



# **RADIO TEST REPORT**

## **FCC ID: 2AJK8-LWE3**

**Product:** Wifi lamp  
**Trade Name:** N/A  
**Model No.:** LWE3  
**Serial Model:** LWE1, LWE2 , LWE4, LWE5  
**Report No.:** NTEK-2016NT08228387F  
**Issue Date:** 20 Oct. 2016

### **Prepared for**

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## 1 TEST RESULT CERTIFICATION

|                                   |                                                                          |
|-----------------------------------|--------------------------------------------------------------------------|
| Applicant's name .....            | Shenzhen Ligan Intelligent Technology Co.,Ltd                            |
| Address .....                     | Baiwang R&D Bldg, Shahe West Road, Nanshan, Shenzhen 518055<br>P.R.China |
| Manufacture's Name .....          | Shenzhen Ligan Intelligent Technology Co.,Ltd                            |
| Address .....                     | Baiwang R&D Bldg, Shahe West Road, Nanshan, Shenzhen 518055<br>P.R.China |
| Product description               |                                                                          |
| Product name .....                | Wifi lamp                                                                |
| Model and/or type reference ..... | LWE3                                                                     |
| Serial Model .....                | LWE1, LWE2, LWE4, LWE5                                                   |

Measurement Procedure Used:

| APPLICABLE STANDARDS                                                                                                                                                                   |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| APPLICABLE STANDARD/ TEST PROCEDURE                                                                                                                                                    | TEST RESULT |
| FCC 47 CFR Part 2, Subpart J:2016<br>FCC 47 CFR Part 15, Subpart C:2016<br>KDB 174176 D01 Line Conducted FAQ v01r01<br>ANSI C63.10-2013<br>FCC KDB 558074 D01 DTS Meas Guidance v03r05 | Complied    |

This device described above has been tested by NTEK Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of NTEK Testing Technology Co., Ltd., this document may be altered or revised by NTEK Testing Technology Co., Ltd., personnel only, and shall be noted in the revision of the document.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : 22 Aug. 2016 ~ 20 Oct. 2016

Testing Engineer : Lake Xie  
(Lake Xie)

Technical Manager : Jason Chen  
(Jason Chen)

Authorized Signatory : Sam. Chen  
(Sam Chen)

## 2 SUMMARY OF TEST RESULTS

| FCC Part15 (15.247), Subpart C |                                 |         |        |
|--------------------------------|---------------------------------|---------|--------|
| Standard Section               | Test Item                       | Verdict | Remark |
| 15.207                         | Conducted Emission              | PASS    |        |
| 15.247 (a)(2)                  | 6dB Bandwidth                   | PASS    |        |
| 15.247 (b)                     | Maximum Output Power            | PASS    |        |
| 15.247 (c)                     | Radiated Spurious Emission      | PASS    |        |
| 15.247 (d)                     | Power Spectral Density          | PASS    |        |
| 15.205                         | Emission in non-restricted Band | PASS    |        |
| 15.203                         | Antenna Requirement             | PASS    |        |

**Remark:**

1. "N/A" denotes test is not applicable in this Test Report.
2. All test items were verified and recorded according to the standards and without any deviation during the test.

### 3 FACILITIES AND ACCREDITATIONS

#### 3.1 FACILITIES

All measurement facilities used to collect the measurement data are located at 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

#### 3.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

: Accredited by CNAS, 2014.09.04

The certificate is valid until 2017.09.03

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)

The Certificate Registration Number is L5516.

Accredited by Industry Canada, August 29, 2012

The Certificate Registration Number is 9270A-1.

Accredited by FCC, September 06, 2013

The Certificate Registration Number is 238937.

Name of Firm : NTEK Testing Technology Co., Ltd

Site Location : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

#### 3.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

| No. | Item                          | Uncertainty             |
|-----|-------------------------------|-------------------------|
| 1   | Conducted Emission Test       | $\pm 1.38\text{dB}$     |
| 2   | RF power, conducted           | $\pm 0.16\text{dB}$     |
| 3   | Spurious emissions, conducted | $\pm 0.21\text{dB}$     |
| 4   | All emissions, radiated(<1G)  | $\pm 4.68\text{dB}$     |
| 5   | All emissions, radiated(>1G)  | $\pm 4.89\text{dB}$     |
| 6   | Temperature                   | $\pm 0.5^\circ\text{C}$ |
| 7   | Humidity                      | $\pm 2\%$               |



## Revision History

[illegible]

#### 4 GENERAL DESCRIPTION OF EUT

| Product Feature and Specification |                                                                                        |
|-----------------------------------|----------------------------------------------------------------------------------------|
| Equipment                         | Wifi lamp                                                                              |
| Trade Name                        | N/A                                                                                    |
| FCC ID                            | 2AJK8-LWE3                                                                             |
| Model No.                         | LWE3                                                                                   |
| Serial Model                      | LWE1, LWE2, LWE4, LWE5                                                                 |
| Model Difference                  | All the model are the same circuit and RF module, except the model No..                |
| Operating Frequency               | 2412-2462MHz for 802.11b/g                                                             |
| Modulation                        | DSSS with DBPSK/DQPSK/CCK for 802.11b;<br>OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g; |
| Number of Channels                | 11 channels for 802.11b/g;                                                             |
| Antenna                           | PCB /1dBi                                                                              |
| Power supply                      | <input type="checkbox"/> DC supply:                                                    |
|                                   | <input checked="" type="checkbox"/> AC supply: AC 100V~240V, 9W, 50/60Hz               |
| HW Version                        | LWE3_V1.0                                                                              |
| SW Version                        | V1.0                                                                                   |

Note 1: Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.

## 5 DESCRIPTION OF TEST MODES

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

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The Y-plane results were found as the worst case and were shown in this report.

Frequency and Channel list for 802.11b/g:

| Channel | Frequency(MHz) |
|---------|----------------|
| 1       | 2412           |
| 2       | 2417           |
| ...     | ...            |
| 5       | 2432           |
| 6       | 2437           |
| ...     | ...            |
| 10      | 2457           |
| 11      | 2462           |

Note:  $f_c = 2412\text{MHz} + k \times 5\text{MHz}$   $k=0$  to 10

The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode. The EUT is use PC test software NCAuth to set 802.11b/g CH1/ CH6/ CH11 to continuously transmitting.

802.11b: default AV output power is 8.0dBm, 802.11g: default AV output power is 8.8dBm.

## Test Mode:

| Test Items                        | Mode        | Data Rate | Channel | Ant |
|-----------------------------------|-------------|-----------|---------|-----|
| AC Power Line Conducted Emissions | Normal Link | -         | -       | -   |
| Maximum Conducted Output Power    | 11b/CCK     | 1 Mbps    | 1/6/11  | 1   |
|                                   | 11g/BPSK    | 6 Mbps    | 1/6/11  | 1   |
| Power Spectral Density            | 11b/CCK     | 1 Mbps    | 1/6/11  | 1   |
|                                   | 11g/BPSK    | 6 Mbps    | 1/6/11  | 1   |
| 6dB Spectrum Bandwidth            | 11b/CCK     | 1 Mbps    | 1/6/11  | 1   |
|                                   | 11g/BPSK    | 6 Mbps    | 1/6/11  | 1   |
| Radiated Emissions Below 1GHz     | 11b/CCK     | 1 Mbps    | 1/6/11  | 1   |
|                                   | 11g/BPSK    | 6 Mbps    | 1/6/11  | 1   |
| Radiated Emissions Above 1GHz     | 11b/CCK     | 1 Mbps    | 1/6/11  | 1   |
|                                   | 11g/BPSK    | 6 Mbps    | 1/6/11  | 1   |
| Band Edge Emissions               | 11b/CCK     | 1 Mbps    | 1/6/11  | 1   |
|                                   | 11g/BPSK    | 6 Mbps    | 1/6/11  | 1   |

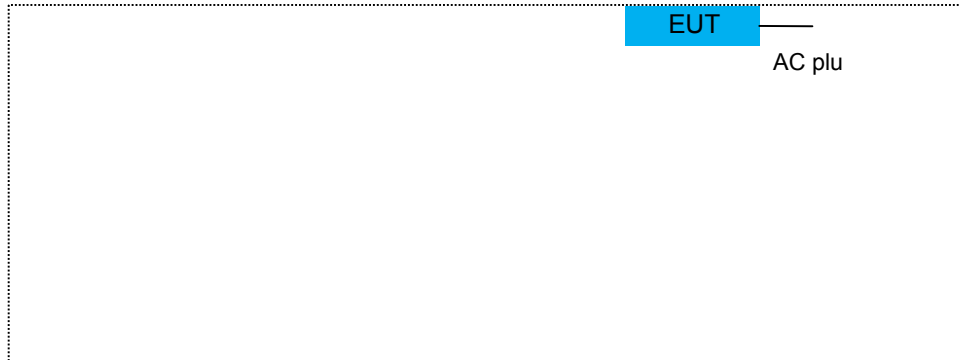
Note: AC power line Conducted Emission was tested for rates (802.11b: 1 Mbps; 802.11g: 6 Mbps) were used for all test. and find the test result is 802.11g low channel is worst.

