

# TEST REPORT

**Product Name** : LED lamp  
**Brand Mark** : N/A  
**Model No.** : 16000312  
**Report Number** : BLA-EMC-202304-A2703  
**FCC ID** : 2AQUQGB16312  
**Date of Sample Receipt** : 2023/4/10  
**Date of Test** : 2023/4/10 to 2023/4/27  
**Date of Issue** : 2023/4/27  
**Test Standard** : 47 CFR Part 15, Subpart C 15.247  
**Test Result** : Pass

Prepared for:

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Prepared by:

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Date:

2023/4/27



## REPORT REVISE RECORD

| Version No. | Date      | Description |
|-------------|-----------|-------------|
| 00          | 2023/4/27 | Original    |

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## 1 TEST SUMMARY

| Test item                                             | Test Requirement                 | Test Method                                          | Class/Severity                                        | Result |
|-------------------------------------------------------|----------------------------------|------------------------------------------------------|-------------------------------------------------------|--------|
| Antenna Requirement                                   | 47 CFR Part 15, Subpart C 15.247 | N/A                                                  | 47 CFR Part 15, Subpart C 15.203 & 15.247(c)          | Pass   |
| Radiated Spurious Emissions                           | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 6.4,6.5,6.6               | 47 CFR Part 15, Subpart C 15.209 & 15.247(d)          | Pass   |
| Radiated Emissions which fall in the restricted bands | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 6.10.5                    | 47 CFR Part 15, Subpart C 15.209 & 15.247(d)          | Pass   |
| Conducted Spurious Emissions                          | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.6 & Section 11.11     | 47 CFR Part 15, Subpart C 15.247(d)                   | Pass   |
| Conducted Band Edges Measurement                      | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2 | 47 CFR Part 15, Subpart C 15.247(d)                   | Pass   |
| Minimum 6dB Bandwidth                                 | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 11.8.1                    | 47 CFR Part 15, Subpart C 15.247a(2)                  | Pass   |
| Power Spectrum Density                                | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 11.10.2                   | 47 CFR Part 15, Subpart C 15.247(e)                   | Pass   |
| Conducted Peak Output Power                           | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.5 & Section 11.9.1    | 47 CFR Part 15, Subpart C 15.247(b)(1) & 15.247(b)(3) | Pass   |
| Conducted Emissions at AC Power Line (150kHz-30MHz)   | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 6.2                       | 47 CFR Part 15, Subpart C 15.207                      | Pass   |

## 2 GENERAL INFORMATION

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| <b>Applicant</b>      | Globe Electric Company Inc.                                              |
| <b>Address</b>        | 150 Oneida, Montreal, Quebec, Canada, H9R 1A8                            |
| <b>Manufacturer</b>   | HangZhou Sky-Lighting Co., Ltd.                                          |
| <b>Address</b>        | No.161 North Star-Bridge Road, Linping, Hangzhou, Zhejiang, 311100 China |
| <b>Factory</b>        | HangZhou Sky-Lighting Co., Ltd.                                          |
| <b>Address</b>        | No.161 North Star-Bridge Road, Linping, Hangzhou, Zhejiang, 311100 China |
| <b>Product Name</b>   | LED lamp                                                                 |
| <b>Test Model No.</b> | 16000312                                                                 |

## 3 GENERAL DESCRIPTION OF E.U.T.

|                             |                                                                                 |
|-----------------------------|---------------------------------------------------------------------------------|
| <b>Hardware Version</b>     | V1.0                                                                            |
| <b>Software Version</b>     | V1.3.21                                                                         |
| <b>Operation Frequency:</b> | 802.11b/g/n(HT20): 2412MHz to 2462MHz<br>802.11n(HT40): 2422MHz to 2452MHz      |
| <b>Modulation Type:</b>     | 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) |
| <b>Channel Spacing:</b>     | 5MHz                                                                            |
| <b>Number of Channels:</b>  | 802.11b/g/n(HT20):11<br>802.11n(HT40):7                                         |
| <b>Antenna Type:</b>        | Internal Antenna                                                                |
| <b>Antenna Gain:</b>        | 1.67dBi (Provided by the applicant)                                             |

**Operation Frequency each of channel**

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| 1       | 2412MHz   | 4       | 2427MHz   | 7       | 2442MHz   | 10      | 2457MHz   |
| 2       | 2417MHz   | 5       | 2432MHz   | 8       | 2447MHz   | 11      | 2462MHz   |
| 3       | 2422MHz   | 6       | 2437MHz   | 9       | 2452MHz   |         |           |

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Test channel    | Frequency (MHz)               |
|-----------------|-------------------------------|
|                 | 802.11b/802.11g/802.11n(HT20) |
| Lowest channel  | 2412MHz                       |
| Middle channel  | 2437MHz                       |
| Highest channel | 2462MHz                       |
| Test channel    | Frequency (MHz)               |
|                 | 802.11n(HT40)                 |
| Lowest channel  | 2422MHz                       |
| Middle channel  | 2437MHz                       |
| Highest channel | 2452MHz                       |

#### 4 TEST ENVIRONMENT

| Environment | Temperature | Voltage |
|-------------|-------------|---------|
| Normal      | 25°C        | AC120V  |

#### 5 TEST MODE

| TEST MODE                                                                                                                                                                                                                                                                         | TEST MODE DESCRIPTION                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Transmitting mode                                                                                                                                                                                                                                                                 | Keep the EUT in continuously transmitting mode with modulation. (The duty cycle is greater than 98%) |
| Remark: Full battery is used during all test except ac conducted emission, 802.11b/g/n(HT20) and 802.11n(HT40) all have been tested, During the radiated spurious emission test , 802.11b/11g/11nH20/11nH40 modulations all have been tested,only worse case 802.11b is reported. |                                                                                                      |

#### 6 MEASUREMENT UNCERTAINTY

| Parameter                                      | Expanded Uncertainty (Confidence of 95%) |
|------------------------------------------------|------------------------------------------|
| Radiated Emission(9kHz-30MHz)                  | ±4.34dB                                  |
| Radiated Emission(30Mz-1000MHz)                | ±4.24dB                                  |
| Radiated Emission(1GHz-18GHz)                  | ±4.68dB                                  |
| AC Power Line Conducted Emission(150kHz-30MHz) | ±3.45dB                                  |

| Parameter                                    | Expanded Uncertainty (Confidence of 95%) |
|----------------------------------------------|------------------------------------------|
| Occupied Channel Bandwidth                   | ±5 %                                     |
| RF output power, conducted                   | ±1.5 dB                                  |
| Power Spectral Density, conducted            | ±3.0 dB                                  |
| Unwanted Emissions, conducted                | ±3.0 dB                                  |
| Temperature                                  | ±3 °C                                    |
| Supply voltages                              | ±3 %                                     |
| Time                                         | ±5 %                                     |
| Unwanted Radiated Emission (30MHz ~ 1000MHz) | ±4.35 dB                                 |
| Unwanted Radiated Emission (1GHz ~ 18GHz)    | ±4.44 dB                                 |



