# Test Report

**FCC Part15 Subpart C & ISED RSS-247 Issue 2**
**(Class II permissive change)**

| | | |
|---|---|---|
| Product Name | : | LED lamp |
| Model No. | : | 9290018215 |
| FCC ID | : | 2AGBW9290018215X |
| IC | : | 20812-8215X |

| | | |
|---|---|---|
| Applicant | : | Philips Lighting (China) Investment Co., Ltd. |
| Address | : | Building 9, Lane 888, Tianlin Road, Minhang district, Shanghai |

| | | |
|---|---|---|
| Date of Receipt | : | Nov. 01, 2017 |
| Test Date | : | Nov. 01, 2017 ~ Dec. 06, 2017 |
| Issued Date | : | Dec. 11, 2017 |
| Report No. | : | 17A2137R-RF- US-P06V03 |
| Report Version | : | V1.0 |

Note: This report was based on DEKRA report (Report No. 1782131R-RF-US-P06V02), the EUT only changes the crystal oscillator. And the frequency of the crystal oscillator has not changed

# Test Report Certification

Issued Date : Dec. 11, 2017
Report No. : 17A2137R-RF-US-P06V03

| | | |
|---|---|---|
| Product Name | : | LED lamp |
| Applicant | : | Philips Lighting (China) Investment Co., Ltd. |
| Address | : | Building 9, Lane 888, Tianlin Road, Minhang district, Shanghai, China |
| Manufacturer | : | Philips Lighting (China) Investment Co., Ltd. |
| Address | : | Building 9, Lane 888, Tianlin Road, Minhang district, Shanghai, China |
| Model No. | : | 9290018215 |
| FCC ID | : | 2AGBW9290018215X |
| IC | : | 20812-8215X |
| EUT Voltage | : | 110-130VAC;10W;50-60Hz |
| Test Voltage | : | AC 120V/60Hz |
| Brand Name | : | Philips |
| Applicable Standard | : | FCC CFR Title 47 Part 15 Subpart C<br>ANSI C63.4:2014; ANSI C63.10:2013;<br>KDB 558074 D01v04<br>ISED RSS-Gen Issue 4 / RSS-247 Issue 2 |
| Test Result | : | Complied |
| Performed Location | : | DEKRA Testing and Certification (Suzhou) Co., Ltd.<br>No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China<br>TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098<br>FCC Designation Number: CN1199; IC Lab Code: 4075B |

Documented By : Kathy Feng

(Project Assistant: Kathy Feng)

Reviewed By : Frank he

(Senior Engineer: Frank He )

Approved By : Harry Zhao

(Engineering Manager: Harry Zhao )

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## History of This Test Report

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| 17A2137R-RF-US-P06V03 | V1.0 | Initial Issued Report | Dec. 11, 2017 |
| | | | |
| | | | |
| | | | |

# 1. General Information

## 1.1. EUT Description

| | |
|---|---|
| Product Name | LED lamp |
| Brand Name | Philips |
| Model No. | 9290018215 |
| EUT Voltage | 110-130VAC;10W;50-60Hz |
| Frequency Range | 2405 ~ 2480 MHz |
| Channel Number | 16 |
| Type of Modulation | O-QPSK |
| Data Rate | 250kbps |
| Antenna Type | Reference to Antenna List |
| Peak Antenna Gain | Reference to Antenna List |

## 1.2. Channel List:

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

## 1.3. Antenna information

| | | | | | | |
|---|---|---|---|---|---|---|
| Antenna manufacturer | N/A | | | | | |
| Antenna Delivery | ☒ | 1*TX+1*RX | ☐ | 2*TX+2*RX | ☐ | 3*TX+3*RX |
| Antenna technology | ☒ | SISO | | | | |
| | ☐ | MIMO | ☐ | Basic | | |
| | | | ☐ | Sectorized antenna systems | | |
| | | | ☐ | Cross-polarized antennas | | |
| | | | ☐ | Unequal antenna gains, with equal transmit powers | | |
| | | | ☐ | Spatial Multiplexing | | |
| | | | ☐ | CDD | | |
| | | | ☐ | Beam-forming | | |
| Antenna Type | ☐ | External | ☐ | Dipole Antenna | | |
| | ☒ | Internal | ☐ | PIFA Antenna | | |
| | | | ☐ | PCB Antenna | | |
| | | | ☒ | Slot Antenna | | |
| | | | ☐ | Ceramic Chip Antenna | | |
| | | | ☐ | Metal plate type F antenna | | |
| | | | ☐ | Cross-polarize Antenna | | |
| Antenna Gain | -1dBi | | | | | |

## 1.4. Mode of Operation

| Test Modes List |
|---|
| Mode 1:Transmit by Zigbee |

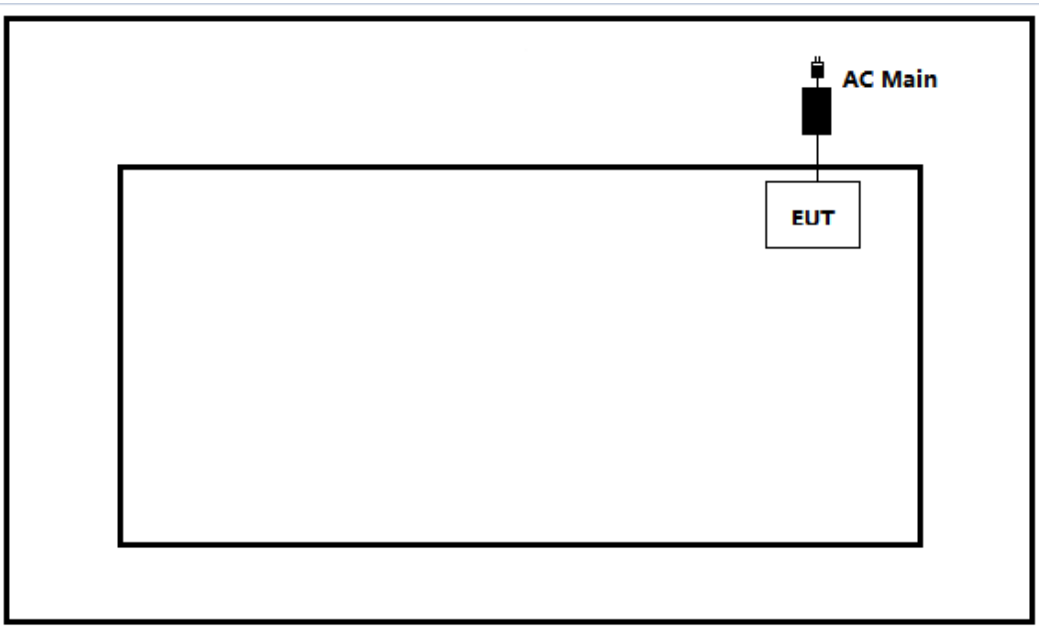
## 1.5. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

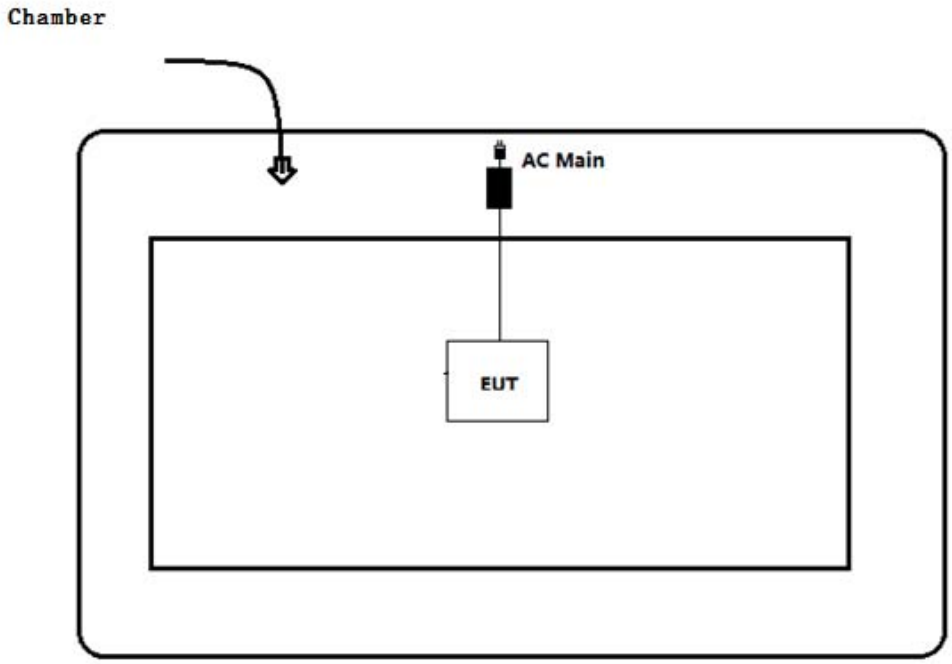
| No. | Product | Manufacturer | Model No. | Serial No. | Power Cord |
|---|---|---|---|---|---|
| 1 | N/A | N/A | N/A | N/A | N/A |

## 1.6. Configuration of Tested System

Test setup Diagram- AC Line Conducted Emission Test




Test setup Diagram- Radiated Emission



# 2. Technical Test

## 2.1. Summary of Test Result

For FCC rule

| Performed Test Item | Normative References | Limit | Result |
|---|---|---|---|
| AC Power Line Conducted Emission | FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.207 | FCC 15.207 | PASS |
| Emissions in restricted frequency bands | FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.209 | FCC 15.209 | PASS |
| Radiated Emission Band Edge | FCC CFR Title 47 Part 15 Subpart C: 2015 15.247(d) | FCC 15.209 | PASS |
| Fundamental emission output power | FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.247(b)(3) | ⩽30dBm | PASS |

3. For IC rule

| Performed Test Item | Normative References | Limit | Result |
|---|---|---|---|
| AC Power Line Conducted Emission | RSS-Gen Issue 4 Section 8.8 | RSS-Gen | PASS |
| Emissions in restricted frequency bands | RSS-Gen Issue 4 Section 8.9 | RSS-Gen | PASS |
| Radiated Emission Band Edge | RSS-247 Issue 2 Section A5.5 | RSS-247 | PASS |
| Fundamental emission output power | RSS-247 Issue 2 Section A5.4(4) | ⩽30dBm | PASS |

## 3.1. Power setting parameter

| Modulation Mode | Test Frequency | Setting value |
|---|---|---|
| Zigbee | 2405 | Auto |
| | 2440 | Auto |
| | 2480 | Auto |

## 3.2. Test Environment

| Items | Required (IEC 68-1) | Actual |
|---|---|---|
| Temperature (°C) | 15-35 | 21 |
| Humidity (%RH) | 25-75 | 50 |
| Barometric pressure (mbar) | 860-1060 | 950-1000 |

## 3.3. Measurement Uncertainty

| Test Items | Uncertainty |
|---|---|
| AC Power Line Conducted Emission | ±2.02dB |
| Radiated Emission | Below 1GHz ±3.8 dB |
| | Above 1GHz ±3.9 dB |
| RF Antenna Port Conducted Emission | ±1.27dB |
| Radiated Emission Band Edge | ±3.9dB |
| Occupied Bandwidth | ±1kHz |
| Power Spectral Density | ±1.27dB |

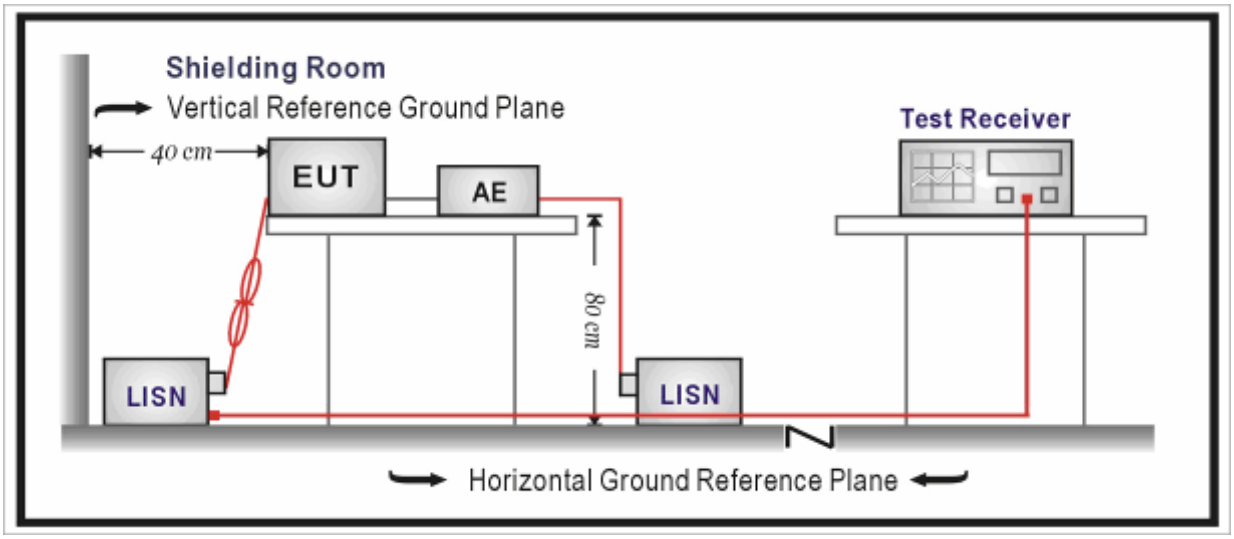
# 4. AC Power Line Conducted Emission

## 4.1. Test Equipment

| AC Power Line Conducted Emission / TR-1 | | | | | |
|---|---|---|---|---|---|
| Instrument | Manufacturer | Type No. | Serial No. | Cal. Date | Cal. Due Date |
| EMI Test Receiver | R&S | ESCI | 100906 | 2017.03.05 | 2018.03.04 |
| Two-Line V-Network | R&S | ENV 216 | 101189 | 2017.07.16 | 2018.07.15 |
| Two-Line V-Network | R&S | ENV 216 | 101044 | 2017.09.16 | 2018.09.15 |
| 50ohm Coaxial Switch | Anritsu | MP59B | 6200464462 | N/A | N/A |
| 50ohm Termination | SHX | TF2 | 07081402 | 2017.09.16 | 2018.09.15 |
| Temperature/Humidity Meter | Zhichen | ZC1-2 | TR1-TH | 2017.01.04 | 2018.01.03 |
| Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards. | | | | | |