Note: For radiated test cases, the worst mode data rate was reported only, was tested for rates (802.11b: 1 Mbps; 802.11g: 6 Mbps) were used for all test. and find the test result is 802.11g low channel is worst. and no other significantly frequencies found in conducted spurious emission.

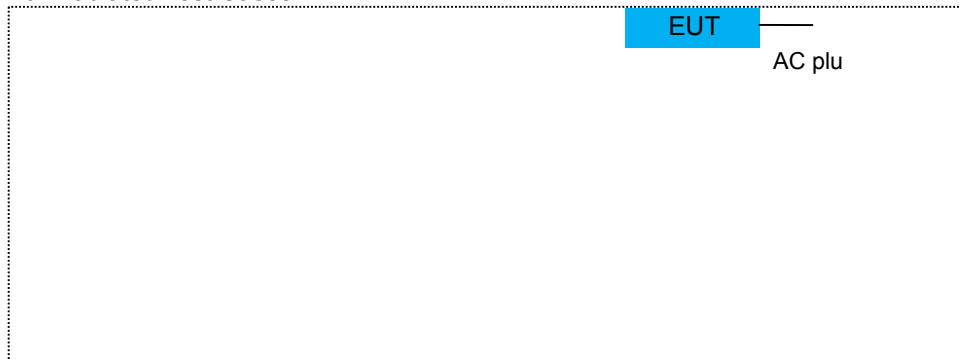
## 6 SETUP OF EQUIPMENT UNDER TEST

### 6.1 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM

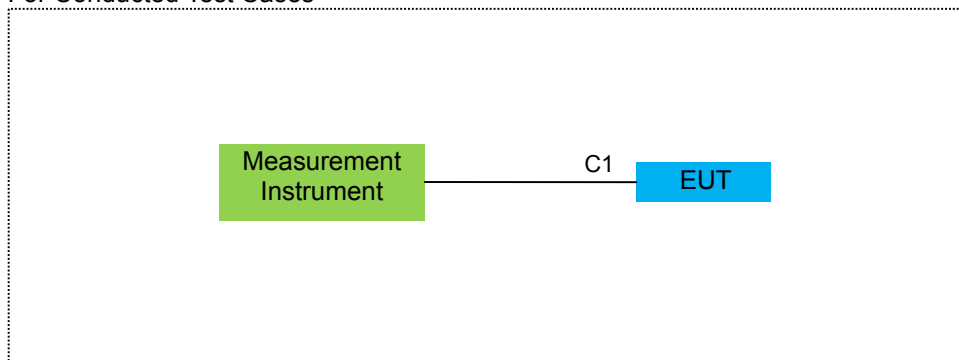
For AC Conducted Emission Mode



For Radiated Test Cases



For Conducted Test Cases



Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

## 6.2 SUPPORT EQUIPMENT

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID     | Note |
|------|-----------|-----------|----------------|------------|------|
| E-1  | Wifi lamp | N/A       | LWE3           | 2AJK8-LWE3 | EUT  |
|      |           |           |                |            |      |
|      |           |           |                |            |      |
|      |           |           |                |            |      |
|      |           |           |                |            |      |
|      |           |           |                |            |      |
|      |           |           |                |            |      |

| Item | Cable Type | Shielded Type | Ferrite Core | Length | Note |
|------|------------|---------------|--------------|--------|------|
| C-1  | RF Cable   | NO            | NO           | 0.5m   |      |
|      |            |               |              |        |      |
|      |            |               |              |        |      |
|      |            |               |              |        |      |
|      |            |               |              |        |      |
|      |            |               |              |        |      |

### Notes:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

### 6.3 EQUIPMENTS LIST FOR ALL TEST ITEMS

#### Radiation Test equipment

| Item | Kind of Equipment                     | Manufacturer | Type No.      | Serial No. | Last calibration | Calibrated until | Calibration period |
|------|---------------------------------------|--------------|---------------|------------|------------------|------------------|--------------------|
| 1    | Spectrum Analyzer                     | Agilent      | E4407B        | MY45108040 | 2016.07.06       | 2017.07.05       | 1 year             |
| 2    | Spectrum Analyzer                     | Agilent      | N9020A        | MY49100060 | 2016.07.06       | 2017.07.05       | 1 year             |
| 3    | EMI Test Receiver                     | Agilent      | N9038A        | MY53227146 | 2016.06.06       | 2017.06.05       | 1 year             |
| 4    | Test Receiver                         | R&S          | ESPI          | 101318     | 2016.06.06       | 2017.06.05       | 1 year             |
| 5    | Bilog Antenna                         | TESEQ        | CBL6111D      | 31216      | 2016.07.06       | 2017.07.05       | 1 year             |
| 6    | 50Ω Coaxial Switch                    | Anritsu      | MP59B         | 6200264416 | 2016.06.06       | 2017.06.05       | 1 year             |
| 7    | Horn Antenna                          | EM           | EM-AH-10180   | 2011071402 | 2016.07.06       | 2017.07.05       | 1 year             |
| 8    | Horn Ant                              | Schwarzbeck  | BBHA 9170     | 9170-181   | 2016.07.06       | 2017.07.05       | 1 year             |
| 9    | Amplifier                             | EM           | EM-30180      | 060538     | 2015.12.22       | 2016.12.21       | 1 year             |
| 10   | Amplifier                             | MITEQ        | TTA1840-35-HG | 177156     | 2016.06.06       | 2017.06.05       | 1 year             |
| 11   | Loop Antenna                          | ARA          | PLA-1030/B    | 1029       | 2016.06.06       | 2017.06.05       | 1 year             |
| 12   | Power Meter                           | DARE         | RPR3006W      | 100696     | 2016.07.06       | 2017.07.05       | 1 year             |
| 13   | Test Cable (9KHz-30MHz)               | N/A          | R-01          | N/A        | 2016.07.06       | 2017.07.05       | 1 year             |
| 14   | Test Cable (30MHz-1GHz)               | N/A          | R-02          | N/A        | 2016.07.06       | 2017.07.05       | 1 year             |
| 15   | High Test Cable(1G-40G Hz)            | N/A          | R-03          | N/A        | 2016.06.06       | 2017.06.05       | 1 year             |
| 16   | High Test Cable(1G-40G Hz)            | N/A          | R-04          | N/A        | 2016.06.06       | 2017.06.05       | 1 year             |
| 17   | temporary antenna connector<br>(Note) | NTS          | R001          | N/A        | N/A              | N/A              | N/A                |

#### Note:

We will use the temporary antenna connector (soldered on the PCB board) When conducted test  
And this temporary antenna connector is listed within the instrument list

### Conduction Test equipment

| Item | Kind of Equipment       | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|------|-------------------------|--------------|----------|------------|------------------|------------------|--------------------|
| 1    | Test Receiver           | R&S          | ESCI     | 101160     | 2016.06.06       | 2017.06.05       | 1 year             |
| 2    | LISN                    | R&S          | ENV216   | 101313     | 2016.08.24       | 2017.08.23       | 1 year             |
| 3    | LISN                    | EMCO         | 3816/2   | 00042990   | 2016.08.24       | 2017.08.23       | 1 year             |
| 4    | 50Ω Coaxial Switch      | Anritsu      | MP59B    | 6200264417 | 2016.06.07       | 2017.06.06       | 1 year             |
| 5    | Test Cable (9KHz-30MHz) | N/A          | C01      | N/A        | 2016.06.08       | 2017.06.07       | 1 year             |
| 6    | Test Cable (9KHz-30MHz) | N/A          | C02      | N/A        | 2016.06.08       | 2017.06.07       | 1 year             |
| 7    | Test Cable (9KHz-30MHz) | N/A          | C03      | N/A        | 2016.06.08       | 2017.06.07       | 1 year             |

Note: Each piece of equipment is scheduled for calibration once a year.