## 7 DESCRIPTION OF SUPPORT UNIT

| Device Type | Manufacturer | Model Name | Serial No. | Remark |
|-------------|--------------|------------|------------|--------|
| N/A         | N/A          | N/A        | N/A        | N/A    |

## 8 LABORATORY LOCATION

All tests were performed at:  
BlueAsia of Technical Services(Shenzhen) Co.,Ltd.  
Building C, No. 107, Shihuan Road, Shiyao Sub-District, Baoan District, Shenzhen, Guangdong Province,  
China  
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

## 9 TEST INSTRUMENTS LIST

| Test Equipment Of RF Conducted Test |              |           |                |            |            |
|-------------------------------------|--------------|-----------|----------------|------------|------------|
| Equipment                           | Manufacturer | Model     | S/N            | Cal.Date   | Cal.Due    |
| Spectrum                            | R&S          | FSP40     | 100817         | 2022/09/15 | 2023/09/14 |
| Spectrum                            | Agilent      | N9020A    | MY49100060     | 2022/09/07 | 2023/09/06 |
| Spectrum                            | KEYSIGHT     | N9030A    | MY52350152     | 2022/07/01 | 2023/06/30 |
| Spectrum                            | KEYSIGHT     | N9010A    | MY54330814     | 2022/07/01 | 2023/06/30 |
| Signal Generator                    | Agilent      | N5182A    | MY47420955     | 2022/09/07 | 2023/09/06 |
| Signal Generator                    | Agilent      | E8257D    | MY44320250     | 2022/07/01 | 2023/06/30 |
| Signal Generator                    | Agilent      | N5181A    | MY46240904     | 2022/08/02 | 2023/08/01 |
| Signal Generator                    | R&S          | CMW500    | 132429         | 2022/09/07 | 2023/09/06 |
| BluetoothTester                     | Anritsu      | MT8852B   | 06262047872    | 2022/09/07 | 2023/09/06 |
| Power probe                         | DARE         | RPR3006W  | 14I00889SN042  | 2022/09/07 | 2023/09/06 |
| DCPowersupply                       | zhaoxin      | KXN-305D  | 20K305D1221363 | 2022/09/14 | 2023/09/13 |
| DCPowersupply                       | zhaoxin      | RXN-1505D | 19R1505D050168 | 2022/09/14 | 2023/09/13 |

| Test Equipment Of Radiated Spurious Emissions |              |                        |                  |            |            |
|-----------------------------------------------|--------------|------------------------|------------------|------------|------------|
| Equipment                                     | Manufacturer | Model                  | S/N              | Cal.Date   | Cal.Due    |
| Chamber 1                                     | SKET         | 966                    | N/A              | 2020/11/10 | 2023/11/9  |
| Chamber 2                                     | SKET         | 966                    | N/A              | 2021/07/20 | 2024/07/19 |
| Spectrum                                      | R&S          | FSP40                  | 100817           | 2022/09/15 | 2023/09/14 |
| Receiver                                      | R&S          | ESR7                   | 101199           | 2022/09/15 | 2023/09/14 |
| Receiver                                      | R&S          | ESPI7                  | 101477           | 2022/07/16 | 2023/07/15 |
| broadband Antenna                             | Schwarzbeck  | VULB9168               | 00836<br>P:00227 | 2022/09/15 | 2023/09/14 |
| Horn Antenna                                  | Schwarzbeck  | BBHA9120D              | 01892<br>P:00331 | 2022/09/13 | 2025/09/12 |
| Amplifier                                     | SKET         | LNPA_30M01G-30         | SK2021060801     | 2022/07/16 | 2023/07/15 |
| Amplifier                                     | SKET         | PA-000318G-45          | N/A              | 2022/09/13 | 2023/09/12 |
| Amplifier                                     | SKET         | LNPA_18G40G-50         | SK2022071301     | 2022/07/14 | 2023/07/13 |
| Filter group                                  | SKET         | 2.4G/5G Filter group r | N/A              | 2022/07/16 | 2023/07/15 |
| EMI software                                  | EZ           | EZ-EMC                 | EEMC-3A1         | N/A        | N/A        |
| Loop antenna                                  | SCHNARZBECK  | FMZB1519B              | 00102            | 2022/9/14  | 2025/9/13  |

|               |          |           |     |     |     |
|---------------|----------|-----------|-----|-----|-----|
| Controller    | SKET     | N/A       | N/A | N/A | N/A |
| Coaxial Cable | BlueAsia | BLA-XC-02 | N/A | N/A | N/A |
| Coaxial Cable | BlueAsia | BLA-XC-03 | N/A | N/A | N/A |
| Coaxial Cable | BlueAsia | BLA-XC-01 | N/A | N/A | N/A |

**Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)**

| Equipment                                       | Manufacturer | Model      | S/N           | Cal.Date   | Cal.Due    |
|-------------------------------------------------|--------------|------------|---------------|------------|------------|
| Shield room                                     | SKET         | 833        | N/A           | 2020/11/25 | 2023/11/24 |
| Receiver                                        | R&S          | ESPI3      | 101082        | 2022/09/14 | 2023/09/13 |
| LISN                                            | R&S          | ENV216     | 3560.6550.15  | 2022/09/14 | 2023/09/13 |
| LISN                                            | AT           | AT166-2    | AKK1806000003 | 2022/09/14 | 2023/09/13 |
| ISN                                             | TESEQ        | ISNT8-cat6 | 53580         | 2022/09/14 | 2023/09/13 |
| Single-channel vehicle artificial power network | Schwarzbeck  | NNBM 8124  | 01045         | 2022/08/17 | 2023/08/16 |
| Single-channel vehicle artificial power network | Schwarzbeck  | NNBM 8124  | 01075         | 2022/08/17 | 2023/08/16 |
| EMI software                                    | EZ           | EZ-EMC     | EEMC-3A1      | N/A        | N/A        |

## 10 ANTENNA REQUIREMENT

|               |                                  |
|---------------|----------------------------------|
| Test Standard | 47 CFR Part 15, Subpart C 15.247 |
| Test Method   | N/A                              |

### 10.1 CONCLUSION

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The best case gain of the antenna is 1.67dBi.

