------------------------------|-----------------------------------|
| Frequency range [MHz] | Limit: QP [dB(μV) <sup>1)</sup> ]      | Limit: AV [dB(μV) <sup>1)</sup> ] |
| 0,15 - 0,50           | 66 - 56 <sup>2)</sup>                  | 56 - 46 <sup>2)</sup>             |
| 0,50 - 5,0            | 56                                     | 46                                |
| 5,0 - 30              | 60                                     | 50                                |

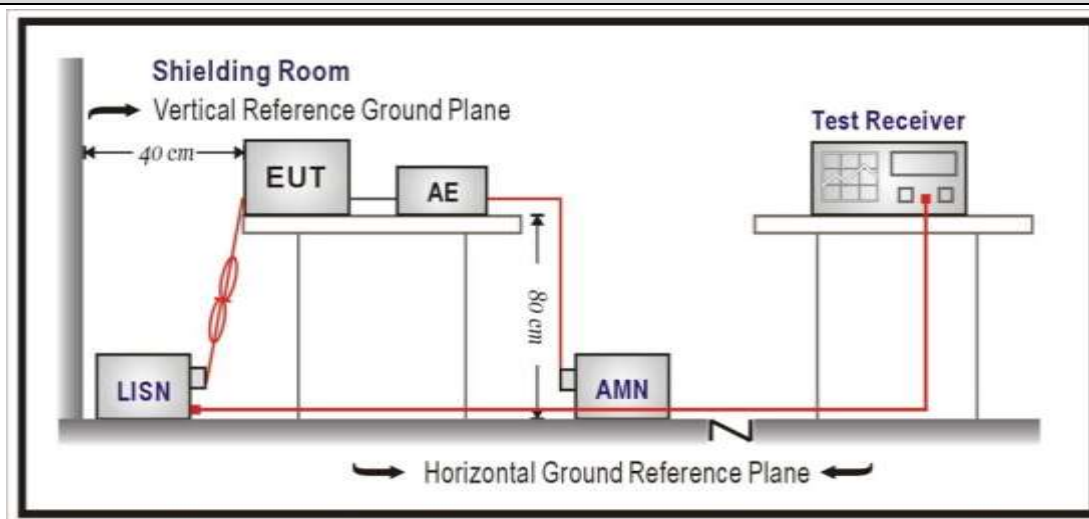
<sup>1)</sup> At the transition frequency, the lower limit applies.

<sup>2)</sup> The limit decreases linearly with the logarithm of the frequency.

**NOTE 1:** The exclusion band for transmitters shall be considered for transmitters operating at frequencies below 30 MHz.

**NOTE 2:** Where the AC output port is directly connected (or via a circuit breaker) to the AC power input port of the EUT the AC power output port need not to be tested.

#### 4.1.2 Test Setup



#### 4.1.3 Test Procedure

|                                     | References Rule  | Chapter | Item                                                                                        |
|-------------------------------------|------------------|---------|---------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | ANSI C63.10-2013 | 6.2     | Standard test method for ac power-line conducted emissions from unlicensed wireless devices |

#### 4.1.4 Test Data

Engineer: Canon

Site: TR1

Time: 2020/05/11

Limit: FCC\_Part15.207\_CE\_AC Power\_ClassB

Margin: 0

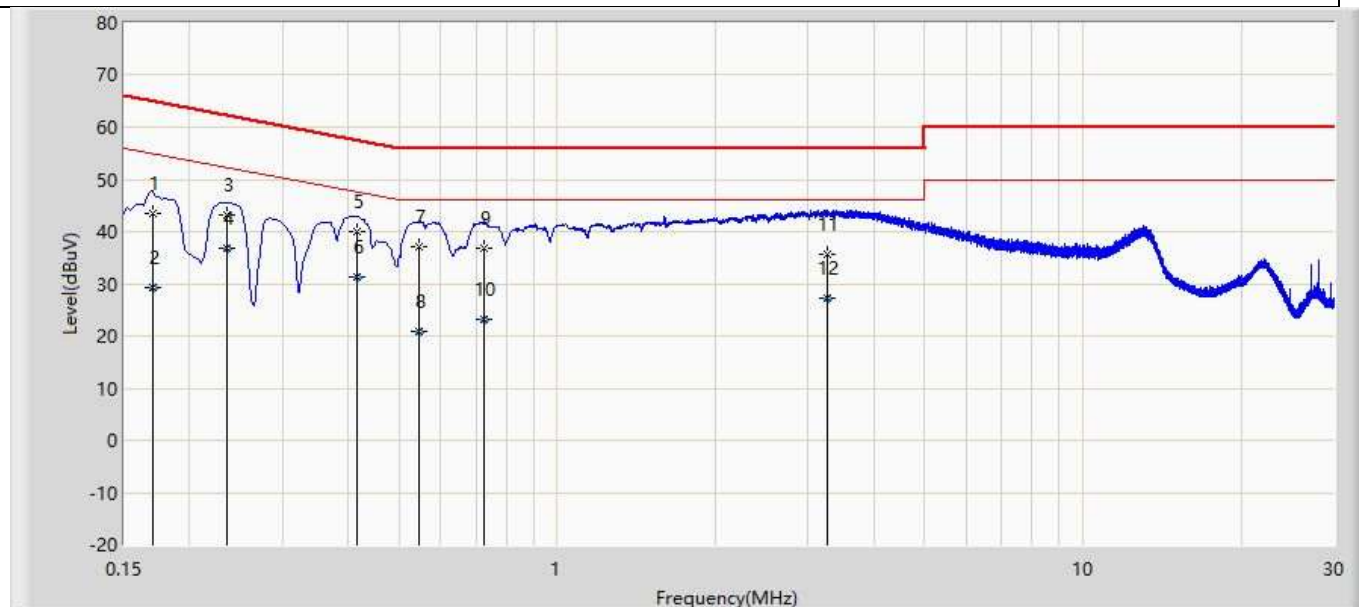
Probe: ENV216\_101190(0.009-30MHz)

Polarity: Line

EUT: LED Device

Power: AC 120V/60Hz

Note: Mode 1



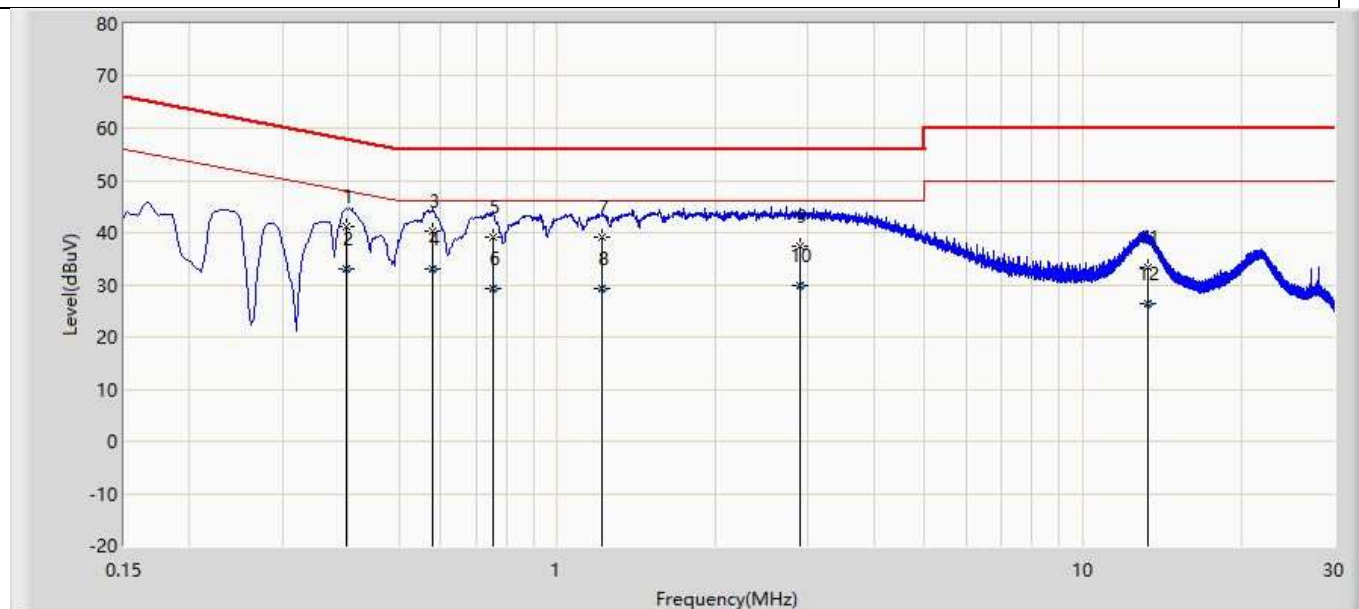
| No | Mark | Frequency (MHz) | Measure Level (dBuV) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV) | Probe (dB) | Cable (dB) | Amp (dB) | Type |
|----|------|-----------------|----------------------|----------------------|-----------------|--------------|------------|------------|----------|------|
| 1  |      | 0.170           | 43.593               | 33.986               | -21.374         | 64.967       | 9.578      | 0.028      | 0.000    | QP   |
| 2  |      | 0.170           | 29.196               | 19.589               | -25.771         | 54.967       | 9.578      | 0.028      | 0.000    | AV   |
| 3  |      | 0.235           | 43.229               | 33.608               | -19.024         | 62.253       | 9.592      | 0.030      | 0.000    | QP   |
| 4  | *    | 0.235           | 36.820               | 27.198               | -15.434         | 52.253       | 9.592      | 0.030      | 0.000    | AV   |
| 5  |      | 0.415           | 39.916               | 30.273               | -17.622         | 57.538       | 9.604      | 0.039      | 0.000    | QP   |
| 6  |      | 0.415           | 31.352               | 21.709               | -16.186         | 47.538       | 9.604      | 0.039      | 0.000    | AV   |
| 7  |      | 0.546           | 37.205               | 27.548               | -18.795         | 56.000       | 9.612      | 0.044      | 0.000    | QP   |
| 8  |      | 0.546           | 20.760               | 11.104               | -25.240         | 46.000       | 9.612      | 0.044      | 0.000    | AV   |
| 9  |      | 0.724           | 36.735               | 27.064               | -19.265         | 56.000       | 9.621      | 0.050      | 0.000    | QP   |
| 10 |      | 0.724           | 23.133               | 13.462               | -22.867         | 46.000       | 9.621      | 0.050      | 0.000    | AV   |
| 11 |      | 3.273           | 35.599               | 25.815               | -20.401         | 56.000       | 9.670      | 0.114      | 0.000    | QP   |
| 12 |      | 3.273           | 27.204               | 17.420               | -18.796         | 46.000       | 9.670      | 0.114      | 0.000    | AV   |

Note:

1. " \* ", means this data is the worst emission level.

2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

|                                          |                     |
|------------------------------------------|---------------------|
| Engineer: Canon                          |                     |
| Site: TR1                                | Time: 2020/05/11    |
| Limit: FCC_Part15.207_CE_AC Power_ClassB | Margin: 0           |
| Probe: ENV216_101190(0.009-30MHz)        | Polarity: Neutral   |
| EUT: LED Device                          | Power: AC 120V/60Hz |
| Note: Mode 1                             |                     |



| No | Mark | Frequency (MHz) | Measure Level (dBuV) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV) | Probe (dB) | Cable (dB) | Amp (dB) | Type |
|----|------|-----------------|----------------------|----------------------|-----------------|--------------|------------|------------|----------|------|
| 1  |      | 0.398           | 41.029               | 31.388               | -16.877         | 57.905       | 9.603      | 0.038      | 0.000    | QP   |
| 2  |      | 0.398           | 33.048               | 23.407               | -14.858         | 47.905       | 9.603      | 0.038      | 0.000    | AV   |
| 3  |      | 0.580           | 40.296               | 30.636               | -15.704         | 56.000       | 9.614      | 0.045      | 0.000    | QP   |
| 4  | *    | 0.580           | 32.922               | 23.262               | -13.078         | 46.000       | 9.614      | 0.045      | 0.000    | AV   |
| 5  |      | 0.753           | 39.009               | 29.336               | -16.991         | 56.000       | 9.622      | 0.051      | 0.000    | QP   |
| 6  |      | 0.753           | 29.363               | 19.690               | -16.637         | 46.000       | 9.622      | 0.051      | 0.000    | AV   |
| 7  |      | 1.216           | 39.137               | 29.441               | -16.863         | 56.000       | 9.630      | 0.066      | 0.000    | QP   |
| 8  |      | 1.216           | 29.224               | 19.528               | -16.776         | 46.000       | 9.630      | 0.066      | 0.000    | AV   |
| 9  |      | 2.897           | 37.476               | 27.716               | -18.524         | 56.000       | 9.654      | 0.106      | 0.000    | QP   |
| 10 |      | 2.897           | 29.949               | 20.189               | -16.051         | 46.000       | 9.654      | 0.106      | 0.000    | AV   |
| 11 |      | 13.326          | 33.252               | 23.101               | -26.748         | 60.000       | 9.917      | 0.234      | 0.000    | QP   |
| 12 |      | 13.326          | 26.281               | 16.130               | -23.719         | 50.000       | 9.917      | 0.234      | 0.000    | AV   |

Note:

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

**4.2 Emissions in restricted frequency bands****VERDICT: PASS****4.2.1 Limit****Standard** FCC Part 15 Subpart C Paragraph 15.209**Restricted Bands of operation**

| Frequency (MHz)     | Frequency (MHz)       | Frequency (MHz) | Frequency (GHz) |
|---------------------|-----------------------|-----------------|-----------------|
| 0.090 – 0.110       | 16.42 – 16.423        | 399.9 – 410     | 4.5 – 5.15      |
| 0.495 – 0.505       | 16.69475 – 16.69525   | 608 – 614       | 5.35 – 5.46     |
| 2.1735 – 2.1905     | 16.80425 – 16.80475   | 960 – 1240      | 7.25 – 7.75     |
| 4.125 – 4.128       | 25.5 – 25.67          | 1300 – 1427     | 8.025 – 8.5     |
| 4.17725 – 4.17775   | 37.5 – 38.25          | 1435 – 1626.5   | 9.0 – 9.2       |
| 4.20725 – 4.20775   | 73 – 74.6             | 1645.5 – 1646.5 | 9.3 – 9.5       |
| 6.215 – 6.218       | 74.8 – 75.2           | 1660 – 1710     | 10.6 – 12.7     |
| 6.26775 – 6.26825   | 108 – 121.94          | 1718.8 – 1722.2 | 13.25 – 13.4    |
| 6.31175 – 6.31225   | 123 – 138             | 2200 – 2300     | 14.47 – 14.5    |
| 8.291 – 8.294       | 149.9 – 150.05        | 2310 – 2390     | 15.35 – 16.2    |
| 8.362 – 8.366       | 156.52475 – 156.52525 | 2483.5 – 2500   | 17.7 – 21.4     |
| 8.37625 – 8.38675   | 156.7 – 156.9         | 2690 – 2900     | 22.01 – 23.12   |
| 8.81425 – 8.81475   | 162.0125 – 167.17     | 3260 – 3267     | 23.6 – 24.0     |
| 12.29 – 12.293      | 167.72 – 173.2        | 3332 – 3339     | 31.2 – 31.8     |
| 12.51975 – 12.52025 | 240 – 285             | 3345.8 – 3358   | 36.43 – 36.5    |
| 12.57675 – 12.57725 | 322 – 335.4           | 3600 – 4400     |                 |
| 13.36 – 13.41       |                       |                 |                 |

**Restricted Bands of operation for IC**

|                     |                       |                 |               |
|---------------------|-----------------------|-----------------|---------------|
| 0.090 - 0.110       | 13.36 - 13.41         | 960 - 1427      | 9.0 - 9.2     |
| 0.495 - 0.505       | 16.42 - 16.423        | 1435 - 1626.5   | 9.3 - 9.5     |
| 2.1735 - 2.1905     | 16.69475 - 16.69525   | 1645.5 - 1646.5 | 10.6 - 12.7   |
| 3.020 - 3.026       | 16.80425 - 16.80475   | 1660 - 1710     | 13.25 - 13.4  |
| 4.125 - 4.128       | 25.5 - 25.67          | 1718.8 - 1722.2 | 14.47 - 14.5  |
| 4.17725 - 4.17775   | 37.5 - 38.25          | 2200 - 2300     | 15.35 - 16.2  |
| 4.20725 - 4.20775   | 73 - 74.6             | 2310 - 2390     | 17.7 - 21.4   |
| 5.677 - 5.683       | 74.8 - 75.2           | 2483.5 - 2500   | 22.01 - 23.12 |
| 6.215 - 6.218       | 108 - 138             | 2655 - 2900     | 23.6 - 24.0   |
| 6.26775 - 6.26825   | 149.9 - 150.05        | 3260 - 3267     | 31.2 - 31.8   |
| 6.31175 - 6.31225   | 156.52475 - 156.52525 | 3332 - 3339     | 36.43 - 36.5  |
| 8.291 - 8.294       | 156.7 - 156.9         | 3345.8 - 3358   | Above 38.6    |
| 8.362 - 8.366       | 162.0125 - 167.17     | 3500 - 4400     |               |
| 8.37625 - 8.38675   | 167.72 - 173.2        | 4500 - 5150     |               |
| 8.41425 - 8.41475   | 240 - 285             | 5350 - 5460     |               |
| 12.29 - 12.293      | 322 - 335.4           | 7250 - 7750     |               |
| 12.51975 - 12.52025 | 399.9 - 410           | 8025 - 8500     |               |
| 12.57675 - 12.57725 | 608 - 614             | --              |               |

## Restricted Band Emissions Limit

| Frequency<br>(MHz) | Field strength<br>( $\mu\text{V/m}$ ) | Field strength<br>(dB $\mu\text{V/m}$ ) | Measurement distance<br>(m) |
|--------------------|---------------------------------------|-----------------------------------------|-----------------------------|
| 0.009 - 0.49       | 2400/F(kHz)                           | 48.5 – 13.8                             | 300 <sub>(Note 1)</sub>     |
| 0.49 - 1.705       | 24000/F(kHz)                          | 33.8 - 23                               | 30 <sub>(Note 1)</sub>      |
| 1.705 - 30         | 30                                    | 29.5                                    | 30 <sub>(Note 1)</sub>      |
| 30 - 88            | 100                                   | 40                                      | 3 <sub>(Note 2)</sub>       |
| 88 - 216           | 150                                   | 43.5                                    | 3 <sub>(Note 2)</sub>       |
| 216 - 960          | 200                                   | 46                                      | 3 <sub>(Note 2)</sub>       |
| Above 960          | 500                                   | 54                                      | 3 <sub>(Note 2)</sub>       |

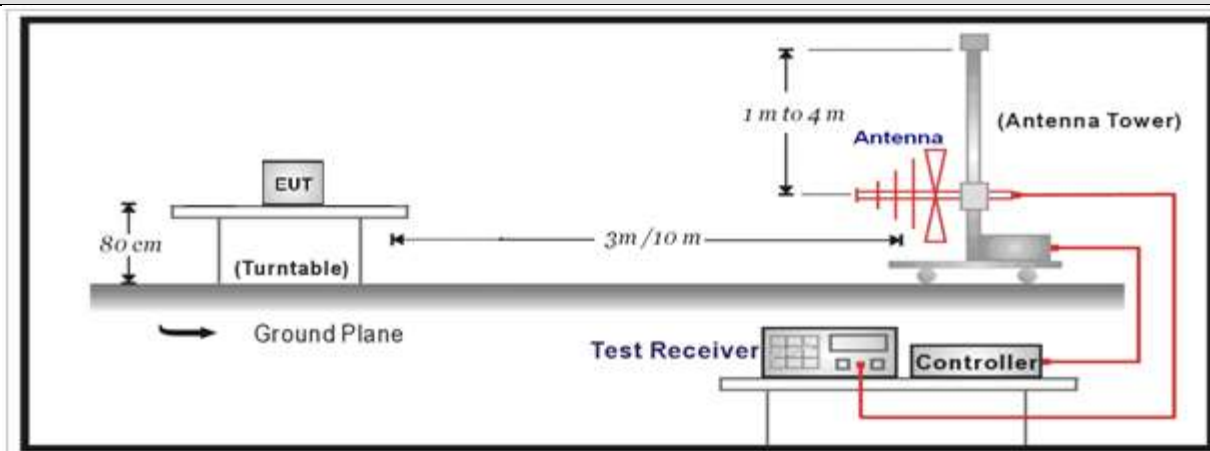
Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment.

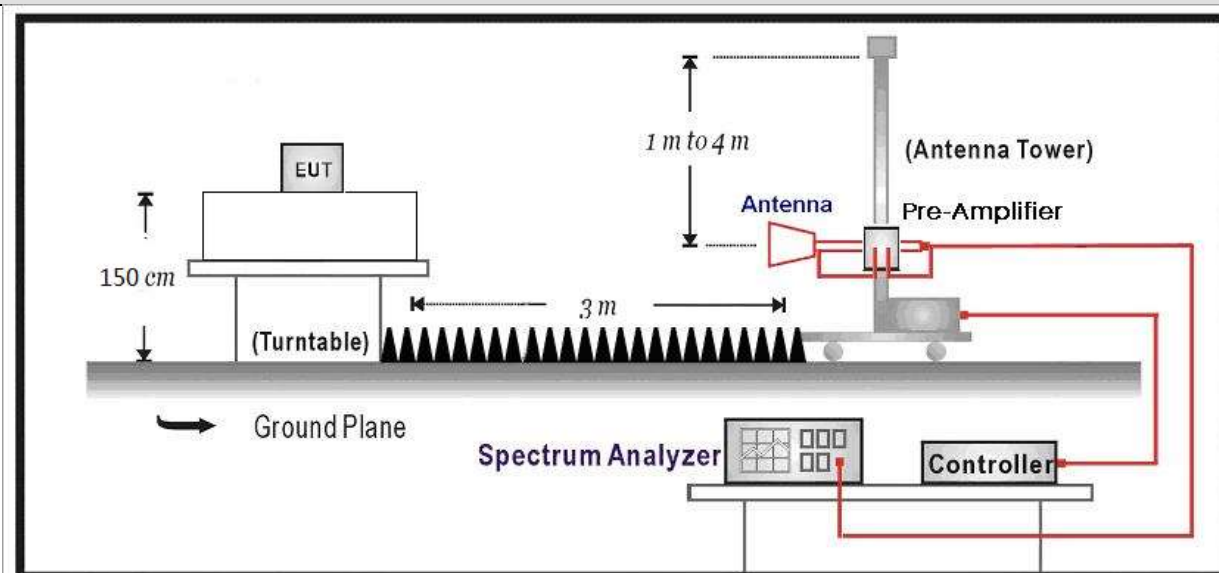
Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

## 4.2.2 Test Setup

### 30MHz-1GHz Test Setup:



### Above 1GHz Test Setup:

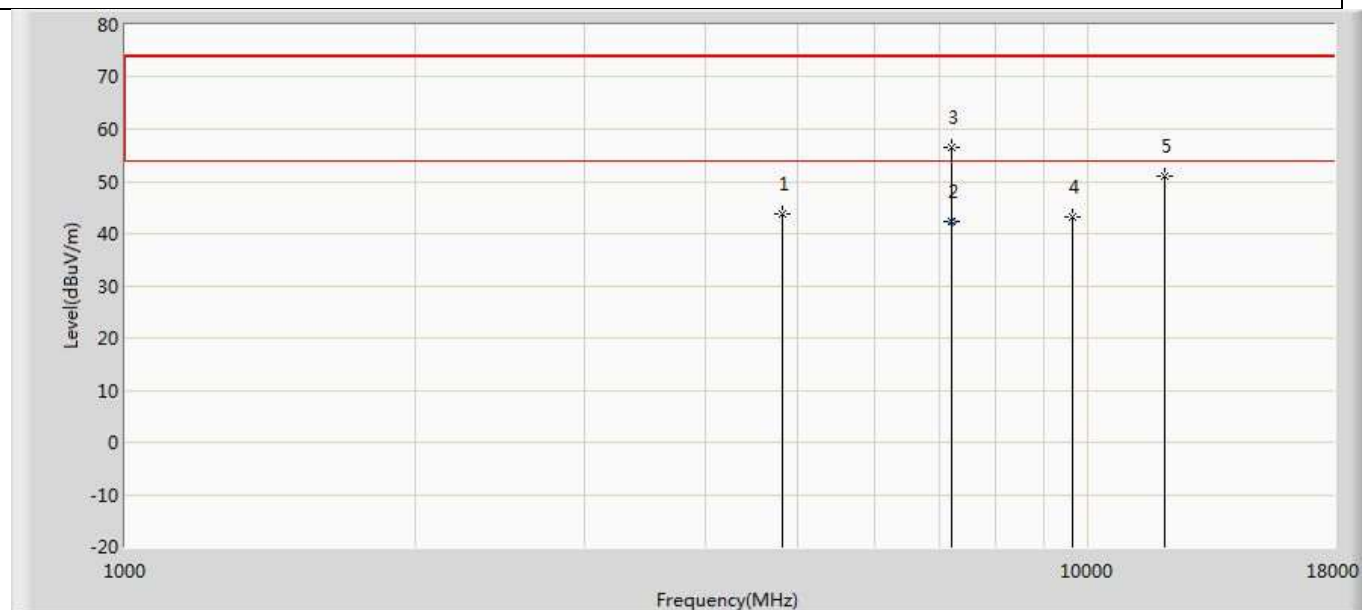


## 4.2.3 Test Procedure

|                                     | References Rule | Chapter   | Description                                                                                      |
|-------------------------------------|-----------------|-----------|--------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | ANSI C63.10     | 11.12     | Emissions in restricted frequency bands                                                          |
| <input checked="" type="checkbox"/> | ANSI C63.10     | 11.12.1   | Radiated emission measurements                                                                   |
| <input checked="" type="checkbox"/> | ANSI C63.10     | 11.12.2.7 | Radiated spurious emission test                                                                  |
| <input checked="" type="checkbox"/> | ANSI C63.10     | 6.4       | Radiated emissions from unlicensed wireless devices below 30 MHz                                 |
| <input checked="" type="checkbox"/> | ANSI C63.10     | 6.5       | Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz |
| <input checked="" type="checkbox"/> | ANSI C63.10     | 6.6       | Radiated emissions from unlicensed wireless devices above 1 GHz                                  |

