

# FCC/ISED Test Report

**Report No.:** RWAY202300005  
**Applicant:** Hengdian Group Tospo Lighting CO.,Ltd  
**Address:** Hengdian Electronic Industrial Zone, Dongyang City, Zhejiang Province, P.R.China  
**Product Name:** LED Fixture  
**Product Model:** CNY LED ALO SWW2 UVOLT PE PIR DDB  
**Multiple Models:** CNY LED ALO SWW2 UVOLT PE PIR WH  
**Trade Mark:** TOSPO  
**FCC ID:** 2AZJ6CNY969229  
**IC:** 26082-CNY284HU8  
**Standards:** FCC CFR Title 47 Part 15C (§15.249)  
RSS-GEN Issue 5, February 2021 Amendment 2  
RSS-210 Issue 10, April 2020 Amendment  
**Test Date:** 22 Nov, 2023 to 25 Nov, 2023  
**Test Result:** Complied  
**Report Date:** 27 Nov, 2023  
**Reviewed by:**

*Abel chen*

**Approved by:**

*Jacob Kong*

Abel Chen  
Project Engineer

Jacob Kong  
Manager

**Prepared by:**

World Alliance Testing and Certification (Shenzhen) Co., Ltd  
No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen,  
Guangdong, People's Republic of China



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## Revision History

| Version No. | Issued Date  | Description |
|-------------|--------------|-------------|
| 00          | 27 Nov, 2023 | Original    |

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# 1 General Information

## 1.1 Client Information

|               |  |
|---------------|--|
| Applicant:    | Hengdian Group Tospo Lighting CO.,Ltd  |
| Address:      | Hengdian Electronic Industrial Zone, Dongyang City, Zhejiang Province, P.R.China |
| Manufacturer: | Hengdian Group Tospo Lighting CO.,Ltd  |
| Address:      | Hengdian Electronic Industrial Zone, Dongyang City, Zhejiang Province, P.R.China |

## 1.2 Product Description of EUT

The EUT is LED Fixture that contains a 5.8G SRD radio, this report covers the full testing of the 5.8G SRD radio.

|                                    |   |
|------------------------------------|---|
| HVIN                               | CNY969229, CNY969230  |
| Sample Serial Number               | 2DIS-1 for Low channel, 2DIS-2 for middle channel, 2DIS-3 for High channel (assigned by WATC) |
| Sample Received Date               | 21 Nov, 2023  |
| Sample Status                      | Good Condition  |
| Frequency Range                    | 5730-5870MHz  |
| Maximum E-field Strength:          | 70.34dBuV/m@3m  |
| Modulation Technology              | CW  |
| Antenna Gain <sup>#</sup>          | 0.35dBi   |
| Spatial Streams <sup>#</sup>       | SISO (1TX, 1RX)   |
| Power Supply                       | AC 120-347V; 50/60Hz  |
| Operating temperature <sup>#</sup> | -40 deg.C to +85 deg.C  |
| Adapter Information                | N/A   |
| Modification                       | Sample No Modification by the test lab  |

## 1.3 Antenna information

### 15.203 requirement:

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

### RSS-GEN Clause 6.8 requirement:

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer. The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

**Device Antenna information:**

The antenna is an internal antenna which cannot replace by end-user. Please see product internal photos for details.

| Antenna type | Antenna gain | Frequency Range | Input impedance |
|--------------|--------------|-----------------|-----------------|
| PCB          | 0.35dBi      | 5725-5875       | 50Ω             |

### 1.4 Related Submittal(s)/Grant(s)

No Related Submittal(s)/Grant(s)

### 1.5 Measurement Uncertainty

| Parameter                          | Expanded Uncertainty<br>(Confidence of 95%(U = 2Uc(y))) |         |
|------------------------------------|---|---------|
| AC Power Lines Conducted Emissions | ±3.14dB   |         |
| Emissions, Radiated                | Below 30MHz   | ±2.78dB |
|                                    | Below 1GHz  | ±4.84dB |
|                                    | Above 1GHz  | ±5.44dB |
| Bandwidth                          | 0.34%   |         |

**Note 1:** The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

**Note 2:** The Decision Rule is based on simple acceptance with ISO Guide 98-4:2012 Clause 8.2 (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

## 1.6 Laboratory Location

World Alliance Testing and Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: [qa@watc.com.cn](mailto:qa@watc.com.cn)

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

## 1.7 Test Methodology

FCC CFR 47 Part 2

FCC CFR 47 Part 15

ANSI C63.10-2020

RSS-GEN Issue 5, February 2021 Amendment 2

## 2 Description of Measurement

### 2.1 Test Configuration

| Operating channels: |                 |             |                 |             |                 |
|---------------------|-----------------|-------------|-----------------|-------------|-----------------|
| Channel No.         | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
| 1                   | 5730            | ...         | ...             | ...         | ...             |
| 2                   | 5731            | 70          | 5799            | 139         | 5868            |
| 3                   | 5732            | 71          | 5800            | 140         | 5869            |
| ...                 | ...             | ...         | ...             | 141         | 5870            |

According to ANSI C63.10-2020 chapter 5.6.1 Table 11 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:

| Lowest channel |                 | Middle channel |                 | Highest channel |                 |
|----------------|-----------------|----------------|-----------------|-----------------|-----------------|
| Channel No.    | Frequency (MHz) | Channel No.    | Frequency (MHz) | Channel No.     | Frequency (MHz) |
| 1              | 5730            | 71             | 5800            | 141             | 5870            |

| Test Mode:                       |   |                |              |
|----------------------------------|---|----------------|--------------|
| Transmitting mode:               | Keep the EUT in continuous transmitting with modulation |                |              |
| Exercise software <sup>#</sup> : | The EUT was configured to transmitting by manufacturer. |                |              |
| Mode                             | Powel Level Setting <sup>#</sup>                        |                |              |
|                                  | Low Channel   | Middle Channel | High Channel |
| SRD                              | Default   | Default        | Default      |

The exercise software and the maximum power setting that provided by manufacturer.

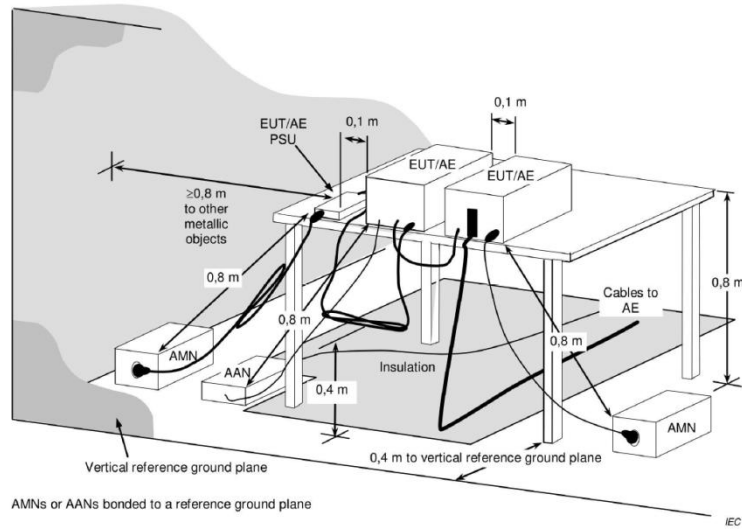
| Worst-Case Configuration:  |
|--|
| For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was recorded in report  |
| For AC power line conducted emission and radiated emission 9kHz-30MHz and above 18GHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario. |

### 2.2 Test Auxiliary Equipment

| Manufacturer | Description | Model | Serial Number |
|--------------|-------------|-------|---------------|
| /            | /           | /     | /             |

## 2.3 Test Setup

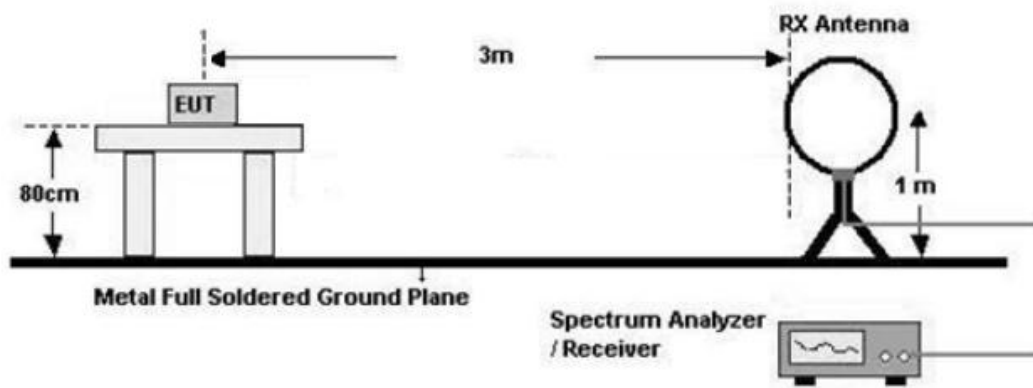
### 1) Conducted emission measurement:



**Note:** The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be  $>0.8$  m.

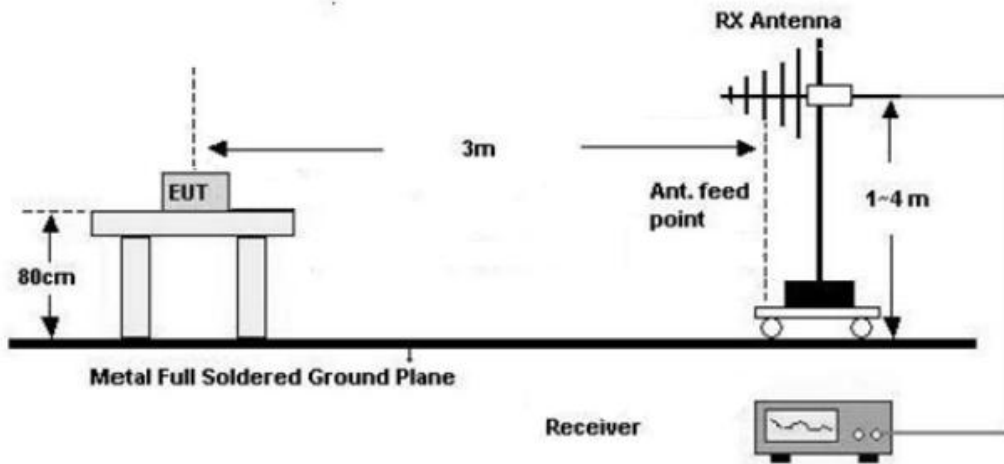
### 2) Radiated emission measurement:

Below 30MHz (3m SAC)