## 11 RADIATED SPURIOUS EMISSIONS

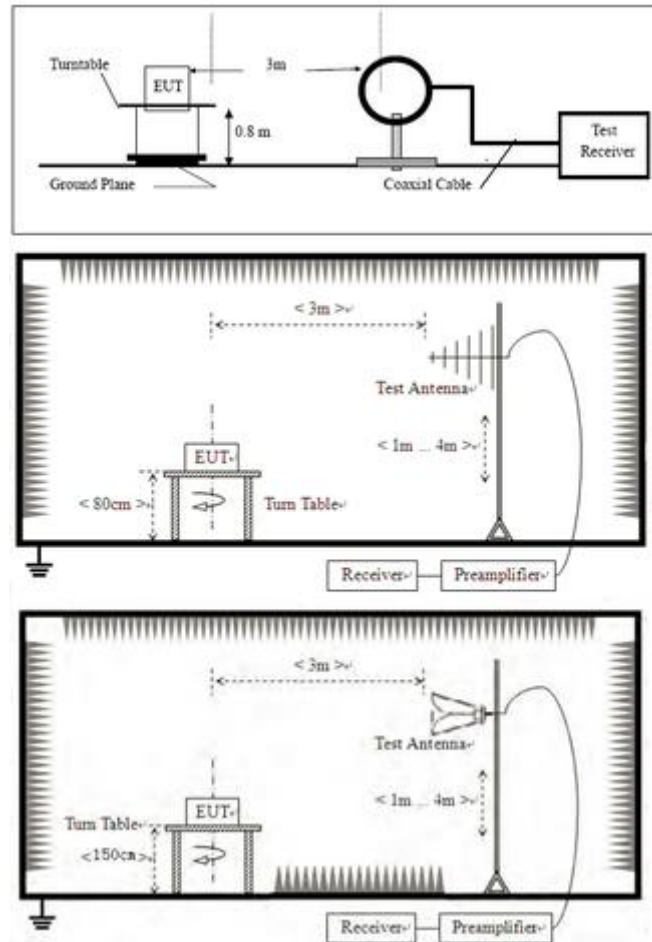
|                               |                                        |
|-------------------------------|----------------------------------------|
| <b>Test Standard</b>          | 47 CFR Part 15, Subpart C 15.247       |
| <b>Test Method</b>            | ANSI C63.10 (2013) Section 6.4,6.5,6.6 |
| <b>Test Mode (Pre-Scan)</b>   | TX                                     |
| <b>Test Mode (Final Test)</b> | TX                                     |
| <b>Tester</b>                 | Jozu                                   |
| <b>Temperature</b>            | 25℃                                    |
| <b>Humidity</b>               | 60%                                    |

### 11.1 LIMITS

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

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

## 11.2 BLOCK DIAGRAM OF TEST SETUP



## 11.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.

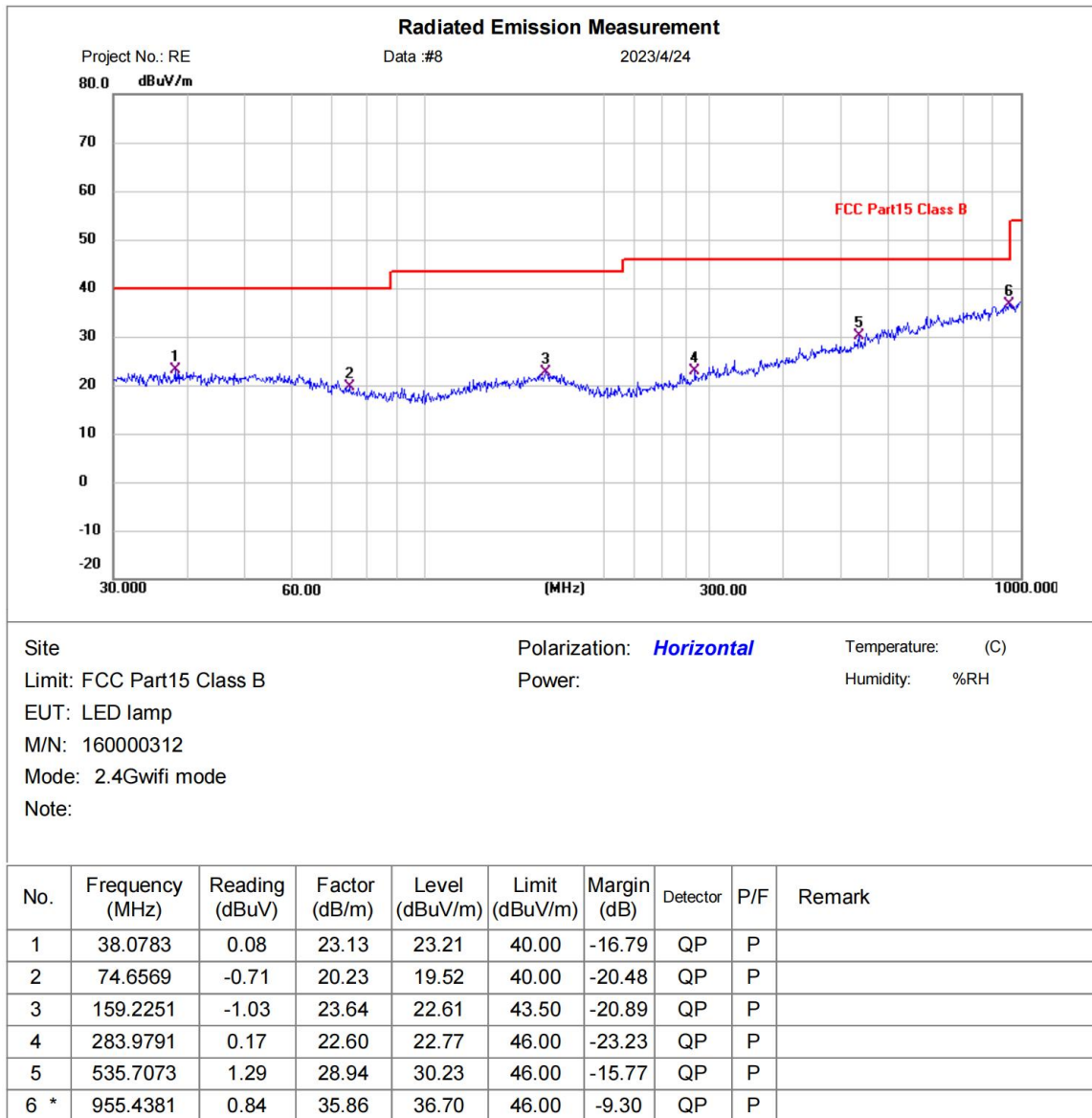
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. fundamental frequency is blocked by filter, and only spurious emission is shown.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

## 11.4 TEST DATA

[TestMode: TX below 1G]; [Polarity: Horizontal]