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
2. The EUT was placed on a table which is 0.8m above ground plane.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. The frequency range from 150KHz to 30MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
9. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 7.1.6 Test Results

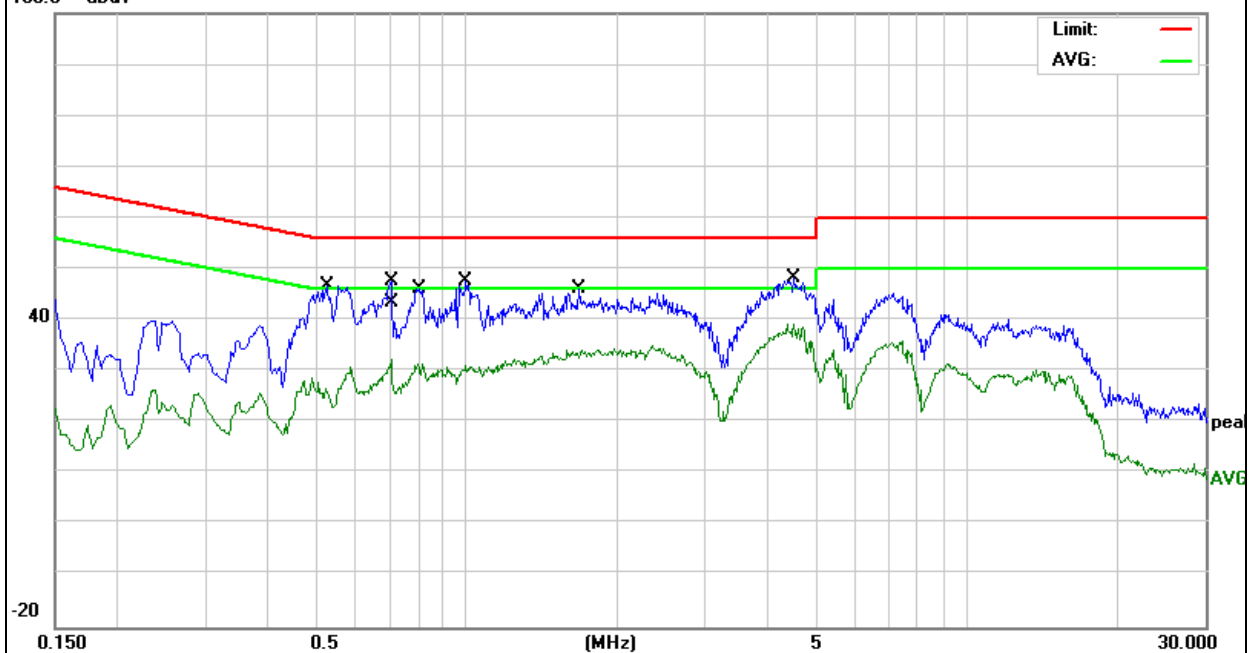
|                |             |                    |             |
|----------------|-------------|--------------------|-------------|
| EUT:           | Wifi lamp   | Model Name. :      | LWE3        |
| Temperature:   | 26 °C       | Relative Humidity: | 56%         |
| Pressure:      | 1010hPa     | Phase :            | L           |
| Test Voltage : | AC120V/60Hz | Test Mode:         | Normal Link |

| Frequency<br>(MHz) | Reading Level<br>(dBμV) | Correct Factor<br>(dB) | Measure-ment<br>(dBμV) | Limits<br>(dBμV) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|------------------------|------------------------|------------------|----------------|--------|
| 0.5260             | 37.06                   | 9.81                   | 46.87                  | 56.00            | -9.13          | QP     |
| 0.5264             | 16.23                   | 9.81                   | 26.04                  | 46.00            | -19.96         | AVG    |
| 0.7059             | 37.78                   | 9.79                   | 47.57                  | 56.00            | -8.43          | QP     |
| 0.7139             | 16.92                   | 9.79                   | 26.71                  | 46.00            | -19.29         | AVG    |
| 0.8020             | 36.41                   | 9.81                   | 46.22                  | 56.00            | -9.78          | QP     |
| 0.8100             | 19.59                   | 9.82                   | 29.41                  | 46.00            | -16.59         | AVG    |
| 0.9979             | 37.77                   | 9.87                   | 47.64                  | 56.00            | -8.36          | QP     |
| 1.0020             | 19.98                   | 9.87                   | 29.85                  | 46.00            | -16.15         | AVG    |
| 1.6779             | 36.46                   | 9.80                   | 46.26                  | 56.00            | -9.74          | QP     |
| 1.6899             | 23.73                   | 9.80                   | 33.53                  | 46.00            | -12.47         | AVG    |
| 4.5058             | 38.30                   | 9.82                   | 48.12                  | 56.00            | -7.88          | QP     |
| 4.5298             | 27.28                   | 9.82                   | 37.10                  | 46.00            | -8.90          | AVG    |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

100.0 dBμV

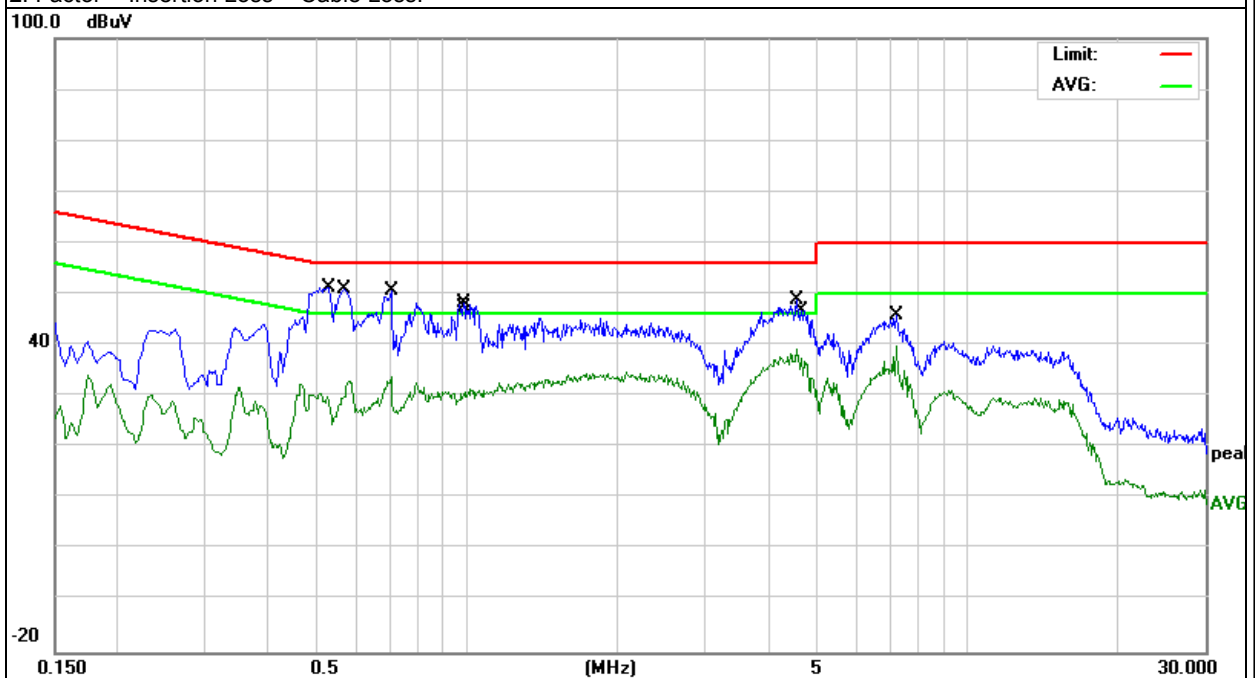


|                |             |                    |             |
|----------------|-------------|--------------------|-------------|
| EUT:           | Wifi lamp   | Model Name. :      | LWE3        |
| Temperature:   | 26 °C       | Relative Humidity: | 56%         |
| Pressure:      | 1010hPa     | Phase :            | N           |
| Test Voltage : | AC120V/60Hz | Test Mode:         | Normal Link |

| Frequency<br>(MHz) | Reading Level<br>(dBμV) | Correct Factor<br>(dB) | Measure-ment<br>(dBμV) | Limits<br>(dBμV) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|------------------------|------------------------|------------------|----------------|--------|
| 0.5299             | 41.52                   | 9.83                   | 51.35                  | 56.00            | -4.65          | QP     |
| 0.5340             | 16.99                   | 9.83                   | 26.82                  | 46.00            | -19.18         | AVG    |
| 0.5700             | 41.02                   | 9.83                   | 50.85                  | 56.00            | -5.15          | QP     |
| 0.5740             | 21.73                   | 9.83                   | 31.56                  | 46.00            | -14.44         | AVG    |
| 0.6980             | 22.72                   | 9.82                   | 32.54                  | 46.00            | -13.46         | AVG    |
| 0.7060             | 40.74                   | 9.82                   | 50.56                  | 56.00            | -5.44          | QP     |
| 0.9860             | 38.38                   | 9.89                   | 48.27                  | 56.00            | -7.73          | QP     |
| 0.9980             | 20.06                   | 9.89                   | 29.95                  | 46.00            | -16.05         | AVG    |
| 4.5779             | 39.19                   | 9.79                   | 48.98                  | 56.00            | -7.02          | QP     |
| 4.6419             | 25.51                   | 9.79                   | 35.30                  | 46.00            | -10.70         | AVG    |
| 7.2299             | 36.03                   | 9.82                   | 45.85                  | 60.00            | -14.15         | QP     |
| 7.2299             | 29.94                   | 9.82                   | 39.76                  | 50.00            | -10.24         | AVG    |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



## 7.2 RADIATED SPURIOUS EMISSION

### 7.2.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and ANSI C63.10-2013

### 7.2.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).  
According to FCC Part 15.205, Restricted bands

| MHz               | MHz                 | MHz           | GHz         |
|-------------------|---------------------|---------------|-------------|
| 0.090-0.110       | 16.42-16.423        | 399.9-410     | 4.5-5.15    |
| 10.495-0.505      | 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   | 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 |
| 8.41425-8.41475   | 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     | (2)         |
| 13.36-13.41       |                     |               |             |

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Restricted Frequency(MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance |
|---------------------------|-----------------------|-------------------------|----------------------|
| 0.009~0.490               | 2400/F(KHz)           | 20 log (uV/m)           | 300                  |
| 0.490~1.705               | 2400/F(KHz)           | 20 log (uV/m)           | 30                   |
| 1.705~30.0                | 30                    | 29.5                    | 30                   |
| 30-88                     | 100                   | 40                      | 3                    |
| 88-216                    | 150                   | 43.5                    | 3                    |
| 216-960                   | 200                   | 46                      | 3                    |
| Above 960                 | 500                   | 54                      | 3                    |