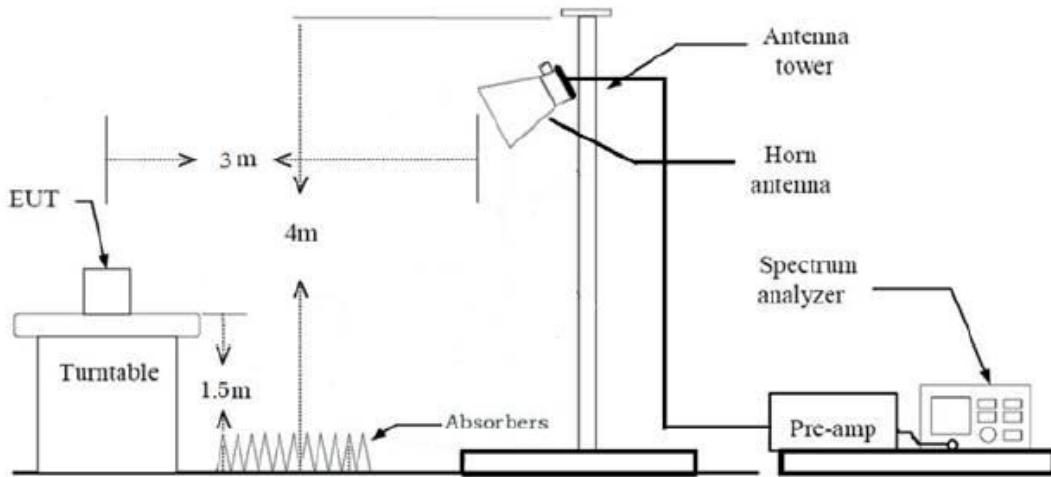




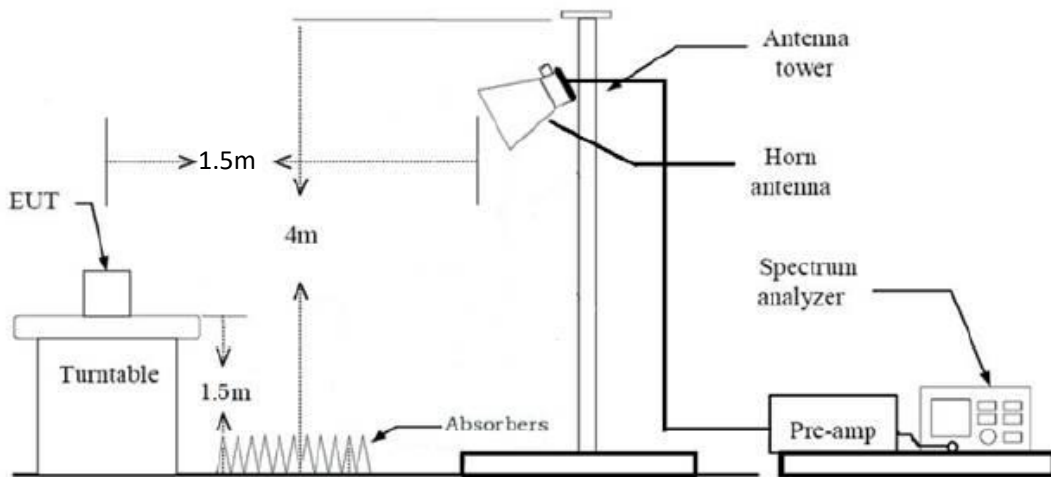
30MHz-1GHz (3m SAC)



1GHz-18GHz(3m FAC)



Above 18GHz (3m FAC)



## 2.4 Test Procedure

### Conducted emission:

1. The E.U.T is placed on a non-conducting table 40cm from the vertical ground plane and 80cm above the horizontal ground plane (Please refer to the block diagram of the test setup and photographs).
2. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
3. Line conducted data is recorded for both Line and Neutral

### Radiated Emission Procedure:

#### a) For below 30MHz

1. All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz- 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were  $40 \cdot \log(\text{test distance} / \text{specification distance})$ .
2. Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, ground-parallel)

#### b) For 30MHz-1GHz:

1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.

#### c) For above 1GHz:

1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m (1-18GHz) and 1.5 m (above 18GHz).
2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.
3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
4. Base on FCC 15.31 (f) (2): 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.

### Bandwidth Test:

1. Use the same setup for radiated above 1GHz, found the maximum fundamental level.

2. Change the spectrum analyzer setting for bandwidth testing
3. Test the bandwidth and record the result

## 2.5 Measurement Method

| Description of Test                                 | Measurement Method                       |
|---|--|
| AC Line Conducted Emissions                         | ANSI C63.10-2020 Section 6.2             |
| 20dB Emission Bandwidth                             | ANSI C63.10-2020 Section 6.9.3           |
| 99% Occupied Bandwidth                              | RSS-GEN Section 6.7                      |
| Field strength of fundamental and Radiated emission | ANSI C63.10-2020 Section 6.3&6.4&6.5&6.6 |

## 2.6 Measurement Equipment

| Manufacturer                           | Description                     | Model       | Management No.   | Calibration Date | Calibration Due Date |
|--|---------------------------------|-------------|------------------|------------------|----------------------|
| <b>AC Line Conducted Emission Test</b> |                                 |             |                  |                  |                      |
| ROHDE& SCHWARZ                         | EMI TEST RECEIVER               | ESR         | 101817           | 2023/7/3         | 2024/7/2             |
| R&S                                    | LISN                            | ENV216      | 101748           | 2023/7/3         | 2024/7/2             |
| N/A                                    | Coaxial Cable                   | NO.12       | N/A              | 2023/7/3         | 2024/7/2             |
| Farad                                  | Test Software                   | EZ-EMC      | Ver.<br>EMEC-3A1 | /                | /                    |
| <b>Radiated Emission Test</b>          |                                 |             |                  |                  |                      |
| R&S                                    | EMI test receiver               | ESR3        | 102758           | 2023/7/3         | 2024/7/2             |
| ROHDE& SCHWARZ                         | SPECTRUM ANALYZER               | FSV40-N     | 101608           | 2023/7/3         | 2024/7/2             |
| SONOMA INSTRUMENT                      | Low frequency amplifier         | 310         | 186014           | 2023/7/12        | 2024/7/11            |
| COM-POWER                              | preamplifier                    | PAM-118A    | 18040152         | 2023/8/21        | 2024/8/20            |
| COM-POWER                              | Amplifier                       | PAM-840A    | 461306           | 2023/8/8         | 2024/8/7             |
| ETS                                    | Passive Loop Antenna            | 6512        | 29604            | 2023/7/7         | 2024/7/6             |
| SCHWARZBECK                            | Log - periodic wideband antenna | VULB 9163   | 9163-872         | 2023/7/7         | 2024/7/6             |
| Astro Antenna Ltd                      | Horn antenna                    | AHA-118S    | 3015             | 2023/7/6         | 2024/7/5             |
| Ducommun technologies                  | Horn Antenna                    | ARH-4223-02 | 1007726-03       | 2023/7/10        | 2024/7/9             |
| Ducommun technologies                  | Horn Antenna                    | ARH-2823-02 | 1007726-03       | 2023/7/10        | 2024/7/9             |
| N/A                                    | Coaxial Cable                   | N/A         | NO.9             | 2023/8/8         | 2024/8/7             |
| N/A                                    | Coaxial Cable                   | N/A         | NO.10            | 2023/8/8         | 2024/8/7             |
| N/A                                    | Coaxial Cable                   | N/A         | NO.11            | 2023/8/8         | 2024/8/7             |
| Audix                                  | Test Software                   | E3          | 191218 V9        | /                | /                    |

Note: All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or International standards.

### 3 Test Results

#### 3.1 Test Summary

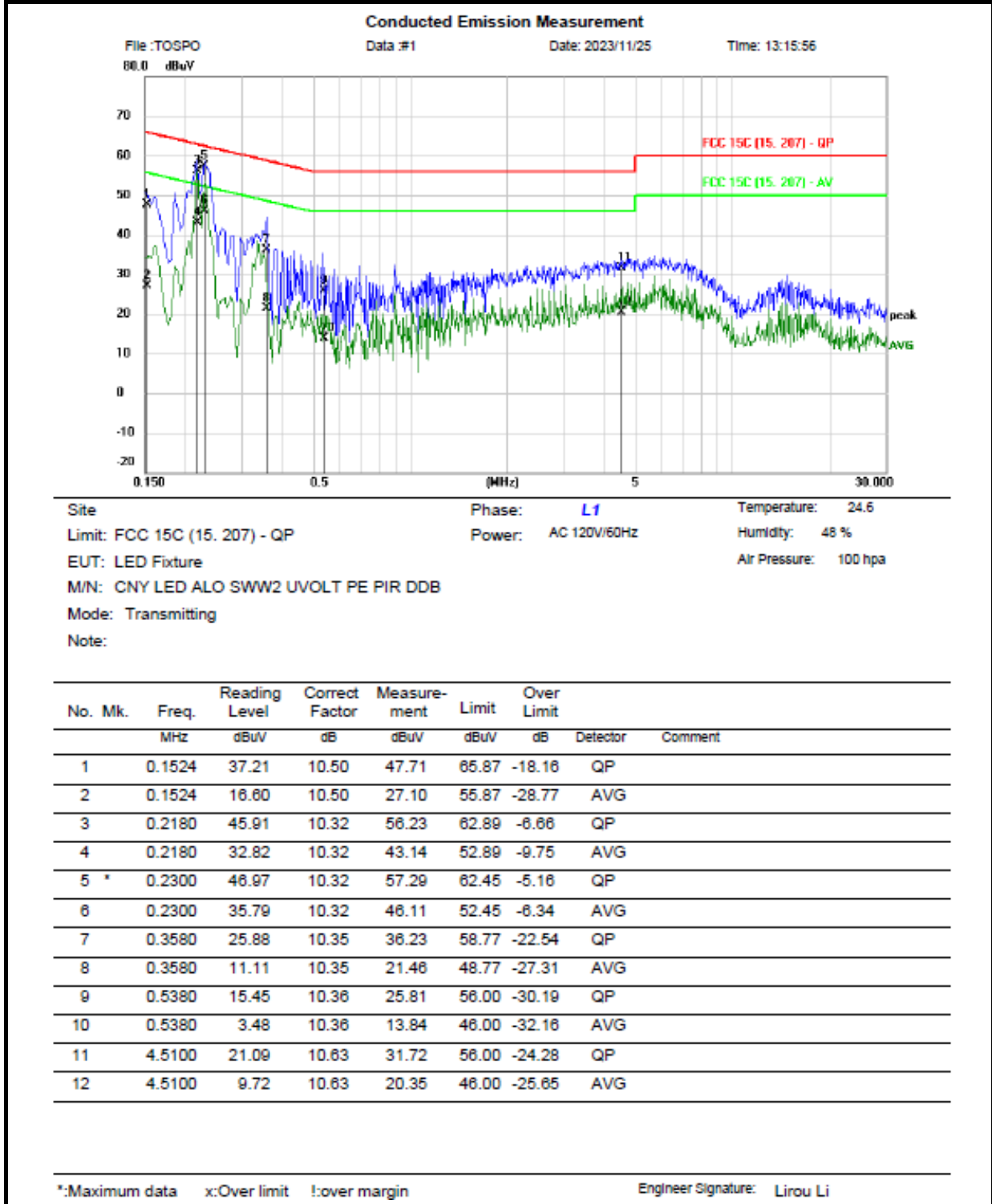
| FCC/ISED Rules   | Description of Test                                 | Result      |
|--|---|-------------|
| FCC §15.203<br>RSS-GEN §6.8  | Antenna Requirement                                 | Compliance  |
| FCC §15.207(a)<br>RSS-GEN §8.8                                       | AC Line Conducted Emissions                         | Compliance  |
| FCC §15.215(c)   | 20dB Emission Bandwidth                             | Report only |
| RSS-GEN §6.7   | 99% Occupied Bandwidth                              | Report only |
| FCC §15.205, §15.209, §15.249<br>RSS-GEN §8.10<br>RSS-210 Annex B.10 | Field strength of fundamental and Radiated emission | Compliance  |