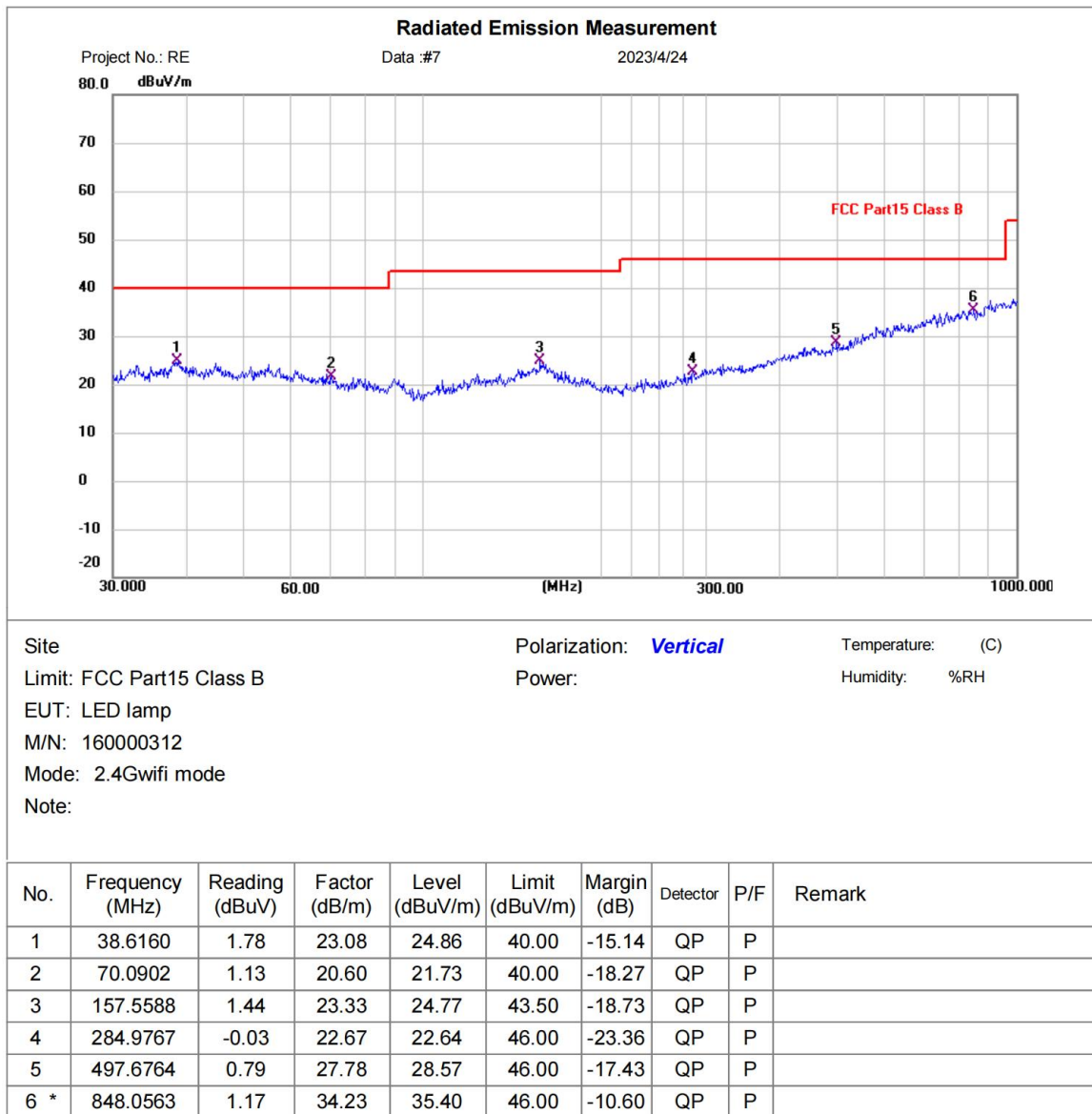


\*:Maximum data    x:Over limit    !:over margin

**Test Result: Pass**



[TestMode: TX below 1G]; [Polarity: Vertical]

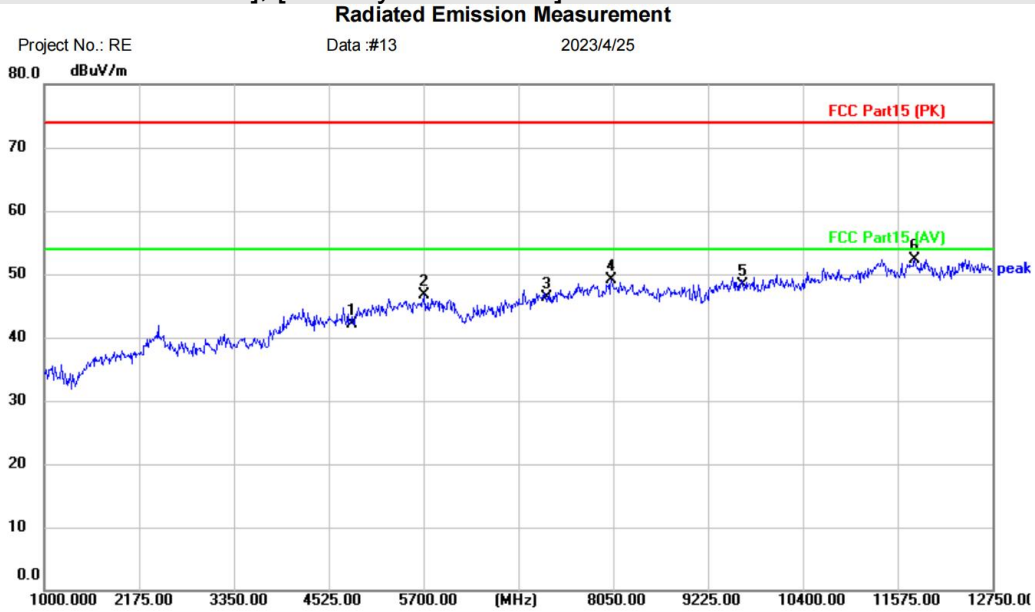


\*:Maximum data    x:Over limit    !:over margin

**Test Result: Pass**

Remark: During the test, pre-scan the 802.11b/g/n mode, and found the 802.11b mode which it is worse case.

[TestMode: TX low channel]; [Polarity: Horizontal]



|                         |                                 |                  |
|-------------------------|---------------------------------|------------------|
| Site                    | Polarization: <b>Horizontal</b> | Temperature: (C) |
| Limit: FCC Part15 (PK)  | Power:                          | Humidity: %RH    |
| EUT: LED lamp           |                                 |                  |
| M/N: 16000312           |                                 |                  |
| Mode: 2.4Gwifi 11B-TX-L |                                 |                  |
| Note:                   |                                 |                  |

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 4824.000     | 37.92                    | 4.13                    | 42.05                      | 74.00           | -31.95     | peak     |         |
| 2   |     | 5711.750     | 39.98                    | 6.81                    | 46.79                      | 74.00           | -27.21     | peak     |         |
| 3   |     | 7236.000     | 38.37                    | 8.00                    | 46.37                      | 74.00           | -27.63     | peak     |         |
| 4   |     | 8026.500     | 40.29                    | 8.91                    | 49.20                      | 74.00           | -24.80     | peak     |         |
| 5   |     | 9648.000     | 37.36                    | 11.01                   | 48.37                      | 74.00           | -25.63     | peak     |         |
| 6   | *   | 11786.50     | 38.57                    | 13.81                   | 52.38                      | 74.00           | -21.62     | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