#### Limits of Radiated Emission Measurement(Above 1000MHz)

| Frequency(MHz) | Class B (dBuV/m) (at 3M) |         |
|----------------|--------------------------|---------|
|                | PEAK                     | AVERAGE |
| Above 1000     | 74                       | 54      |

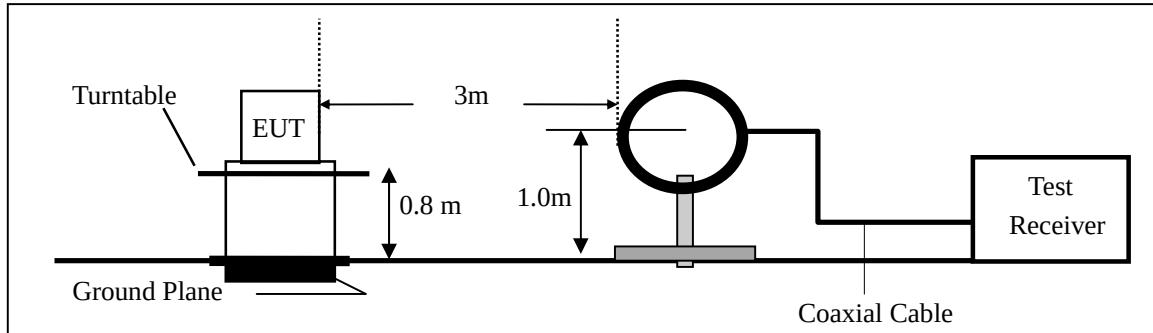
- Remark :1. Emission level in dBuV/m=20 log (uV/m)  
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.  
3. Distance extrapolation factor =40log(Specific distance/ test distance)( dB);  
Limit line=Specific limits(dBuV) + distance extrapolation factor.

### 7.2.3 Measuring Instruments

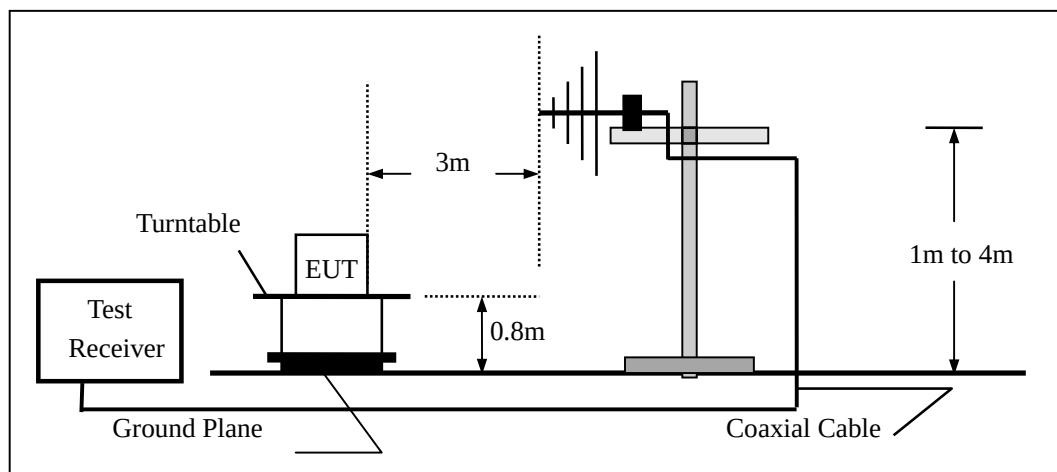
The Measuring equipment is listed in the section 6.3 of this test report.

### 7.2.4 Test Configuration

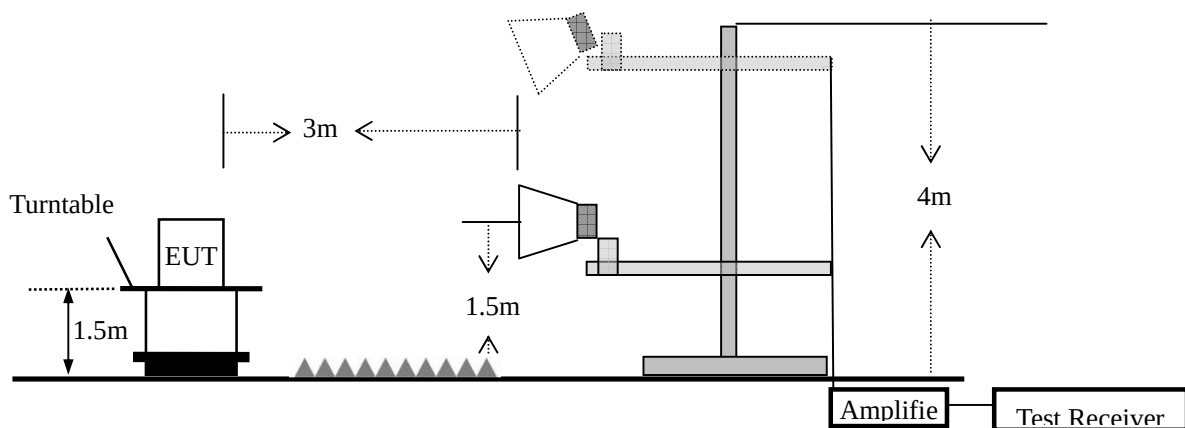
(a) For radiated emissions below 30MHz



(b) For radiated emissions from 30MHz to 1000MHz



(c) For radiated emissions above 1000MHz



### 7.2.5 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.

Use the following spectrum analyzer settings:

| Spectrum Parameter                    | Setting                                          |
|---------------------------------------|--------------------------------------------------|
| Attenuation                           | Auto                                             |
| Start Frequency                       | 1000 MHz                                         |
| Stop Frequency                        | 10th carrier harmonic                            |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average |

| Receiver Parameter     | Setting                          |
|------------------------|----------------------------------|
| Attenuation            | Auto                             |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP    |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP    |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz and frequencies above 1GHz,
- The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For the radiated emission test above 1GHz:  
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

| Frequency Band (MHz) | Function | Resolution bandwidth | Video Bandwidth |
|----------------------|----------|----------------------|-----------------|
| 30 to 1000           | QP       | 120 kHz              | 300 kHz         |
| Above 1000           | Peak     | 1 MHz                | 1 MHz           |
|                      | Average  | 1 MHz                | 10 Hz           |

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where  $RBWCF [dB] = 10 \cdot \lg(100 [kHz] / \text{narrower RBW} [kHz])$ . , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

## 7.2.6 Test Results

### ■ Spurious Emission below 30MHz (9KHz to 30MHz)

|              |                |                    |          |
|--------------|----------------|--------------------|----------|
| EUT:         | Wifi lamp      | Model No.:         | LWE3     |
| Temperature: | 20 °C          | Relative Humidity: | 48%      |
| Test Mode:   | TX (802.11b/g) | Test By:           | Lake Xie |

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level(dBuV/m) |    | Limit 3m(dBuV/m) |    | Over(dB) |    |
|----------------|-----------------|------------------------|----|------------------|----|----------|----|
|                |                 | PK                     | AV | PK               | AV | PK       | AV |
| --             | --              | --                     | -- | --               | -- | --       | -- |

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor =  $20 \log(\text{Specific distance} / \text{test distance})$  ( dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor

■ Spurious Emission below 1GHz (30MHz to 1GHz)

|              |                |                    |             |
|--------------|----------------|--------------------|-------------|
| EUT:         | Wifi lamp      | Model Name :       | LWE3        |
| Temperature: | 20 °C          | Relative Humidity: | 48%         |
| Pressure:    | 1010 hPa       | Test Voltage :     | AC120V/60Hz |
| Test Mode :  | TX (802.11b/g) |                    |             |

All the modulation modes have been tested, and the worst result was report as below:

| Polar<br>(H/V) | Frequency | Meter<br>Reading | Factor | Emission<br>Level | Limits   | Margin | Remark |
|----------------|-----------|------------------|--------|-------------------|----------|--------|--------|
|                | (MHz)     | (dBuV)           | (dB)   | (dBuV/m)          | (dBuV/m) | (dB)   |        |
| V              | 51.8430   | 29.64            | 8.12   | 37.76             | 40.00    | -2.24  | QP     |
| V              | 57.3922   | 29.50            | 6.75   | 36.25             | 40.00    | -3.75  | QP     |
| V              | 85.2980   | 26.69            | 9.51   | 36.20             | 40.00    | -3.80  | QP     |
| V              | 97.7980   | 27.82            | 11.70  | 39.52             | 43.50    | -3.98  | QP     |
| V              | 125.8863  | 26.92            | 13.58  | 40.50             | 43.50    | -3.00  | QP     |
| V              | 168.4138  | 24.52            | 11.66  | 36.18             | 43.50    | -7.32  | QP     |