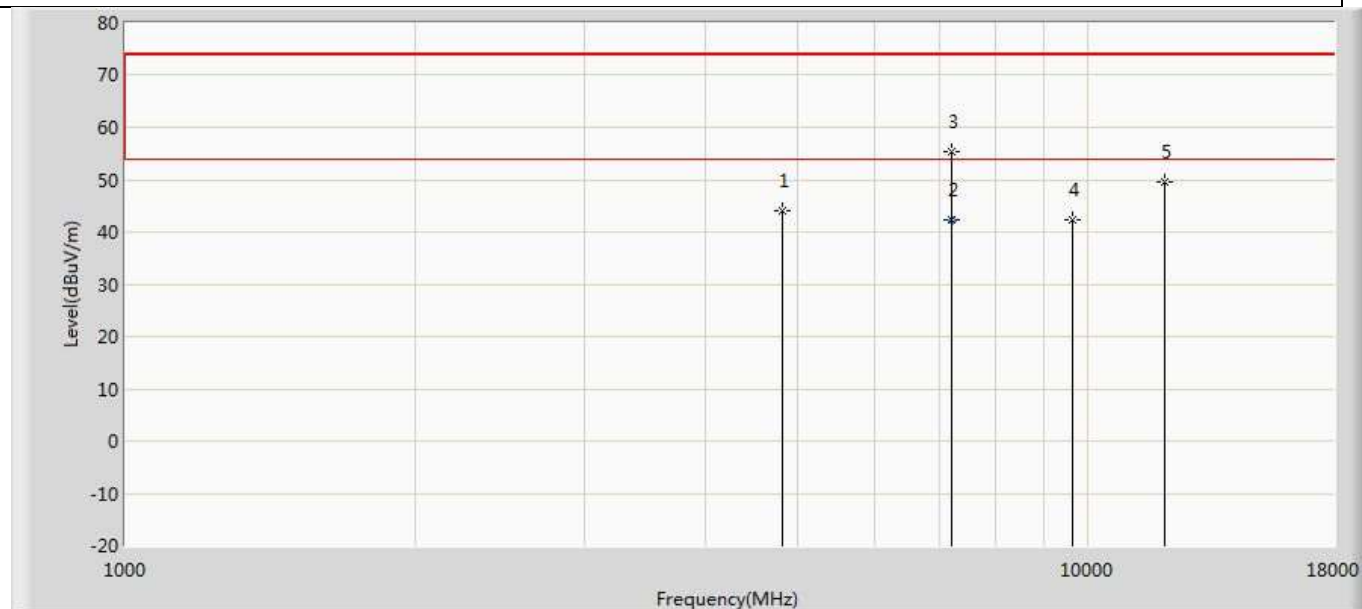
#### 4.2.4 Test Data

|                                            |                          |
|--------------------------------------------|--------------------------|
| Profile: 2060819R                          | Page No.: 213            |
| Engineer: Yingfeiwang                      |                          |
| Site: AC5                                  | Time: 2020/06/24 - 02:20 |
| Limit: FCC_Part15.209_RE(3m)               | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz)         | Polarity: Horizontal     |
| EUT: LED Device                            | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2405MHz by Zigbee |                          |



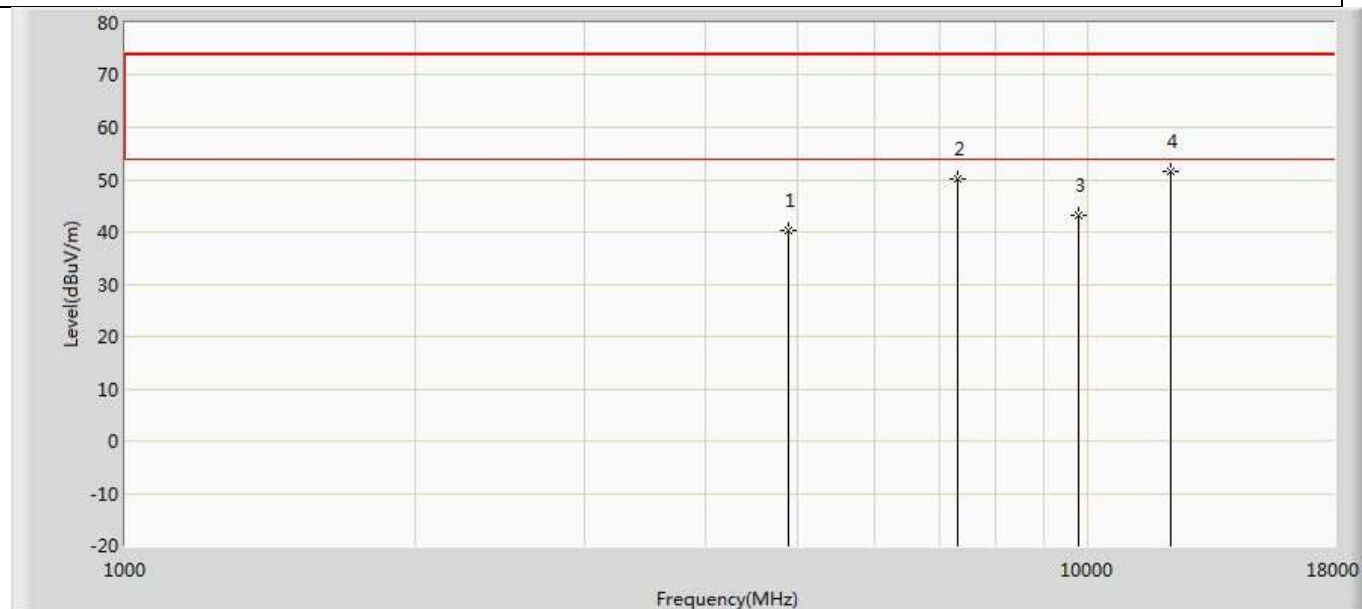
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  |      | 4808.000        | 43.625                 | 39.946               | -30.375         | 74.000         | 3.678       | PK   |
| 2  | *    | 7213.320        | 42.277                 | 35.602               | -11.723         | 54.000         | 6.675       | AV   |
| 3  |      | 7213.500        | 56.509                 | 49.834               | -17.491         | 74.000         | 6.676       | PK   |
| 4  |      | 9620.000        | 43.076                 | 34.667               | -30.924         | 74.000         | 8.409       | PK   |
| 5  |      | 12024.500       | 51.148                 | 38.250               | -22.852         | 74.000         | 12.898      | PK   |

|                                            |                          |
|--------------------------------------------|--------------------------|
| Profile: 2060819R                          | Page No.: 214            |
| Engineer: Yingfeiwang                      |                          |
| Site: AC5                                  | Time: 2020/06/24 - 01:20 |
| Limit: FCC_Part15.209_RE(3m)               | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz)         | Polarity: Vertical       |
| EUT: LED Device                            | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2405MHz by Zigbee |                          |



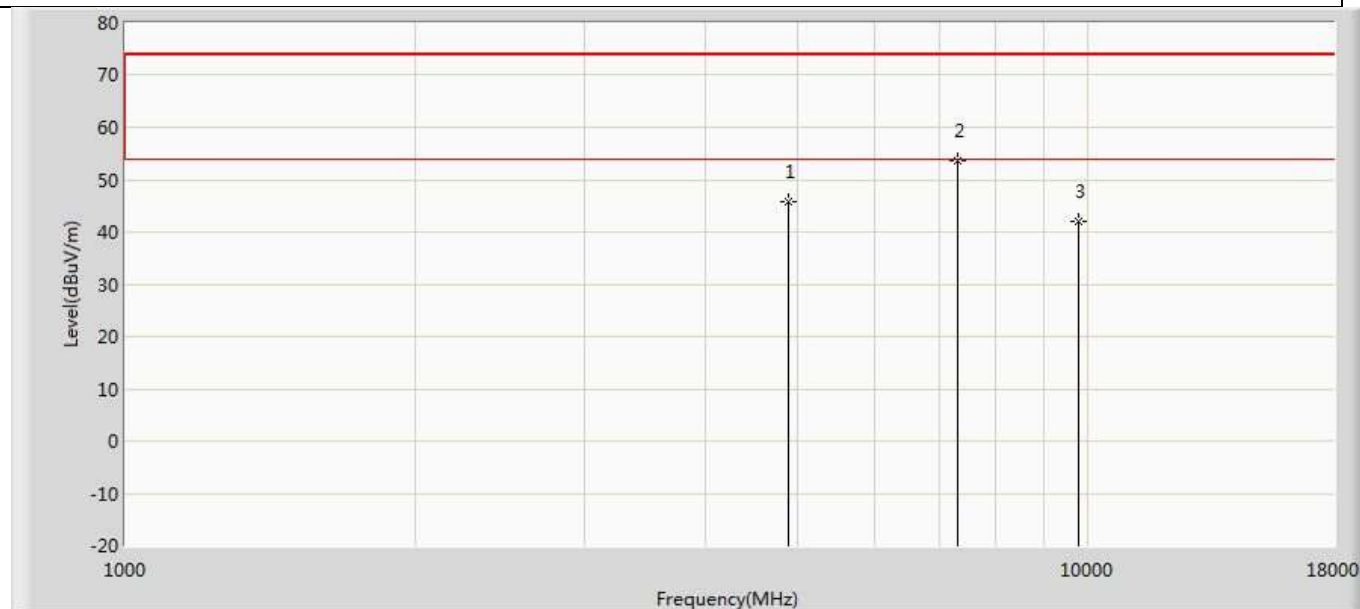
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  |      | 4808.000        | 43.961                 | 40.282               | -30.039         | 74.000         | 3.678       | PK   |
| 2  | *    | 7213.320        | 42.277                 | 35.602               | -11.723         | 54.000         | 6.675       | AV   |
| 3  |      | 7213.500        | 55.354                 | 48.679               | -18.646         | 74.000         | 6.676       | PK   |
| 4  |      | 9620.000        | 42.191                 | 33.782               | -31.809         | 74.000         | 8.409       | PK   |
| 5  |      | 12024.500       | 49.537                 | 36.639               | -24.463         | 74.000         | 12.898      | PK   |

|                                            |                          |
|--------------------------------------------|--------------------------|
| Profile: 2060819R                          | Page No.: 215            |
| Engineer: Yingfeiwang                      |                          |
| Site: AC5                                  | Time: 2020/06/24 - 01:21 |
| Limit: FCC_Part15.209_RE(3m)               | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz)         | Polarity: Horizontal     |
| EUT: LED Device                            | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2440MHz by Zigbee |                          |



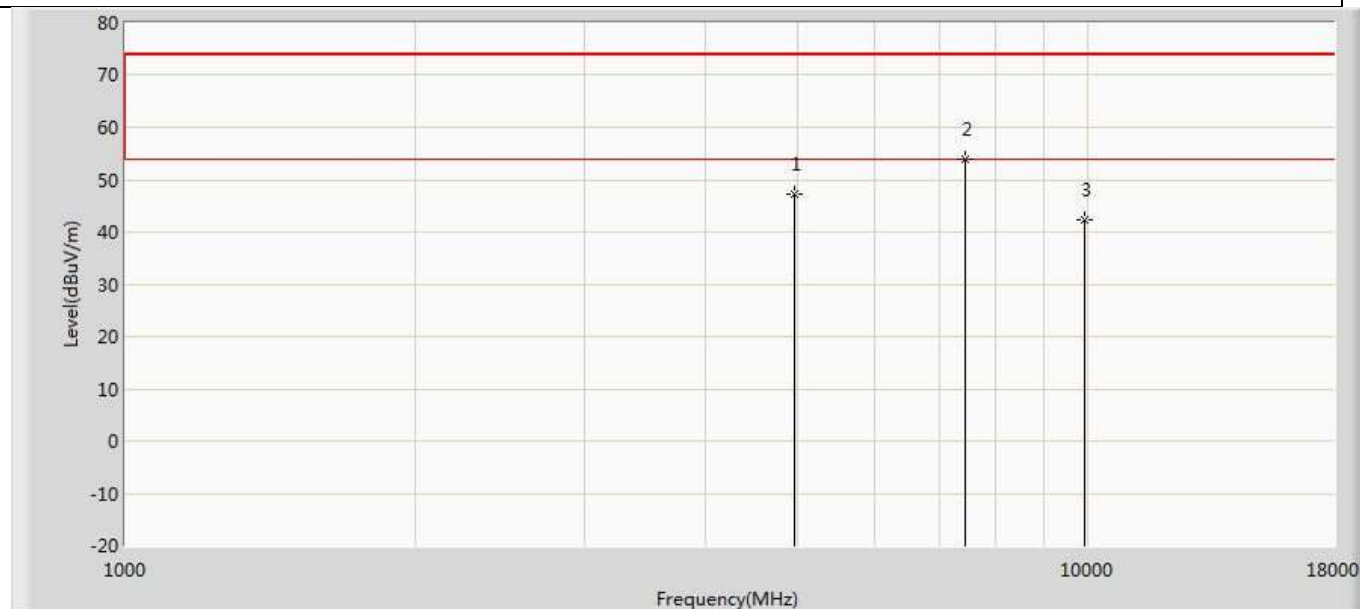
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  |      | 4880.000        | 40.230                 | 36.589               | -33.770         | 74.000         | 3.640       | PK   |
| 2  |      | 7315.500        | 50.058                 | 43.401               | -23.942         | 74.000         | 6.658       | PK   |
| 3  |      | 9760.000        | 43.205                 | 34.501               | -30.795         | 74.000         | 8.704       | PK   |
| 4  | *    | 12194.500       | 51.645                 | 38.357               | -22.355         | 74.000         | 13.288      | PK   |

|                                            |                          |
|--------------------------------------------|--------------------------|
| Profile: 2060819R                          | Page No.: 216            |
| Engineer: Yingfeiwang                      |                          |
| Site: AC5                                  | Time: 2020/06/24 - 01:21 |
| Limit: FCC_Part15.209_RE(3m)               | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz)         | Polarity: Vertical       |
| EUT: LED Device                            | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2440MHz by Zigbee |                          |