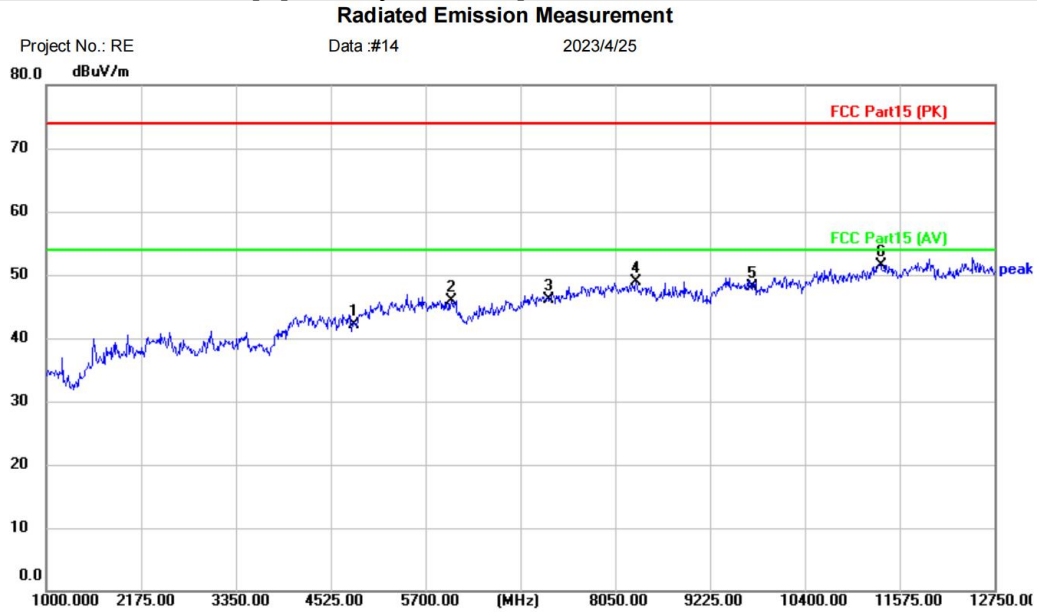
(Reference Only)

Receiver: ESR\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX low channel]; [Polarity: Vertical]



Site:      Polarization: **Vertical**      Temperature: (C)  
Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
EUT: LED lamp  
M/N: 16000312  
Mode: 2.4Gwifi 11B-TX-L  
Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 4824.000     | 37.99                    | 4.13                    | 42.12                      | 74.00           | -31.88     | peak     |         |
| 2   |     | 6017.250     | 42.01                    | 3.97                    | 45.98                      | 74.00           | -28.02     | peak     |         |
| 3   |     | 7236.000     | 38.10                    | 8.00                    | 46.10                      | 74.00           | -27.90     | peak     |         |
| 4   |     | 8308.500     | 39.88                    | 9.04                    | 48.92                      | 74.00           | -25.08     | peak     |         |
| 5   |     | 9748.000     | 36.90                    | 11.26                   | 48.16                      | 74.00           | -25.84     | peak     |         |
| 6   | *   | 11340.00     | 38.00                    | 13.60                   | 51.60                      | 74.00           | -22.40     | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

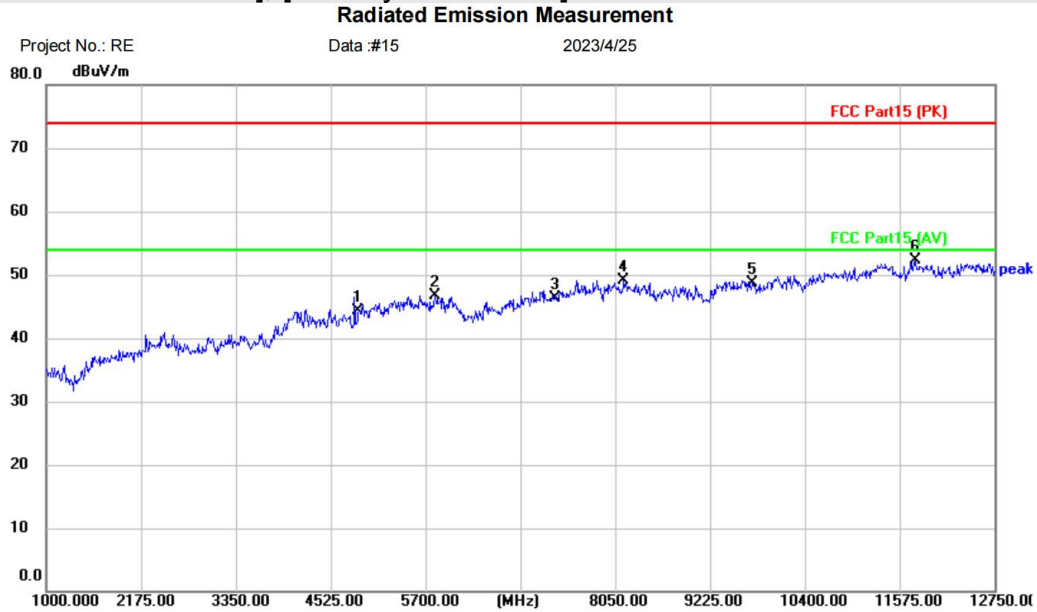
(Reference Only)

Receiver: ESR\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX mid channel]; [Polarity: Horizontal]



Site:      Polarization: **Horizontal**      Temperature: (C)  
Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
EUT: LED lamp  
M/N: 16000312  
Mode: 2.4Gwifi 11B-TX-M  
Note:

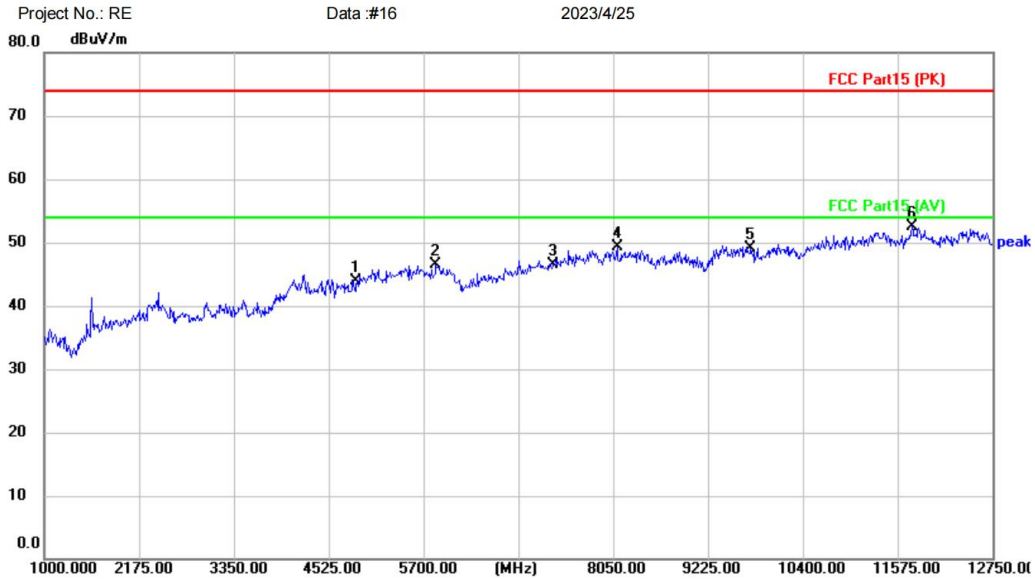
| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 4874.000     | 39.97                    | 4.32                    | 44.29                      | 74.00           | -29.71     | peak     |         |
| 2   |     | 5817.500     | 40.00                    | 6.78                    | 46.78                      | 74.00           | -27.22     | peak     |         |
| 3   |     | 7311.000     | 38.13                    | 8.18                    | 46.31                      | 74.00           | -27.69     | peak     |         |
| 4   |     | 8155.750     | 40.09                    | 8.97                    | 49.06                      | 74.00           | -24.94     | peak     |         |
| 5   |     | 9748.000     | 37.54                    | 11.26                   | 48.80                      | 74.00           | -25.20     | peak     |         |
| 6   | *   | 11763.00     | 38.43                    | 13.80                   | 52.23                      | 74.00           | -21.77     | peak     |         |