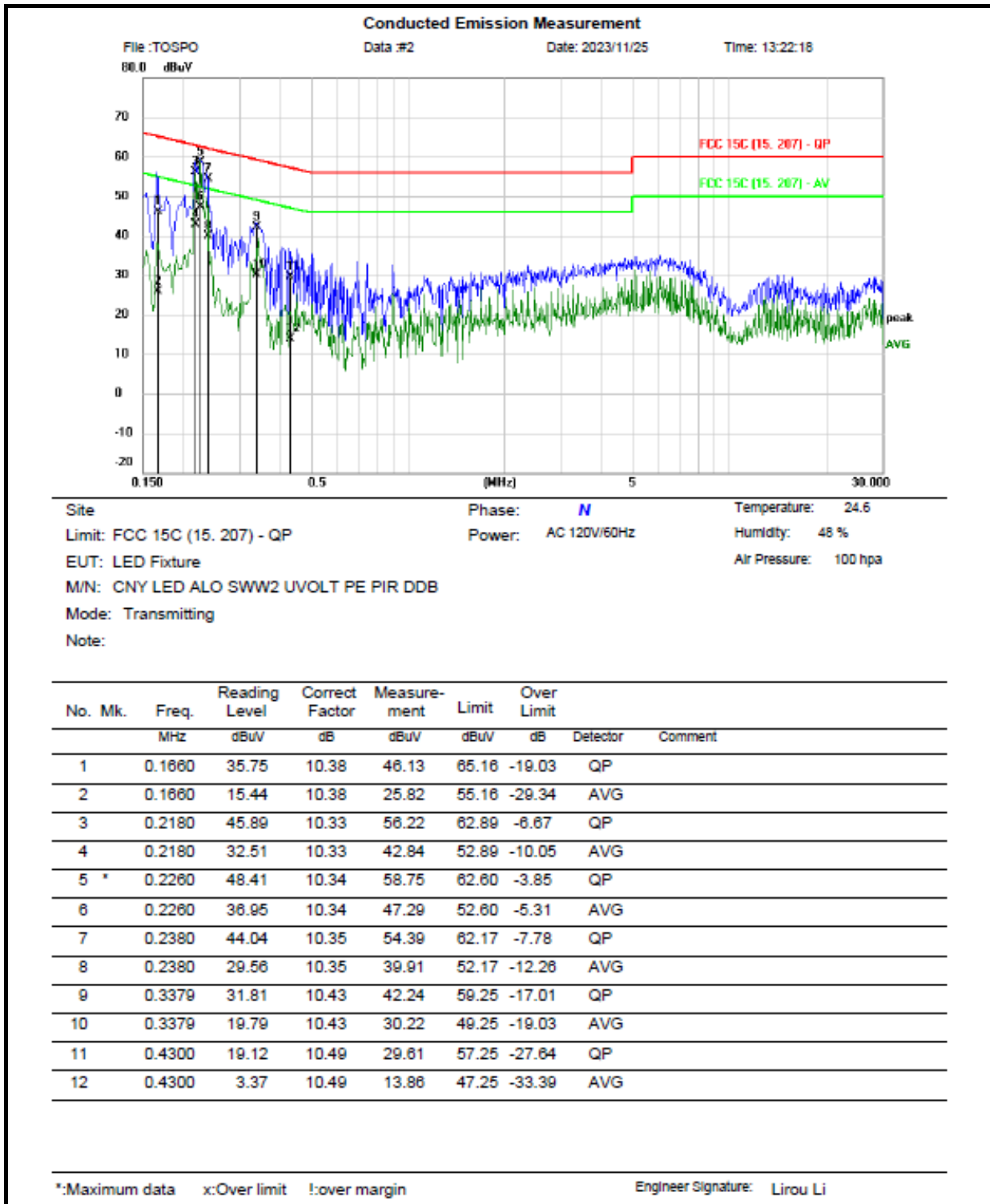
### 3.2 Limit

| Test items  | Limit   |  |  |  |             |    |     |                 |    |     |               |    |     |                |     |      |
|---|---|--|--|--|-------------|----|-----|-----------------|----|-----|---------------|----|-----|----------------|-----|------|
| AC Line Conducted Emissions                         | See details §15.207 (a)   |  |  |  |             |    |     |                 |    |     |               |    |     |                |     |      |
| Field strength of fundamental and Radiated emission | <p>The field strength of fundamental and harmonic emissions measured at 3 m shall not exceed the limits as below:</p> <table border="1" data-bbox="592 477 1428 745"> <thead> <tr> <th data-bbox="596 483 778 551">Fundamental frequency</th> <th data-bbox="778 483 1102 551">Field strength of fundamental (millivolts/meter)</th> <th data-bbox="1102 483 1423 551">Field strength of harmonics (microvolts/meter)</th> </tr> </thead> <tbody> <tr> <td data-bbox="596 562 778 595">902–928 MHz</td> <td data-bbox="778 562 1102 595">50</td> <td data-bbox="1102 562 1423 595">500</td> </tr> <tr> <td data-bbox="596 607 778 640">2400–2483.5 MHz</td> <td data-bbox="778 607 1102 640">50</td> <td data-bbox="1102 607 1423 640">500</td> </tr> <tr> <td data-bbox="596 651 778 685">5725–5875 MHz</td> <td data-bbox="778 651 1102 685">50</td> <td data-bbox="1102 651 1423 685">500</td> </tr> <tr> <td data-bbox="596 696 778 730">24.0–24.25 GHz</td> <td data-bbox="778 696 1102 730">250</td> <td data-bbox="1102 696 1423 730">2500</td> </tr> </tbody> </table> <p>The field strength shall be measured using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using an International Special Committee on Radio Interference (CISPR) quasi-peak detector.</p> <p>Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209/RSS-GEN, whichever is the lesser attenuation.</p> <p>For frequencies above 1000 MHz, the field strength limits in above table are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.</p> | Fundamental frequency                          | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) | 902–928 MHz | 50 | 500 | 2400–2483.5 MHz | 50 | 500 | 5725–5875 MHz | 50 | 500 | 24.0–24.25 GHz | 250 | 2500 |
| Fundamental frequency                               | Field strength of fundamental (millivolts/meter)  | Field strength of harmonics (microvolts/meter) |  |  |             |    |     |                 |    |     |               |    |     |                |     |      |
| 902–928 MHz   | 50  | 500  |  |  |             |    |     |                 |    |     |               |    |     |                |     |      |
| 2400–2483.5 MHz                                     | 50  | 500  |  |  |             |    |     |                 |    |     |               |    |     |                |     |      |
| 5725–5875 MHz                                       | 50  | 500  |  |  |             |    |     |                 |    |     |               |    |     |                |     |      |
| 24.0–24.25 GHz                                      | 250   | 2500   |  |  |             |    |     |                 |    |     |               |    |     |                |     |      |

### 3.3 AC Line Conducted Emissions Test Data

|                               |  |                 |          |
|-------------------------------|--|-----------------|----------|
| <b>Test Date:</b>             | 2023-11-25   | <b>Test By:</b> | Lirou Li |
| <b>Environment condition:</b> | Temperature: 24.5°C; Relative Humidity:48%; ATM Pressure: 100kPa |                 |          |





**Remark:**

Measurement (dBuV)= Reading Level (dBuV) + Correct Factor(dB)

Correct Factor (dB)= LISN Voltage Division Factor (dB)+ Cable loss(dB)

Over = Measurement – Limit



### 3.4 Radiated emission Test Data

9 kHz-30MHz:

|                               |  |                 |         |
|-------------------------------|--|-----------------|---------|
| <b>Test Date:</b>             | 2023-11-22   | <b>Test By:</b> | Luke Li |
| <b>Environment condition:</b> | Temperature: 24°C; Relative Humidity:54%; ATM Pressure: 101kPa |                 |         |

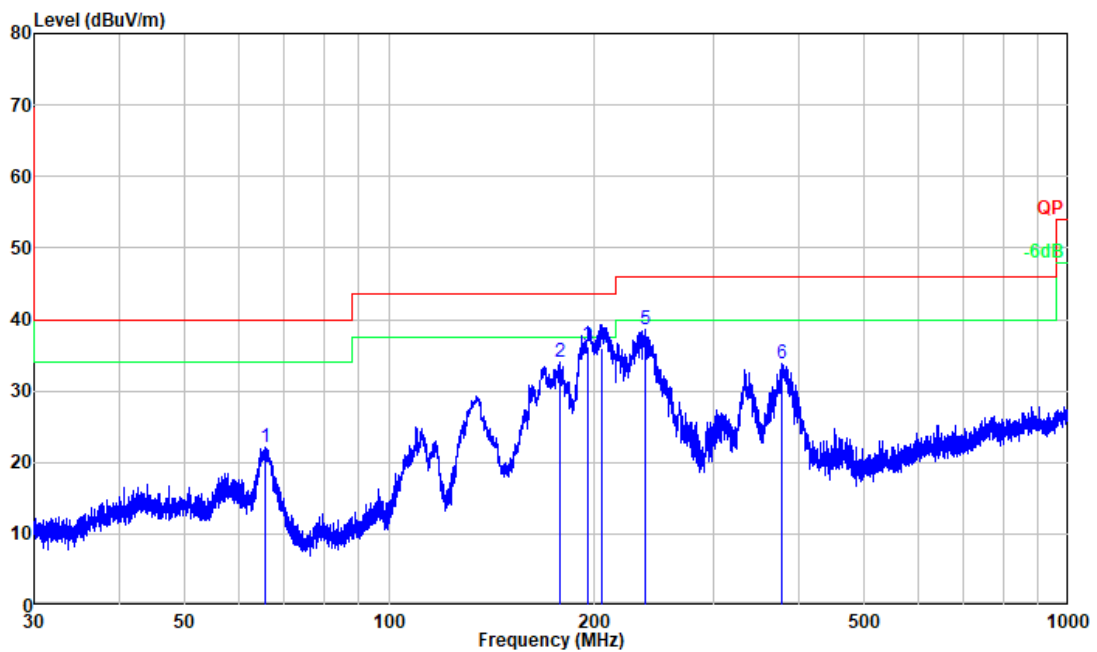
For radiated emissions below 30MHz, there were no emissions found within 20dB of limit.