## 4.2. Test Setup

AC Power Line Conducted Emission test setup



## 4.3. Limit

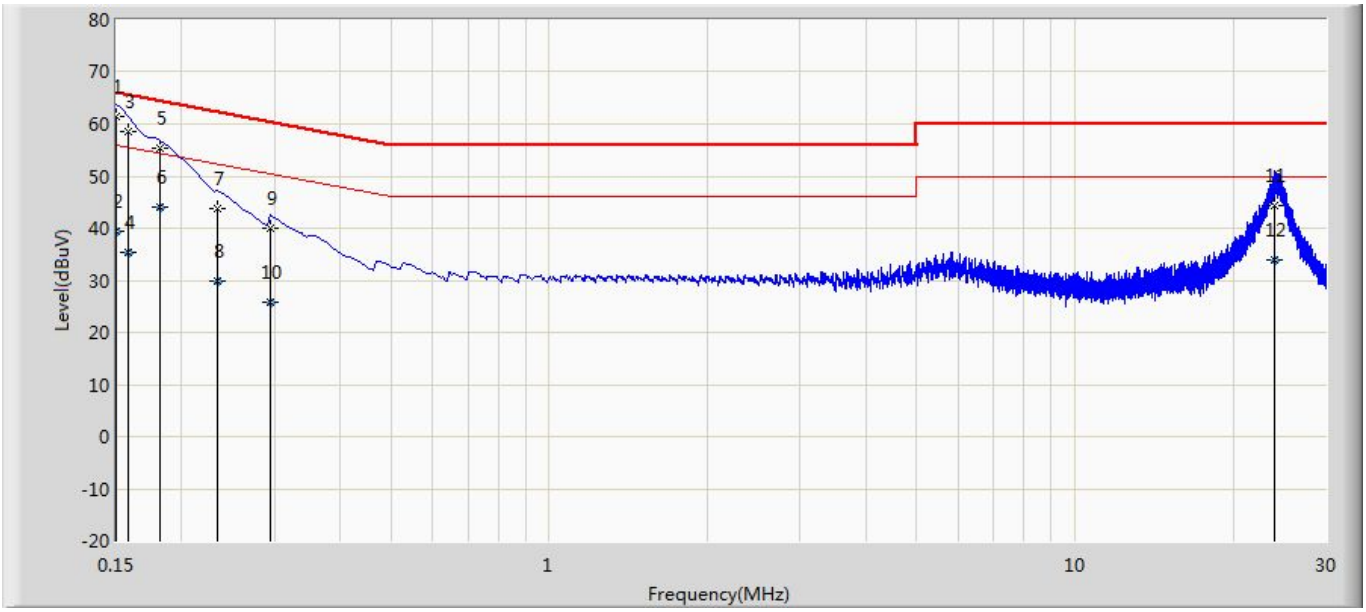
| Frequency of Emission (MHz) | Conducted Limit | |
|---|---|---|
| | Quasi-peak (dB $\mu$ V) | Average(dB $\mu$ V) |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |
| Note 1: The lower limit shall apply at the transition frequencies.<br>Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz. | | |

## 4.4. Test Procedure

| Test Method | | | |
|---|---|---|---|
| | References Rule | Chapter | Item |
| ☒ | ANSI C63.10-2013 | 6.2 | Standard test method for ac power-line conducted emissions from unlicensed wireless devices |
| ☒ | ANSI C63.4-2014 | 7 | AC power-line conducted emission measurements |

## 4.5. Test Result

| | |
|---|---|
| Engineer: Michael | |
| Site: TR1 | Time: 2017/11/21 |
| Limit: FCC_Part15.107_CE_AC Power_ClassB | Margin: 0 |
| Probe: ENV216_101190(0.009-30MHz) | Polarity: Line |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: SN 6017127-1 | |

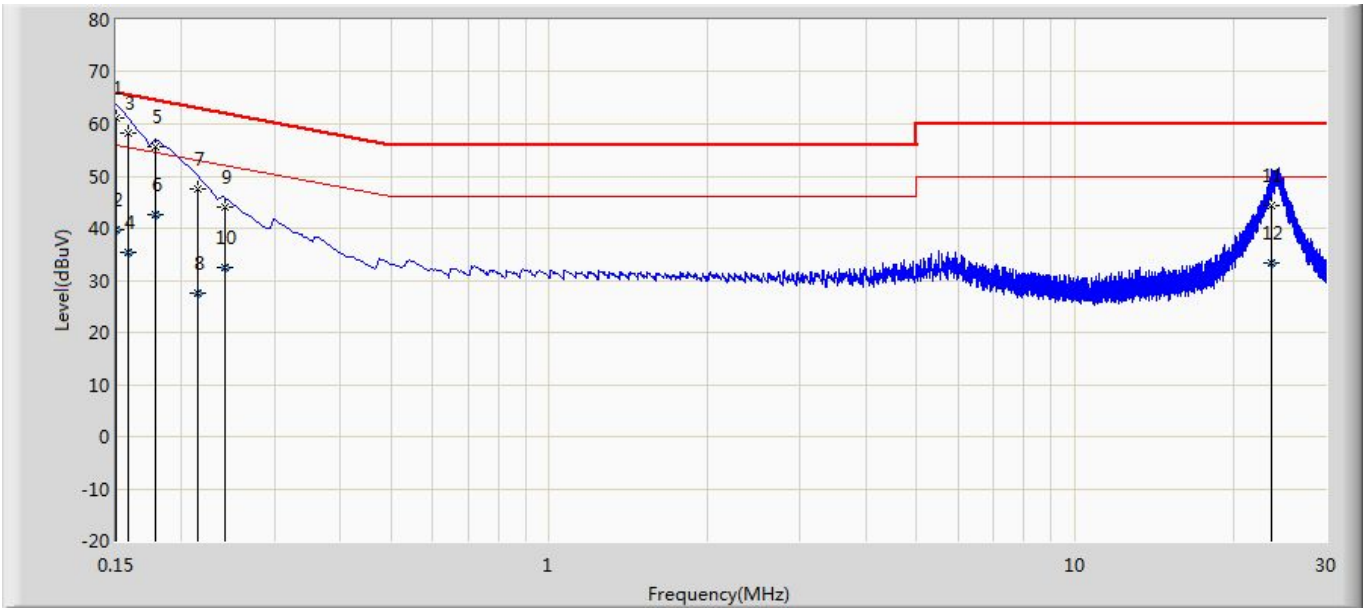



| No | Mark | Frequency (MHz) | Measure Level (dBuV) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV) | Probe (dB) | Cable (dB) | Amp (dB) | Type |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * | 0.150 | 61.384 | 51.749 | -4.616 | 66.000 | 9.610 | 0.025 | 0.000 | QP |
| 2 | | 0.150 | 39.543 | 29.908 | -16.457 | 56.000 | 9.610 | 0.025 | 0.000 | AV |
| 3 | | 0.158 | 58.417 | 48.783 | -7.151 | 65.568 | 9.608 | 0.026 | 0.000 | QP |
| 4 | | 0.158 | 35.304 | 25.670 | -20.264 | 55.568 | 9.608 | 0.026 | 0.000 | AV |
| 5 | | 0.182 | 55.320 | 45.689 | -9.073 | 64.394 | 9.603 | 0.028 | 0.000 | QP |
| 6 | | 0.182 | 43.971 | 34.340 | -10.423 | 54.394 | 9.603 | 0.028 | 0.000 | AV |
| 7 | | 0.234 | 43.792 | 34.163 | -18.514 | 62.307 | 9.600 | 0.030 | 0.000 | QP |
| 8 | | 0.234 | 29.754 | 20.124 | -22.552 | 52.307 | 9.600 | 0.030 | 0.000 | AV |
| 9 | | 0.294 | 39.935 | 30.301 | -20.476 | 60.411 | 9.600 | 0.034 | 0.000 | QP |
| 10 | | 0.294 | 25.729 | 16.095 | -24.682 | 50.411 | 9.600 | 0.034 | 0.000 | AV |
| 11 | | 23.954 | 44.259 | 33.542 | -15.741 | 60.000 | 10.401 | 0.317 | 0.000 | QP |
| 12 | | 23.954 | 33.956 | 23.238 | -16.044 | 50.000 | 10.401 | 0.317 | 0.000 | AV |

Note:

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

| | |
|---|---|
| Engineer: Michael | |
| Site: TR1 | Time: 2017/11/21 |
| Limit: FCC_Part15.107_CE_AC Power_ClassB | Margin: 0 |
| Probe: ENV216_101190(0.009-30MHz) | Polarity: Neutral |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: SN 6017127-1 | |




| No | Mark | Frequency (MHz) | Measure Level (dBuV) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV) | Probe (dB) | Cable (dB) | Amp (dB) | Type |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * | 0.150 | 61.219 | 51.600 | -4.781 | 66.000 | 9.594 | 0.025 | 0.000 | QP |
| 2 | | 0.150 | 39.629 | 30.010 | -16.371 | 56.000 | 9.594 | 0.025 | 0.000 | AV |
| 3 | | 0.158 | 58.285 | 48.667 | -7.283 | 65.568 | 9.592 | 0.026 | 0.000 | QP |
| 4 | | 0.158 | 35.352 | 25.734 | -20.217 | 55.568 | 9.592 | 0.026 | 0.000 | AV |
| 5 | | 0.178 | 55.646 | 46.022 | -8.932 | 64.578 | 9.596 | 0.028 | 0.000 | QP |
| 6 | | 0.178 | 42.619 | 32.995 | -11.960 | 54.578 | 9.596 | 0.028 | 0.000 | AV |
| 7 | | 0.214 | 47.421 | 37.793 | -15.628 | 63.049 | 9.599 | 0.029 | 0.000 | QP |
| 8 | | 0.214 | 27.468 | 17.840 | -25.581 | 53.049 | 9.599 | 0.029 | 0.000 | AV |
| 9 | | 0.242 | 44.168 | 34.539 | -17.859 | 62.027 | 9.598 | 0.030 | 0.000 | QP |
| 10 | | 0.242 | 32.594 | 22.966 | -19.433 | 52.027 | 9.598 | 0.030 | 0.000 | AV |
| 11 | | 23.714 | 44.238 | 33.387 | -15.762 | 60.000 | 10.536 | 0.315 | 0.000 | QP |
| 12 | | 23.714 | 33.206 | 22.354 | -16.794 | 50.000 | 10.536 | 0.315 | 0.000 | AV |

Note:

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

# 5. Emissions in restricted frequency bands

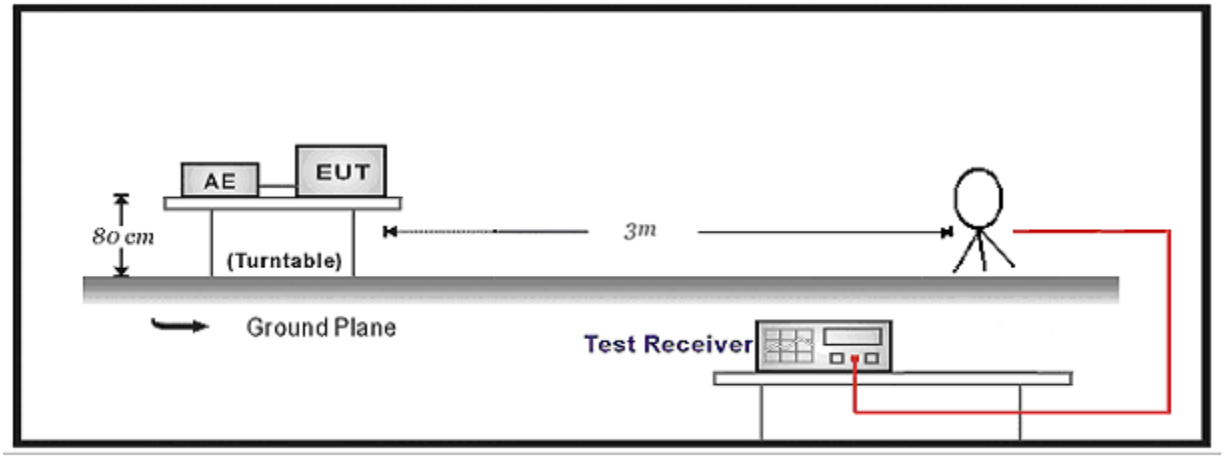
## 5.1. Test Equipment

| Radiated Emission(Below 1GHz) / AC-2 | | | | | |
|---|---|---|---|---|---|
| Instrument | Manufacturer | Type No. | Serial No. | Cal. Date | Cal. Due Date |
| EMI Test Receiver | R&S | ESCI | 100573 | 2017.03.29 | 2018.03.28 |
| Loop Antenna | R&S | HFH2-Z2 | 833799/003 | 2017.11.16 | 2018.11.15 |
| Bilog Antenna | Teseq GmbH | CBL6112D | 27611 | 2017.10.16 | 2018.10.15 |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 106 | AC2-C | 2017.03.02 | 2018.03.01 |
| Temperature/Humidity Meter | Zhichen | ZC1-2 | AC2-TH | 2017.01.04 | 2018.01.03 |
| Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards. | | | | | |