\*:Maximum data    x:Over limit    !:over margin      (Reference Only)  
Receiver: ESR\_1      Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX mid channel]; [Polarity: Vertical]

**Radiated Emission Measurement**



Site: Limit: FCC Part15 (PK) Polarization: **Vertical** Temperature: (C)  
EUT: LED lamp Power: Humidity: %RH  
M/N: 16000312  
Mode: 2.4Gwifi 11B-TX-M  
Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 4874.000     | 39.51                    | 4.32                    | 43.83                      | 74.00           | -30.17     | peak     |         |
| 2   |     | 5852.750     | 39.68                    | 6.80                    | 46.48                      | 74.00           | -27.52     | peak     |         |
| 3   |     | 7311.000     | 38.34                    | 8.18                    | 46.52                      | 74.00           | -27.48     | peak     |         |
| 4   |     | 8097.000     | 40.28                    | 8.94                    | 49.22                      | 74.00           | -24.78     | peak     |         |
| 5   |     | 9748.000     | 37.76                    | 11.26                   | 49.02                      | 74.00           | -24.98     | peak     |         |
| 6   | *   | 11751.25     | 38.81                    | 13.79                   | 52.60                      | 74.00           | -21.40     | peak     |         |

\*:Maximum data x:Over limit !:over margin

(Reference Only)

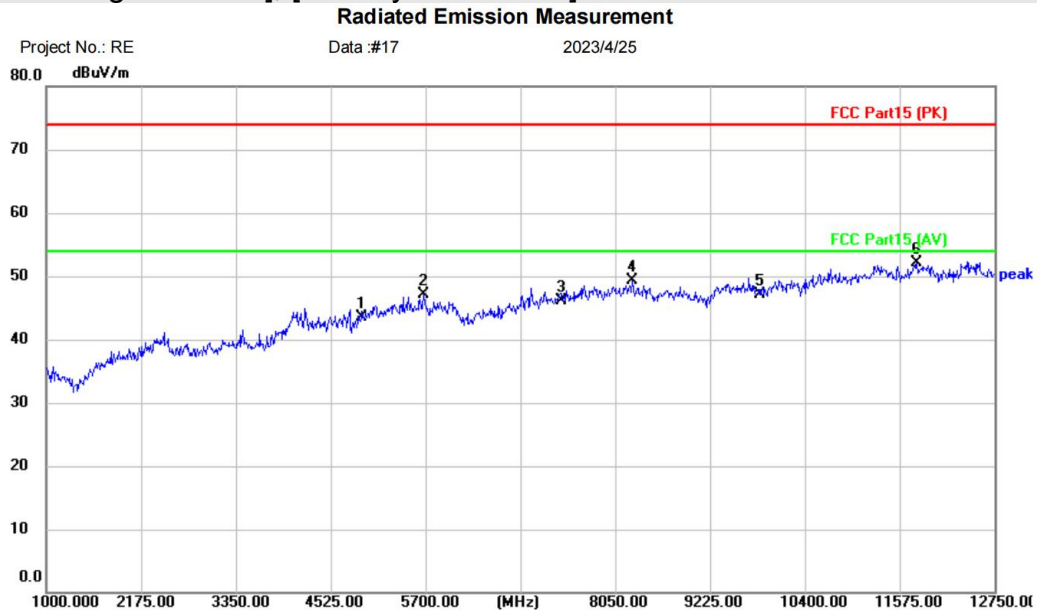
Receiver: ESR\_1

Spectrum Analyzer:

FSP40

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Horizontal]



Site:      Polarization: **Horizontal**      Temperature: (C)  
Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
EUT: LED lamp  
M/N: 16000312  
Mode: 2.4Gwifi 11B-TX-H  
Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 4924.000     | 38.59                    | 4.82                    | 43.41                      | 74.00           | -30.59     | peak     |         |
| 2   |     | 5676.500     | 40.36                    | 6.79                    | 47.15                      | 74.00           | -26.85     | peak     |         |
| 3   |     | 7386.000     | 37.73                    | 8.36                    | 46.09                      | 74.00           | -27.91     | peak     |         |
| 4   |     | 8261.500     | 40.36                    | 9.02                    | 49.38                      | 74.00           | -24.62     | peak     |         |
| 5   |     | 9848.000     | 35.57                    | 11.52                   | 47.09                      | 74.00           | -26.91     | peak     |         |
| 6   | *   | 11786.50     | 38.28                    | 13.81                   | 52.09                      | 74.00           | -21.91     | peak     |         |

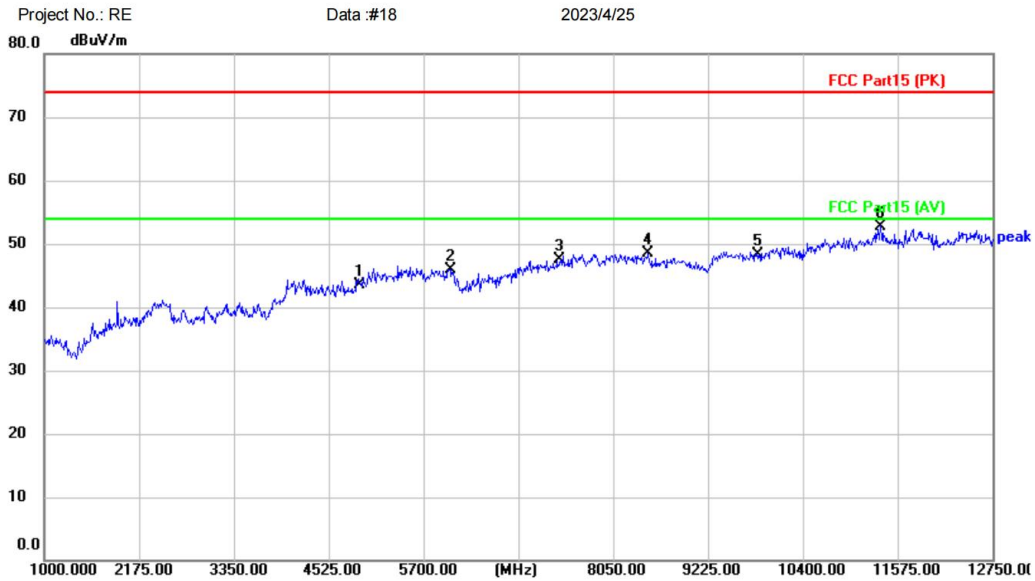
\*:Maximum data    x:Over limit    !:over margin      (Reference Only)  
Receiver: ESR\_1      Spectrum Analyzer: FSP40

**Test Result: Pass**



[TestMode: TX high channel]; [Polarity: Vertical]