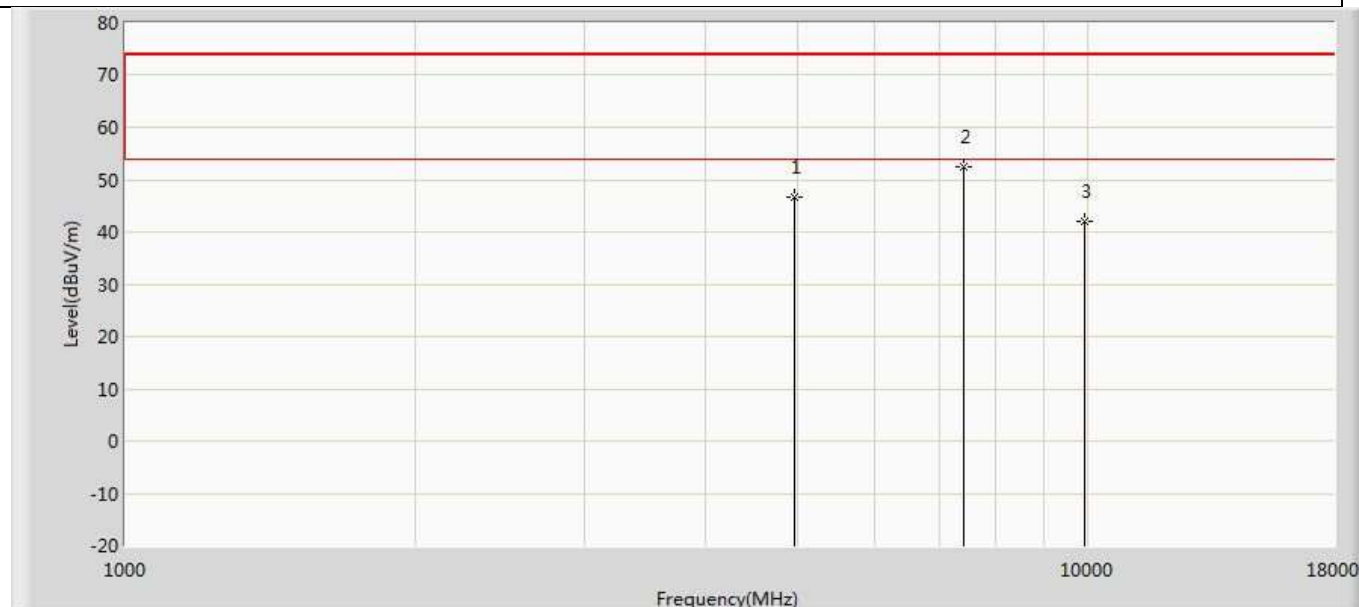
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  |      | 4884.500        | 45.844                 | 42.253               | -28.156         | 74.000         | 3.591       | PK   |
| 2  | *    | 7315.500        | 53.747                 | 47.090               | -20.253         | 74.000         | 6.658       | PK   |
| 3  |      | 9760.000        | 42.145                 | 33.441               | -31.855         | 74.000         | 8.704       | PK   |

|                                            |                          |
|--------------------------------------------|--------------------------|
| Profile: 2060819R                          | Page No.: 217            |
| Engineer: Yingfeiwang                      |                          |
| Site: AC5                                  | Time: 2020/06/24 - 01:21 |
| Limit: FCC_Part15.209_RE(3m)               | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz)         | Polarity: Horizontal     |
| EUT: LED Device                            | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2480MHz by Zigbee |                          |



| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  |      | 4961.000        | 47.170                 | 43.559               | -26.830         | 74.000         | 3.611       | PK   |
| 2  | *    | 7443.000        | 53.974                 | 47.372               | -20.026         | 74.000         | 6.601       | PK   |
| 3  |      | 9920.000        | 42.305                 | 33.580               | -31.695         | 74.000         | 8.725       | PK   |

|                                            |                          |
|--------------------------------------------|--------------------------|
| Profile: 2060819R                          | Page No.: 218            |
| Engineer: Yingfeiwang                      |                          |
| Site: AC5                                  | Time: 2020/06/24 - 01:21 |
| Limit: FCC_Part15.209_RE(3m)               | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz)         | Polarity: Vertical       |
| EUT: LED Device                            | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2480MHz by Zigbee |                          |



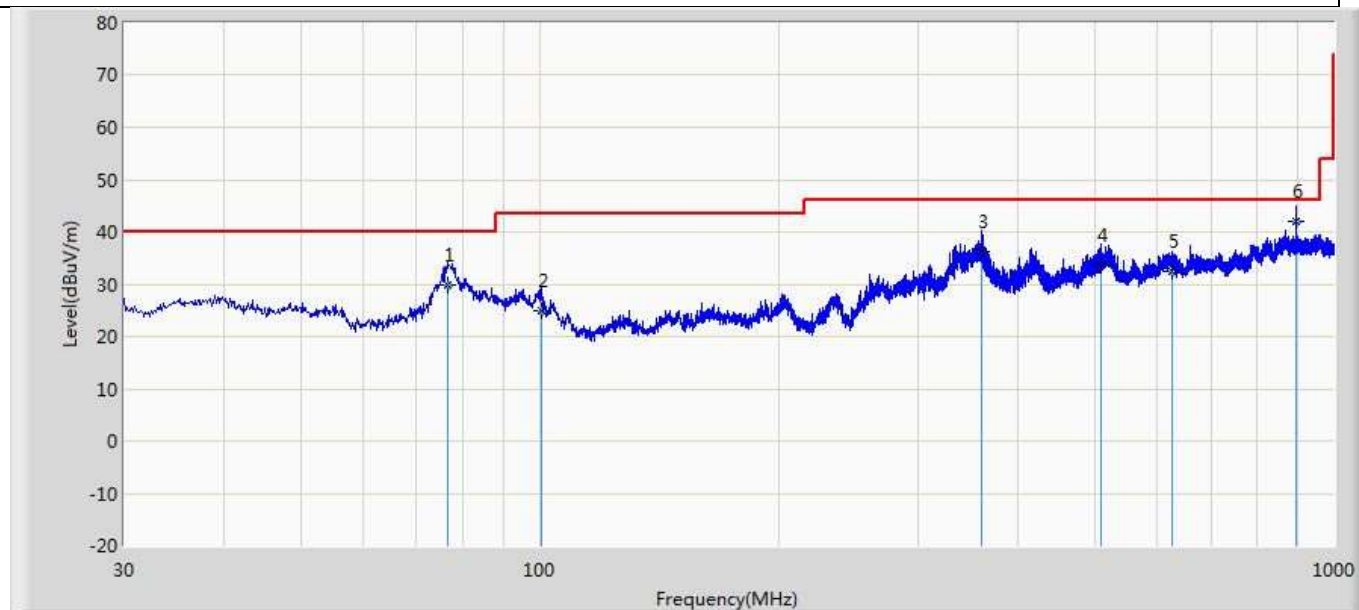
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  |      | 4961.000        | 46.762                 | 43.151               | -27.238         | 74.000         | 3.611       | PK   |
| 2  | *    | 7434.500        | 52.594                 | 46.039               | -21.406         | 74.000         | 6.555       | PK   |
| 3  |      | 9920.000        | 41.972                 | 33.247               | -32.028         | 74.000         | 8.725       | PK   |

## Note:

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, 18GHz~26GHz, both of the worst case are at least 20dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
4. As the radiated emission was performed, so conducted emission was not tested.

### The worst case of Radiated Emission below 1GHz:

|                                     |                          |
|-------------------------------------|--------------------------|
| Profile: 2060819R                   | Page No.: 1              |
| Engineer: Shuo                      |                          |
| Site: AC3                           | Time: 2020/05/12 - 14:24 |
| Limit: FCC_Part15.209_RE(3m)_ClassB | Margin: 0                |
| Probe: SuZ-2141                     | Polarity: Horizontal     |
| EUT: LED Device                     | Power: AC 120V/60Hz      |
| Note: Mode 1                        |                          |

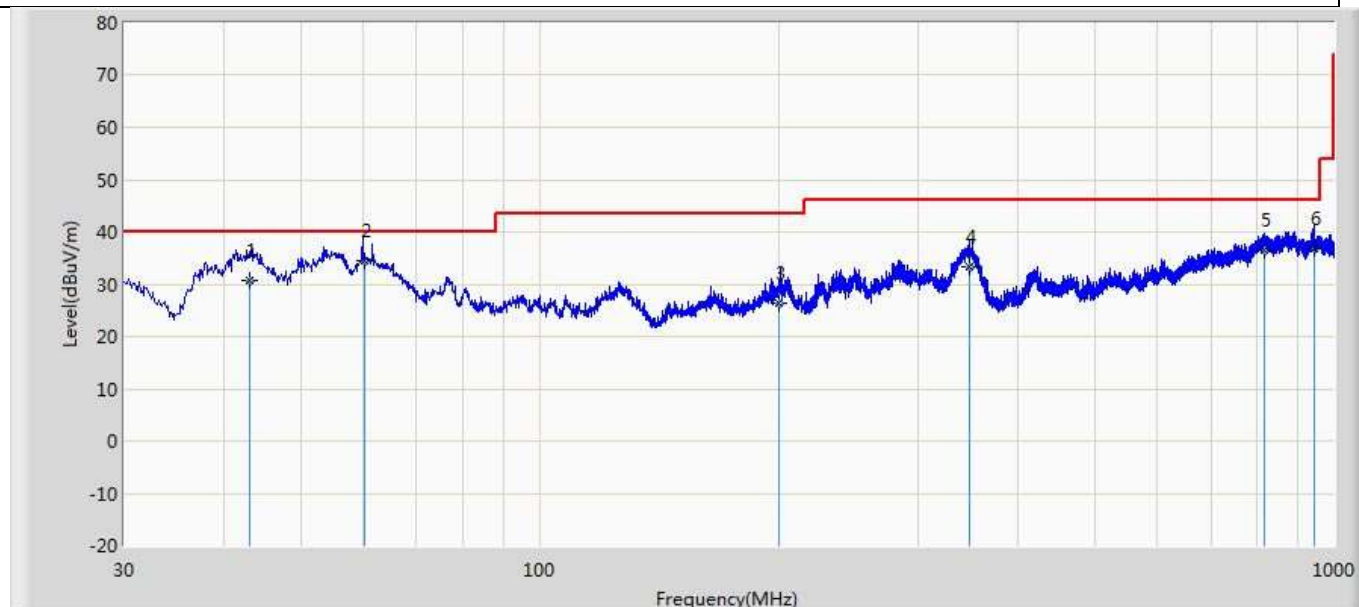


| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Probe (dB/m) | Cable (dB) | Amp (dB) | Ant Pos (cm) | Table Pos (deg) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|--------------|------------|----------|--------------|-----------------|------|
| 1  |      | 76.560          | 29.855                 | 16.200               | -10.145         | 40.000         | 7.010        | 6.645      | 0.000    | 100          | 188             | QP   |
| 2  |      | 100.689         | 25.045                 | 11.400               | -18.455         | 43.500         | 6.865        | 6.780      | 0.000    | 100          | 239             | QP   |
| 3  |      | 360.000         | 36.297                 | 11.300               | -9.703          | 46.000         | 17.244       | 7.753      | 0.000    | 0            | 0               | QP   |
| 4  |      | 508.570         | 33.521                 | 5.300                | -12.479         | 46.000         | 20.025       | 8.196      | 0.000    | 0            | 0               | QP   |
| 5  |      | 624.489         | 32.328                 | 1.300                | -13.672         | 46.000         | 22.526       | 8.503      | 0.000    | 0            | 0               | QP   |
| 6  | *    | 895.230         | 41.931                 | 8.200                | -4.069          | 46.000         | 24.572       | 9.159      | 0.000    | 0            | 0               | QP   |

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " \* ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

|                                     |                          |
|-------------------------------------|--------------------------|
| Profile: 2060819R                   | Page No.: 2              |
| Engineer: Shuo                      |                          |
| Site: AC3                           | Time: 2020/05/12 - 14:27 |
| Limit: FCC_Part15.109_RE(3m)_ClassB | Margin: 0                |
| Probe: SuZ-2141                     | Polarity: Vertical       |
| EUT: LED Device                     | Power: AC 120V/60Hz      |
| Note: Mode 1                        |                          |



| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Probe (dB/m) | Cable (dB) | Amp (dB) | Ant Pos (cm) | Table Pos (deg) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|--------------|------------|----------|--------------|-----------------|------|
| 1  |      | 43.203          | 30.845                 | 10.300               | -9.155          | 40.000         | 14.101       | 6.443      | 0.000    | 100          | 63              | QP   |
| 2  | *    | 60.213          | 34.494                 | 10.200               | -5.506          | 40.000         | 17.738       | 6.556      | 0.000    | 100          | 52              | QP   |
| 3  |      | 200.131         | 26.456                 | 2.600                | -17.044         | 43.500         | 16.654       | 7.202      | 0.000    | 100          | 51              | QP   |
| 4  |      | 347.531         | 33.405                 | 8.600                | -12.595         | 46.000         | 17.092       | 7.713      | 0.000    | 100          | 52              | QP   |
| 5  |      | 817.230         | 36.660                 | 1.300                | -9.340          | 46.000         | 26.374       | 8.986      | 0.000    | 100          | 52              | QP   |
| 6  |      | 946.230         | 36.726                 | 2.300                | -9.274          | 46.000         | 25.145       | 9.280      | 0.000    | 100          | 210             | QP   |