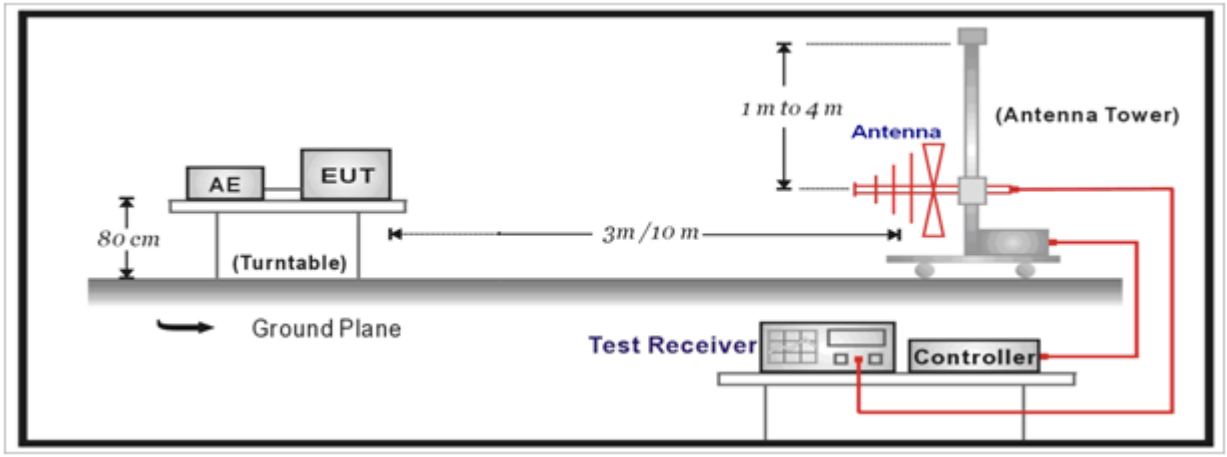
| Radiated Emission(Above 1GHz) / AC-5 | | | | | |
|---|---|---|---|---|---|
| Instrument | Manufacturer | Type No. | Serial No. | Cal. Date | Cal. Due Date |
| Spectrum Analyzer | Agilent | E4446A | MY45300103 | 2017.01.03 | 2018.01.02 |
| Preamplifier | Miteq | NSP1800-25 | 1364185 | 2017.05.06 | 2018.05.05 |
| Preamplifier | QTK | AP-040G | CHM-0906001 | 2017.05.06 | 2018.05.05 |
| DRG Horn | ETS-Lindgren | 3117 | 00123988 | 2017.01.22 | 2018.01.21 |
| Broad-Band Horn Antenna | Schwarzbeck | BBHA9170 | 294 | 2017.11.25 | 2018.11.24 |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 106 | AC5-C1 | 2017.03.02 | 2018.03.01 |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 106 | AC5-C2 | 2017.03.02 | 2018.03.01 |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 102 | AC5-C3 | 2017.03.02 | 2018.03.01 |
| EMI Receiver | Agilent | N9038A | MY51210196 | 2017.06.10 | 2018.06.09 |
| Temperature/Humidity Meter | Zhichen | ZC1-2 | AC5-TH | 2017.01.04 | 2018.01.03 |
| Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards. | | | | | |

## 5.2. Test Setup

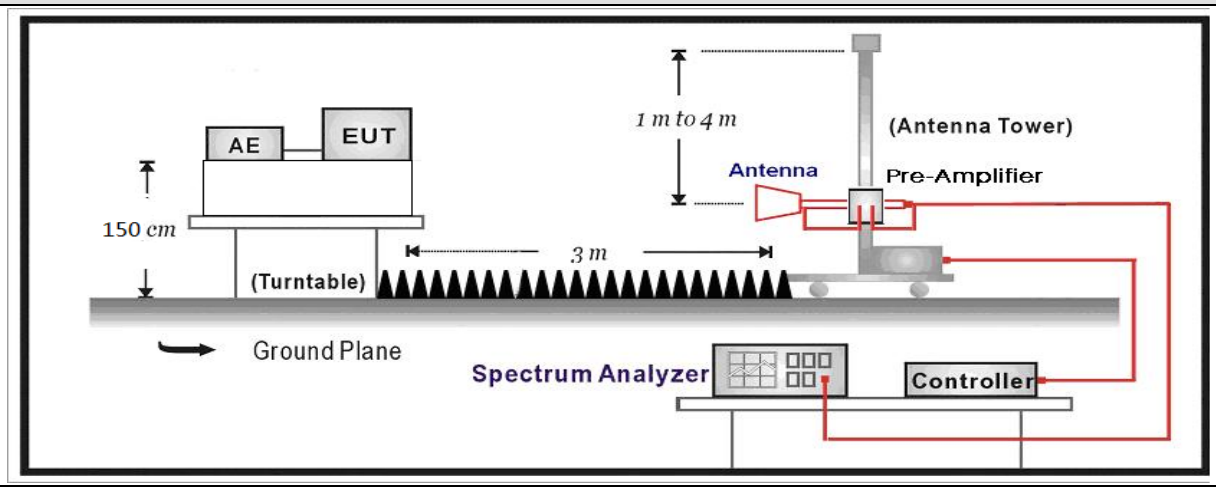
Below 30MHz Test Setup:




30MHz-1GHz Test Setup:




Above 1GHz Test Setup:



## 5.3. Limit

**For FCC:**

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

**For IC:**

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

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

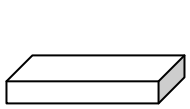
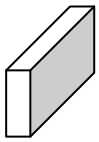
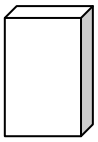
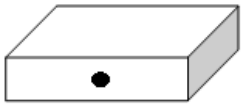
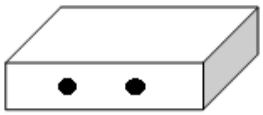
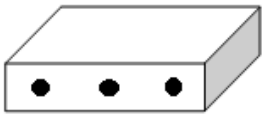
Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed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

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

## 5.4. Test Procedure

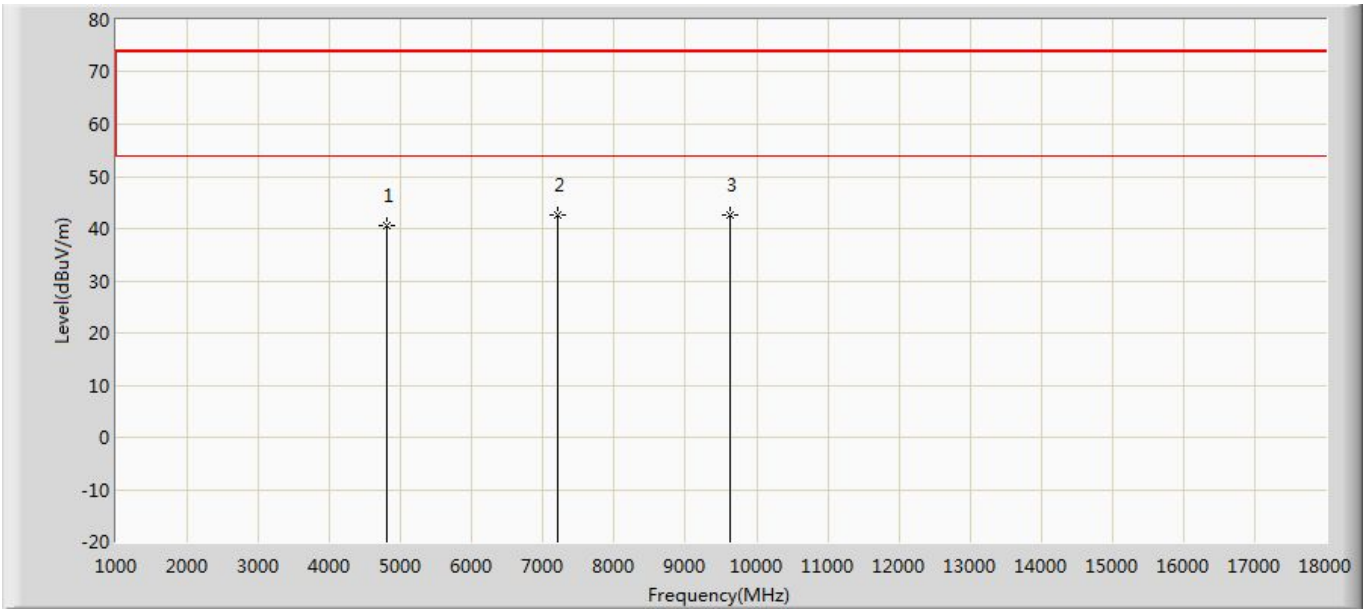
| Test Method | | | | | | |
|---|---|---|---|---|---|---|
| | References Rule | | | | Chapter | Description |
| ☐ | ANSI C63.10 | | | | 11.11 | Emissions in non-restricted frequency bands |
| | ☐ | ANSI C63.10 | | | 11.11.2 | Reference level measurement |
| | ☐ | ANSI C63.10 | | | 11.11.3 | Emission level measurement |
| ☒ | ANSI C63.10 | | | | 11.12 | Emissions in restricted frequency bands |
| | ☒ | ANSI C63.10 | | | 11.12.1 | Radiated emission measurements |
| | ☒ | ANSI C63.10 | | | 11.12.2.7 | Radiated spurious emission test |
| | | ☒ | ANSI C63.10 | | 6.4 | Radiated emissions from unlicensed wireless devices below 30 MHz |
| | | ☒ | ANSI C63.10 | | 6.5 | Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz |
| | | ☒ | ANSI C63.10 | | 6.6 | Radiated emissions from unlicensed wireless devices above 1 GHz |
| | | ☐ | ANSI C63.10 | | 11.12.2.3 | Quasi-peak measurement procedure |
| | | ☒ | ANSI C63.10 | | 11.12.2.4 | Peak power measurement procedure |
| | | ☒ | ANSI C63.10 | | 11.12.2.5 | Average power measurement procedures |
| | | | ☐ | ANSI C63.10 | 11.12.2.5.1 | Trace averaging with continuous EUT transmission at full power |
| | | | ☐ | ANSI C63.10 | 11.12.2.5.2 | Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction |
| | | | ☒ | ANSI C63.10 | 11.12.2.5.3 | Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold |

## 5.5. EUT test Axis definition

<table>
<tr><td>Item</td><td colspan="4">Emissions in restricted frequency bands</td></tr>
<tr><td rowspan="2">Device Category</td><td>☒</td><td colspan="3">Fixed position use</td></tr>
<tr><td>☐</td><td colspan="3">Mobile position use</td></tr>
<tr><td>Test mode</td><td colspan="4">Mode 1</td></tr>
<tr><td rowspan="11">Test method</td><td>☒</td><td colspan="3">Radiated</td></tr>
<tr><td rowspan="3"></td><td>X Axis</td><td>Y Axis</td><td>Z Axis</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Worst Axis ☒</td><td>Worst Axis ☐</td><td>Worst Axis ☐</td></tr>
<tr><td>☐</td><td colspan="3">Conducted</td></tr>
<tr><td>☐</td><td colspan="3">Chain 1</td></tr>
<tr><td></td><td colspan="3">  </td></tr>
<tr><td>☐</td><td>Chain 1</td><td colspan="2">Chain 2</td></tr>
<tr><td></td><td colspan="3">  </td></tr>
<tr><td>☐</td><td>Chain 1</td><td>Chain 2</td><td>Chain 3</td></tr>
<tr><td></td><td colspan="3">  </td></tr>
</table>

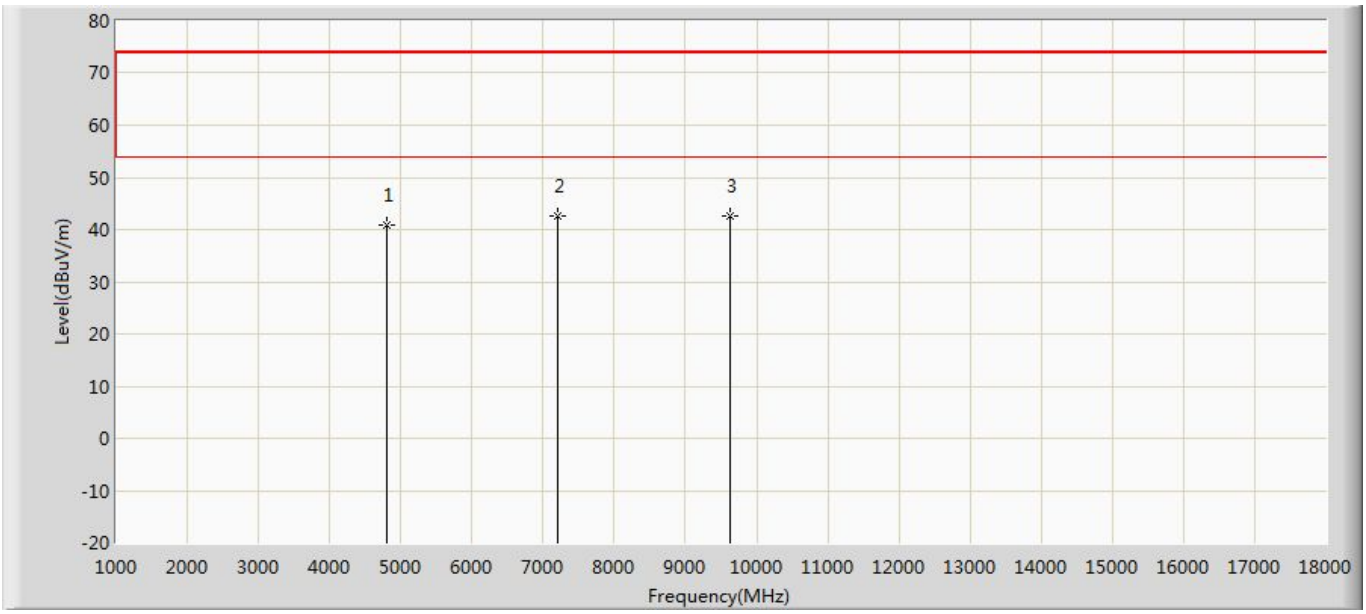
## 5.6. Test Result

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:50 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2405MHz by zigbee | |