**30MHz-1GHz:**

|                               |  |                 |         |
|-------------------------------|--|-----------------|---------|
| <b>Test Date:</b>             | 2023-11-22   | <b>Test By:</b> | Luke Li |
| <b>Environment condition:</b> | Temperature: 24°C; Relative Humidity:54%; ATM Pressure: 101kPa |                 |         |

**Low channel**

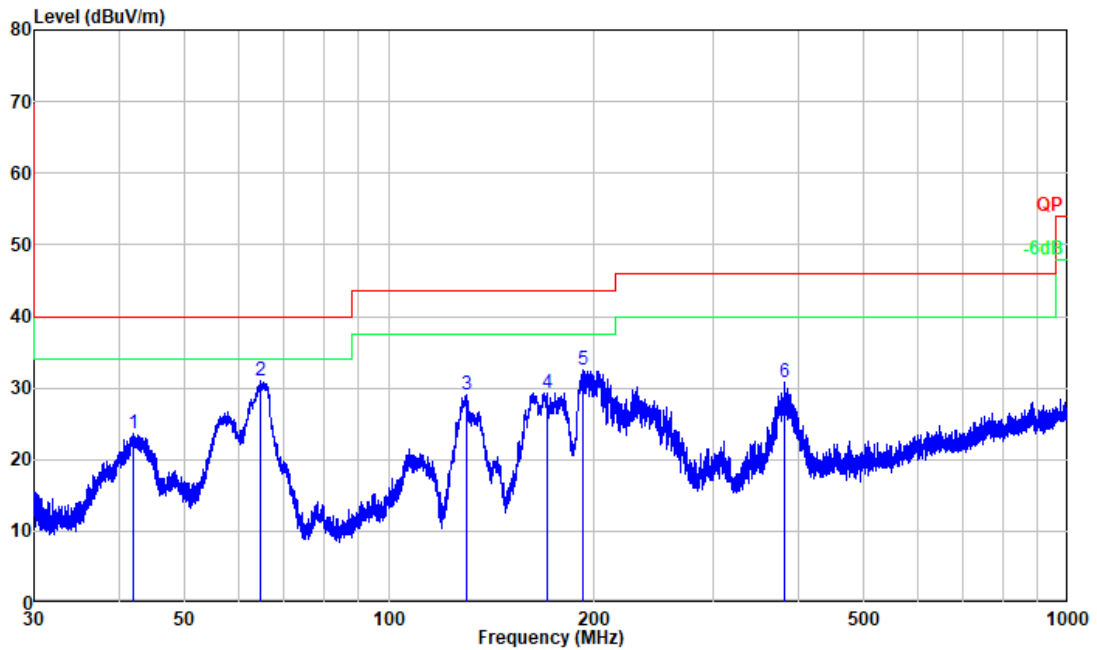
EUT/Model No.: CNY LED ALO SWW2 UVOLT PE PIR DDB  
 Test Mode : Transmitting  
 Test Voltage : AC 120V/60Hz  
 Environment : 24°C/54%R.H./101kPa  
 Tested by : Luke Li  
 Polarization : horizontal  
 Remark : 5730MHz



| --No. | Frequency (MHz) | Reading (dBμV) | Factor (dB/m) | Result (dBμV/m) | Limit (dBμV/m) | Over Limit (dB) | Detector |
|-------|-----------------|----------------|---------------|-----------------|----------------|-----------------|----------|
| 1     | 65.694          | 36.48          | -14.28        | 22.20           | 40.00          | -17.80          | Peak     |
| 2     | 178.329         | 49.56          | -15.57        | 33.99           | 43.50          | -9.51           | Peak     |
| 3     | 195.868         | 50.10          | -13.84        | 36.26           | 43.50          | -7.24           | QP       |
| 4     | 205.634         | 49.60          | -13.62        | 35.98           | 43.50          | -7.52           | QP       |
| 5     | 238.163         | 51.20          | -12.55        | 38.65           | 46.00          | -7.35           | Peak     |
| 6     | 378.870         | 42.80          | -8.94         | 33.86           | 46.00          | -12.14          | Peak     |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

EUT/Model No.: CNY LED ALO SWW2 UVOLT PE PIR DBB  
 Test Mode : Transmitting  
 Test Voltage : AC 120V/60Hz  
 Environment : 24°C/54%R.H./101kPa  
 Tested by : Luke Li  
 Polarization : vertical  
 Remark : 5730MHz

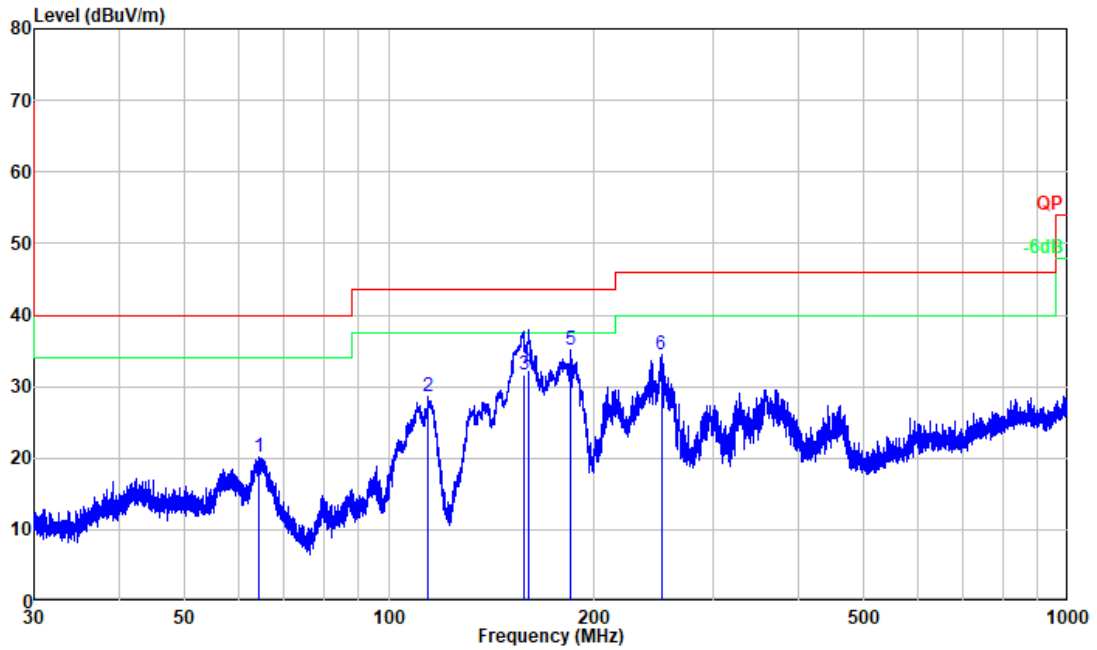


| --No. | Frequency (MHz) | Reading (dB $\mu$ V) | Factor (dB/m) | Result (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Over Limit (dB) | Detector |
|-------|-----------------|----------------------|---------------|-----------------------|----------------------|-----------------|----------|
| 1     | 41.916          | 35.94                | -12.29        | 23.65                 | 40.00                | -16.35          | Peak     |
| 2     | 64.609          | 44.99                | -14.06        | 30.93                 | 40.00                | -9.07           | Peak     |
| 3     | 130.289         | 46.14                | -17.04        | 29.10                 | 43.50                | -14.40          | Peak     |
| 4     | 170.830         | 45.47                | -16.14        | 29.33                 | 43.50                | -14.17          | Peak     |
| 5     | 192.970         | 46.72                | -14.14        | 32.58                 | 43.50                | -10.92          | Peak     |
| 6     | 382.207         | 39.74                | -8.86         | 30.88                 | 46.00                | -15.12          | Peak     |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

**Middle channel**

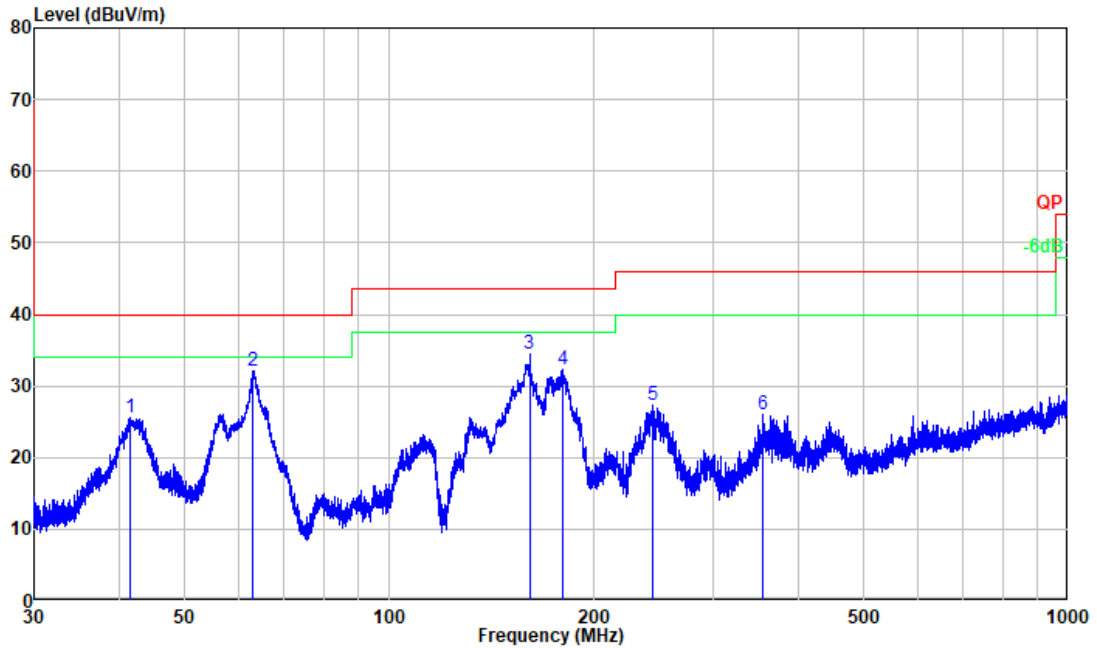
EUT/Model No.: CNY LED ALO SWW2 UVOLT PE PIR DDB  
 Test Mode : Transmitting  
 Test Voltage : AC 120V/60Hz  
 Environment : 24°C/54%R.H./101kPa  
 Tested by : Luke Li  
 Polarization : horizontal  
 Remark : 5800MHz



| --No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector |
|-------|-----------------|----------------|---------------|-----------------|----------------|-----------------|----------|
| 1     | 64.411          | 34.16          | -14.02        | 20.14           | 40.00          | -19.86          | Peak     |
| 2     | 114.233         | 43.14          | -14.57        | 28.57           | 43.50          | -14.93          | Peak     |
| 3     | 157.799         | 48.49          | -16.79        | 31.70           | 43.50          | -11.80          | QP       |
| 4     | 160.590         | 48.90          | -16.62        | 32.28           | 43.50          | -11.22          | QP       |
| 5     | 184.775         | 50.20          | -15.00        | 35.20           | 43.50          | -8.30           | Peak     |
| 6     | 251.578         | 46.57          | -12.18        | 34.39           | 46.00          | -11.61          | Peak     |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