## Note:

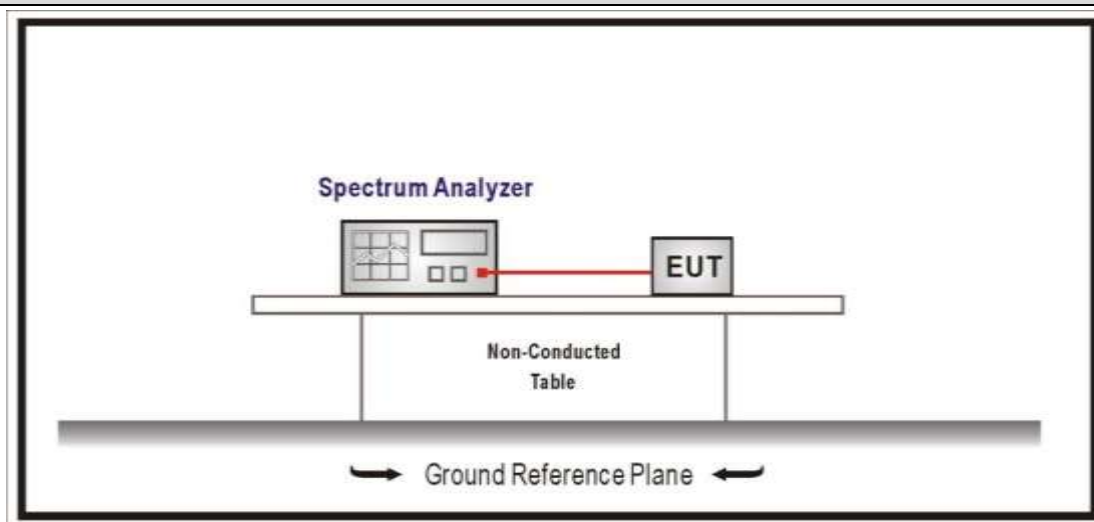
1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " \* ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

**4.3 Emissions in non-restricted frequency band****VERDICT: PASS****4.3.1 Limit**

| Standard                            | FCC Part 15 Subpart C Paragraph 15.247(d) |
|-------------------------------------|-------------------------------------------|
| RF Output power (Detection methods) | Limit(dB)                                 |
| RF Output power(Average detector)   | 30dBc(Note1)                              |
| RF Output power(PK detector)        | 20dBc(Note2)                              |

Note 1: If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).

Note 2: If the maximum peak conducted output power procedure was used, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

**4.3.2 Test Setup****4.3.3 Test Procedure**

| References Rule                                 | Chapter | Description                                 |
|-------------------------------------------------|---------|---------------------------------------------|
| <input checked="" type="checkbox"/> ANSI C63.10 | 11.11   | Emissions in non-restricted frequency bands |
| <input checked="" type="checkbox"/> ANSI C63.10 | 11.11.1 | General                                     |
| <input checked="" type="checkbox"/> ANSI C63.10 | 11.11.2 | Reference level measurement                 |
| <input checked="" type="checkbox"/> ANSI C63.10 | 11.11.3 | Emission level measurement                  |

#### 4.3.4 Test Data

| Mode | Channel | Test Frequency (MHz) | Maximum In-Band PSD[a] (dBm/100kHz) | Frequency (MHz) | Out-Band PSD[b] (dBm/100kHz) | [a]-[b] (dB) | Limit (dB) | Result |
|------|---------|----------------------|-------------------------------------|-----------------|------------------------------|--------------|------------|--------|
| 1    | 11      | 2405                 | 6.554                               | 2400            | -46.243                      | 52.797       | >20        | Pass   |
|      | 26      | 2480                 | 6.431                               | 2500            | -53.073                      | 59.504       | >20        | Pass   |

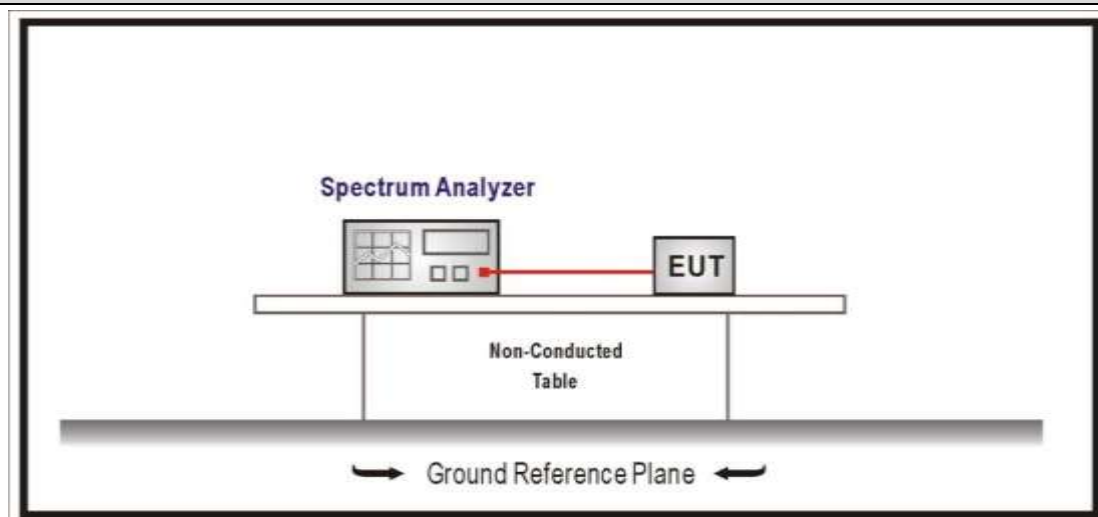
Note 1: The worst data plot as below:

Mode1/CH11/2405MHz



**4.4 Duty cycle****VERDICT: PASS****4.4.1 Limit**

N/A

**4.4.2 Test Setup****4.4.3 Test Procedure**

| References Rule                     |             | Chapter | Description                                                                |
|-------------------------------------|-------------|---------|----------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | ANSI C63.10 | 11.6    | Duty cycle (D), transmission duration (T), and maximum power control level |

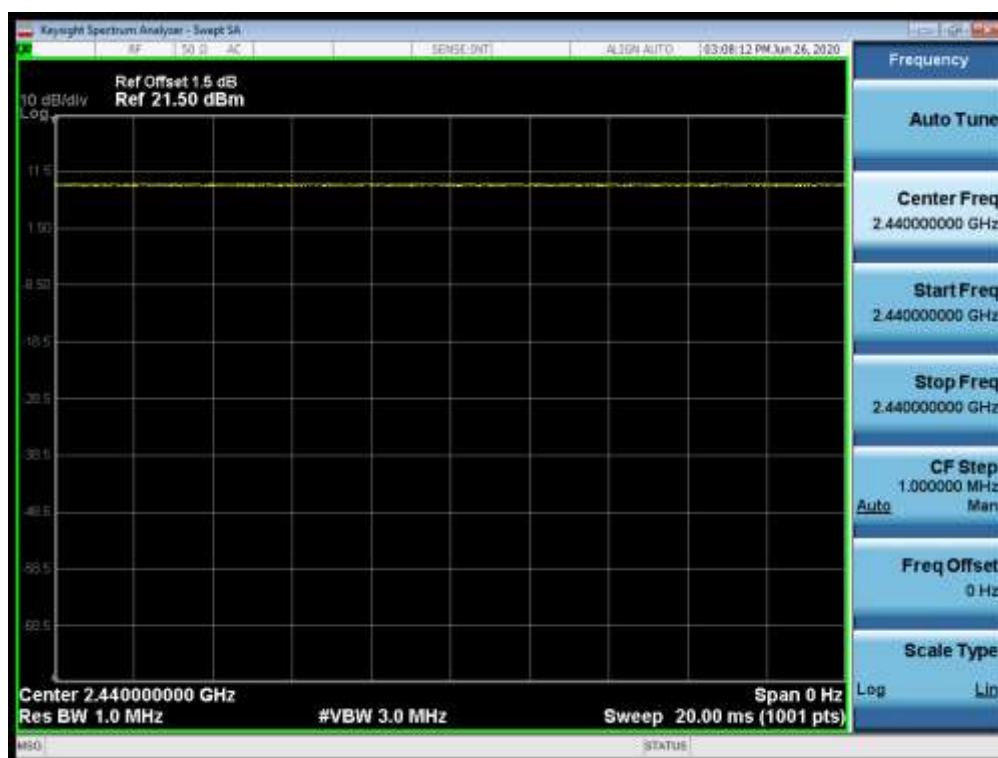
#### 4.4.4 Test Data

| Test Mode | Tx On<br>(us) | Tx Off<br>(us) | VBW<br>(kHz) | Tx On + Tx Off<br>(us) | Duty Cycle<br>(%) |
|-----------|---------------|----------------|--------------|------------------------|-------------------|
| Mode 1    | --            | --             | --           | --                     | 100               |

Note 1: T means the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Note 2: According to KDB 558074, when test for Radiated Emission Band Edge and Radiated Emission, for average detector set:  $VBW \geq 1/T$  will be used.

Mode 1 CH18 2440MHz



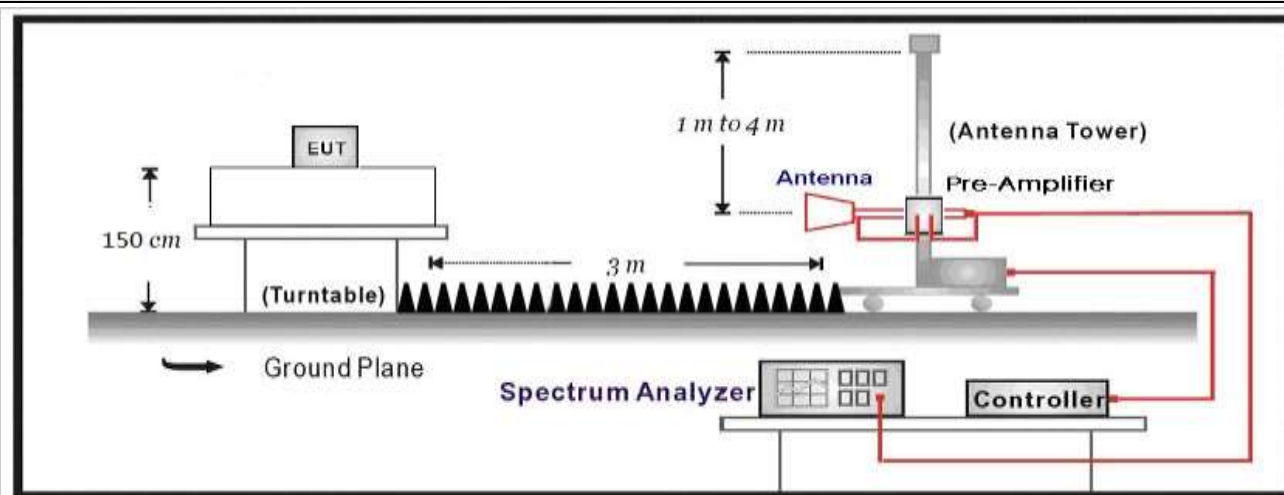
**4.5 Radiated Emission Band Edge****VERDICT: PASS****4.5.1 Limit**

| Standard              |          | FCC Part 15 Subpart C Paragraph 15.247(d) , 15.209 |           |              |
|-----------------------|----------|----------------------------------------------------|-----------|--------------|
| Frequency bands (MHz) | Detector | Limit (dB $\mu$ V/m)                               | RBW (MHz) | Distance (m) |
| 2310-2390             | PK       | 74                                                 | 1         | 3            |
| 2483.5-2500           | AV       | 54                                                 | 1         | 3            |

Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.