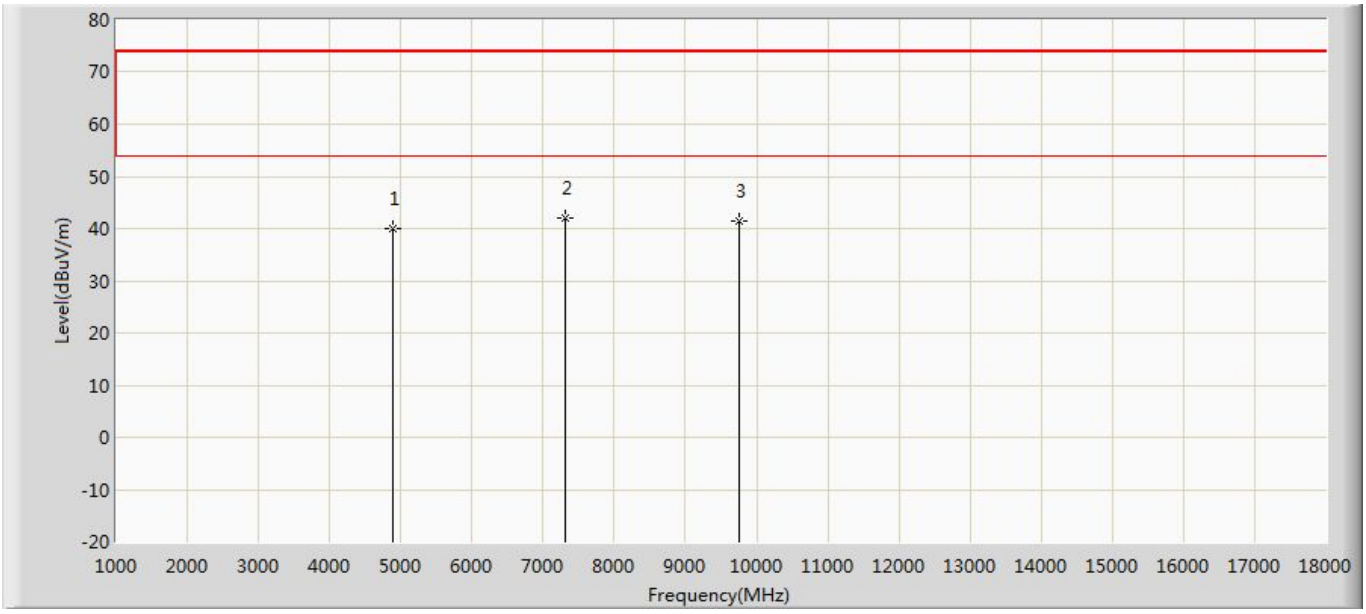

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4810.000 | 40.440 | 42.114 | -33.560 | 74.000 | -1.675 | PK |
| 2 | * | 7215.000 | 42.649 | 39.975 | -31.351 | 74.000 | 2.673 | PK |
| 3 | | 9620.000 | 42.545 | 37.474 | -31.455 | 74.000 | 5.071 | PK |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:50 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2405MHz by zigbee | |



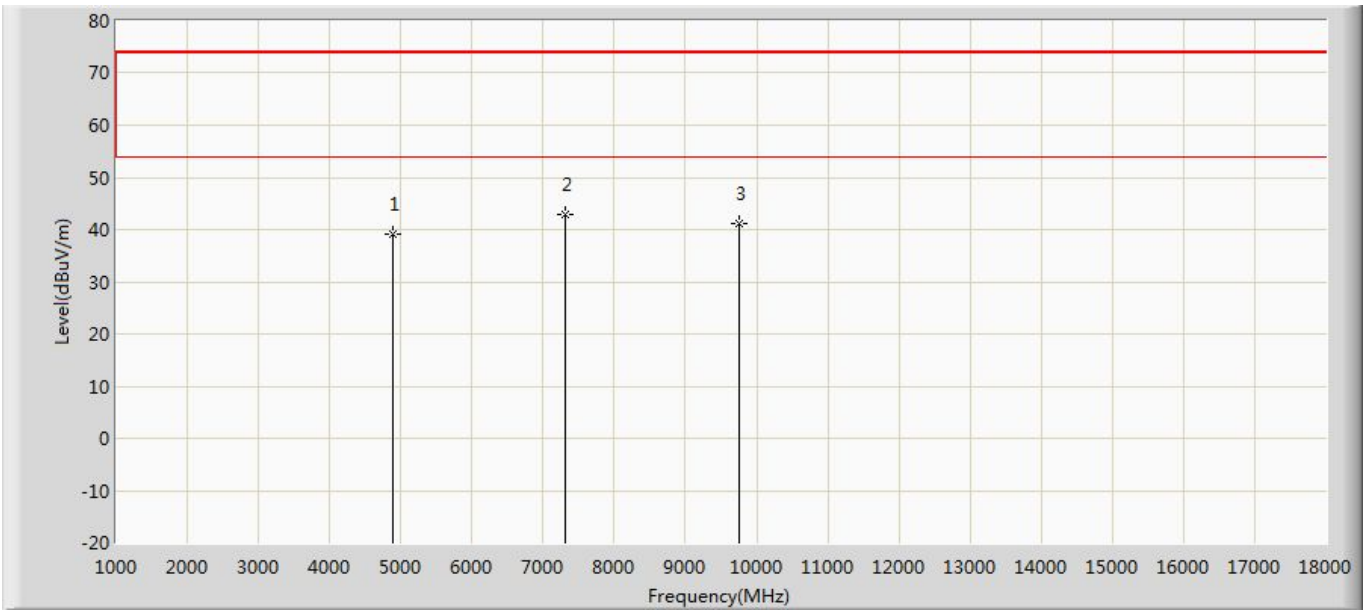

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4810.000 | 40.777 | 42.451 | -33.223 | 74.000 | -1.675 | PK |
| 2 | | 7215.000 | 42.560 | 39.886 | -31.440 | 74.000 | 2.673 | PK |
| 3 | * | 9620.000 | 42.658 | 37.587 | -31.342 | 74.000 | 5.071 | PK |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/09 - 21:50 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2440MHz by zigbee | |



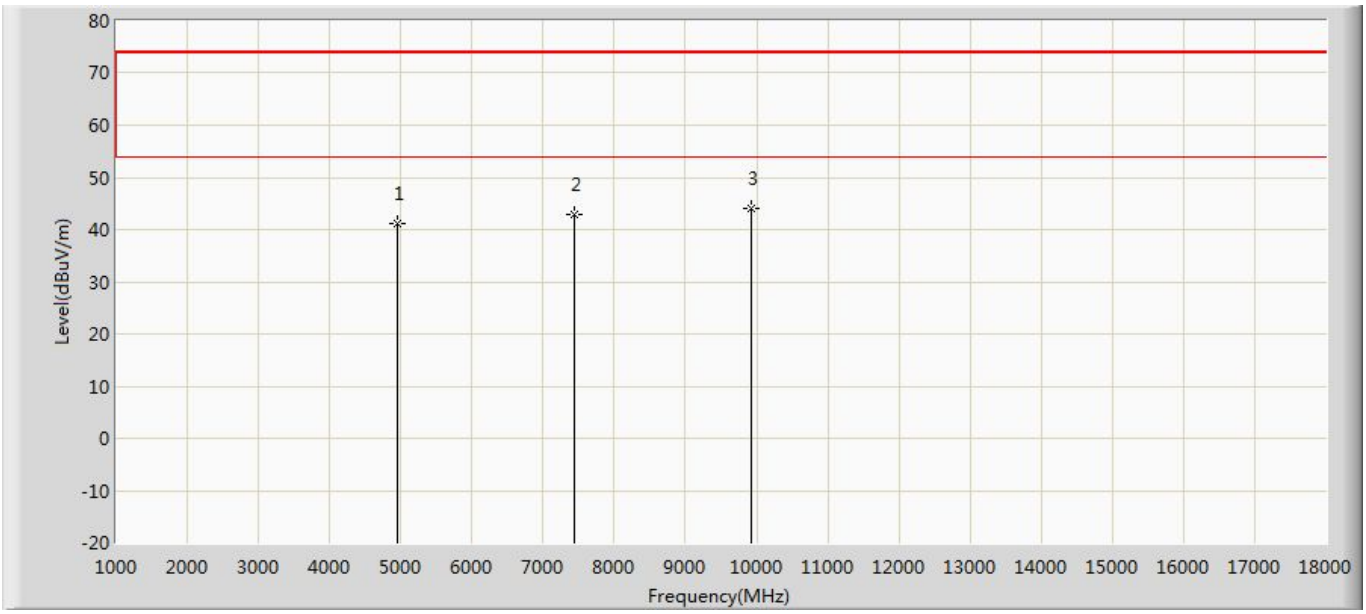

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4880.000 | 39.937 | 41.573 | -34.063 | 74.000 | -1.635 | PK |
| 2 | * | 7320.000 | 42.122 | 39.302 | -31.878 | 74.000 | 2.820 | PK |
| 3 | | 9760.000 | 41.410 | 37.352 | -32.590 | 74.000 | 4.058 | PK |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/09 - 21:50 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2440MHz by zigbee | |



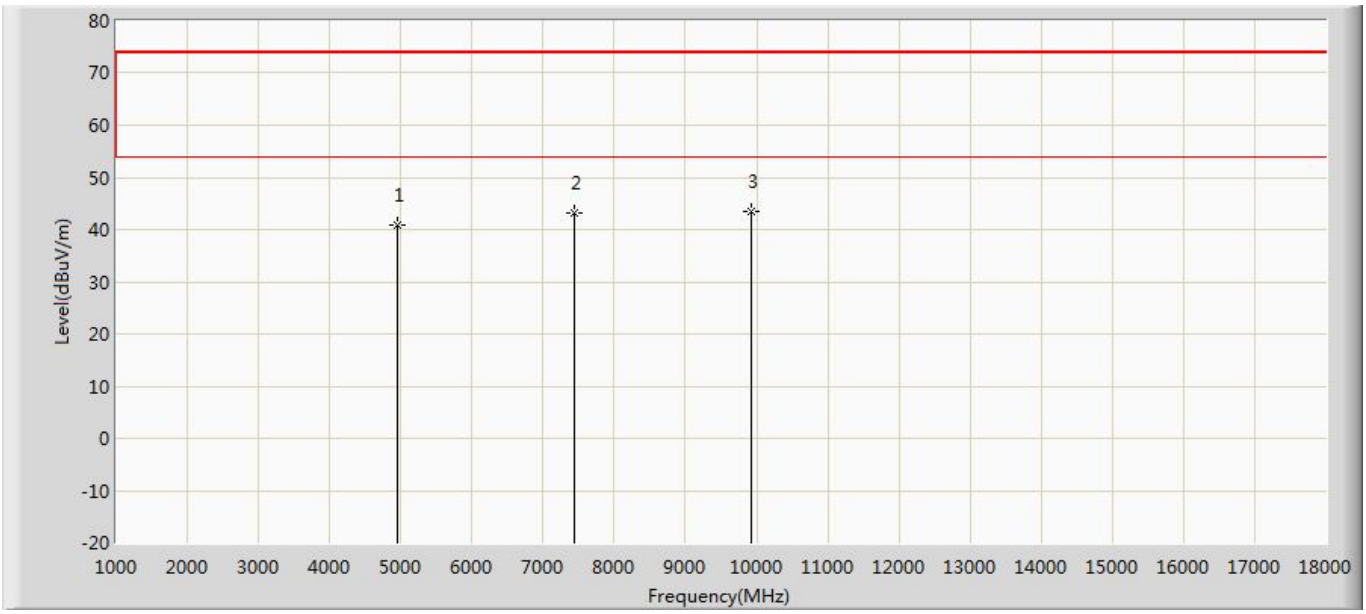

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4880.000 | 39.043 | 40.679 | -34.957 | 74.000 | -1.635 | PK |
| 2 | * | 7320.000 | 43.013 | 40.193 | -30.987 | 74.000 | 2.820 | PK |
| 3 | | 9760.000 | 41.122 | 37.064 | -32.878 | 74.000 | 4.058 | PK |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:50 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2480MHz by zigbee | |




| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4960.000 | 41.038 | 42.964 | -32.962 | 74.000 | -1.926 | PK |
| 2 | | 7440.000 | 42.777 | 40.064 | -31.223 | 74.000 | 2.713 | PK |
| 3 | * | 9920.000 | 44.090 | 38.959 | -29.910 | 74.000 | 5.130 | PK |

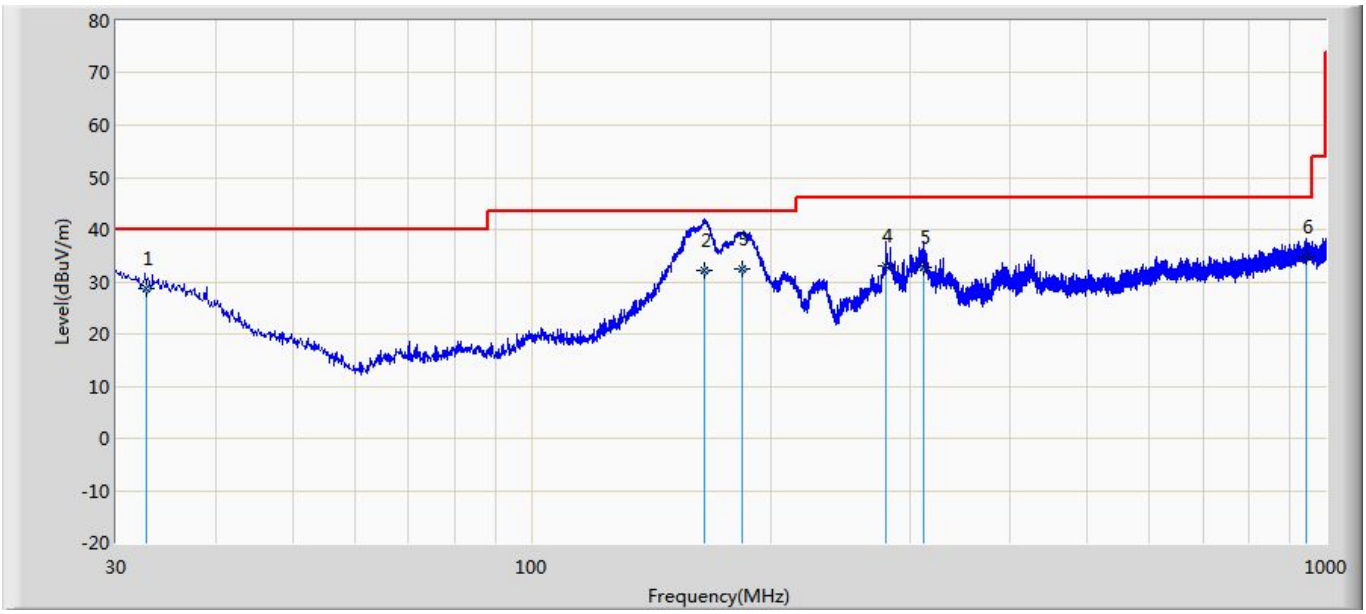
| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:50 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2480MHz by zigbee | |




| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 4960.000 | 40.850 | 42.776 | -33.150 | 74.000 | -1.926 | PK |
| 2 | | 7440.000 | 43.198 | 40.485 | -30.802 | 74.000 | 2.713 | PK |
| 3 | * | 9920.000 | 43.385 | 38.254 | -30.615 | 74.000 | 5.130 | PK |