EUT/Model No.: CNY LED ALO SWW2 UVOLT PE PIR DDB  
 Test Mode : Transmitting  
 Test Voltage : AC 120V/60Hz  
 Environment : 24°C/54%R.H./101kPa  
 Tested by : Luke Li  
 Polarization : vertical  
 Remark : 5800MHz

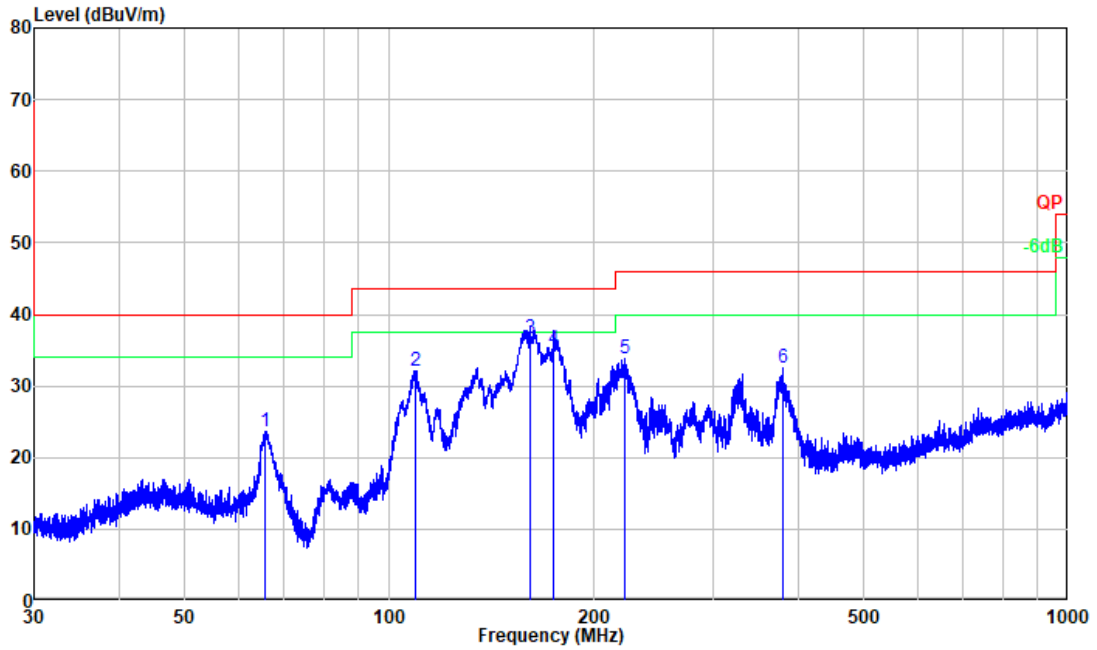


| --No. | Frequency (MHz) | Reading (dB $\mu$ V) | Factor (dB/m) | Result (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Over Limit (dB) | Detector |
|-------|-----------------|----------------------|---------------|-----------------------|----------------------|-----------------|----------|
| 1     | 41.496          | 37.94                | -12.41        | 25.53                 | 40.00                | -14.47          | Peak     |
| 2     | 63.015          | 45.83                | -13.74        | 32.09                 | 40.00                | -7.91           | Peak     |
| 3     | 160.943         | 51.17                | -16.59        | 34.58                 | 43.50                | -8.92           | Peak     |
| 4     | 179.820         | 47.90                | -15.50        | 32.40                 | 43.50                | -11.10          | Peak     |
| 5     | 244.618         | 39.58                | -12.33        | 27.25                 | 46.00                | -18.75          | Peak     |
| 6     | 355.537         | 35.35                | -9.30         | 26.05                 | 46.00                | -19.95          | Peak     |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

**High channel**

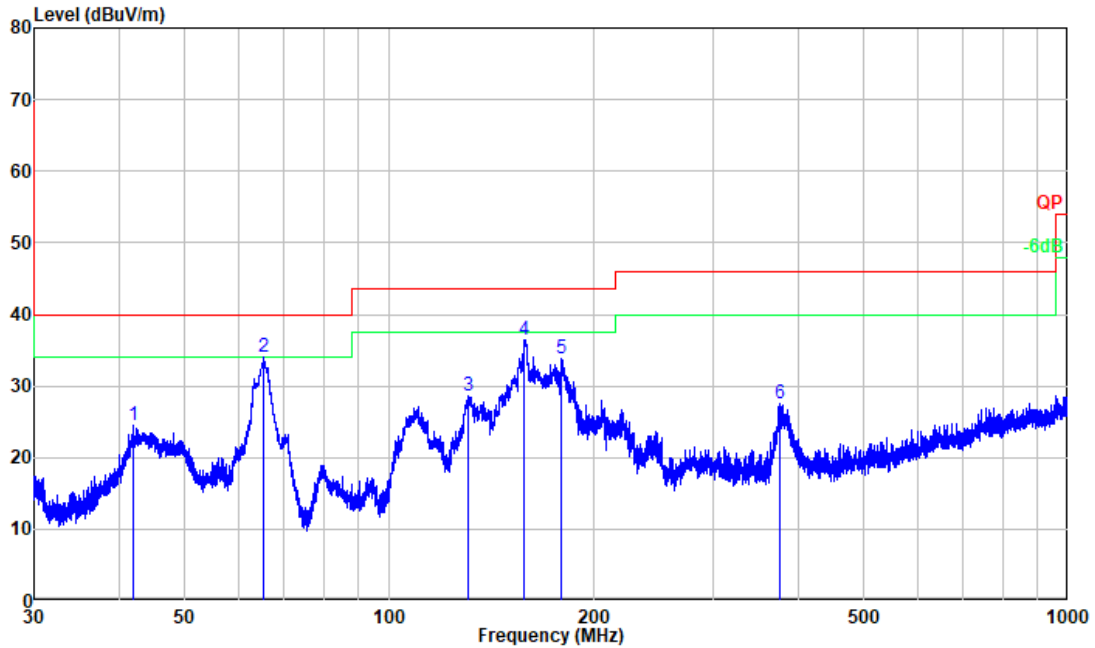
EUT/Model No.: CNY LED ALO SWW2 UVOLT PE PIR DDB  
 Test Mode : Transmitting  
 Test Voltage : AC 120V/60Hz  
 Environment : 24°C/54%R.H./101kPa  
 Tested by : Luke Li  
 Polarization : horizontal  
 Remark : 5870MHz



| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|-------|-----------------|----------------|---------------|-----------------|----------------|-----------------|----------|
| 1     | 65.723          | 37.92          | -14.28        | 23.64           | 40.00          | -16.36          | Peak     |
| 2     | 109.142         | 46.05          | -13.86        | 32.19           | 43.50          | -11.31          | Peak     |
| 3     | 161.084         | 53.20          | -16.58        | 36.62           | 43.50          | -6.88           | QP       |
| 4     | 174.922         | 50.90          | -15.83        | 35.07           | 43.50          | -8.43           | QP       |
| 5     | 222.615         | 47.04          | -13.25        | 33.79           | 46.00          | -12.21          | Peak     |
| 6     | 380.035         | 41.50          | -8.91         | 32.59           | 46.00          | -13.41          | Peak     |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

EUT/Model No.: CNY LED ALO SWW2 UVOLT PE PIR DBB  
 Test Mode : Transmitting  
 Test Voltage : AC 120V/60Hz  
 Environment : 24°C/54%R.H./101kPa  
 Tested by : Luke Li  
 Polarization : vertical  
 Remark : 5870MHz



| --No. | Frequency (MHz) | Reading (dB $\mu$ V) | Factor (dB/m) | Result (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Over Limit (dB) | Detector |
|-------|-----------------|----------------------|---------------|-----------------------|----------------------|-----------------|----------|
| 1     | 42.045          | 36.69                | -12.26        | 24.43                 | 40.00                | -15.57          | Peak     |
| 2     | 65.350          | 48.20                | -14.21        | 33.99                 | 40.00                | -6.01           | Peak     |
| 3     | 130.746         | 45.75                | -17.04        | 28.71                 | 43.50                | -14.79          | Peak     |
| 4     | 158.076         | 53.26                | -16.78        | 36.48                 | 43.50                | -7.02           | Peak     |
| 5     | 179.191         | 49.24                | -15.50        | 33.74                 | 43.50                | -9.76           | Peak     |
| 6     | 375.728         | 36.51                | -9.04         | 27.47                 | 46.00                | -18.53          | Peak     |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

**Remark:**

Level = Reading + Factor

Factor = Antenna factor + Cable loss – Amplifier gain

Over Limit = Result – Limit

**Above 1GHz:**

|                               |  |                 |         |
|-------------------------------|--|-----------------|---------|
| <b>Test Date:</b>             | 2023-11-22   | <b>Test By:</b> | Luke Li |
| <b>Environment condition:</b> | Temperature: 24°C; Relative Humidity:54%; ATM Pressure: 101kPa |                 |         |