**Remark:**

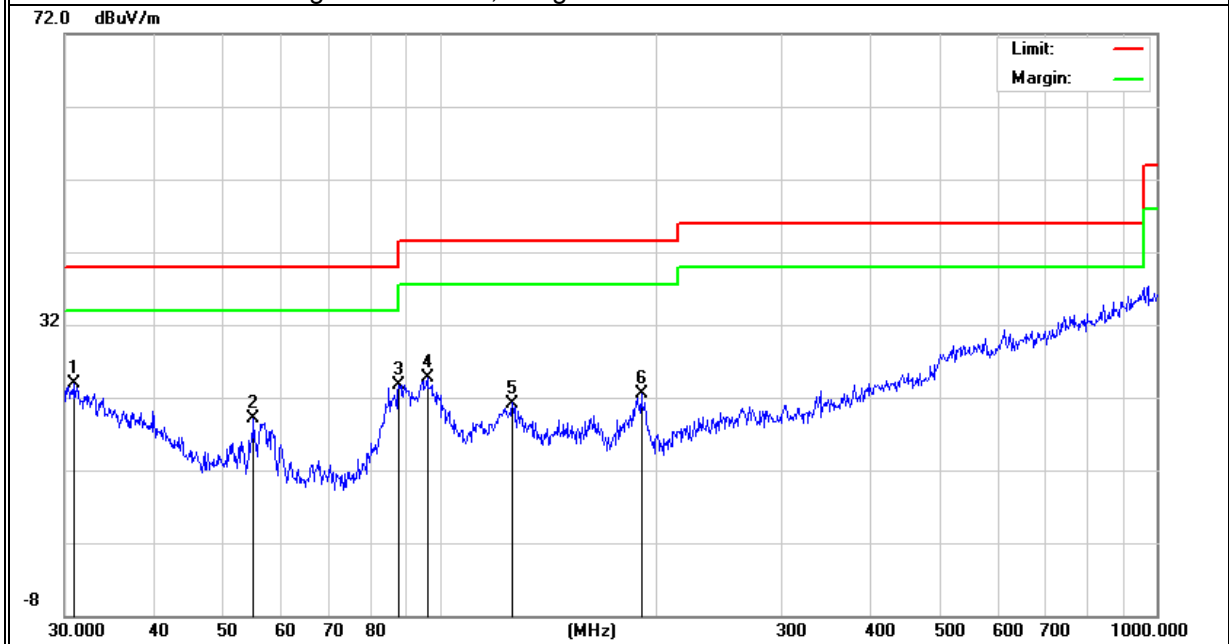
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



| Polar<br>(H/V) | Frequency | Meter<br>Reading | Factor | Emission<br>Level | Limits   | Margin | Remark |
|----------------|-----------|------------------|--------|-------------------|----------|--------|--------|
|                | (MHz)     | (dBuV)           | (dB)   | (dBuV/m)          | (dBuV/m) | (dB)   |        |
| H              | 30.9618   | 4.54             | 19.37  | 23.91             | 40.00    | -16.09 | QP     |
| H              | 55.0274   | 12.10            | 7.09   | 19.19             | 40.00    | -20.81 | QP     |
| H              | 87.7248   | 13.68            | 10.10  | 23.78             | 40.00    | -16.22 | QP     |
| H              | 96.0986   | 13.20            | 11.56  | 24.76             | 43.50    | -18.74 | QP     |
| H              | 126.3285  | 7.65             | 13.55  | 21.20             | 43.50    | -22.30 | QP     |
| H              | 191.0738  | 11.99            | 10.48  | 22.47             | 43.50    | -21.03 | QP     |

**Remark:**

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



■ Spurious Emission Above 1GHz (1GHz to 27GHz)

|              |                |                    |          |
|--------------|----------------|--------------------|----------|
| EUT:         | Wifi lamp      | Model No.:         | LWE3     |
| Temperature: | 20 °C          | Relative Humidity: | 48%      |
| Test Mode:   | TX (802.11b/g) | Test By:           | Lake Xie |

All the modulation modes have been tested, and the worst result was report as below:

| Frequency<br>(MHz)                        | Read Level<br>(dBμV) | Cable loss<br>(dB) | Antenna Factor<br>(dB/m) | Preamp Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Remark | Comment    |
|-------------------------------------------|----------------------|--------------------|--------------------------|-----------------------|----------------------------|--------------------|----------------|--------|------------|
| Low Channel (2412 MHz)(802.11b)--Above 1G |                      |                    |                          |                       |                            |                    |                |        |            |
| 4824.96                                   | 56.15                | 5.21               | 35.59                    | 44.30                 | 52.65                      | 74.00              | -21.35         | Pk     | Vertical   |
| 4824.96                                   | 43.94                | 5.21               | 35.59                    | 44.30                 | 40.44                      | 54.00              | -13.56         | AV     | Vertical   |
| 7236.26                                   | 53.19                | 6.48               | 36.27                    | 44.60                 | 51.34                      | 74.00              | -22.66         | Pk     | Vertical   |
| 7236.26                                   | 42.06                | 6.48               | 36.27                    | 44.60                 | 40.21                      | 54.00              | -13.79         | AV     | Vertical   |
| 4824.12                                   | 51.71                | 5.21               | 35.55                    | 44.30                 | 48.17                      | 74.00              | -25.83         | Pk     | Horizontal |
| 4824.12                                   | 42.11                | 5.21               | 35.55                    | 44.30                 | 38.57                      | 54.00              | -15.43         | AV     | Horizontal |
| 7236.53                                   | 52.15                | 6.48               | 36.27                    | 44.52                 | 50.38                      | 74.00              | -23.62         | Pk     | Horizontal |
| 7236.53                                   | 41.20                | 6.48               | 36.27                    | 44.52                 | 39.43                      | 54.00              | -14.57         | AV     | Horizontal |
| Low Channel (2437 MHz)(802.11b)--Above 1G |                      |                    |                          |                       |                            |                    |                |        |            |
| 4874.21                                   | 54.90                | 5.21               | 35.66                    | 44.20                 | 51.57                      | 74.00              | -22.43         | Pk     | Vertical   |
| 4874.21                                   | 43.68                | 5.21               | 35.66                    | 44.20                 | 40.35                      | 54.00              | -13.65         | AV     | Vertical   |
| 7311.01                                   | 54.72                | 7.10               | 36.50                    | 44.43                 | 53.89                      | 74.00              | -20.11         | Pk     | Vertical   |
| 7311.01                                   | 42.19                | 7.10               | 36.50                    | 44.43                 | 41.36                      | 54.00              | -12.64         | AV     | Vertical   |
| 4874.22                                   | 52.34                | 5.21               | 35.66                    | 44.20                 | 49.01                      | 74.00              | -24.99         | Pk     | Horizontal |
| 4874.22                                   | 41.47                | 5.21               | 35.66                    | 44.20                 | 38.14                      | 54.00              | -15.86         | AV     | Horizontal |
| 7311.07                                   | 52.49                | 7.10               | 36.50                    | 44.43                 | 51.66                      | 74.00              | -22.34         | Pk     | Horizontal |
| 7311.07                                   | 42.52                | 7.10               | 36.50                    | 44.43                 | 41.69                      | 54.00              | -12.31         | AV     | Horizontal |
| Low Channel (2462 MHz)(802.11b)--Above 1G |                      |                    |                          |                       |                            |                    |                |        |            |
| 4924.57                                   | 56.97                | 5.21               | 35.52                    | 44.21                 | 53.49                      | 74.00              | -20.51         | Pk     | Vertical   |
| 4924.57                                   | 43.27                | 5.21               | 35.52                    | 44.21                 | 39.79                      | 54.00              | -14.21         | AV     | Vertical   |
| 7386.21                                   | 51.39                | 7.10               | 36.53                    | 44.60                 | 50.42                      | 74.00              | -23.58         | Pk     | Vertical   |
| 7386.21                                   | 42.42                | 7.10               | 36.53                    | 44.60                 | 41.45                      | 54.00              | -12.55         | AV     | Vertical   |
| 4924.02                                   | 54.29                | 5.21               | 35.52                    | 44.21                 | 50.81                      | 74.00              | -23.19         | Pk     | Horizontal |
| 4924.02                                   | 40.52                | 5.21               | 35.52                    | 44.21                 | 37.04                      | 54.00              | -16.96         | AV     | Horizontal |
| 7386.82                                   | 50.19                | 7.10               | 36.53                    | 44.60                 | 49.22                      | 74.00              | -24.78         | Pk     | Horizontal |
| 7386.82                                   | 43.81                | 7.10               | 36.53                    | 44.60                 | 42.84                      | 54.00              | -11.16         | AV     | Horizontal |

- Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).  
(2) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor  
(3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.  
(4)"802.11b" mode is the worst mode. When PK value is lower than the Average value limit, average didn't record.