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

| | |
|---|---|
| Engineer: Nero | |
| Site: AC3 | Time: 2017/11/21 |
| Limit: FCC_Part15.109_RE(3m)_ClassB | Margin: 0 |
| Probe: AC3_3m (30-1000MHz) | Polarity: Horizontal |
| EUT: LED lamp | Power: AC 120V/60Hz |

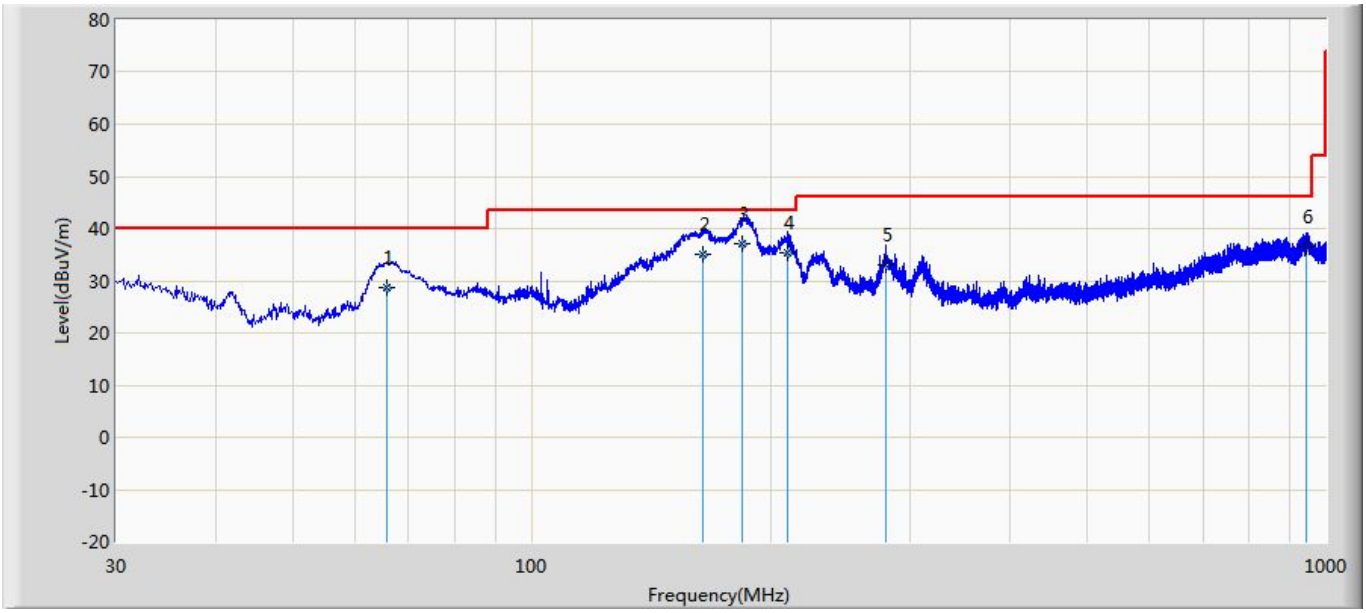



| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Probe (dB/m) | Cable (dB) | Amp (dB) | Ant Pos (cm) | Table Pos (deg) | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 32.780 | 28.642 | 2.200 | -11.358 | 40.000 | 19.972 | 6.470 | 0.000 | 100 | 45 | QP |
| 2 | | 165.143 | 32.286 | 14.700 | -11.214 | 43.500 | 10.441 | 7.145 | 0.000 | 100 | 78 | QP |
| 3 | * | 183.990 | 32.509 | 15.200 | -10.991 | 43.500 | 10.089 | 7.220 | 0.000 | 100 | 222 | QP |
| 4 | | 279.850 | 32.951 | 12.300 | -13.049 | 46.000 | 13.101 | 7.550 | 0.000 | 100 | 22 | QP |
| 5 | | 311.680 | 32.711 | 11.600 | -13.289 | 46.000 | 13.461 | 7.651 | 0.000 | 100 | 46 | QP |
| 6 | | 946.640 | 34.788 | 2.200 | -11.212 | 46.000 | 23.389 | 9.198 | 0.000 | 100 | 46 | QP |

Note:

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

| | |
|---|---|
| Engineer: Nero | |
| Site: AC3 | Time: 2017/11/21 |
| Limit: FCC_Part15.109_RE(3m)_ClassB | Margin: 0 |
| Probe: AC3_3m (30-1000MHz) | Polarity: Vertical |
| EUT: LED lamp | Power: AC 120V/60Hz |




| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Probe (dB/m) | Cable (dB) | Amp (dB) | Ant Pos (cm) | Table Pos (deg) | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 65.870 | 28.812 | 13.500 | -11.188 | 40.000 | 8.634 | 6.679 | 0.000 | 100 | 14 | QP |
| 2 | | 164.580 | 35.061 | 16.200 | -8.439 | 43.500 | 11.717 | 7.144 | 0.000 | 100 | 36 | QP |
| 3 | * | 184.268 | 37.091 | 16.800 | -6.409 | 43.500 | 13.070 | 7.221 | 0.000 | 100 | 130 | QP |
| 4 | | 209.790 | 35.250 | 11.900 | -8.250 | 43.500 | 16.035 | 7.315 | 0.000 | 200 | 144 | QP |
| 5 | | 279.870 | 33.185 | 8.600 | -12.815 | 46.000 | 17.035 | 7.550 | 0.000 | 200 | 112 | QP |
| 6 | | 943.360 | 36.436 | 2.100 | -9.564 | 46.000 | 25.148 | 9.188 | 0.000 | 100 | 222 | QP |

Note:

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

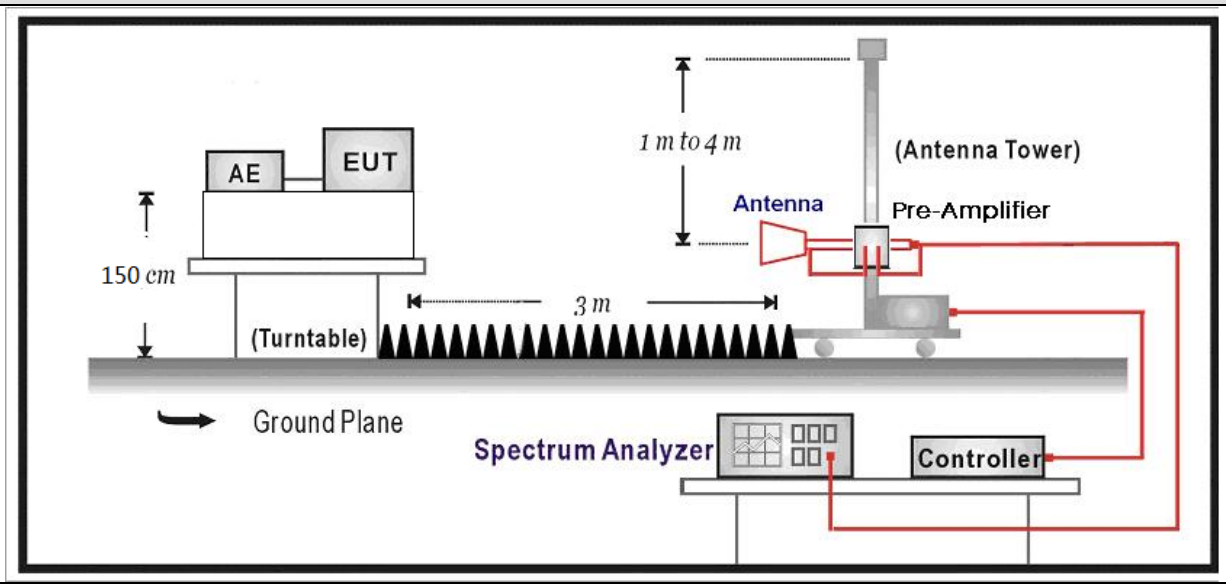
# 6. Radiated Emission Band Edge

## 6.1. Test Equipment

| Radiated Emission Band Edge/ AC-5 | | | | | |
|---|---|---|---|---|---|
| Instrument | Manufacturer | Type No. | Serial No. | Cal. Date | Cal. Due Date |
| EMI Receiver | Agilent | N9038A | MY51210196 | 2017.07.16 | 2018.07.15 |
| Pre-Amplifier | Miteq | NSP1800-25 | 1364185 | 2017.05.03 | 2018.05.02 |
| DRG Horn Antenna | ETS-Lindgren | 3117 | 00167055 | 2017.07.12 | 2018.07.11 |
| Broad-Band Horn Antenna | Schwarzbeck | BBHA9170 | 294 | 2017.09.18 | 2018.09.17 |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 106 | AC5-C1 | 2017.02.28 | 2018.02.27 |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 106 | AC5-C2 | 2017.02.28 | 2018.02.27 |
| Temperature/Humidity Meter | Zhichen | ZC1-2 | AC5-TH | 2017.01.05 | 2018.01.04 |
| Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards. | | | | | |

## 6.2. Test Setup

Above 1GHz Test Setup:



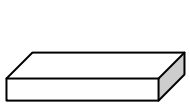
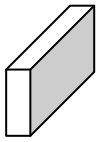
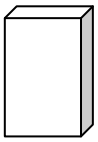
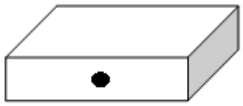
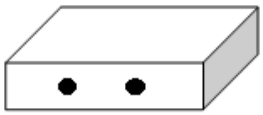

## 6.3. Limit

| Band edge Limit | | | | |
|---|---|---|---|---|
| Frequency bands (MHz) | Detector | Limit (dB $\mu$ V/m) | RBW (MHz) | Distance (m) |
| 2310-2390<br>2483.5-2500 | PK | 74 | 1 | 3 |
| | AV | 54 | 1 | 3 |
| Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits. | | | | |

## 6.4. Test Procedure

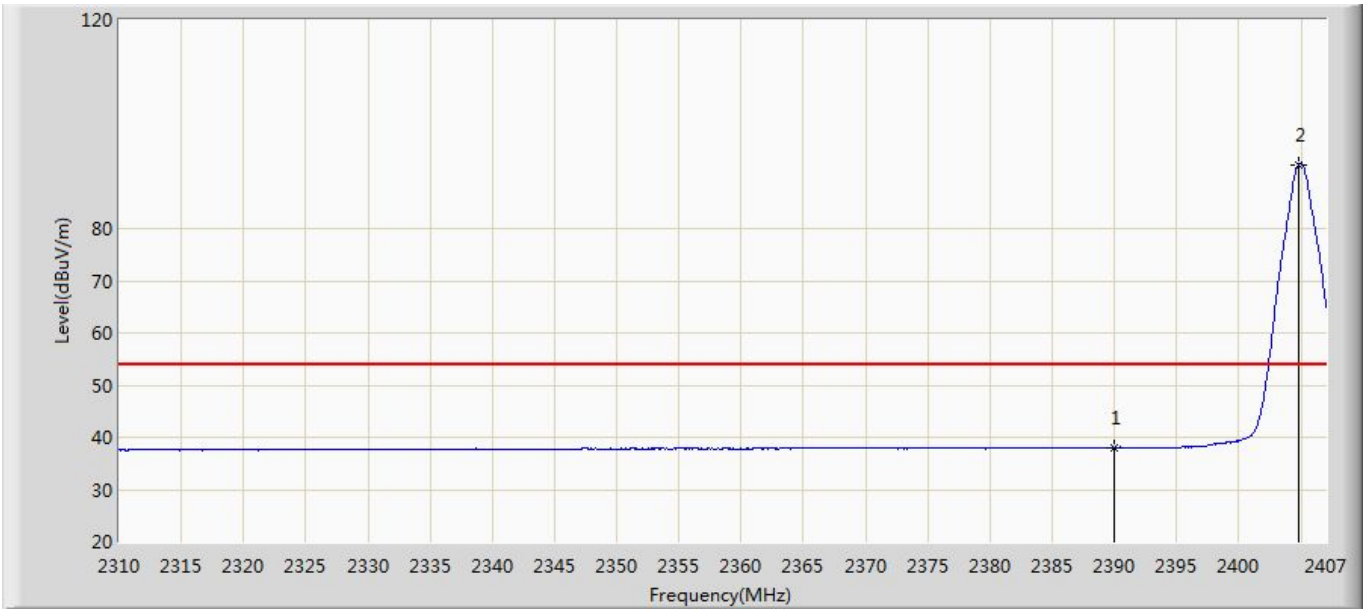
| Test Method | | | | | | |
|---|---|---|---|---|---|---|
| | References Rule | | | | Chapter | Description |
| ☒ | ANSI C63.10 | | | | 6.10 | Band-edge testing |
| | ☒ | ANSI C63.10 | | | 6.10.5 | Restricted-band band-edge measurements |
| | ☐ | ANSI C63.10 | | | 6.10.6 | Marker-delta method |
| ☒ | ANSI C63.10 | | | | 11.12 | Emissions in restricted frequency bands |
| | ☒ | ANSI C63.10 | | | 11.12.1 | Radiated emission measurements |
| | ☒ | ANSI C63.10 | | | 11.12.2.7 | Radiated spurious emission test |
| ☐ | ANSI C63.10 | | | | 6.4 | Radiated emissions from unlicensed wireless devices below 30 MHz |
| ☐ | ANSI C63.10 | | | | 6.5 | Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz |
| ☒ | ANSI C63.10 | | | | 6.6 | Radiated emissions from unlicensed wireless devices above 1 GHz |
| | | ☐ | ANSI C63.10 | | 11.12.2.3 | Quasi-peak measurement procedure |
| | | ☒ | ANSI C63.10 | | 11.12.2.4 | Peak power measurement procedure |
| | | ☒ | ANSI C63.10 | | 11.12.2.5 | Average power measurement procedures |
| | | | ☐ | ANSI C63.10 | 11.12.2.5.1 | Trace averaging with continuous EUT transmission at full power |
| | | | ☐ | ANSI C63.10 | 11.12.2.5.2 | Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction |
| | | | ☒ | ANSI C63.10 | 11.12.2.5.3 | Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold |

## 6.5. EUT test definition

<table>
<tr><td>Item</td><td colspan="4">Radiated Emission Band Edge</td></tr>
<tr><td rowspan="2">Device Category</td><td>☒</td><td colspan="3">Fixed position use</td></tr>
<tr><td>☐</td><td colspan="3">Mobile position use</td></tr>
<tr><td>Test mode</td><td colspan="4">Mode 1</td></tr>
<tr><td rowspan="11">Test method</td><td>☐</td><td colspan="3">Radiated</td></tr>
<tr><td rowspan="3"></td><td>X Axis</td><td>Y Axis</td><td>Z Axis</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Worst Axis ☒</td><td>Worst Axis ☐</td><td>Worst Axis ☐</td></tr>
<tr><td>☐</td><td colspan="3">Conducted</td></tr>
<tr><td>☐</td><td colspan="3">Chain 1</td></tr>
<tr><td></td><td colspan="3">  </td></tr>
<tr><td>☐</td><td>Chain 1</td><td colspan="2">Chain 2</td></tr>
<tr><td></td><td colspan="3">  </td></tr>
<tr><td>☐</td><td>Chain 1</td><td>Chain 2</td><td>Chain 3</td></tr>
<tr><td></td><td colspan="3">  </td></tr>
</table>

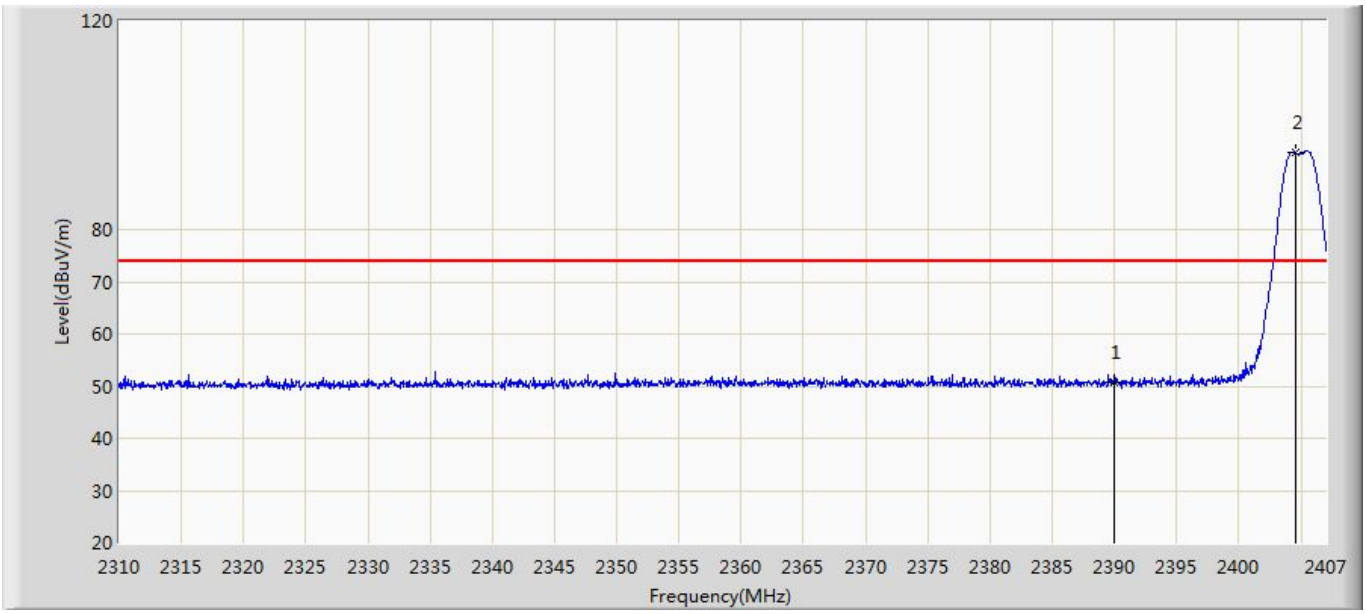
## 6.6. Test Result

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 09:53 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2405MHz by zigbee | |



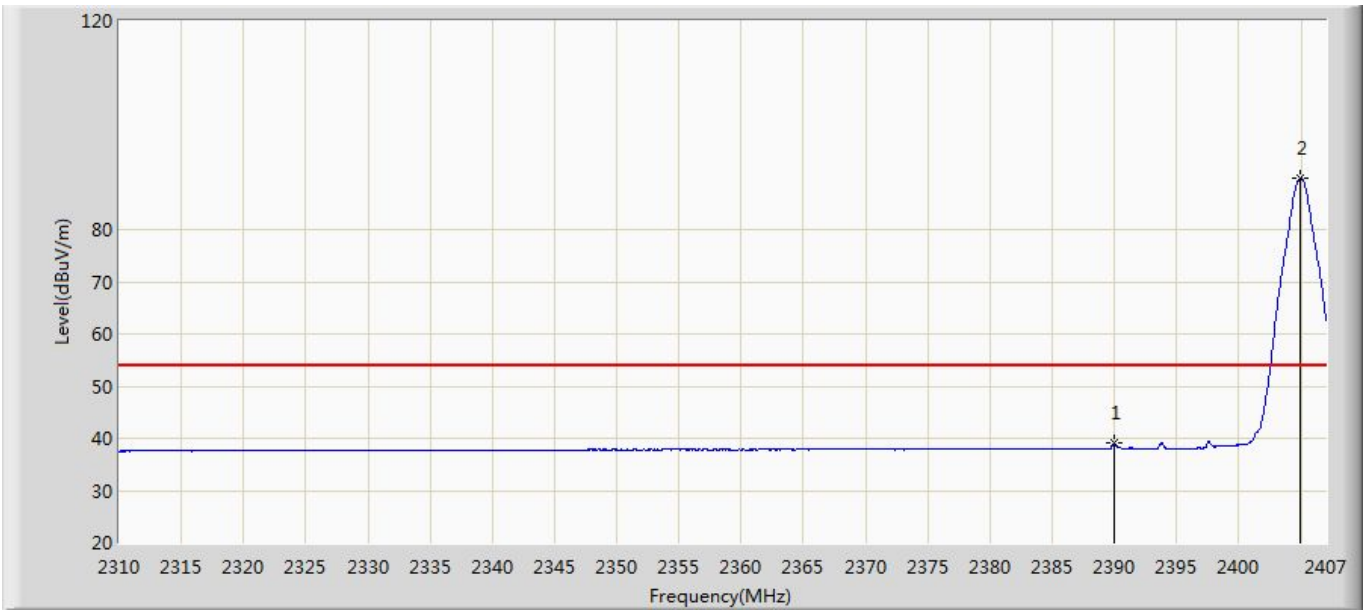

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2390.000 | 38.043 | 2.361 | -15.957 | 54.000 | 35.682 | AV |
| 2 | * | 2404.817 | 92.227 | 56.507 | N/A | N/A | 35.721 | AV |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 09:59 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2405MHz by zigbee | |



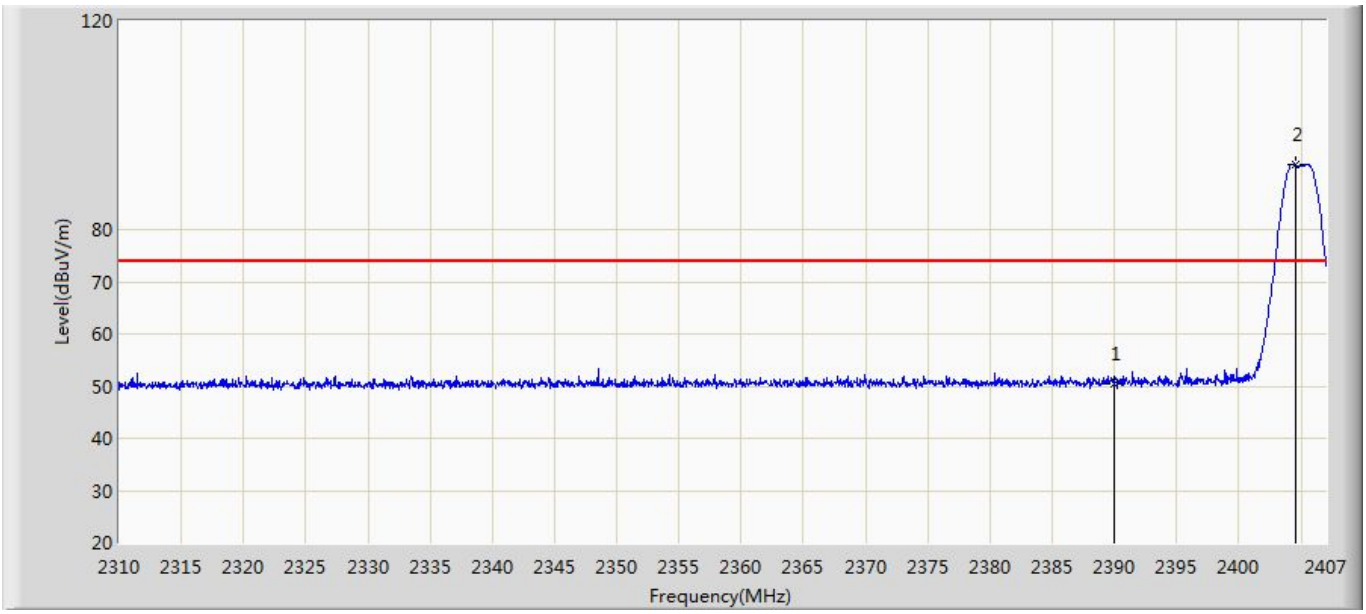

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2390.000 | 50.841 | 15.159 | -23.159 | 74.000 | 35.682 | PK |
| 2 | * | 2404.527 | 94.832 | 59.112 | N/A | N/A | 35.719 | PK |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:02 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2405MHz by zigbee | |



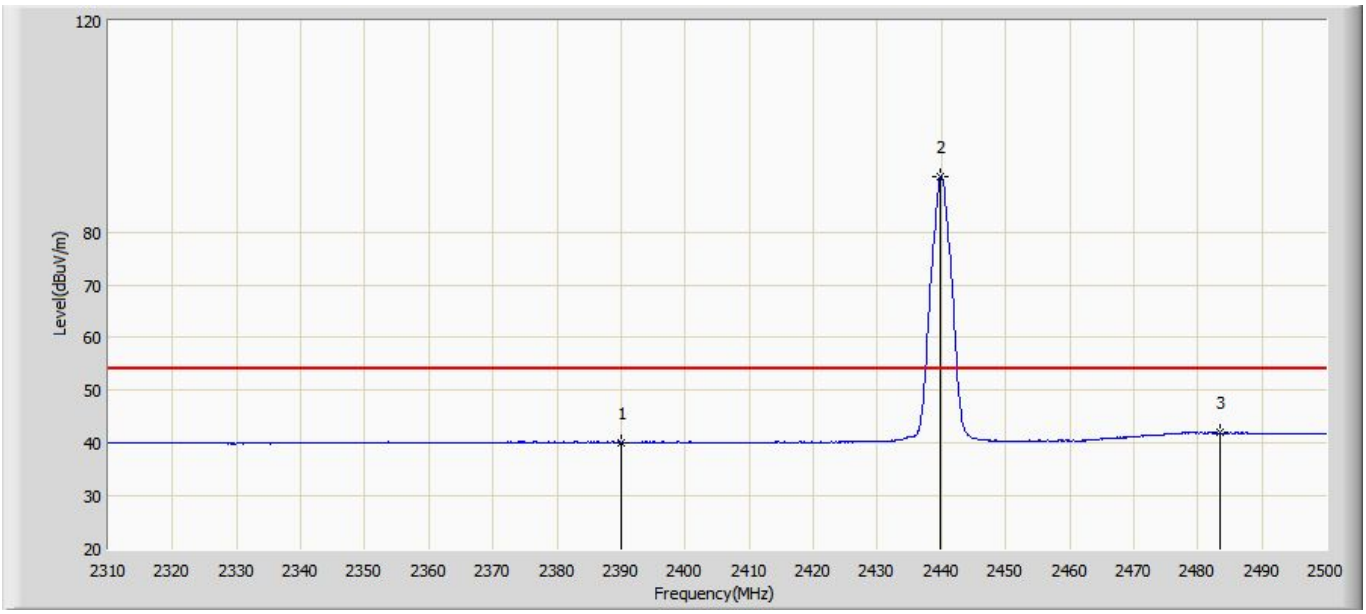

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2390.000 | 39.088 | 3.406 | -14.912 | 54.000 | 35.682 | AV |
| 2 | * | 2404.915 | 89.726 | 54.005 | N/A | N/A | 35.721 | AV |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:03 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2405MHz by zigbee | |