| Frequency (MHz) | Reading level (dBµV) | Polar      | Corrected Factor (dB/m) | Corrected Amplitude (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Remark  |
|-----------------|----------------------|------------|-------------------------|------------------------------|----------------|-------------|---------|
| Low Channel     |                      |            |                         |                              |                |             |         |
| 5730.000        | 67.85                | horizontal | 1.58                    | 69.43                        | 94.00          | -24.57      | Average |
| 5730.000        | 68.76                | horizontal | 1.58                    | 70.34                        | 114.00         | -43.66      | Peak    |
| 11460.000       | 36.31                | horizontal | 7.12                    | 43.43                        | 54.00          | -10.57      | Average |
| 11460.000       | 45.36                | horizontal | 7.12                    | 52.48                        | 74.00          | -21.52      | Peak    |
| 5730.000        | 64.66                | vertical   | 1.58                    | 66.24                        | 94.00          | -27.76      | Average |
| 5730.000        | 65.25                | vertical   | 1.58                    | 66.83                        | 114.00         | -47.17      | Peak    |
| 11460.000       | 34.11                | vertical   | 7.12                    | 41.23                        | 54.00          | -12.77      | Average |
| 11460.000       | 44.48                | vertical   | 7.12                    | 51.60                        | 74.00          | -22.40      | Peak    |
| 5725.000        | 34.65                | horizontal | 1.56                    | 36.21                        | 54.00          | -17.79      | Average |
| 5725.000        | 47.28                | horizontal | 1.56                    | 48.84                        | 74.00          | -25.16      | Peak    |
| 5725.000        | 34.28                | vertical   | 1.56                    | 35.84                        | 54.00          | -18.16      | Average |
| 5725.000        | 48.19                | vertical   | 1.56                    | 49.75                        | 74.00          | -24.25      | Peak    |
| Middle Channel  |                      |            |                         |                              |                |             |         |
| 5800.000        | 67.52                | horizontal | 1.79                    | 69.31                        | 94.00          | -24.69      | Average |
| 5800.000        | 68.33                | horizontal | 1.79                    | 70.12                        | 114.00         | -43.88      | Peak    |
| 11600.000       | 36.92                | horizontal | 7.18                    | 44.10                        | 54.00          | -9.90       | Average |
| 11600.000       | 45.18                | horizontal | 7.18                    | 52.36                        | 74.00          | -21.64      | Peak    |
| 5800.000        | 64.81                | vertical   | 1.79                    | 66.60                        | 94.00          | -27.40      | Average |
| 5800.000        | 65.06                | vertical   | 1.79                    | 66.85                        | 114.00         | -47.15      | Peak    |
| 11600.000       | 34.83                | vertical   | 7.18                    | 42.01                        | 54.00          | -11.99      | Average |
| 11600.000       | 45.49                | vertical   | 7.18                    | 52.67                        | 74.00          | -21.33      | Peak    |
| High Channel    |                      |            |                         |                              |                |             |         |
| 5870.000        | 65.55                | horizontal | 1.79                    | 67.34                        | 94.00          | -26.66      | Average |
| 5870.000        | 66.06                | horizontal | 1.79                    | 67.85                        | 114.00         | -46.15      | Peak    |
| 11740.000       | 36.26                | horizontal | 7.20                    | 43.46                        | 54.00          | -10.54      | Average |
| 11740.000       | 43.67                | horizontal | 7.20                    | 50.87                        | 74.00          | -23.13      | Peak    |
| 5870.000        | 62.30                | vertical   | 1.79                    | 64.09                        | 94.00          | -29.91      | Average |
| 5870.000        | 62.99                | vertical   | 1.79                    | 64.78                        | 114.00         | -49.22      | Peak    |
| 11740.000       | 35.50                | vertical   | 7.20                    | 42.70                        | 54.00          | -11.30      | Average |
| 11740.000       | 43.64                | vertical   | 7.20                    | 50.84                        | 74.00          | -23.16      | Peak    |



|          |       |            |      |       |       |        |         |
|----------|-------|------------|------|-------|-------|--------|---------|
| 5875.000 | 34.12 | horizontal | 1.79 | 35.91 | 54.00 | -18.09 | Average |
| 5875.000 | 47.79 | horizontal | 1.79 | 49.58 | 74.00 | -24.42 | Peak    |
| 5875.000 | 34.05 | vertical   | 1.79 | 35.84 | 54.00 | -18.16 | Average |
| 5875.000 | 46.13 | vertical   | 1.79 | 47.92 | 74.00 | -26.08 | Peak    |

Remark:

Corrected Amplitude= Reading level + corrected Factor

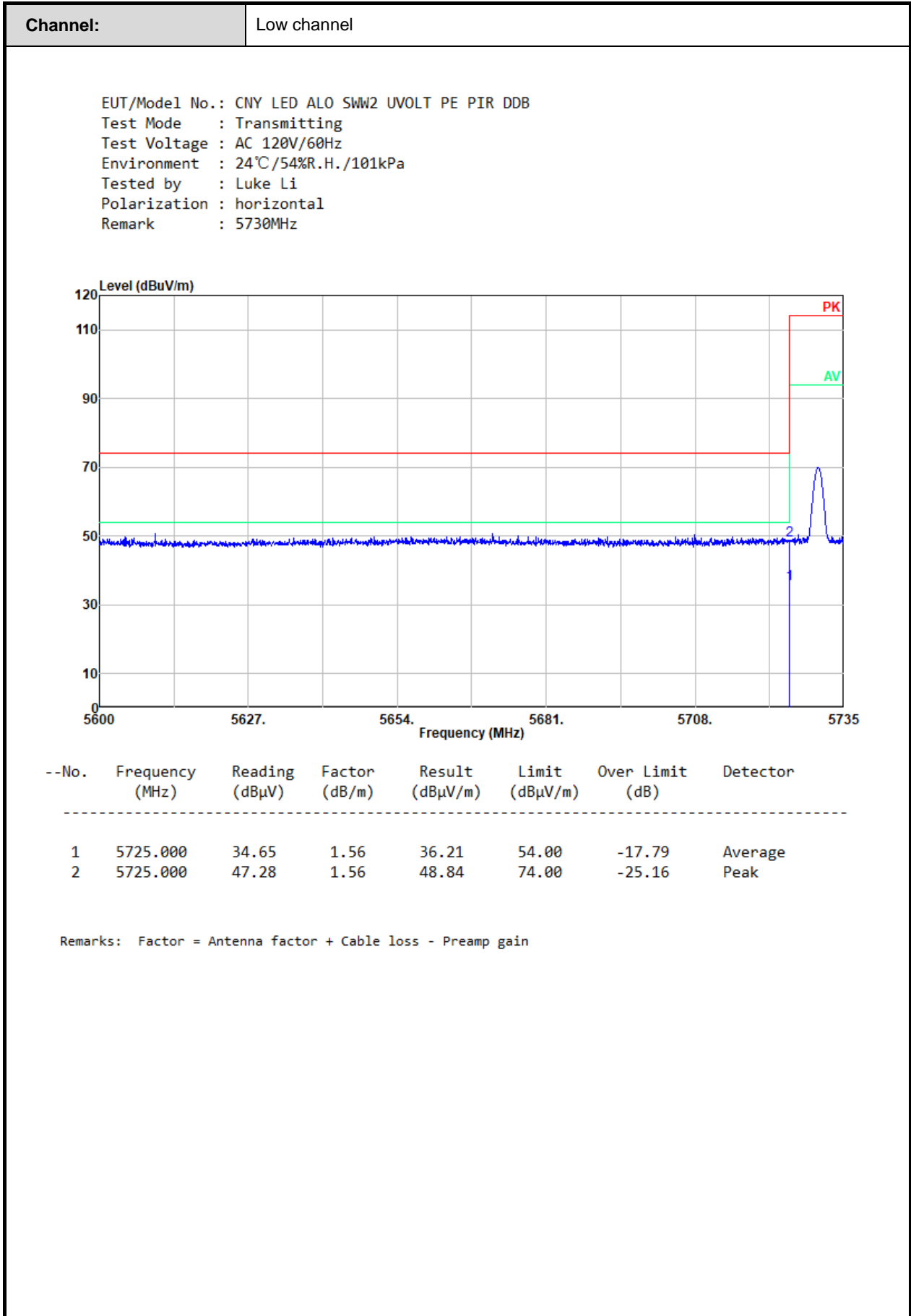
Corrected Factor = Antenna factor + Cable loss – Amplifier gain