■ Spurious Emission in Restricted Band 2310MHz-18000MHz the worst result was report as below:

| Frequency<br>(MHz) | Meter<br>Reading<br>(dBμV) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>dB/m | Preamp<br>Factor<br>(dB) | Emission<br>Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector<br>Type | Comment    |
|--------------------|----------------------------|-----------------------|---------------------------|--------------------------|-------------------------------|--------------------|----------------|------------------|------------|
| 802.11b            |                            |                       |                           |                          |                               |                    |                |                  |            |
| 2310.00            | 50.40                      | 2.97                  | 27.80                     | 43.80                    | 37.37                         | 74                 | -36.63         | Pk               | Horizontal |
| 2310.00            | 41.28                      | 2.97                  | 27.80                     | 43.80                    | 28.25                         | 54                 | -25.75         | AV               | Horizontal |
| 2310.00            | 52.38                      | 2.97                  | 27.80                     | 43.80                    | 39.35                         | 74                 | -34.65         | Pk               | Vertical   |
| 2310.00            | 42.23                      | 2.97                  | 27.80                     | 43.80                    | 29.20                         | 54                 | -24.80         | AV               | Vertical   |
| 2390.00            | 52.69                      | 3.14                  | 27.21                     | 43.80                    | 39.24                         | 74                 | -34.76         | Pk               | Vertical   |
| 2390.00            | 41.01                      | 3.14                  | 27.21                     | 43.80                    | 27.56                         | 54                 | -26.44         | AV               | Vertical   |
| 2390.00            | 53.84                      | 3.14                  | 27.21                     | 43.80                    | 40.39                         | 74                 | -33.61         | Pk               | Horizontal |
| 2390.00            | 40.47                      | 3.14                  | 27.21                     | 43.80                    | 27.02                         | 54                 | -26.98         | AV               | Horizontal |
| 2483.50            | 51.79                      | 3.58                  | 27.70                     | 44.00                    | 39.07                         | 74                 | -34.93         | Pk               | Vertical   |
| 2483.50            | 40.80                      | 3.58                  | 27.70                     | 44.00                    | 28.08                         | 54                 | -25.92         | AV               | Vertical   |
| 2483.50            | 51.80                      | 3.58                  | 27.70                     | 44.00                    | 39.08                         | 74                 | -34.92         | Pk               | Horizontal |
| 2483.50            | 43.67                      | 3.58                  | 27.70                     | 44.00                    | 30.95                         | 54                 | -23.05         | AV               | Horizontal |
| 802.11g            |                            |                       |                           |                          |                               |                    |                |                  |            |
| 2310.00            | 53.93                      | 2.97                  | 27.80                     | 43.80                    | 40.90                         | 74                 | -33.10         | Pk               | Horizontal |
| 2310.00            | 40.86                      | 2.97                  | 27.80                     | 43.80                    | 27.83                         | 54                 | -26.17         | AV               | Horizontal |
| 2310.00            | 51.64                      | 2.97                  | 27.80                     | 43.80                    | 38.61                         | 74                 | -35.39         | Pk               | Vertical   |
| 2310.00            | 42.53                      | 2.97                  | 27.80                     | 43.80                    | 29.50                         | 54                 | -24.50         | AV               | Vertical   |
| 2390.00            | 51.80                      | 3.14                  | 27.21                     | 43.80                    | 38.35                         | 74                 | -35.65         | Pk               | Vertical   |
| 2390.00            | 44.66                      | 3.14                  | 27.21                     | 43.80                    | 31.21                         | 54                 | -22.79         | AV               | Vertical   |
| 2390.00            | 50.56                      | 3.14                  | 27.21                     | 43.80                    | 37.11                         | 74                 | -36.89         | Pk               | Horizontal |
| 2390.00            | 44.28                      | 3.14                  | 27.21                     | 43.80                    | 30.83                         | 54                 | -23.17         | AV               | Horizontal |
| 2483.50            | 52.30                      | 3.58                  | 27.70                     | 44.00                    | 39.58                         | 74                 | -34.42         | Pk               | Vertical   |
| 2483.50            | 40.14                      | 3.58                  | 27.70                     | 44.00                    | 27.42                         | 54                 | -26.58         | AV               | Vertical   |
| 2483.50            | 50.18                      | 3.58                  | 27.70                     | 44.00                    | 37.46                         | 74                 | -36.54         | Pk               | Horizontal |
| 2483.50            | 44.48                      | 3.58                  | 27.70                     | 44.00                    | 31.76                         | 54                 | -22.24         | AV               | Horizontal |

(1) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor

### Spurious Emission in Restricted Bands 3260MHz- 18000MHz

All the modulation modes have been tested, the worst result was report as below:

| Frequency | Reading Level | Cable Loss | Antenna Factor | Preamp Factor | Emission Level | Limits   | Margin | Detector | Comment    |
|-----------|---------------|------------|----------------|---------------|----------------|----------|--------|----------|------------|
| (MHz)     | (dBμV)        | (dB)       | dB/m           | (dB)          | (dBμV/m)       | (dBμV/m) | (dB)   | Type     |            |
| 3260      | 60.39         | 4.04       | 29.57          | 44.70         | 49.30          | 74       | -24.70 | Pk       | Vertical   |
| 3260      | 54.48         | 4.04       | 29.57          | 44.70         | 43.39          | 54       | -10.61 | AV       | Vertical   |
| 3260      | 60.31         | 4.04       | 29.57          | 44.70         | 49.22          | 74       | -24.78 | Pk       | Horizontal |
| 3260      | 56.90         | 4.04       | 29.57          | 44.70         | 45.81          | 54       | -8.19  | AV       | Horizontal |
| 3332      | 60.13         | 4.26       | 29.87          | 44.40         | 49.86          | 74       | -24.14 | Pk       | Vertical   |
| 3332      | 53.10         | 4.26       | 29.87          | 44.40         | 42.83          | 54       | -11.17 | AV       | Vertical   |
| 3332      | 62.33         | 4.26       | 29.87          | 44.40         | 52.06          | 74       | -21.94 | Pk       | Horizontal |
| 3332      | 53.32         | 4.26       | 29.87          | 44.40         | 43.05          | 54       | -10.95 | AV       | Horizontal |
| 17789     | 58.02         | 10.99      | 43.95          | 43.50         | 69.46          | 74       | -4.54  | Pk       | Vertical   |
| 17789     | 40.32         | 10.99      | 43.95          | 43.50         | 51.76          | 54       | -2.24  | AV       | Vertical   |
| 17957     | 58.36         | 11.81      | 43.69          | 44.60         | 69.26          | 74       | -4.74  | Pk       | Horizontal |
| 17957     | 40.21         | 11.81      | 43.69          | 44.60         | 51.11          | 54       | -2.89  | AV       | Horizontal |

802.11b" mode is the worst mode. When PK value is lower than the Average value limit, average didn't record.

### **7.3 6DB BANDWIDTH**

#### **7.3.1 Applicable Standard**

According to FCC Part 15.247(a)(2) and KDB 558074 DTS 01 Meas. Guidance v03r05

#### **7.3.2 Conformance Limit**

The minimum permissible 6dB bandwidth is 500 kHz.

#### **7.3.3 Measuring Instruments**

The Measuring equipment is listed in the section 6.3 of this test report.

#### **7.3.4 Test Setup**

Please refer to Section 6.1 of this test report.

#### **7.3.5 Test Procedure**

The testing follows KDB 558074 DTS 01 Meas. Guidance v03r05

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW = 100KHz

VBW  $\geq$  3\*RBW

Sweep = auto

Detector function = peak

Trace = max hold

### 7.3.6 Test Results

|              |              |                    |          |
|--------------|--------------|--------------------|----------|
| EUT:         | Wifi lamp    | Model No.:         | LWE3     |
| Temperature: | 20 °C        | Relative Humidity: | 48%      |
| Test Mode:   | TX 802.11b/g | Test By:           | Lake Xie |

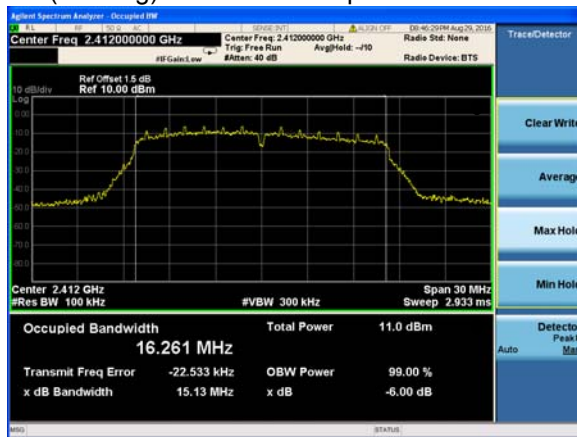
| Mode    | Channel | Frequency<br>(MHz) | 6dB bandwidth | Limit<br>(kHz) | Result |
|---------|---------|--------------------|---------------|----------------|--------|
|         |         |                    | (MHz)         |                |        |
| 802.11b | Low     | 2412               | 9.105         | 500            | Pass   |
|         | Middle  | 2437               | 9.573         | 500            | Pass   |
|         | High    | 2462               | 10.13         | 500            | Pass   |
| 802.11g | Low     | 2412               | 15.13         | 500            | Pass   |
|         | Middle  | 2437               | 15.71         | 500            | Pass   |
|         | High    | 2462               | 16.49         | 500            | Pass   |