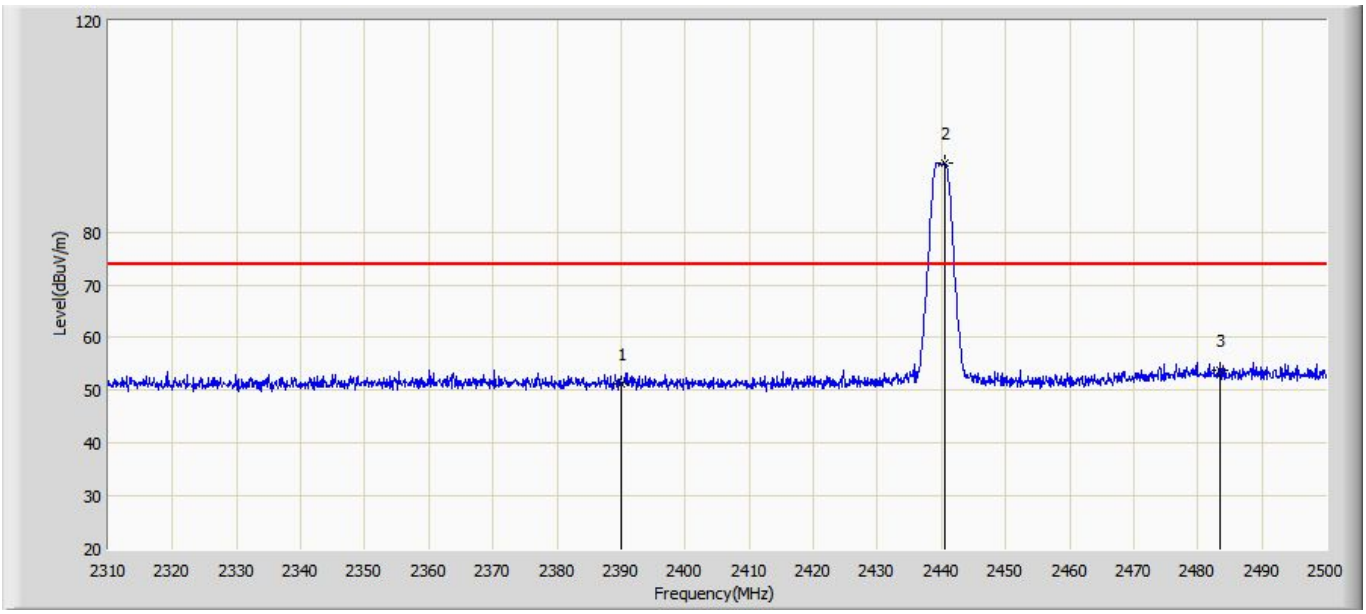

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2390.000 | 50.400 | 14.718 | -23.600 | 74.000 | 35.682 | PK |
| 2 | * | 2404.527 | 92.368 | 56.648 | N/A | N/A | 35.719 | PK |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:05 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2440MHz by zigbee | |



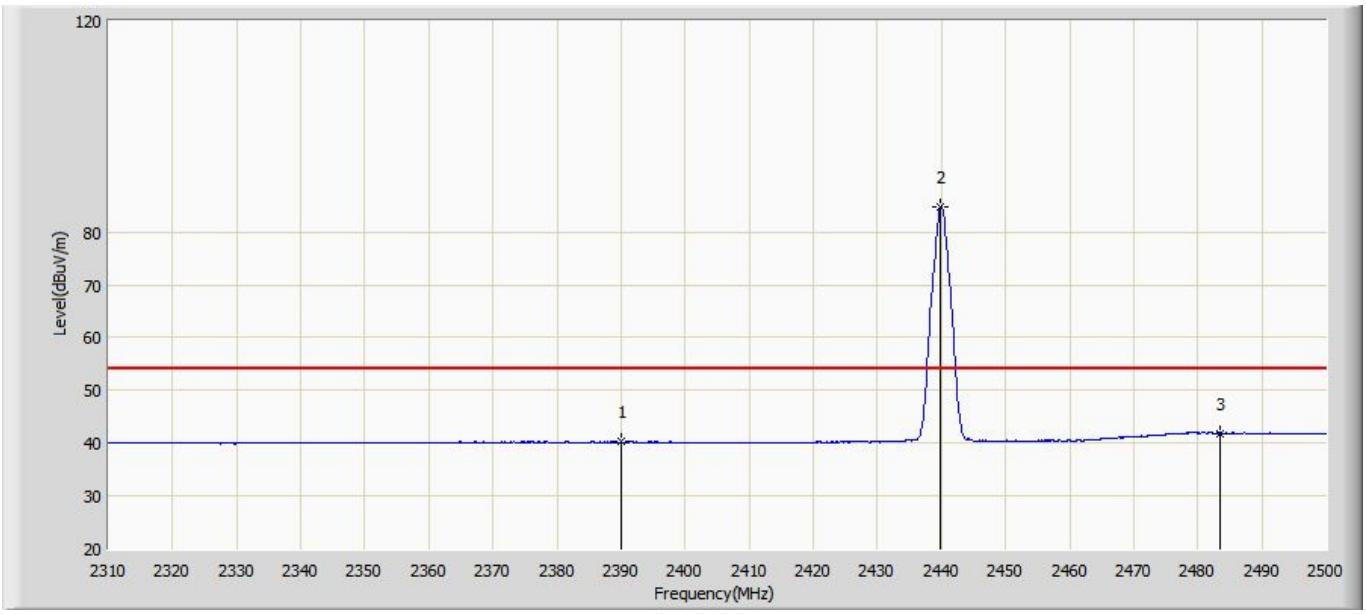

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2390.000 | 40.088 | 11.040 | -13.912 | 54.000 | 29.048 | AV |
| 2 | * | 2439.865 | 90.417 | 61.483 | N/A | N/A | 28.934 | AV |
| 3 | | 2483.500 | 41.942 | 11.458 | -12.058 | 54.000 | 30.484 | AV |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:18 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2440MHz by zigbee | |



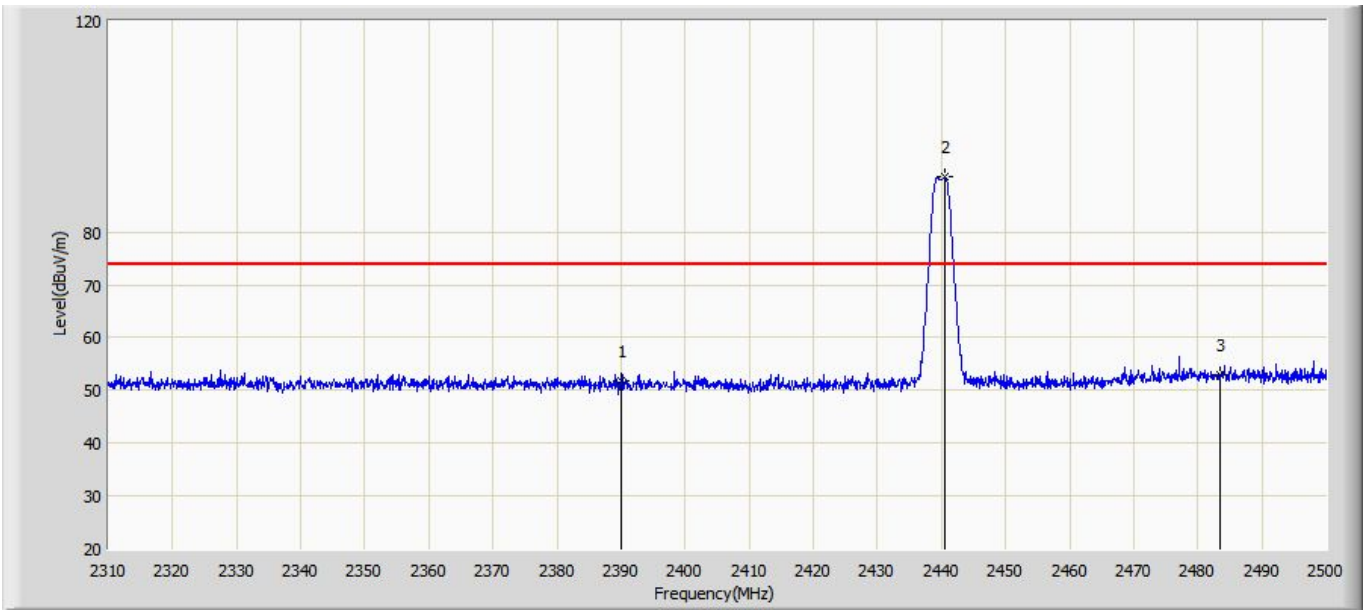

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2390.000 | 51.165 | 22.117 | -22.835 | 74.000 | 29.048 | PK |
| 2 | * | 2440.435 | 93.032 | 64.099 | N/A | N/A | 28.933 | PK |
| 3 | | 2483.500 | 53.837 | 23.352 | -20.163 | 74.000 | 30.484 | PK |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:20 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2440MHz by zigbee | |



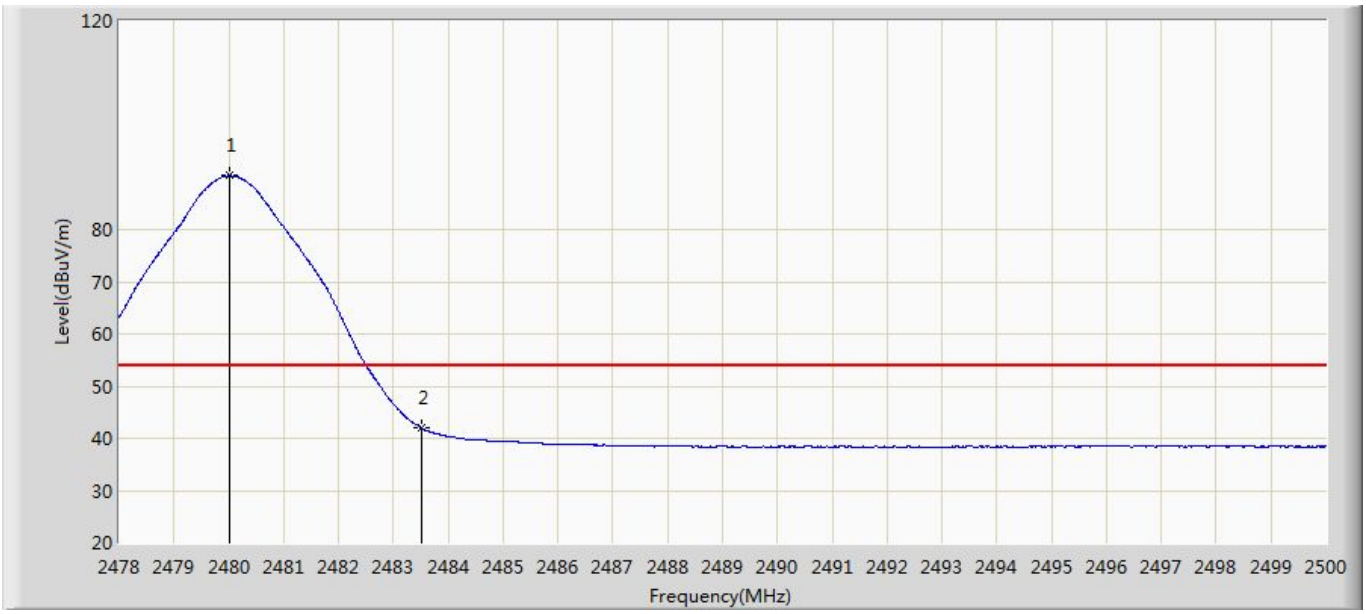

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2390.000 | 40.201 | 11.153 | -13.799 | 54.000 | 29.048 | AV |
| 2 | * | 2439.865 | 84.763 | 55.829 | N/A | N/A | 28.934 | AV |
| 3 | | 2483.500 | 41.876 | 11.392 | -12.124 | 54.000 | 30.484 | AV |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:22 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2440MHz by zigbee | |



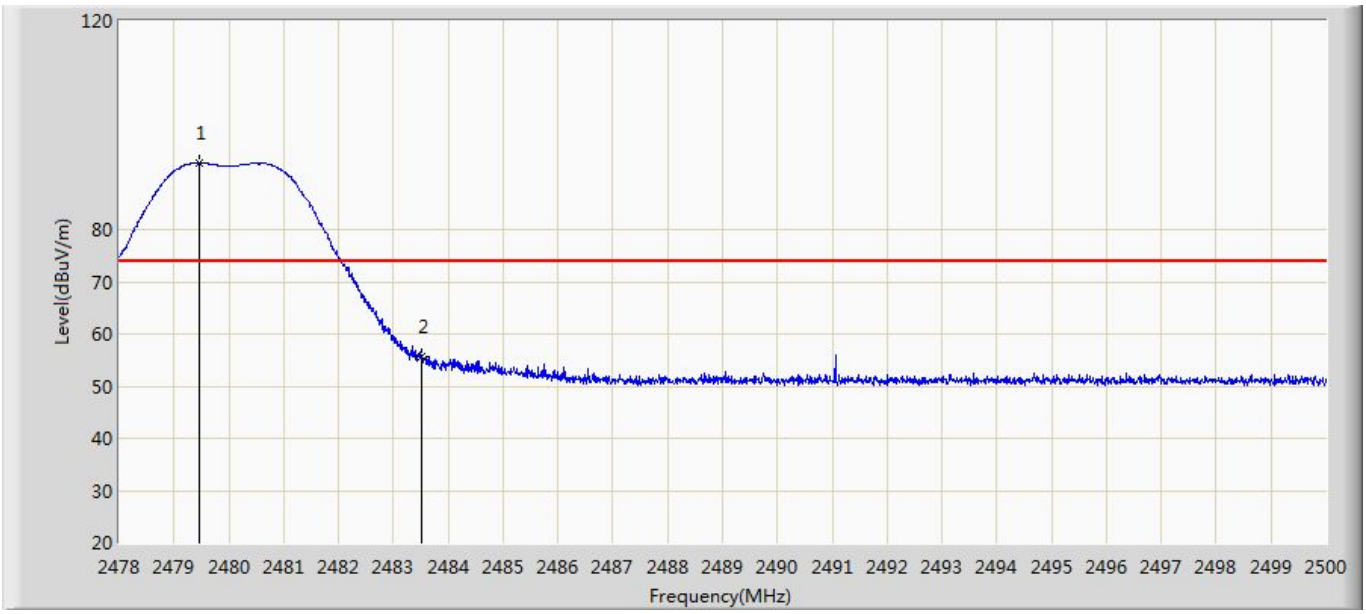

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | | 2390.000 | 51.718 | 22.670 | -22.282 | 74.000 | 29.048 | PK |
| 2 | * | 2440.435 | 90.473 | 61.540 | N/A | N/A | 28.933 | PK |
| 3 | | 2483.500 | 52.875 | 22.391 | -21.125 | 74.000 | 30.484 | PK |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:24 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2480MHz by zigbee | |