**4.5.2 Test Setup**

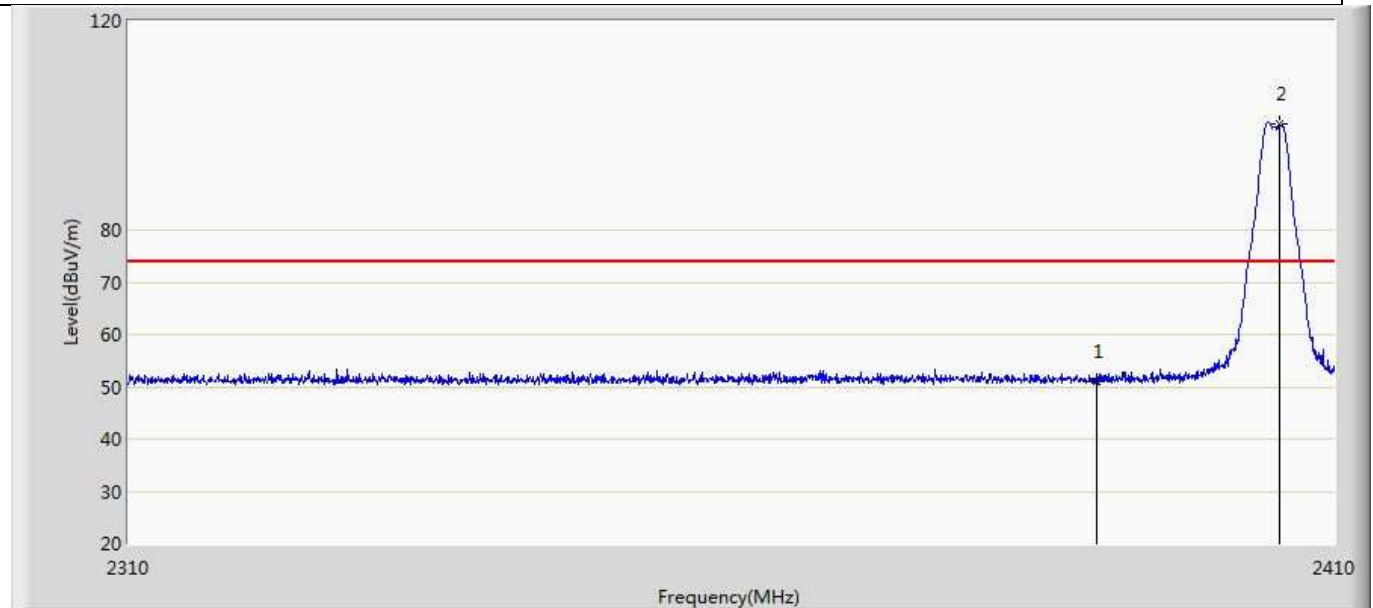
Above 1GHz Test Setup:

**4.5.3 Test Procedure**

|                                     | References Rule | Chapter   | Description                                                                                      |
|-------------------------------------|-----------------|-----------|--------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | ANSI C63.10     | 6.10      | Band-edge testing                                                                                |
| <input checked="" type="checkbox"/> | ANSI C63.10     | 6.10.5    | Restricted-band band-edge measurements                                                           |
| <input type="checkbox"/>            | ANSI C63.10     | 6.10.6    | Marker-delta method                                                                              |
| <input checked="" type="checkbox"/> | ANSI C63.10     | 11.12     | Emissions in restricted frequency bands                                                          |
| <input checked="" type="checkbox"/> | ANSI C63.10     | 11.12.1   | Radiated emission measurements                                                                   |
| <input checked="" type="checkbox"/> | ANSI C63.10     | 11.12.2.7 | Radiated spurious emission test                                                                  |
| <input type="checkbox"/>            | ANSI C63.10     | 6.4       | Radiated emissions from unlicensed wireless devices below 30 MHz                                 |
| <input type="checkbox"/>            | ANSI C63.10     | 6.5       | Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz |
| <input checked="" type="checkbox"/> | ANSI C63.10     | 6.6       | Radiated emissions from unlicensed wireless devices above 1 GHz                                  |

#### 4.5.4 Test Data

|                                    |                          |
|------------------------------------|--------------------------|
| Profile: 2060819R                  | Page No.: 1              |
| Engineer: YULIU                    |                          |
| Site: AC5                          | Time: 2020/03/12 - 00:49 |
| Limit: FCC_Part15.209_RE(3m)       | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical       |
| EUT: LED Device                    | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2405MHz   |                          |



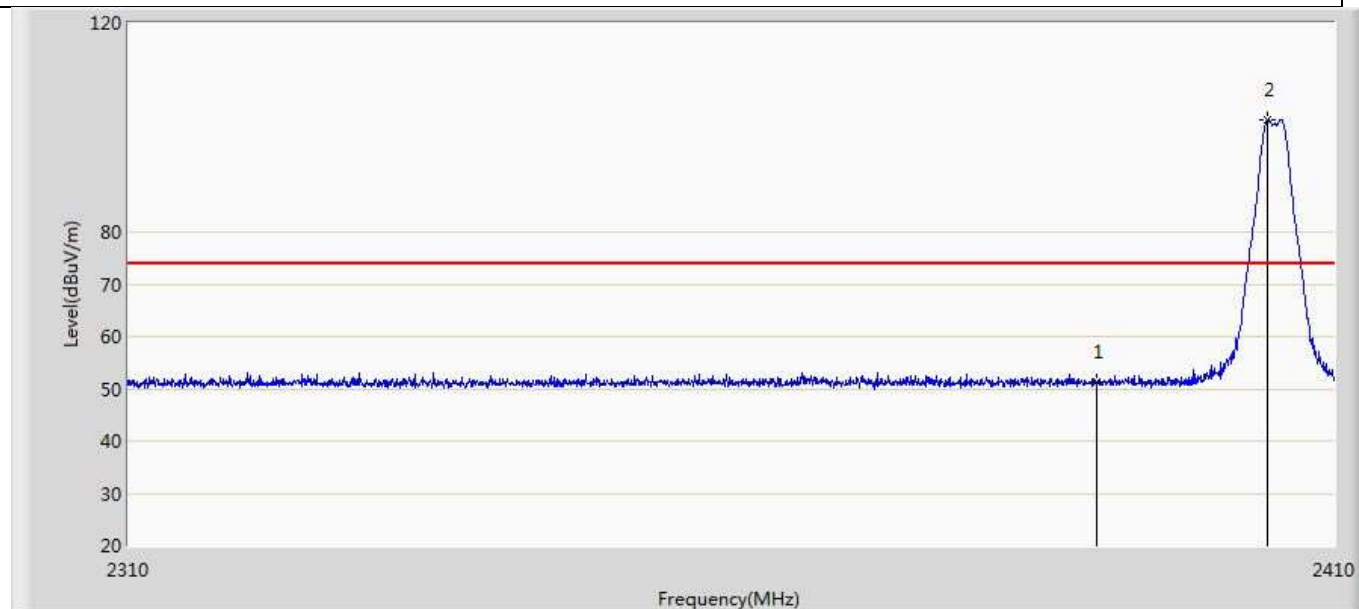
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  |      | 2390.000        | 51.094                 | 15.779               | -22.906         | 74.000         | 35.315      | PK   |
| 2  | *    | 2405.450        | 100.434                | 65.123               | 26.434          | 74.000         | 35.311      | PK   |

|                                    |                          |
|------------------------------------|--------------------------|
| Profile: 2060819R                  | Page No.: 2              |
| Engineer: YULIU                    |                          |
| Site: AC5                          | Time: 2020/04/28 - 20:21 |
| Limit: FCC_Part15.209_RE(3m)       | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical       |
| EUT: LED Device                    | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2405MHz   |                          |



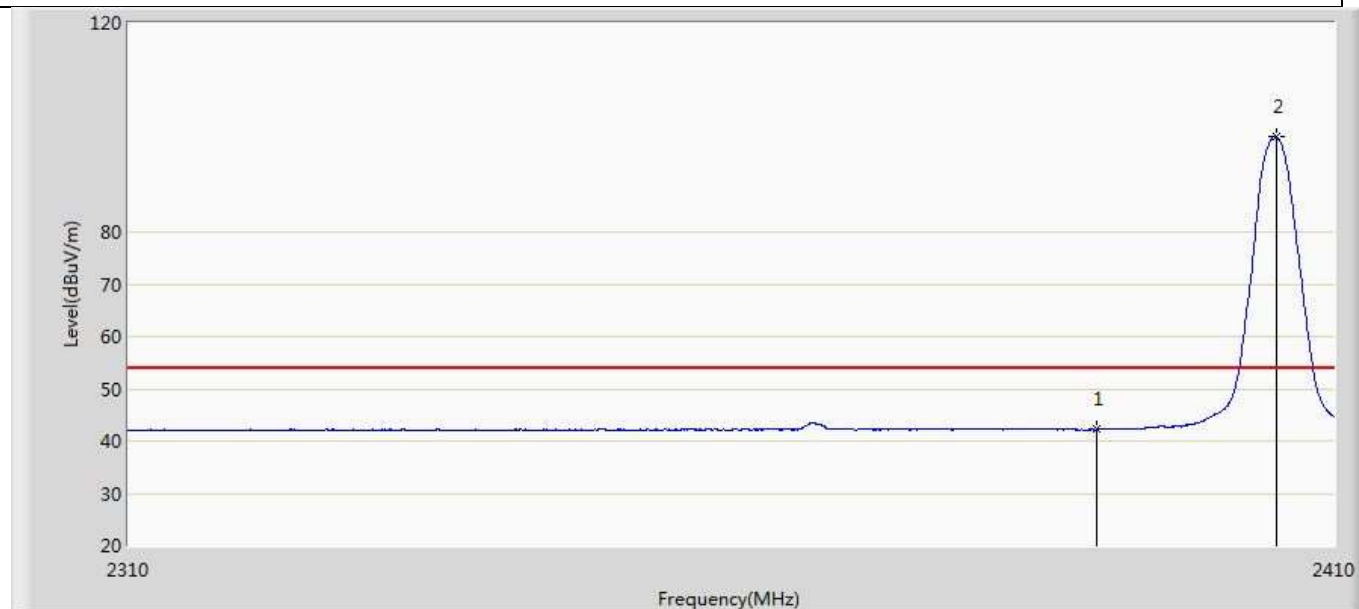
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  |      | 2390.000        | 42.148                 | 6.833                | -11.852         | 54.000         | 35.315      | AV   |
| 2  | *    | 2405.150        | 94.966                 | 59.655               | 40.966          | 54.000         | 35.311      | AV   |

|                                     |                          |
|-------------------------------------|--------------------------|
| Profile: 2060819R                   | Page No.: 3              |
| Engineer: YULIU                     |                          |
| Site: AC5                           | Time: 2020/04/28 - 20:24 |
| Limit: FCC_Part15.209_RE(3m)        | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz)  | Polarity: Horizontal     |
| EUT: LED Device                     | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2405MHz by |                          |



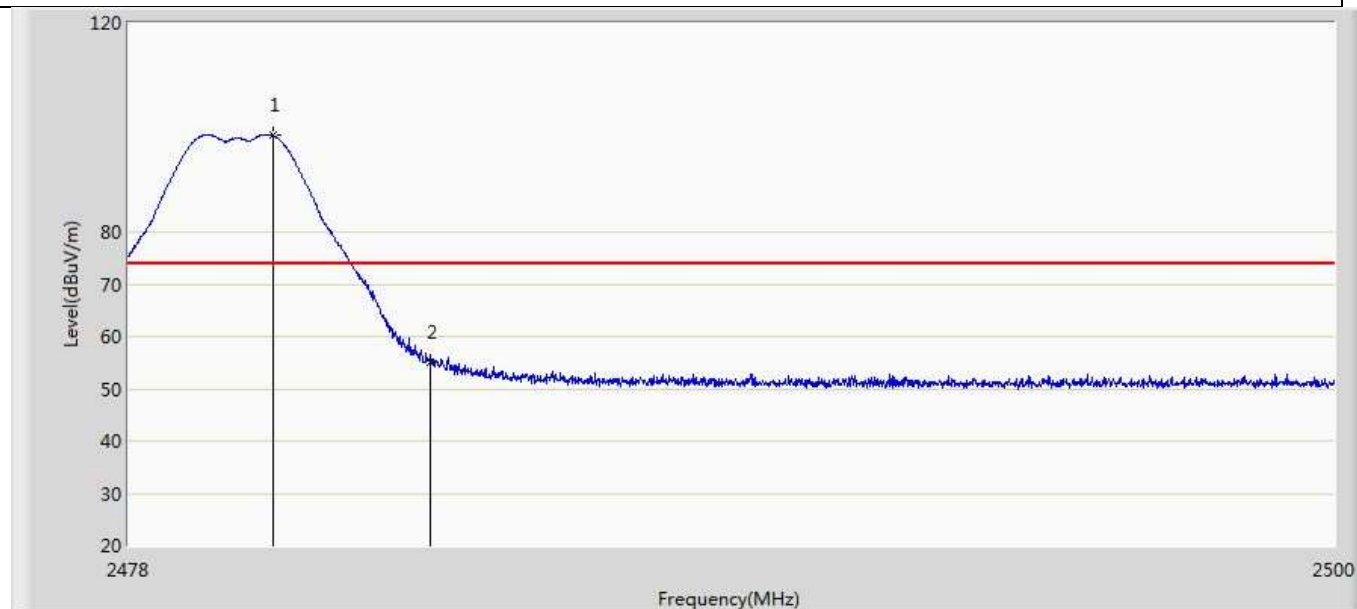
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  |      | 2390.000        | 51.423                 | 16.108               | -22.577         | 74.000         | 35.315      | PK   |
| 2  | *    | 2404.350        | 101.340                | 66.029               | 27.340          | 74.000         | 35.311      | PK   |

|                                    |                          |
|------------------------------------|--------------------------|
| Profile: 2060819R                  | Page No.: 4              |
| Engineer: YULIU                    |                          |
| Site: AC5                          | Time: 2020/04/28 - 20:26 |
| Limit: FCC_Part15.209_RE(3m)       | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal     |
| EUT: LED Device                    | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2405MHz   |                          |