### Test plot

(802.11b) 6dB Bandwidth plot on channel 1



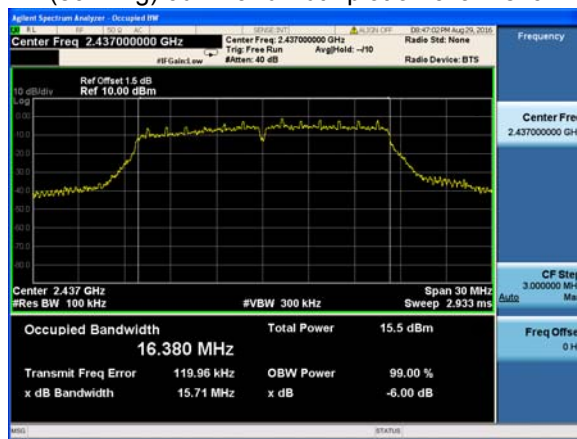
(802.11g) 6dB Bandwidth plot on channel 1



(802.11b) 6dB Bandwidth plot on channel 6



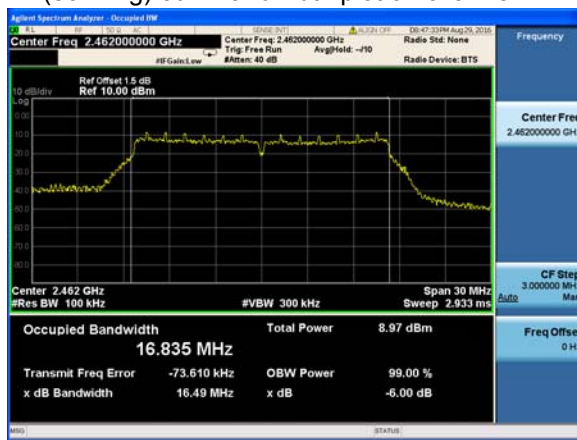
(802.11g) 6dB Bandwidth plot on channel 6



(802.11b) 6dB Bandwidth plot on channel 11



(802.11g) 6dB Bandwidth plot on channel 11



## **7.4 20DB BANDWIDTH**

### **7.4.1 Applicable Standard**

According to FCC Part 15.247(a)(2) and KDB 558074 DTS 01 Meas. Guidance v03r05

### **7.4.2 Conformance Limit**

N/A

### **7.4.3 Measuring Instruments**

The Measuring equipment is listed in the section 6.3 of this test report.

### **7.4.4 Test Setup**

Please refer to Section 6.1 of this test report.

### **7.4.5 Test Procedure**

The testing follows KDB 558074 DTS 01 Meas. Guidance v03r05

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW = 300KHz

VBW  $\geq$  3\*RBW

Sweep = auto

Detector function = peak

Trace = max hold

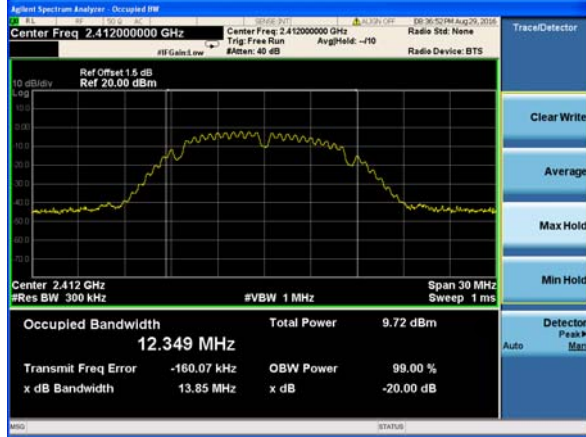
#### 7.4.6 Test Results

|              |              |                    |          |
|--------------|--------------|--------------------|----------|
| EUT:         | Wifi lamp    | Model No.:         | LWE3     |
| Temperature: | 20 ℃         | Relative Humidity: | 48%      |
| Test Mode:   | TX 802.11b/g | Test By:           | Lake Xie |

| Mode    | Channel | Frequency<br>(MHz) | -20dB bandwidth | Result |
|---------|---------|--------------------|-----------------|--------|
|         |         |                    | (MHz)           |        |
| 802.11b | Low     | 2412               | 13.85           | Pass   |
|         | Middle  | 2437               | 13.88           | Pass   |
|         | High    | 2462               | 15.28           | Pass   |
| 802.11g | Low     | 2412               | 18.68           | Pass   |
|         | Middle  | 2437               | 18.97           | Pass   |
|         | High    | 2462               | 19.56           | Pass   |

### Test plot

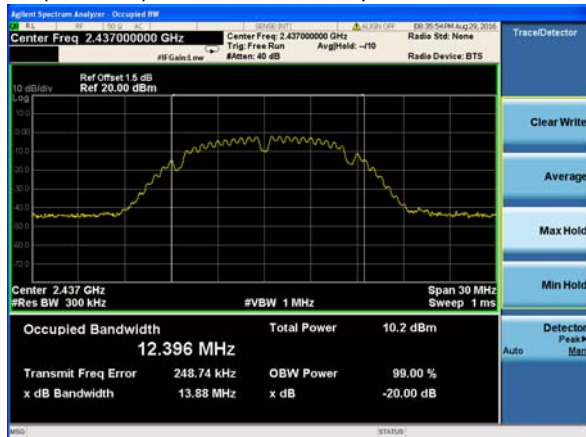
(802.11b) -20dB Bandwidth plot on channel 1



(802.11g) -20dB Bandwidth plot on channel 1



(802.11b) -20dB Bandwidth plot on channel 6



(802.11g) -20dB Bandwidth plot on channel 6



(802.11b) -20dB Bandwidth plot on channel 11



(802.11g) -20dB Bandwidth plot on channel 11



## 7.5 DUTY CYCLE

### 7.5.1 Applicable Standard

According to KDB 558074 DTS 01 Meas. Guidance v03r05

### 7.5.2 Conformance Limit

No limit requirement.

### 7.5.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

### 7.5.4 Test Setup

Please refer to Section 6.1 of this test report.

### 7.5.5 Test Procedure

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set  $RBW \geq OBW$  if possible; otherwise, set RBW to the largest available value. Set  $VBW \geq RBW$ . Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are  $> 50/T$  and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if  $T \leq 16.7$  microseconds.)

The transmitter output is connected to the Spectrum Analyzer. We tested according to the zero-span measurement method, 6.0b) in KDB 558074 DTS 01 Meas. Guidance v03r05

The largest available value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if  $T \leq 6.25$  microseconds. ( $50/6.25 = 8$ )

The zero-span method was used because all measured T data are  $> 6.25$  microseconds and both RBW and VBW are  $> 50/T$ .

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = Zero Span

RBW = 8MHz(the largest available value)

VBW = 8MHz ( $\geq$  RBW)

Number of points in Sweep  $> 100$

Detector function = peak

Trace = Clear write

Measure  $T_{total}$  and  $T_{on}$

Calculate Duty Cycle =  $T_{on} / T_{total}$  and Duty Cycle Factor =  $10 \cdot \log(1/\text{Duty Cycle})$

### 7.5.6 Test Results

|              |              |                    |          |
|--------------|--------------|--------------------|----------|
| EUT:         | Wifi lamp    | Model No.:         | LWE3     |
| Temperature: | 20 °C        | Relative Humidity: | 48%      |
| Test Mode:   | TX 802.11b/g | Test By:           | Lake Xie |

#### Test Results

| Mode    | Data rate | Channel | T <sub>on</sub> | T <sub>total</sub> | Duty Cycle % | Duty Cycle Factor (dB) | 1/T Minimum VBW (kHz) |
|---------|-----------|---------|-----------------|--------------------|--------------|------------------------|-----------------------|
| 802.11b | 1Mbps     | 6       | 1.376ms         | 1.376ms            | 100          | 0.00                   | 0.16                  |
| 802.11g | 6Mbps     | 6       | 2.213ms         | 2.213ms            | 100          | 0.00                   | 0.16                  |

## 7.6 MAXIMUM OUTPUT POWER

### 7.6.1 Applicable Standard

According to FCC Part 15.247(b)(3) and KDB 558074 DTS 01 Meas. Guidance v03r05

### 7.6.2 Conformance Limit

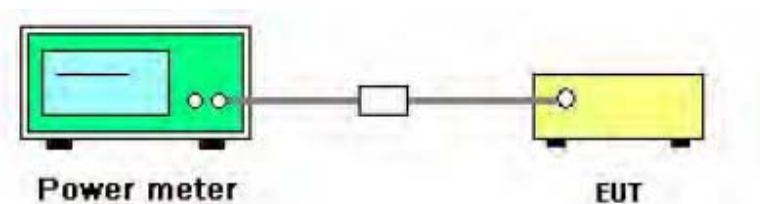
The maximum peak conducted output power of the intentional radiator for systems using digital modulation in the 2400 - 2483.5 MHz bands shall not exceed: 1 Watt (30dBm). If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

### 7.6.3 Measuring Instruments

The following table is the setting of the power meter.

| Power Meter Parameter | Setting |
|-----------------------|---------|
| Detector              | Average |

### 7.6.4 Test Setup



### 7.6.5 Test Procedure

1. Test procedures refer KDB 558074 D01 v03r05 section 9.2.3.2 Measurement using a power meter (PM).
2. Alternatively, measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

### 7.6.6 EUT opration during Test

The EUT was programmed to be in continuously transmitting mode.