**Radiated Emission Measurement**



Site: Polarization: **Vertical** Temperature: (C)  
Limit: FCC Part15 (PK) Power: Humidity: %RH  
EUT: LED lamp  
M/N: 16000312  
Mode: 2.4Gwifi 11B-TX-H  
Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 4924.000     | 38.62                    | 4.82                    | 43.44                      | 74.00           | -30.56     | peak     |         |
| 2   |     | 6029.000     | 41.98                    | 4.02                    | 46.00                      | 74.00           | -28.00     | peak     |         |
| 3   |     | 7386.000     | 39.09                    | 8.36                    | 47.45                      | 74.00           | -26.55     | peak     |         |
| 4   |     | 8484.750     | 39.44                    | 9.12                    | 48.56                      | 74.00           | -25.44     | peak     |         |
| 5   |     | 9848.000     | 36.72                    | 11.52                   | 48.24                      | 74.00           | -25.76     | peak     |         |
| 6   | *   | 11363.50     | 39.18                    | 13.62                   | 52.80                      | 74.00           | -21.20     | peak     |         |

\*:Maximum data x:Over limit !:over margin

(Reference Only)

Receiver: ESR\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

## 12 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

|                               |                                   |
|-------------------------------|-----------------------------------|
| <b>Test Standard</b>          | 47 CFR Part 15, Subpart C 15.247  |
| <b>Test Method</b>            | ANSI C63.10 (2013) Section 6.10.5 |
| <b>Test Mode (Pre-Scan)</b>   | TX                                |
| <b>Test Mode (Final Test)</b> | TX                                |
| <b>Tester</b>                 | Jozu                              |
| <b>Temperature</b>            | 25℃                               |
| <b>Humidity</b>               | 60%                               |

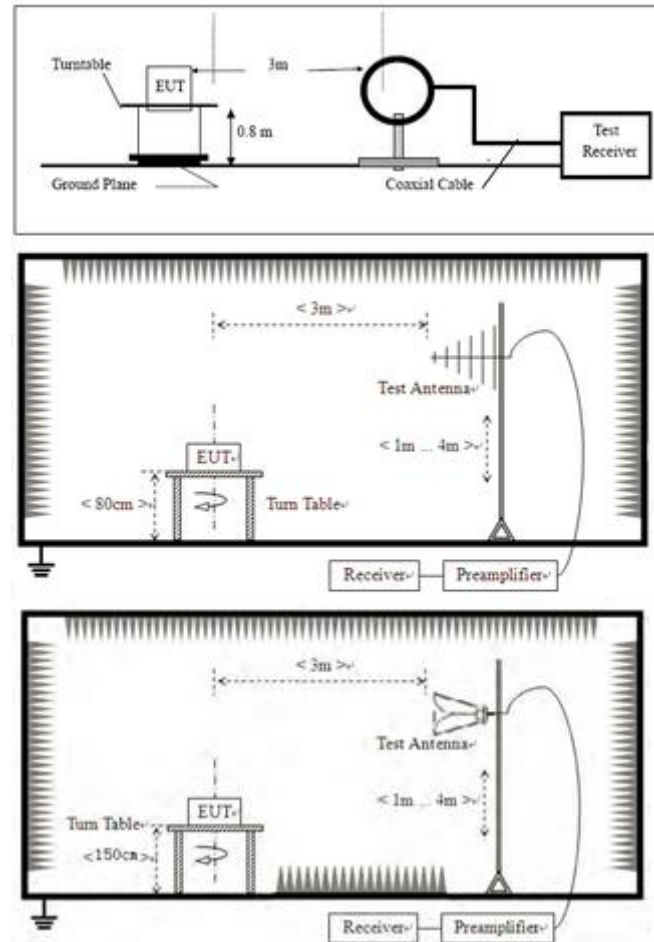
### 12.1 LIMITS

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

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



## 12.2 BLOCK DIAGRAM OF TEST SETUP



## 12.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1:  $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$

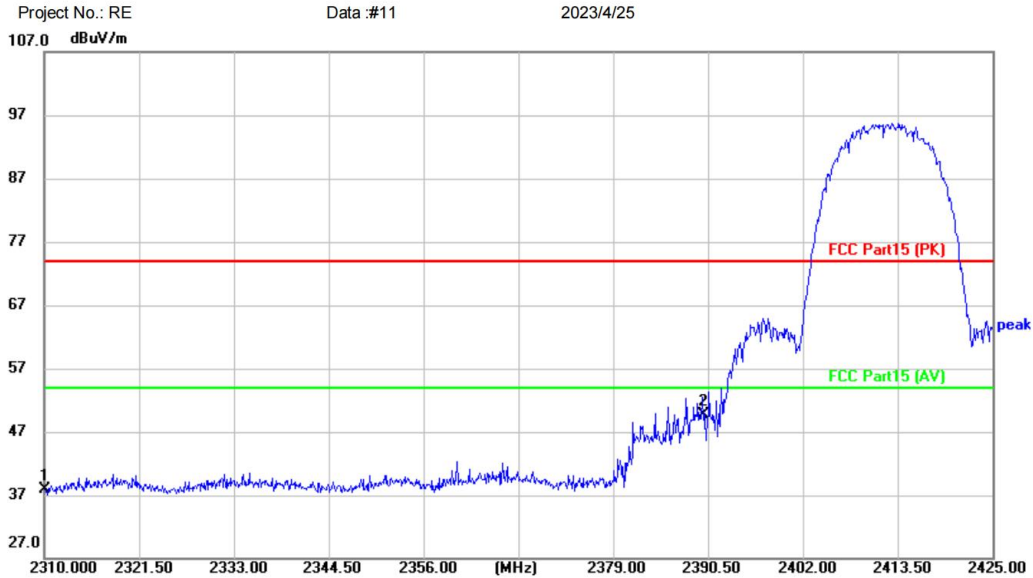
Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

BlueAsia

## 12.4 TEST DATA

[TestMode: TX b low channel]; [Polarity: Horizontal]

### Radiated Emission Measurement



Site Polarization: **Horizontal** Temperature: (C)  
Limit: FCC Part15 (PK) Power: Humidity: %RH  
EUT: LED lamp  
M/N: 16000312  
Mode: 2.4Gwifi 11B-TX-L  
Note:

| No. Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|---------|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1       | 2310.000     | 42.13                    | -4.27                   | 37.86                      | 74.00           | -36.14     | peak     |         |
| 2 *     | 2390.000     | 53.50                    | -3.82                   | 49.68                      | 74.00           | -24.32     | peak     |         |

\*:Maximum data x:Over limit !:over margin

(Reference Only)