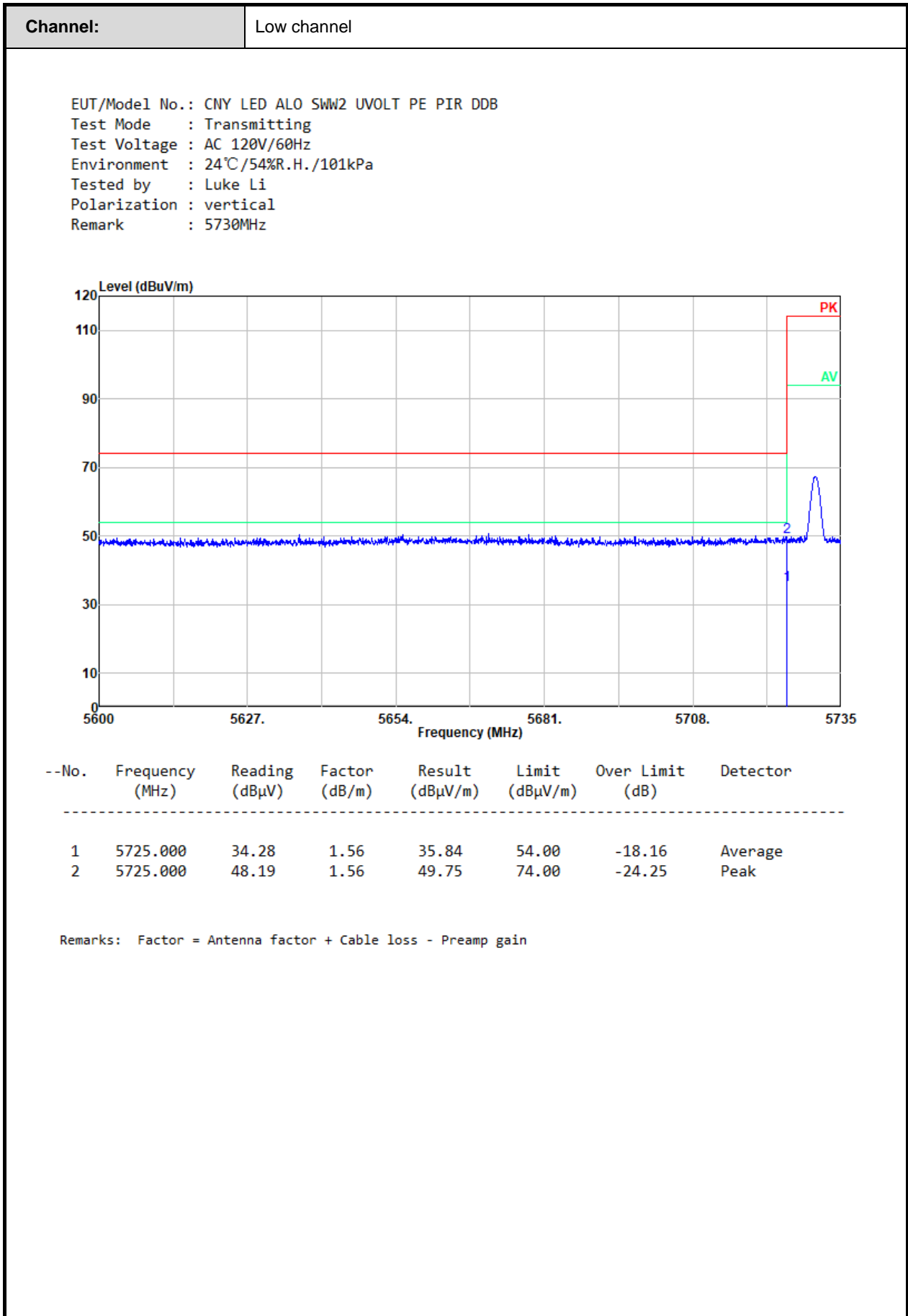
Margin = Corrected Amplitude – Limit

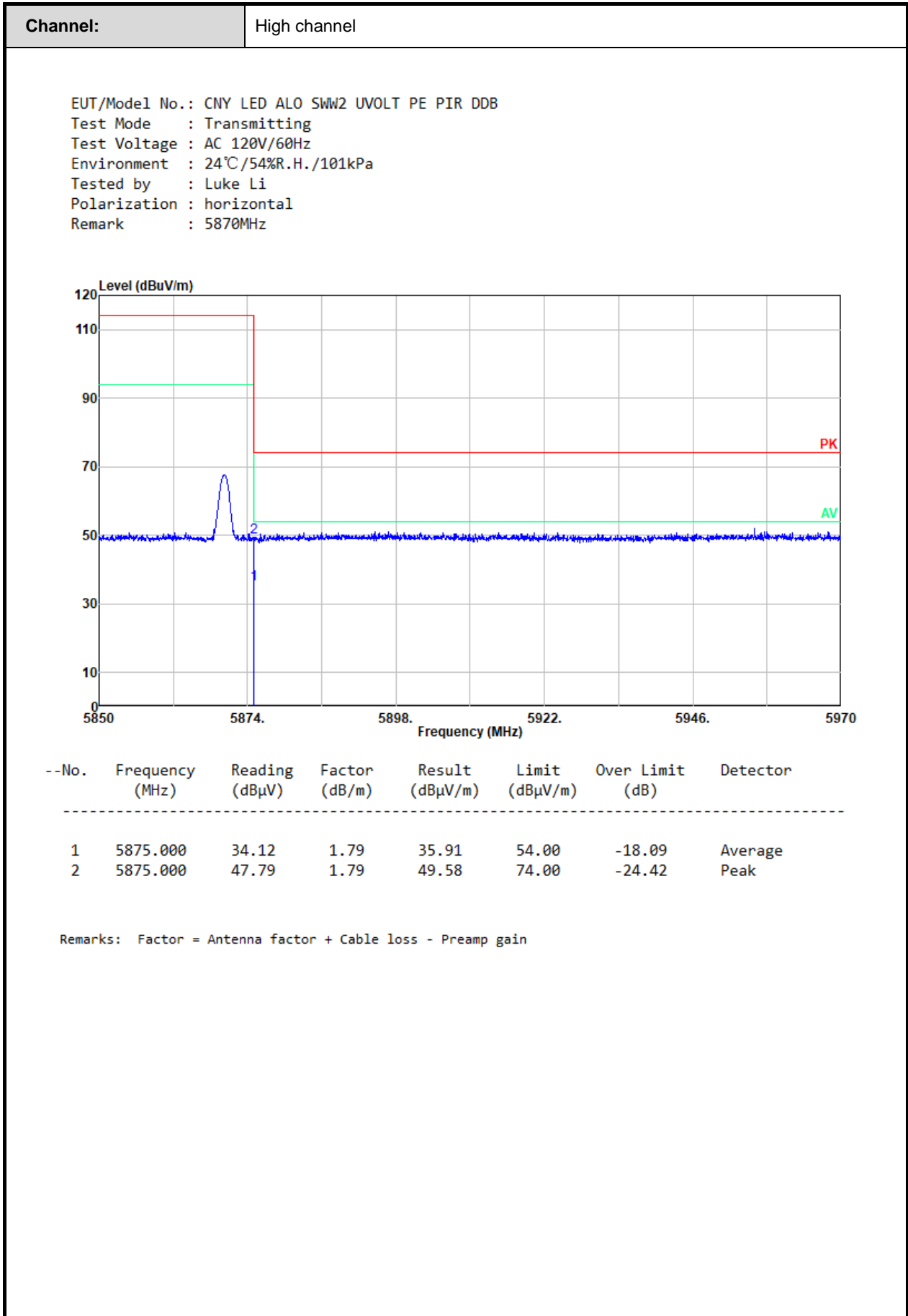
The emission levels of other frequencies that were lower than the limit 20dB not show in test report.

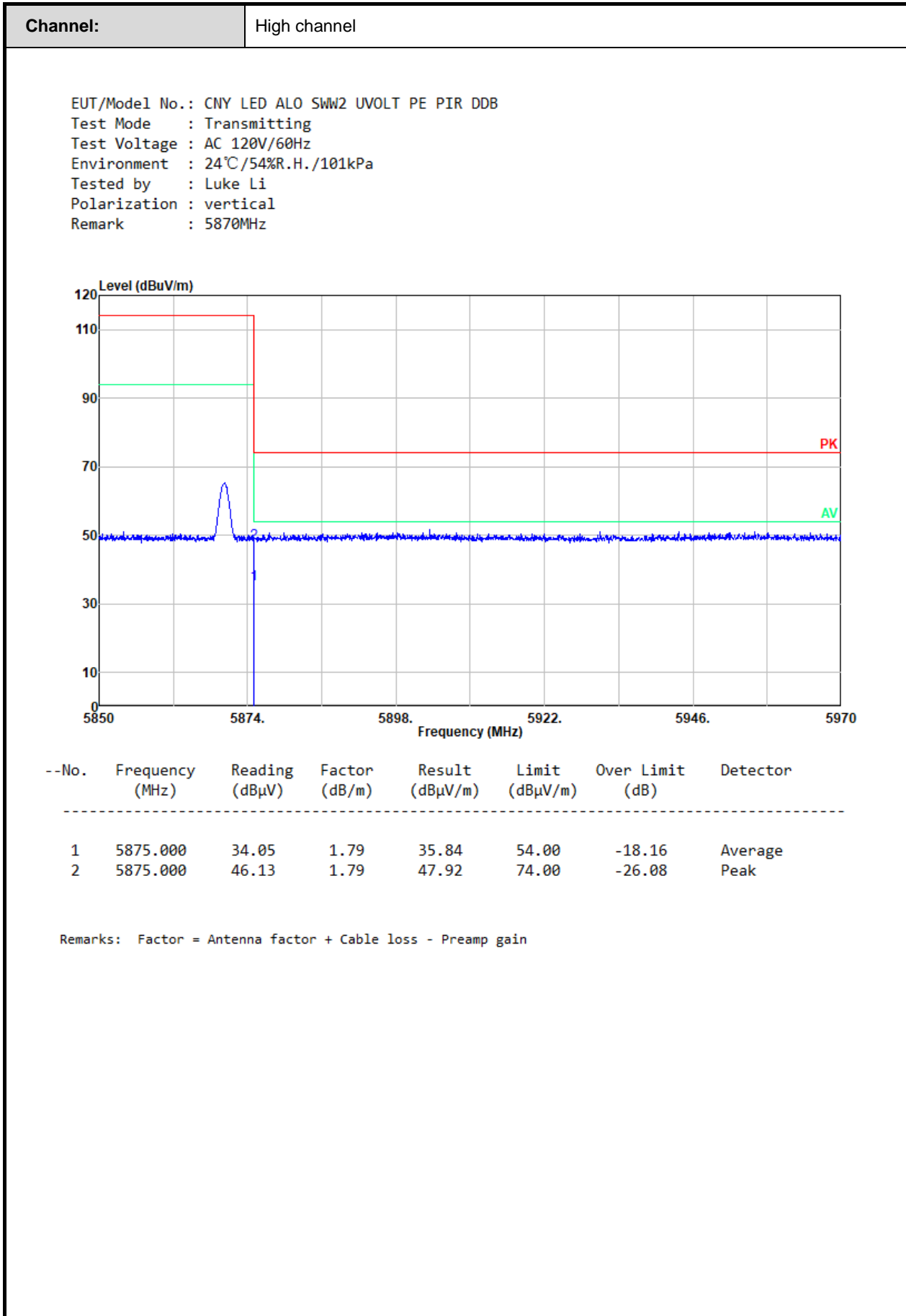
For emissions in 18GHz-40GHz range, all emissions were investigated and in the noise floor level.