### 7.6.7 Test Results

|              |              |                    |          |
|--------------|--------------|--------------------|----------|
| EUT:         | Wifi lamp    | Model No.:         | LWE3     |
| Temperature: | 20 °C        | Relative Humidity: | 48%      |
| Test Mode:   | TX 802.11b/g | Test By:           | Lake Xie |

| Mode    | Channel | Frequency (MHz) | Conducted Output Power | Limit (dBm) | Result |
|---------|---------|-----------------|------------------------|-------------|--------|
|         |         |                 | (dBm)                  |             |        |
| 802.11b | Low     | 2412            | 7.17                   | 30.00       | Pass   |
|         | Middle  | 2437            | 8.20                   | 30.00       | Pass   |
|         | High    | 2462            | 7.52                   | 30.00       | Pass   |
| 802.11g | Low     | 2412            | 8.80                   | 30.00       | Pass   |
|         | Middle  | 2437            | 8.53                   | 30.00       | Pass   |
|         | High    | 2462            | 7.44                   | 30.00       | Pass   |

## 7.7 POWER SPECTRAL DENSITY

### 7.7.1 Applicable Standard

According to FCC Part 15.247(e) and KDB 558074 DTS 01 Meas. Guidance v03r05

### 7.7.2 Conformance Limit

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 7.7.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

### 7.7.4 Test Setup

Please refer to Section 6.1 of this test report.

### 7.7.5 Test Procedure

The testing follows Measurement Procedure 10.3 Method AVGPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05

This procedure may be used when the maximum (average) conducted output power was used to demonstrate compliance to the output power limit. This is the baseline method for determining the maximum (average) conducted PSD level. If the instrument has an RMS power averaging detector, it must be used; otherwise, use the sample detector. The EUT must be configured to transmit continuously (duty cycle  $\geq 98\%$ ); otherwise sweep triggering/signal gating must be implemented to ensure that measurements are made only when the EUT is transmitting at its maximum power control level (no transmitter off time is to be considered).

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

a) Set instrument center frequency to DTS channel center frequency.

b) Set span to at least 1.5 times the OBW.

c) Set RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .

d) Set VBW  $\geq 3 \times \text{RBW}$ .

e) Detector = power averaging (RMS) or sample detector (when RMS not available).

f) Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span}/\text{RBW}$ .

g) Sweep time = auto couple.

h) Employ trace averaging (RMS) mode over a minimum of 100 traces.

i) Use the peak marker function to determine the maximum amplitude level.

j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducin

### 7.7.6 Test Results

|              |              |                    |          |
|--------------|--------------|--------------------|----------|
| EUT:         | Wifi lamp    | Model No.:         | LWE3     |
| Temperature: | 20 °C        | Relative Humidity: | 48%      |
| Test Mode:   | TX 802.11b/g | Test By:           | Lake Xie |

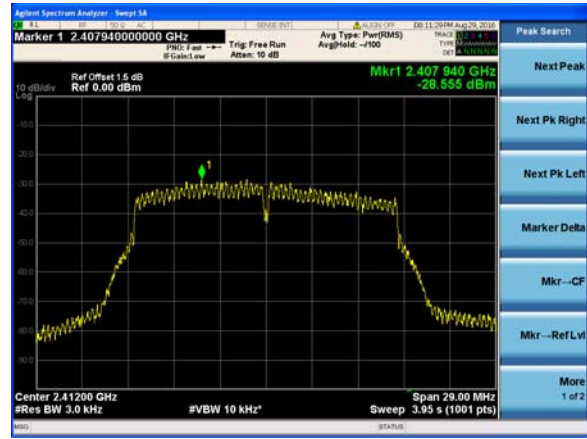
| Mode    | Channel | Frequency (MHz) | Power Density | Limit (dBm/3KHz) | Result |
|---------|---------|-----------------|---------------|------------------|--------|
|         |         |                 | (dBm/3KHz)    |                  |        |
| 802.11b | Low     | 2412            | -23.08        | 8.00             | Pass   |
|         | Middle  | 2437            | -19.37        | 8.00             | Pass   |
|         | High    | 2462            | -25.27        | 8.00             | Pass   |
| 802.11g | Low     | 2412            | -28.56        | 8.00             | Pass   |
|         | Middle  | 2437            | -25.16        | 8.00             | Pass   |
|         | High    | 2462            | -31.68        | 8.00             | Pass   |

### Test plot

(802.11b) PSD plot on channel 1



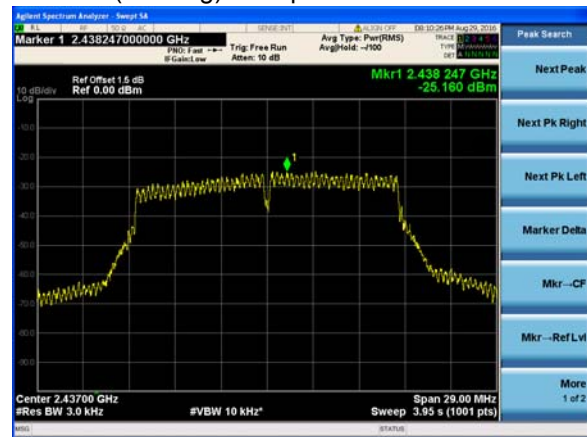
(802.11g) PSD plot on channel 1



(802.11b) PSD plot on channel 6



(802.11g) PSD plot on channel 6



(802.11b) PSD plot on channel 11



(802.11g) PSD plot on channel 11



## 7.8 Emission in non-Restricted Band

### 7.8.1 Applicable Standard

According to FCC Part 15.247(d) and KDB 558074 DTS 01 Meas. Guidance v03r05

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:<sup>7</sup>

a) If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, 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).

b) 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).

c) In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required.<sup>8</sup> The following procedures shall be used to demonstrate compliance to these limits. Note that these procedures can be used in either an antenna-port conducted or radiated test set-up. Radiated tests must conform to the test site requirements and utilize maximization procedures defined herein.

### 7.8.2 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

### 7.8.3 Test Setup

Reference level measurement

Establish a reference level by using the following procedure:

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set the span to  $\geq 1.5$  times the DTS bandwidth.
- c) Set the RBW = 100 kHz.
- d) Set the VBW  $\geq 3 \times$  RBW.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Emission level measurement

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW  $\geq 3 \times$  RBW.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b).

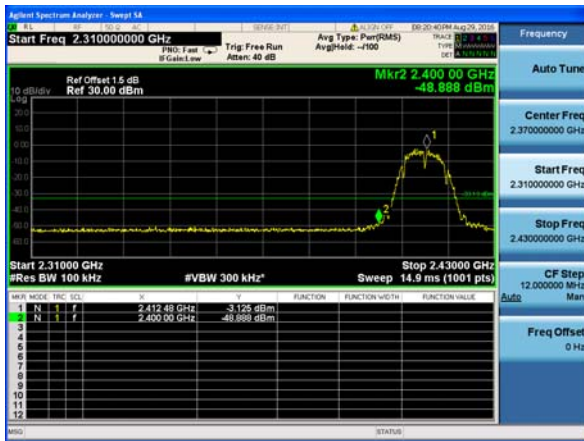
b). Report the three highest emissions relative to the limit.

**7.8.4 Test Results**

|              |              |                    |          |
|--------------|--------------|--------------------|----------|
| EUT:         | Wifi lamp    | Model No.:         | LWE3     |
| Temperature: | 20 ℃         | Relative Humidity: | 48%      |
| Test Mode:   | TX 802.11b/g | Test By:           | Lake Xie |

**Test plot For (802.11b)**

(802.11b) Emission not in Restricted Band plot on channel 1 Reference Level

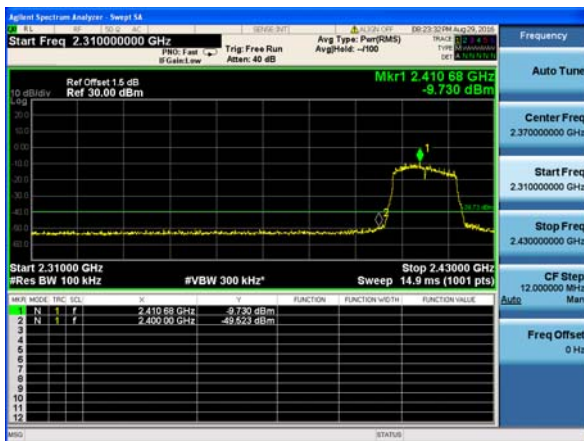


(802.11b) Emission not in Restricted Band plot on channel 11 Reference Level



**Test plot For (802.11g)**

(802.11g) Emission not in Restricted Band plot on channel 1 Reference Level



(802.11g) Emission not in Restricted Band plot on channel 11 Reference Level



## **7.9 ANTENNA APPLICATION**

### **7.9.1 Antenna Requirement**

15.203 requirement: For intentional device, according to 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.

### **7.9.2 Result**

The EUT antenna is permanent attached (pcb)antenna. It comply with the standard requirement.

END OF REPORT