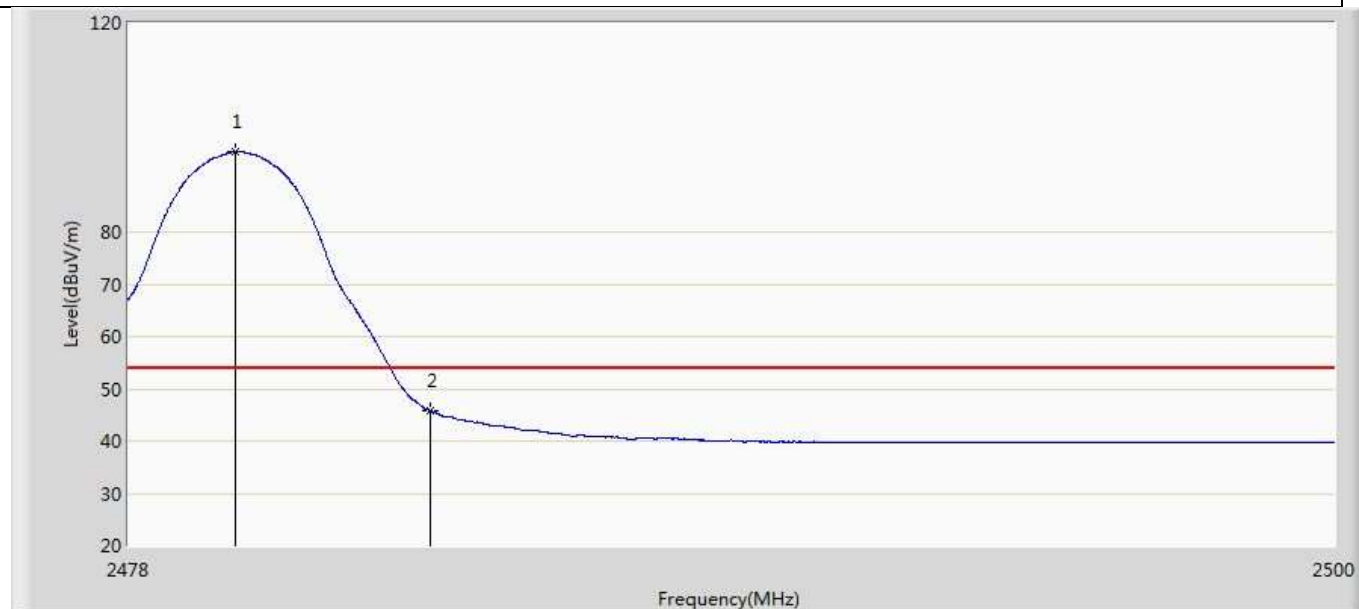
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  |      | 2390.000        | 42.181                 | 6.866                | -11.819         | 54.000         | 35.315      | AV   |
| 2  | *    | 2405.150        | 98.149                 | 62.838               | 44.149          | 54.000         | 35.311      | AV   |

|                                    |                          |
|------------------------------------|--------------------------|
| Profile: 2060819R                  | Page No.: 5              |
| Engineer: YULIU                    |                          |
| Site: AC5                          | Time: 2020/04/28 - 20:28 |
| Limit: FCC_Part15.209_RE(3m)       | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical       |
| EUT: LED Device                    | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2480MHz   |                          |



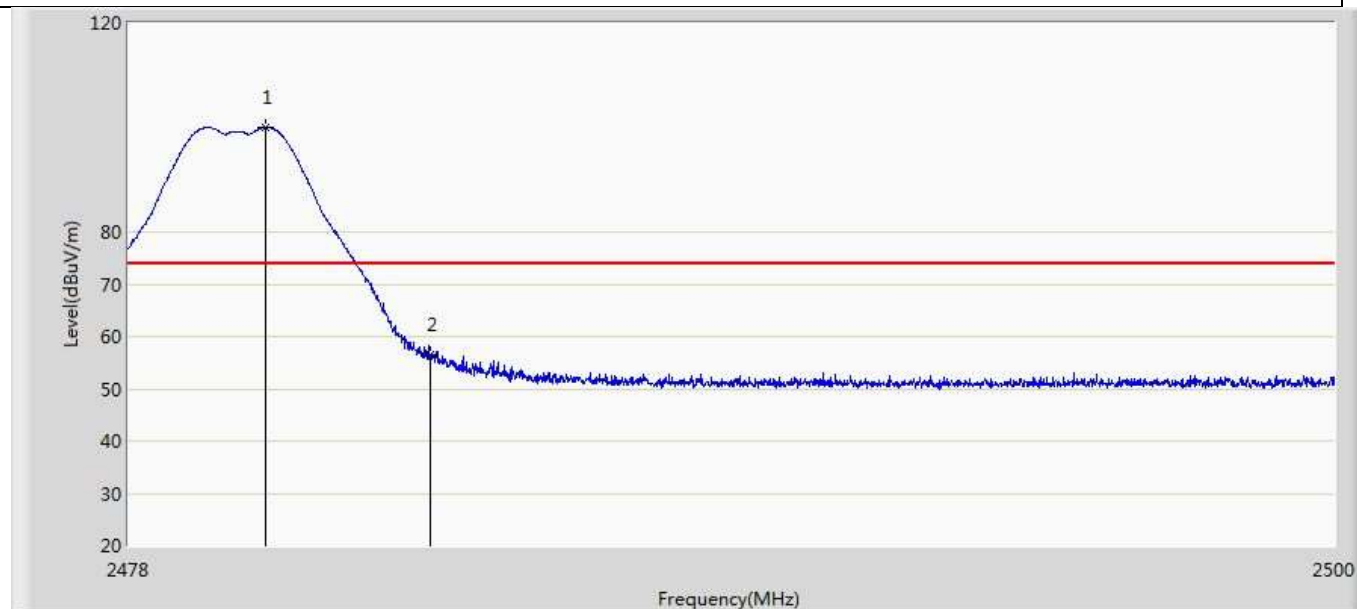
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  | *    | 2480.629        | 98.458                 | 63.160               | 24.458          | 74.000         | 35.298      | PK   |
| 2  |      | 2483.500        | 55.189                 | 19.891               | -18.811         | 74.000         | 35.297      | PK   |

|                                    |                          |
|------------------------------------|--------------------------|
| Profile: 2060819R                  | Page No.: 6              |
| Engineer: YULIU                    |                          |
| Site: AC5                          | Time: 2020/04/28 - 20:31 |
| Limit: FCC_Part15.209_RE(3m)       | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical       |
| EUT: LED Device                    | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2480MHz   |                          |



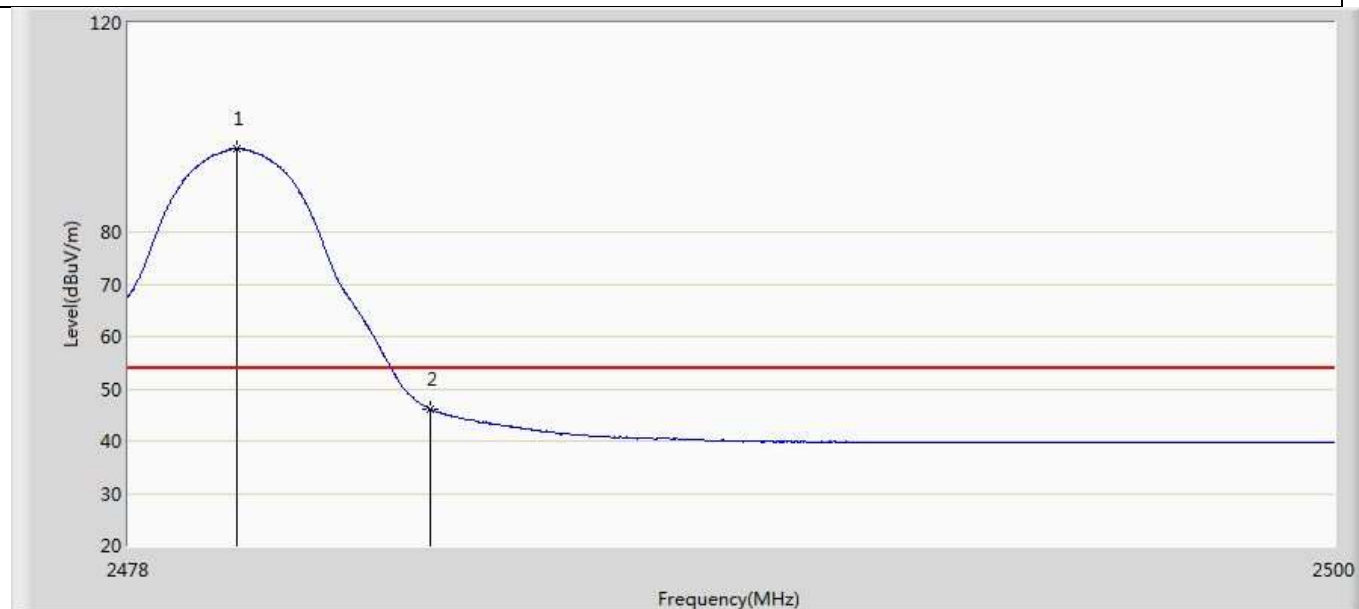
| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  | *    | 2479.936        | 95.336                 | 60.037               | 41.336          | 54.000         | 35.299      | AV   |
| 2  |      | 2483.500        | 45.721                 | 10.423               | -8.279          | 54.000         | 35.297      | AV   |

|                                    |                          |
|------------------------------------|--------------------------|
| Profile: 2060819R                  | Page No.: 7              |
| Engineer: YULIU                    |                          |
| Site: AC5                          | Time: 2020/04/28 - 20:33 |
| Limit: FCC_Part15.209_RE(3m)       | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal     |
| EUT: LED Device                    | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2480MHz   |                          |



| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  | *    | 2480.486        | 99.971                 | 64.673               | 25.971          | 74.000         | 35.298      | PK   |
| 2  |      | 2483.500        | 56.607                 | 21.309               | -17.393         | 74.000         | 35.297      | PK   |

|                                    |                          |
|------------------------------------|--------------------------|
| Profile: 2060819R                  | Page No.: 8              |
| Engineer: YULIU                    |                          |
| Site: AC5                          | Time: 2020/04/28 - 20:36 |
| Limit: FCC_Part15.209_RE(3m)       | Margin: 0                |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal     |
| EUT: LED Device                    | Power: AC 120V/60Hz      |
| Note: Mode 1:Transmit at 2480MHz   |                          |

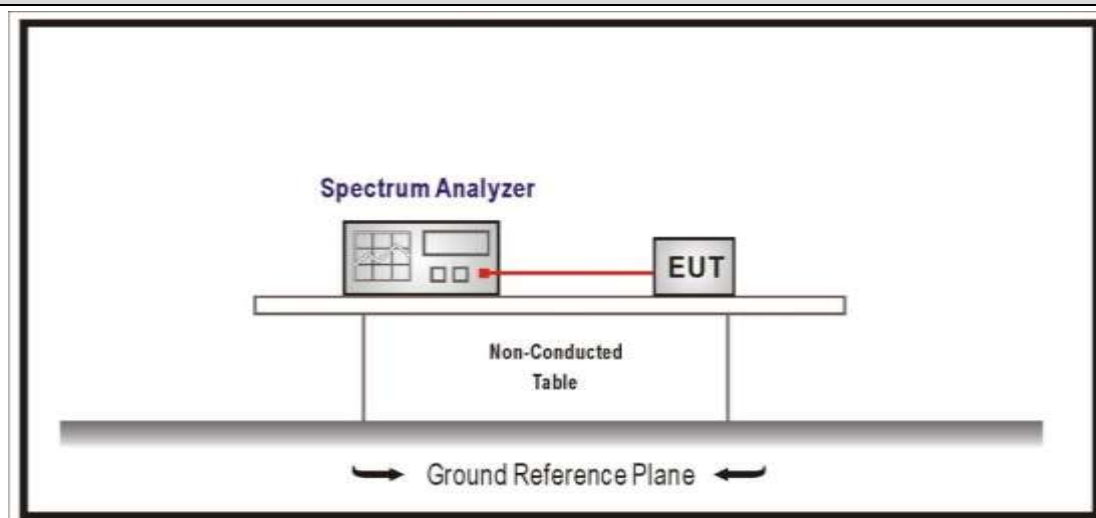


| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1  | *    | 2479.980        | 95.934                 | 60.635               | 41.934          | 54.000         | 35.299      | AV   |
| 2  |      | 2483.500        | 45.997                 | 10.699               | -8.003          | 54.000         | 35.297      | AV   |

**4.6 DTS Bandwidth****VERDICT: PASS****4.6.1 Limit**

|                 |                                               |
|-----------------|-----------------------------------------------|
| <b>Standard</b> | FCC Part 15 Subpart C Paragraph 15.247 (a)(2) |
|-----------------|-----------------------------------------------|

Systems using digital modulation techniques operate in the 2400-2483.5 MHz. The minimum 6 dB bandwidth shall be at least 500 kHz

**4.6.2 Test Setup****4.6.3 Test Procedure**

|                                     | Reference Rule | Chapter | Description   |
|-------------------------------------|----------------|---------|---------------|
| <input checked="" type="checkbox"/> | ANSI C63.10    | 11.8    | DTS bandwidth |
| <input type="checkbox"/>            | ANSI C63.10    | 11.8.1  | Option 1      |
| <input checked="" type="checkbox"/> | ANSI C63.10    | 11.8.2  | Option 2      |