**Test plot for Band edge:**

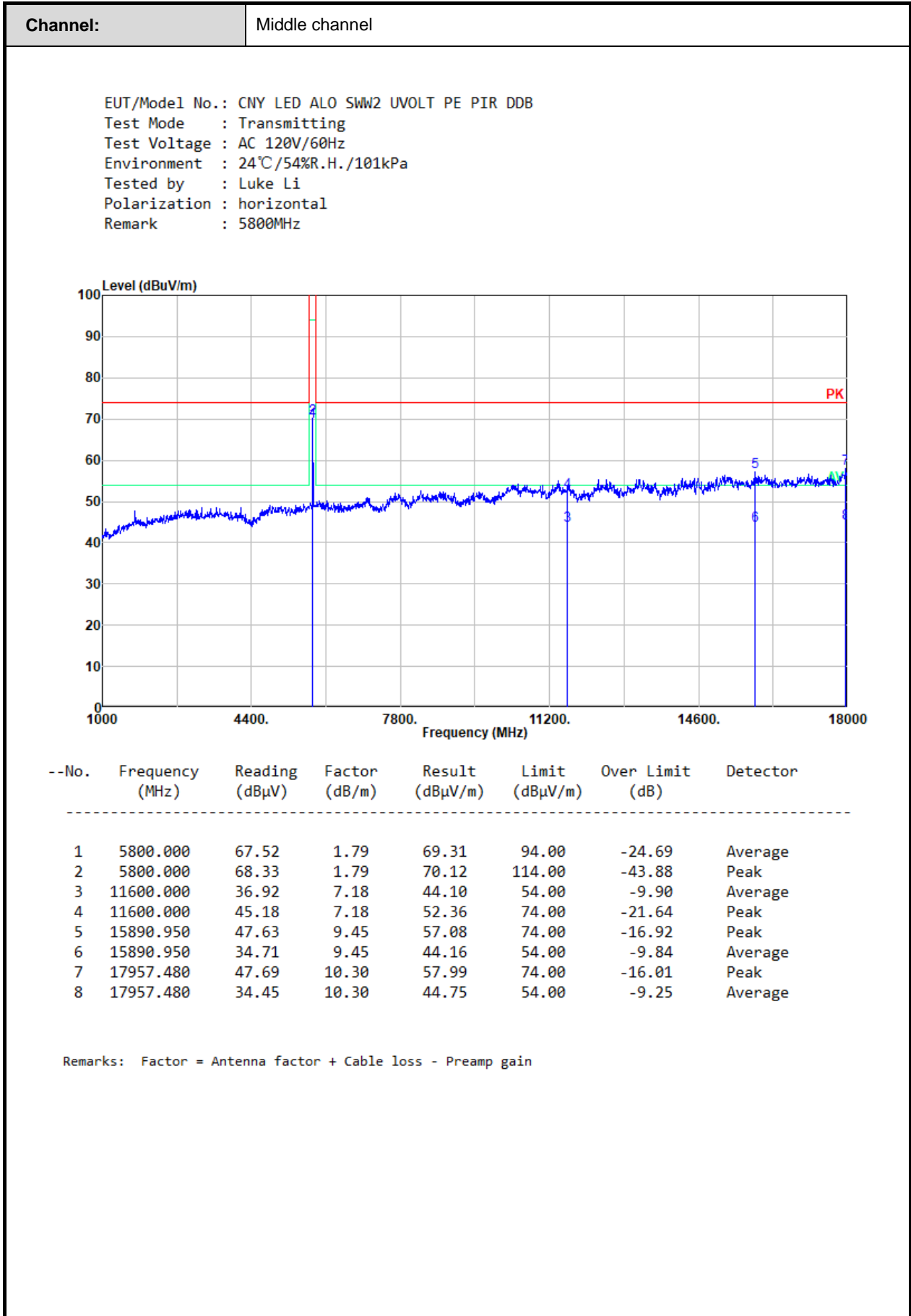


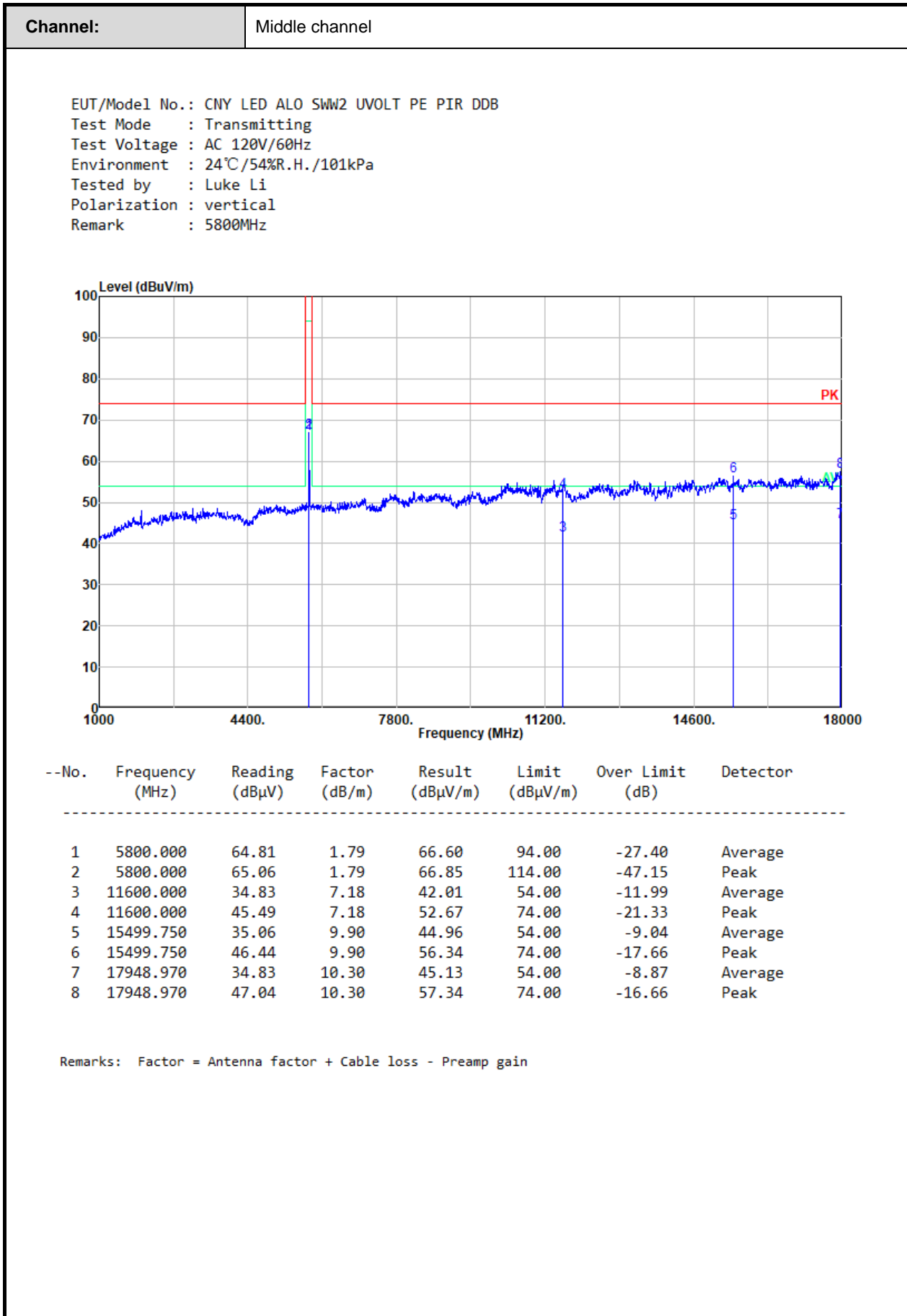






**Test plot for example as below:**



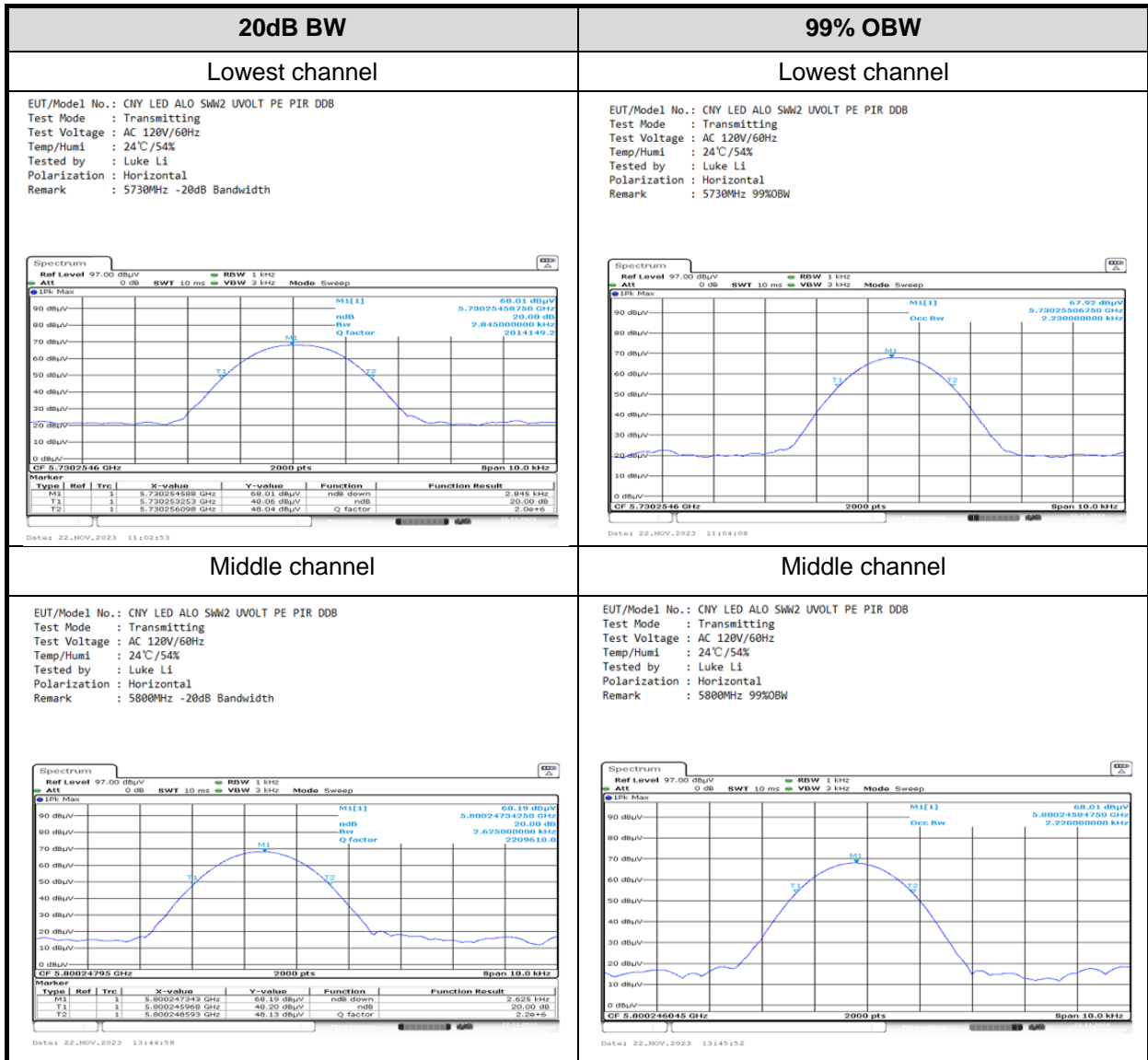


### 3.5 Bandwidth Test Data

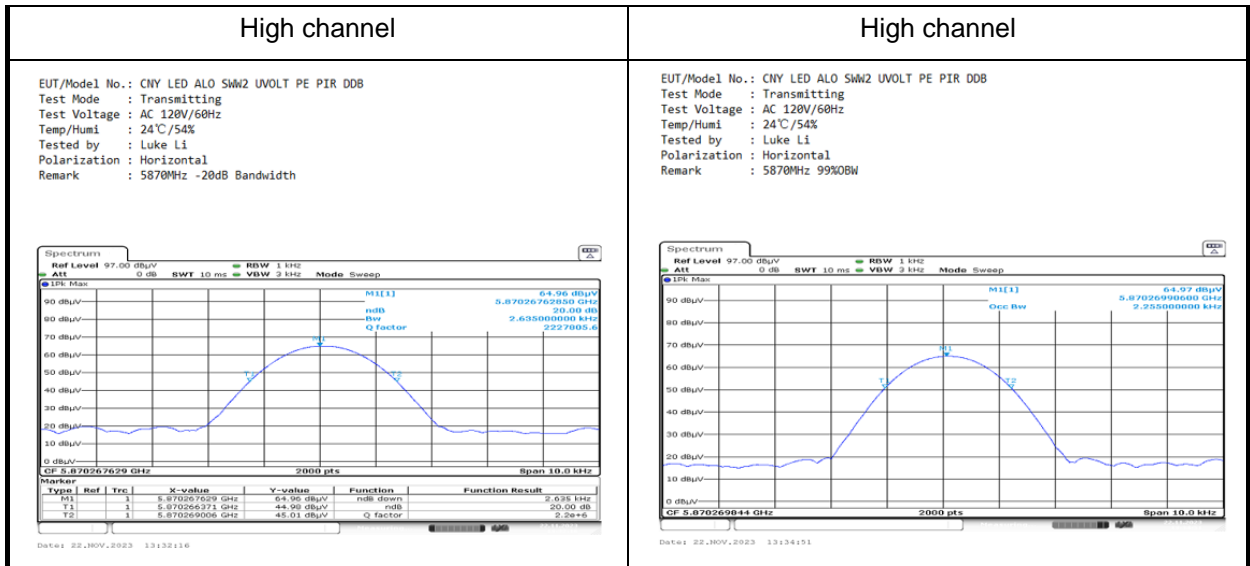
|                               |  |                 |         |
|-------------------------------|--|-----------------|---------|
| <b>Test Date:</b>             | 2023-11-22   | <b>Test By:</b> | Luke Li |
| <b>Environment condition:</b> | Temperature: 24°C; Relative Humidity:54%; ATM Pressure: 101kPa |                 |         |

| Channel | 20dB BW [kHz] | 99% OBW[kHz] |
|---------|---------------|--------------|
| Low     | 2.845         | 2.230        |
| Middle  | 2.625         | 2.220        |
| High    | 2.635         | 2.225        |

### Test Plots:







## 4 Test Setup Photo

Please refer to the attachment.

## 5 E.U.T Photo

Please refer to the attachment.

**---End of Report---**