Receiver: ESR\_1

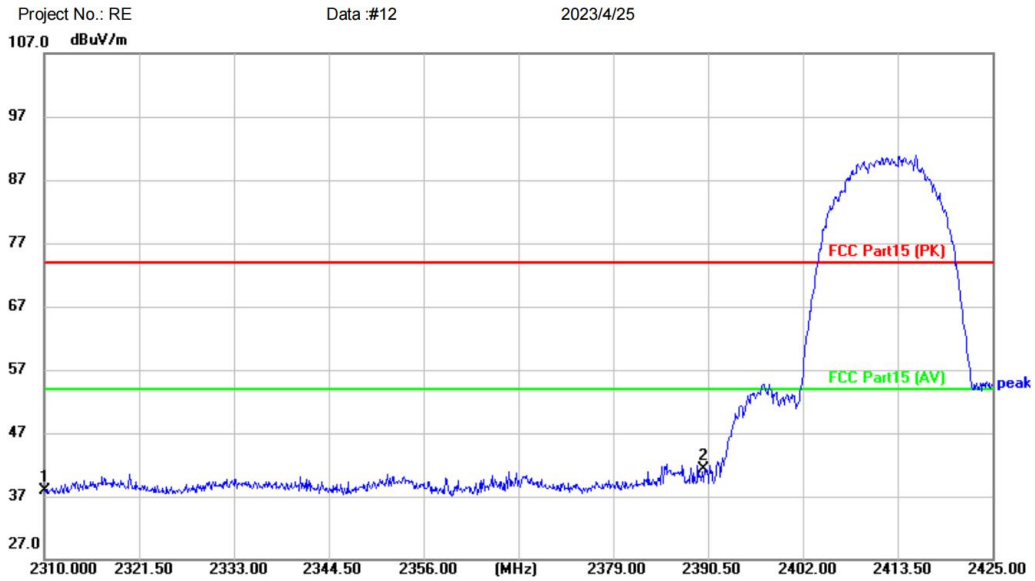
Spectrum Analyzer:

FSP40

**Test Result: Pass**

[TestMode: TX b low channel]; [Polarity: Vertical]

**Radiated Emission Measurement**



Site Polarization: **Vertical** Temperature: (C)  
Limit: FCC Part15 (PK) Power: Humidity: %RH  
EUT: LED lamp  
M/N: 16000312  
Mode: 2.4Gwifi 11B-TX-L  
Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 2310.000     | 42.09                    | -4.27                   | 37.82                      | 74.00           | -36.18     | peak     |         |
| 2   | *   | 2390.000     | 45.02                    | -3.82                   | 41.20                      | 74.00           | -32.80     | peak     |         |

\*:Maximum data x:Over limit !:over margin

(Reference Only)

Receiver: ESR\_1

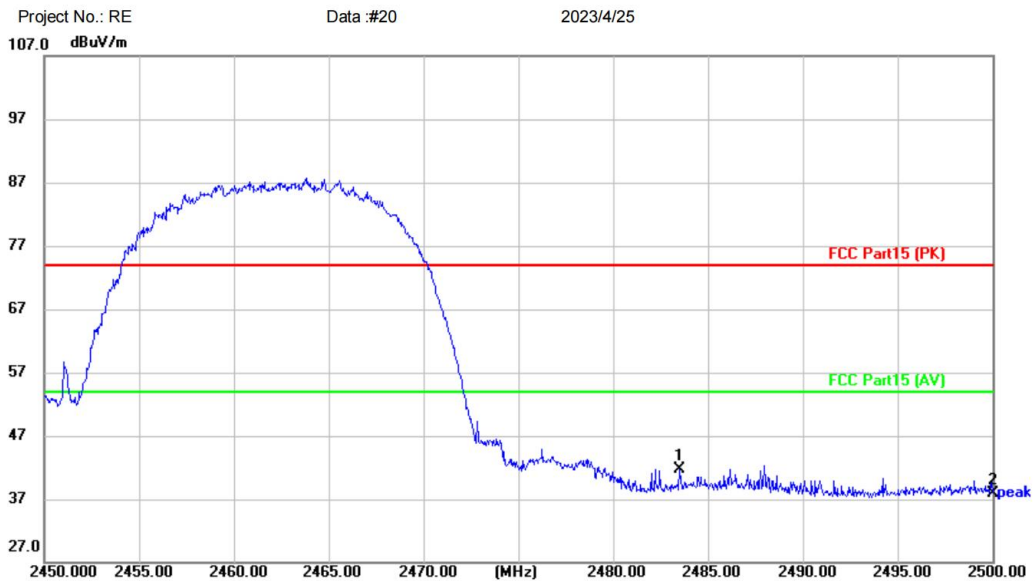
Spectrum Analyzer:

FSP40

**Test Result: Pass**

[TestMode: TX b high channel]; [Polarity: Vertical]

**Radiated Emission Measurement**



Site: Limit: FCC Part15 (PK) Polarization: **Vertical** Temperature: (C)  
EUT: LED lamp Power: Humidity: %RH  
M/N: 16000312  
Mode: 2.4Gwifi 11B-TX-H  
Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   | *   | 2483.500     | 45.76                    | -3.96                   | 41.80                      | 74.00           | -32.20     | peak     |         |
| 2   |     | 2500.000     | 41.91                    | -4.00                   | 37.91                      | 74.00           | -36.09     | peak     |         |

\*:Maximum data x:Over limit !:over margin (Reference Only)  
Receiver: ESR\_1 Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX b high channel]; [Polarity: Horizontal]

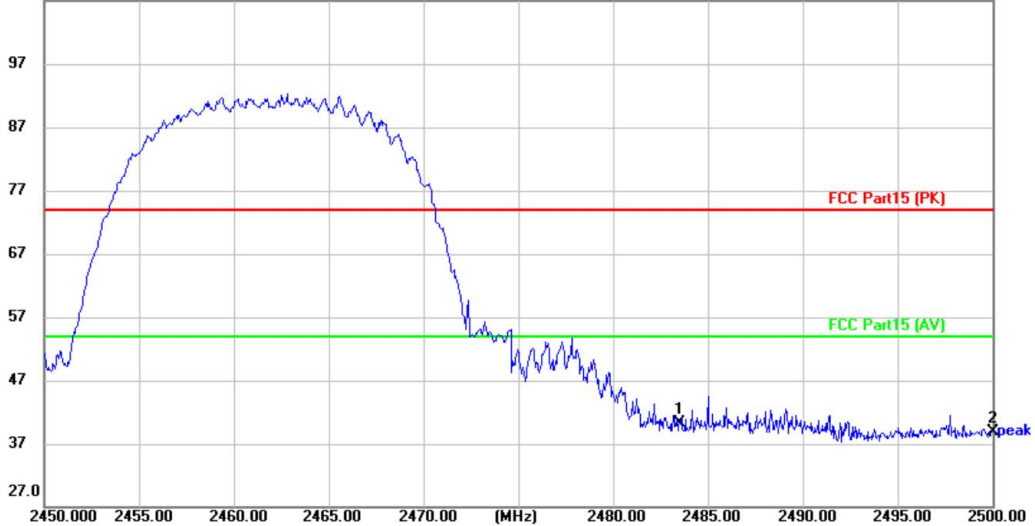
**Radiated Emission Measurement**

Project No.: RE

Data :#19

2023/4/25

107.0 dBuV/m



Site

Polarization: **Horizontal**

Temperature: (C)

Limit: FCC Part15 (PK)

Power:

Humidity: %RH

EUT: LED lamp

M/N: 16000312

Mode: 2.4Gwifi 11B-TX-H

Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   | *   | 2483.500     | 44.33                    | -3.96                   | 40.37                      | 74.00           | -33.63     | peak     |         |
| 2   |     | 2500.000     | 42.85                    | -4.00                   | 38.85                      | 74.00           | -35.15     | peak     |         |

\*:Maximum data x:Over limit !:over margin

⟨Reference Only

Receiver: ESR\_1

Spectrum Analyzer:

FSP40

**Test Result: Pass**