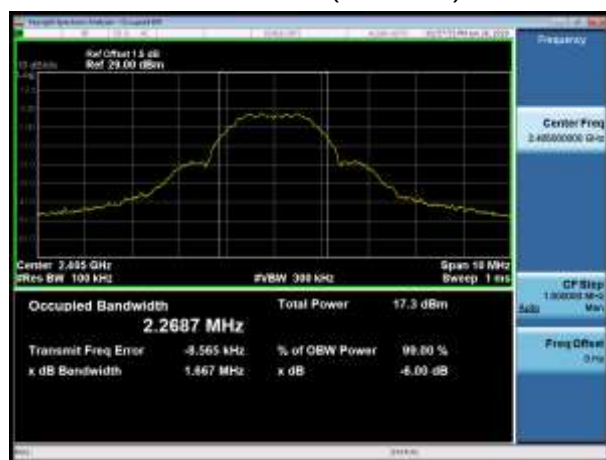
#### 4.6.4 Test Data

| Mode | CH. | Test Freq.<br>(MHz) | 99% Occupied<br>Bandwidth<br>(kHz) | 6dB Occupied<br>Bandwidth<br>(kHz) | Limit<br>(kHz) | Result |
|------|-----|---------------------|------------------------------------|------------------------------------|----------------|--------|
| 1    | 11  | 2405                | 2268.7                             | 1667.0                             | >500           | Pass   |
|      | 18  | 2440                | 2272.6                             | 1666.0                             | >500           | Pass   |
|      | 26  | 2480                | 2278.5                             | 1667.0                             | >500           | Pass   |

Note : The worst case of Occupied Bandwidth as below:

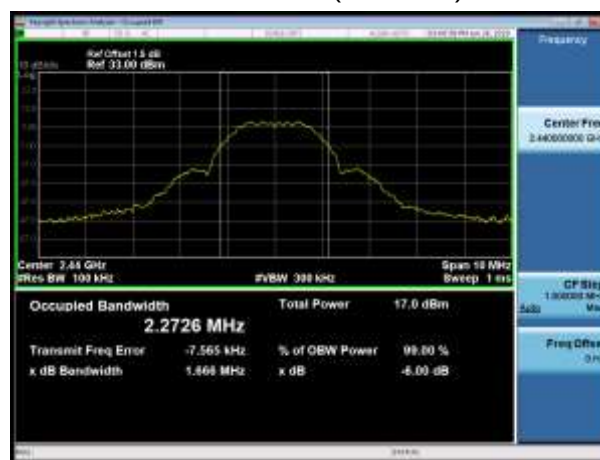
99% Occupied Bandwidth

Mode 1 CH11 (2405MHz)



6dB Occupied Bandwidth

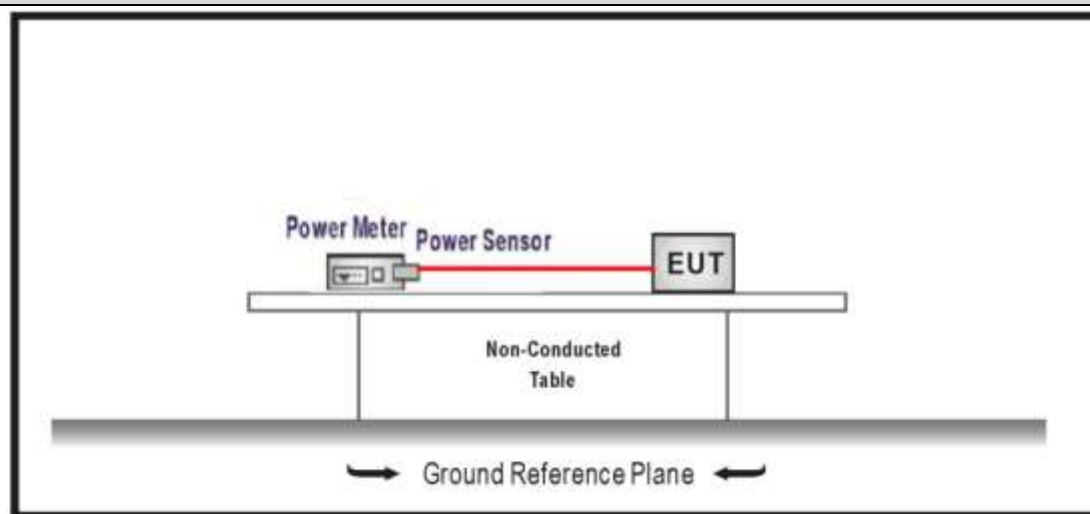
Mode 1 CH18 (2440MHz)



**4.7 Fundamental emission output power****VERDICT: PASS****4.7.1 Limit**

| Standard                            |                                                         | FCC Part 15 Subpart C Paragraph 15.247 (b)(3)  |
|-------------------------------------|---------------------------------------------------------|------------------------------------------------|
| <input checked="" type="checkbox"/> | GTX < 6dBi                                              | $P_{out} \leq 30\text{dBm}$                    |
| <input type="checkbox"/>            | GTX > 6dBi                                              |                                                |
| <input type="checkbox"/>            | Non-Fix point-point                                     | $P_{out} \leq 30 - (GTX - 6)$                  |
| <input type="checkbox"/>            | Fix point-point                                         | $P_{out} \leq 30 - [(GTX - 6)]/3$              |
| <input type="checkbox"/>            | Point-to-multipoint                                     | $P_{out} \leq 30 - (GTX - 6)$                  |
| <input type="checkbox"/>            | Overlap Beams                                           | $P_{out} \leq 30 - [(GTX - 6)]/3$              |
| <input type="checkbox"/>            | Aggregate power transmitted simultaneously on all beams | $P_{out} \leq 30 - [(GTX - 6)]/3$              |
| <input type="checkbox"/>            | single directional beam                                 | $P_{out} \leq 30 - [(GTX - 6)]/3 + 8\text{dB}$ |

Note 1 : GTX directional gain of transmitting antennas.  
 Note 2 : Pout is maximum peak conducted output power .

**4.7.2 Test Setup**

### 4.7.3 Test Procedure

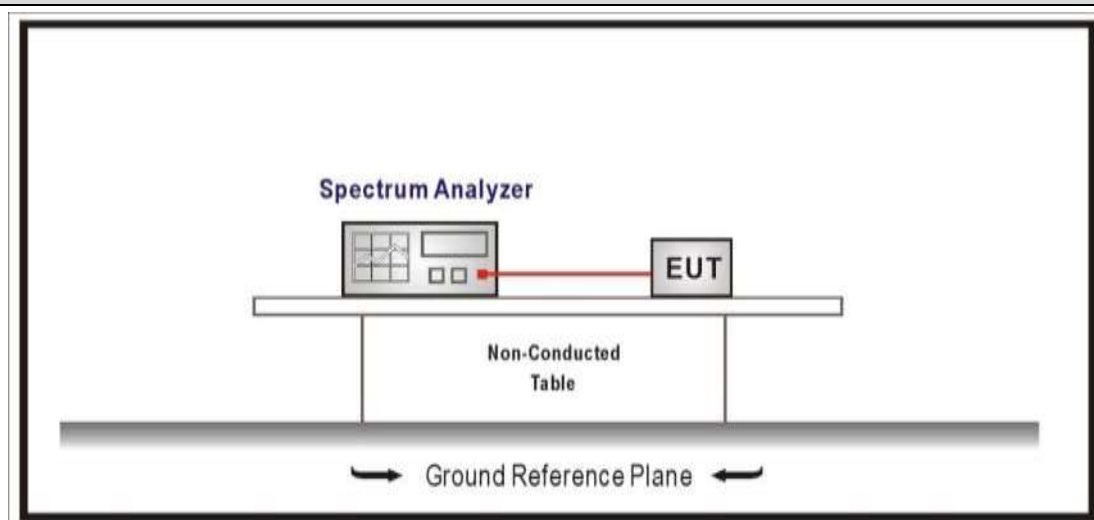
|                                     | References Rule                     |                                     |                                     | Chapter     | Description                                |                                          |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------|--------------------------------------------|------------------------------------------|
| <input checked="" type="checkbox"/> | ANSI C63.10                         |                                     |                                     | 11.9        | Fundamental emission output power          |                                          |
|                                     | <input checked="" type="checkbox"/> | ANSI C63.10                         |                                     |             | 11.9.1                                     | Maximum peak conducted output power      |
|                                     |                                     | <input type="checkbox"/>            | ANSI C63.10                         | 11.9.1.1    | RBW ≥ DTS bandwidth                        |                                          |
|                                     |                                     | <input type="checkbox"/>            | ANSI C63.10                         | 11.9.1.2    | Integrated band power method               |                                          |
|                                     |                                     | <input type="checkbox"/>            | ANSI C63.10                         | 11.9.1.3    | PKPM1 Peak power meter method              |                                          |
|                                     | <input type="checkbox"/>            | ANSI C63.10                         |                                     |             | 11.9.2                                     | Maximum conducted (average) output power |
|                                     |                                     | <input type="checkbox"/>            | ANSI C63.10                         | 11.9.2.2    | Measurement using a spectrum analyzer (SA) |                                          |
|                                     |                                     |                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.9.2.2.2                                 | Method AVGSA-1(Duty cycle≥98%)           |
|                                     |                                     |                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.9.2.2.3                                 | Method AVGSA-1A(Duty cycle≥98%)          |
|                                     |                                     |                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.9.2.2.4                                 | Method AVGSA-2(Duty cycle≤98%)           |
|                                     |                                     |                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.9.2.2.5                                 | Method AVGSA-2A(Duty cycle≤98%)          |
|                                     |                                     |                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.9.2.2.4                                 | Method AVGSA-3                           |
|                                     |                                     |                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.9.2.2.5                                 | Method AVGSA-3A                          |
|                                     |                                     | <input checked="" type="checkbox"/> | ANSI C63.10                         | 11.9.2.3    | Measurement using a power meter (PM)       |                                          |
|                                     |                                     |                                     | <input checked="" type="checkbox"/> | ANSI C63.10 | 11.9.2.3.1                                 | Method AVGPM                             |
|                                     |                                     |                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.9.2.3.2                                 | Method AVGPM-G                           |

#### 4.7.4 Test Data

| Mode   | Channel | Test Frequency (MHz) | Power Output (dBm) | Limit (dBm) | Result |
|--------|---------|----------------------|--------------------|-------------|--------|
| Mode 1 | 11      | 2405                 | 13.21              | $\leq 30$   | Pass   |
|        | 18      | 2440                 | 13.13              | $\leq 30$   | Pass   |
|        | 26      | 2480                 | 13.16              | $\leq 30$   | Pass   |

**4.8 Power Density****VERDICT: PASS****4.8.1 Limit:**

|                 |                                               |
|-----------------|-----------------------------------------------|
| <b>Standard</b> | FCC Part 15 Subpart C Paragraph 15.247 (b)(3) |
|-----------------|-----------------------------------------------|

Power Spectral Density  $\leq 8\text{dBm}/3\text{kHz}$ **4.8.2 Test Setup****4.8.3 Test Procedure**

|                                     | References Rule                     |             | Chapter | Description                                                      |
|-------------------------------------|-------------------------------------|-------------|---------|------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | ANSI C63.10                         |             | 11.10   | Maximum power spectral density level in the fundamental emission |
|                                     | <input checked="" type="checkbox"/> | ANSI C63.10 | 11.10.2 | Method PKPSD (peak PSD)                                          |
|                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.10.3 | Method AVGPSD-1(Duty cycle $\geq 98\%$ )                         |
|                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.10.4 | Method AVGPSD-1A(Duty cycle $\geq 98\%$ )                        |
|                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.10.5 | Method AVGPSD-2(Duty cycle $< 98\%$ )                            |
|                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.10.6 | Method AVGPSD-2A(Duty cycle $< 98\%$ )                           |
|                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.10.7 | Method AVGPSD-3                                                  |
|                                     | <input type="checkbox"/>            | ANSI C63.10 | 11.10.8 | Method AVGPSD-3A                                                 |

#### 4.8.4 Test Data

| Mode   | Channel | Test Frequency (MHz) | Measurement PSD (dBm/3kHz) | Limit (dBm/3kHz) | Result |
|--------|---------|----------------------|----------------------------|------------------|--------|
| Mode 1 | 11      | 2405                 | -5.331                     | ≤8               | Pass   |
|        | 18      | 2440                 | -6.425                     | ≤8               | Pass   |
|        | 26      | 2480                 | -6.313                     | ≤8               | Pass   |

Note : The worst case of PSD as below:

Mode 1 CH11(2405MHz)



**4.9 Antenna Requirement****VERDICT: PASS****4.9.1 Limit:****Standard**

FCC Part 15 Subpart C Paragraph 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.

**4.9.2 Antenna Connector Construction:**

- |                                     |                                                                  |
|-------------------------------------|------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | The use of a permanently attached antenna                        |
| <input type="checkbox"/>            | The antenna use of a unique coupling to the intentional radiator |
| <input type="checkbox"/>            | The use of a nonstandard antenna jack or electrical connector    |

Please refer to the attached document "Internal Photograph" to show the antenna connector.

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## 5 TEST SETUP PHOTO AND EUT PHOTO

Remark: The test setup photo and EUT Photo please see appendix.

\_\_\_\_\_ The End \_\_\_\_\_