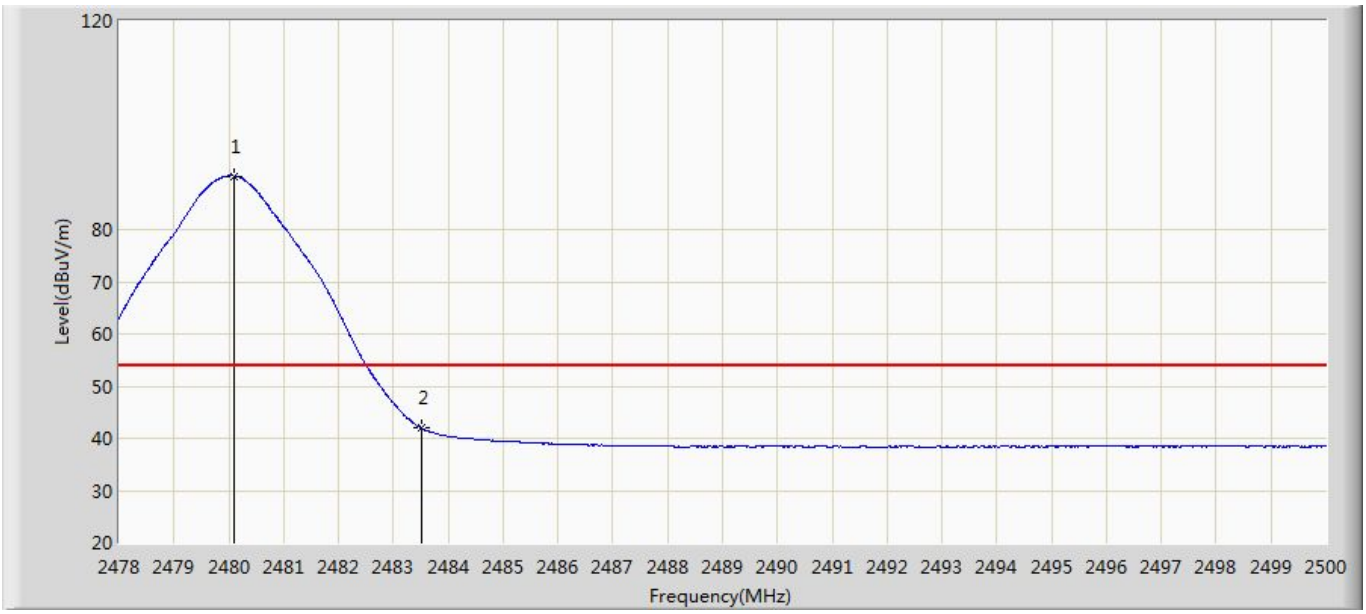

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 2480.024 | 90.311 | 54.444 | N/A | N/A | 35.866 | AV |
| 2 | | 2483.500 | 41.997 | 6.105 | -12.003 | 54.000 | 35.891 | AV |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:27 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Horizontal |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2480MHz by zigbee | |



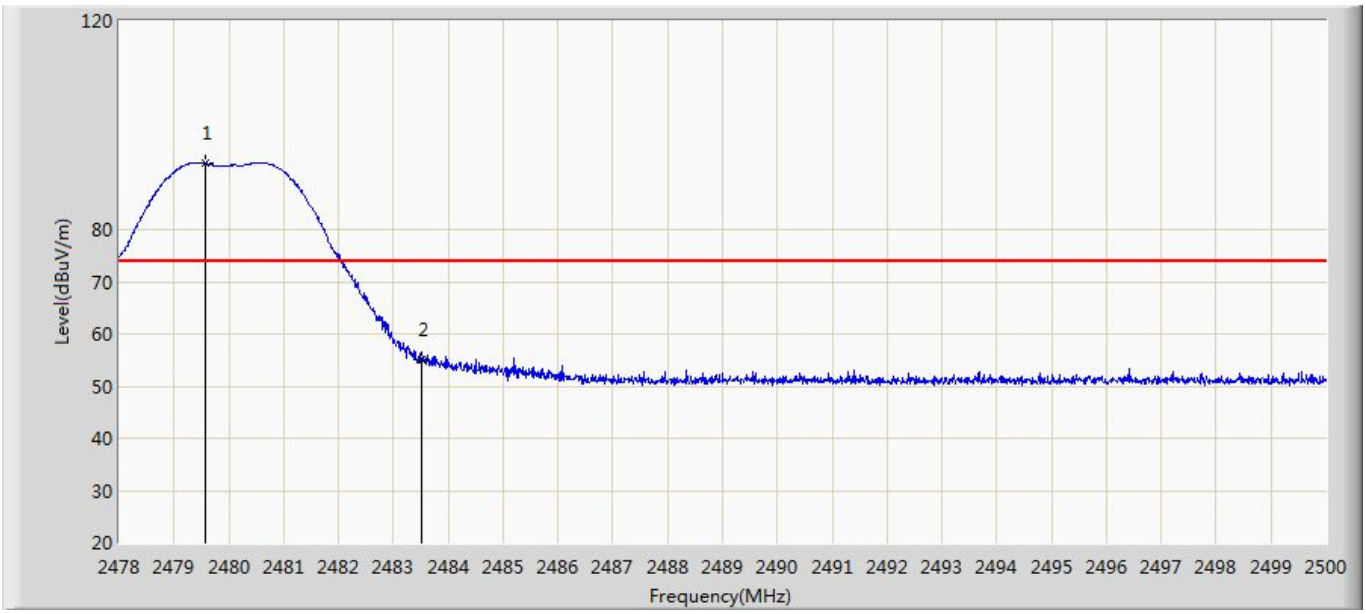

| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 2479.474 | 92.845 | 56.982 | N/A | N/A | 35.863 | PK |
| 2 | | 2483.500 | 55.527 | 19.635 | -18.473 | 74.000 | 35.891 | PK |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:28 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2480MHz by zigbee | |




| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 2480.090 | 90.282 | 54.415 | N/A | N/A | 35.867 | AV |
| 2 | | 2483.500 | 41.951 | 6.059 | -12.049 | 54.000 | 35.891 | AV |

| | |
|---|---|
| Engineer: Slark | |
| Site: AC5 | Time: 2017/11/07 - 10:30 |
| Limit: FCC_Part15.209_RE(3m) | Margin: 0 |
| Probe: Horn_3117_00167055(1-18GHz) | Polarity: Vertical |
| EUT: LED lamp | Power: AC 120V/60Hz |
| Note: Mode 1:Transmit at 2480MHz by zigbee | |




| No | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|---|---|---|---|---|---|---|---|---|
| 1 | * | 2479.573 | 92.734 | 56.871 | N/A | N/A | 35.864 | PK |
| 2 | | 2483.500 | 55.173 | 19.281 | -18.827 | 74.000 | 35.891 | PK |

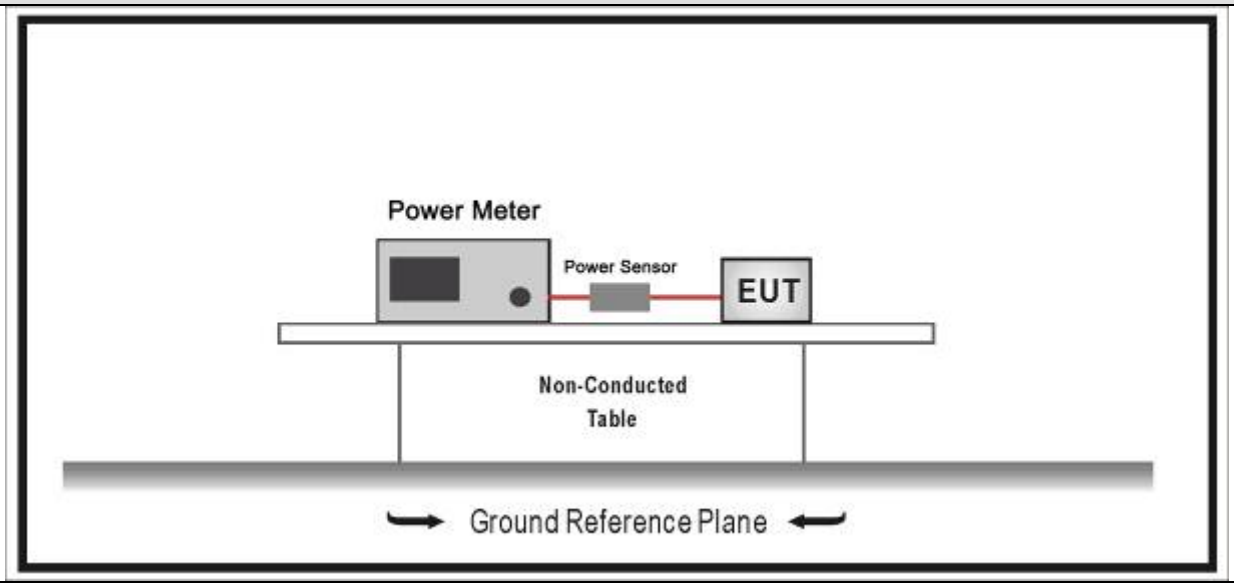
# 7. Fundamental emission output power

## 7.1. Test Equipment

| Fundamental emission output power/ TR-8 | | | | | |
|---|---|---|---|---|---|
| Instrument | Manufacturer | Type No. | Serial No. | Cal. Date | Cal. Due Date |
| Spectrum Analyzer | Agilent | E4446A | MY45300103 | 2017.01.03 | 2018.01.02 |
| Spectrum Analyzer | Agilent | N9010A | MY48030494 | 2017.02.04 | 2018.02.03 |
| Wideband Peak Power Meter | Anritsu | ML2495A | 0905006 | 2017.10.14 | 2018.10.13 |
| Power Sensor | Anritsu | MA2411B | 0846014 | 2017.10.14 | 2018.10.13 |
| Temperature/Humidity Meter | zhicheng | ZC1-2 | TR8-TH | 2017.04.10 | 2018.04.09 |
| Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards. | | | | | |

## 7.2. Test Setup

Fundamental emission output power test setup



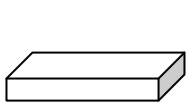
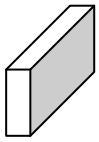
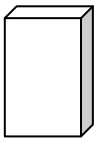
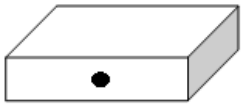
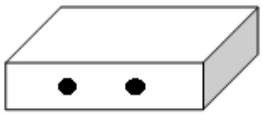
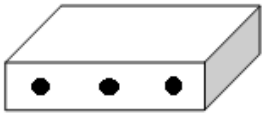
## 7.3. Limit

| Fundamental emission output power Limit | | | |
|---|---|---|---|
| ☒ | $G_{TX}$ ＜6dBi | | $P_{out}$≤30dBm |
| ☐ | $G_{TX}$ ＞6dBi | | |
| | ☐ | Non-Fix point-point | $P_{out}$≤30-( $G_{TX}$ -6) |
| | ☐ | Fix point-point | $P_{out}$≤30-[($G_{TX}$-6)]/3 |
| | ☐ | emits multiple directional beams but does not do emit multiple directional beams simultaneously | $P_{out}$≤30-[($G_{TX}$-6)]/3 |
| | ☐ | operates simultaneously on multiple directional beams using the same or different frequency channels | $P_{out}$≤30-[($G_{TX}$-6)]/3+8dB |
| | ☐ | single directional beam | $P_{out}$≤30-[($G_{TX}$-6)]/3 |
| Note 1 : $G_{TX}$ directional gain of transmitting antennas.<br>Note 2 : $P_{out}$ is maximum peak conducted output power . | | | |

## 7.4. Test Procedure

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

## 7.5. EUT test definition

<table>
<tr><td>Item</td><td colspan="4">Fundamental emission output power</td></tr>
<tr><td rowspan="2">Device Category</td><td>☒</td><td colspan="3">Fixed position use</td></tr>
<tr><td>☐</td><td colspan="3">Mobile position use</td></tr>
<tr><td>Test mode</td><td colspan="4">Mode 1</td></tr>
<tr><td rowspan="12">Test method</td><td>☐</td><td colspan="3">Radiated</td></tr>
<tr><td rowspan="3"></td><td>X Axis</td><td>Y Axis</td><td>Z Axis</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Worst Axis ☐</td><td>Worst Axis ☐</td><td>Worst Axis ☐</td></tr>
<tr><td>☒</td><td colspan="3">Conducted</td></tr>
<tr><td>☒</td><td colspan="3">Chain 1</td></tr>
<tr><td></td><td colspan="3">  </td></tr>
<tr><td>☐</td><td>Chain 1</td><td colspan="2">Chain 2</td></tr>
<tr><td></td><td colspan="3">  </td></tr>
<tr><td>☐</td><td>Chain 1</td><td>Chain 2</td><td>Chain 3</td></tr>
<tr><td></td><td colspan="3">  </td></tr>
</table>

## 7.6. Test Result

| | | | | | |
|---|---|---|---|---|---|
| Product Name | : | LED lamp | Power | : | AC 120V/60Hz |
| Test Mode | : | Mode 1 | Test Site | : | TR8 |
| Mode No. | : | 9290018215 | Test Date | : | 2017.11.30 |

| Mode | Channel | Test Frequency (MHz) | Average Power Output (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|---|
| 1 | 11 | 2405 | 8.06 | 30 | Pass |
| 1 | 18 | 2440 | 7.44 | 30 | Pass |
| 1 | 26 | 2480 | 6.56 | 30 | Pass |

The End