



# FCC Part 15B Test Report

## FCC ID:2AGQF-WT-UNOQ-B

Applicant: Wavetec FZCO

Address: Light Industrial Unit # 9, Dubai Silicon Oasis P.O. Box 341133, Dubai, United Arab Emirates

Manufacturer: Wavetec FZCO

Address: Light Industrial Unit # 9, Dubai Silicon Oasis P.O. Box 341133, Dubai, United Arab Emirates

EUT: UnoQ Counter Bulb

Trade Mark: N/A

Model Number: WSL-B008P-12  
WSL-B001P, WSL-B002P, WSL-B003P, WSL-B004P, WSL-B005P, WSL-B006P, WSL-B007P,  
WSL-B008P, WSL-B008P-12-E26, WSL-B008P-12-E27, WSL-B009P, WSL-B010P,  
GL-B-001P, GL-B-002P, GL-B-003P, GL-B-004P, GL-B-005P, GL-B-006P, GL-B-007P,  
GL-B-008P, GL-B-009P, GL-B-010P

Date of Receipt: Oct. 21, 2024

Test Date: Oct. 21, 2024 - Oct. 30, 2024

Date of Report: Oct. 30, 2024

Prepared By: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Comprehensive Building, Tongzhou Electronics Longgang Factory Area, No.1  
Baolong Fifth Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China

Applicable Standards: FCC Part 15 Subpart B  
ANSI C63.4:2014

Test Result: Pass

Report Number: DL-241021014-1ER

Prepared (Test Engineer): Alisa Song

Reviewer (Supervisor): Jack Bu

Approved (Manager): Jade Yang



*This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.*



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**1. VERSION**

| Version No. | Date          | Description |
|-------------|---------------|-------------|
| 00          | Oct. 30, 2024 | Original    |
|             |               |             |
|             |               |             |

**2. TEST SUMMARY**

| EMC Emission  |                                   |         |        |        |
|---------------|-----------------------------------|---------|--------|--------|
| Standard      | Test Item                         | Limit   | Result | Remark |
| FCC PART 15 B | Conducted Emission at power ports | Class B | PASS   |        |
|               | Radiated Emission below 1GHz      | Class B | PASS   |        |
|               | Radiated Emission above 1GHz      | Class B | PASS   |        |

**NOTE:**

(1) "N/A" denotes test is not applicable in this Test Report

(2) Test Facility: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Comprehensive Building, Tongzhou Electronics Longgang Factory Area, No.1  
Baolong Fifth Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China



### 3. GENERAL INFORMATION

#### 3.1 Description of Device (EUT)

EUT: UnoQ Counter Bulb

Trade Mark: N/A

Model Number: WSL-B008P-12  
WSL-B001P, WSL-B002P, WSL-B003P, WSL-B004P, WSL-B005P, WSL-B006P,  
WSL-B007P, WSL-B008P, WSL-B008P-12-E26, WSL-B008P-12-E27,  
WSL-B009P, WSL-B010P, GL-B-001P, GL-B-002P, GL-B-003P, GL-B-004P,  
GL-B-005P, GL-B-006P, GL-B-007P, GL-B-008P, GL-B-009P, GL-B-010P

Test Model: WSL-B008P-12

Model difference: All models are same as the samples except model name and thread joint, they have the same structure and circuit.

Power Supply: 100-240V ~ 50/60Hz

Working Frequency: 2405~2480 MHz

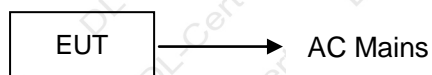
Note: (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(2) The EUT's all information provided by client.

#### 3.2 Tested System Details

None.

#### 3.3 Block Diagram of Test Set-up



#### 3.4 Test Mode Description

Mode1. On Mode(2.4G RX)

#### 3.5 Test Auxiliary Equipment

None.

#### 3.6 Test Uncertainty

Conducted Emission Uncertainty :  $\pm 2.56\text{dB}$

Radiated Emission Uncertainty :  $\pm 3.24\text{dB}$





#### 4. TEST INSTRUMENT USED

##### For Conducted Emission Test (843 Shielded Room)

| Equipment         | Manufacturer | Model     | Serial | Last Cal.     | Next Cal.     |
|-------------------|--------------|-----------|--------|---------------|---------------|
| 843 Shielded Room | YIHENG       | 843 Room  | 843    | Nov. 05, 2023 | Nov. 04, 2026 |
| EMI Receiver      | R&S          | ESR       | 101421 | Nov. 04, 2023 | Nov. 03, 2024 |
| LISN              | R&S          | ENV216    | 102417 | Nov. 04, 2023 | Nov. 03, 2024 |
| Clamp             | COM-POWER    | CLA-050   | 431072 | Nov. 04, 2023 | Nov. 03, 2024 |
| 3-Loop Antenna    | DAZE         | ZN30401   | 13021  | Nov. 04, 2023 | Nov. 03, 2024 |
| ISN T8            | Schwarzbeck  | NTFM 8158 | 101135 | Nov. 04, 2023 | Nov. 03, 2024 |
| ISN T5            | Schwarzbeck  | NTFM 8158 | 101136 | Nov. 04, 2023 | Nov. 03, 2024 |
| 843 Cable 1#      | ChengYu      | CE Cable  | 001    | Nov. 04, 2023 | Nov. 03, 2024 |
| 843 Cable 1#      | ChengYu      | CE Cable  | 002    | Nov. 04, 2023 | Nov. 03, 2024 |

##### For Radiated Emission Test (966 chamber)

| Equipment                | Manufacturer | Model     | Serial     | Last Cal.     | Next Cal.     |
|--------------------------|--------------|-----------|------------|---------------|---------------|
| 966 chamber              | YIHENG       | 966 Room  | 966        | Nov. 06, 2023 | Nov. 05, 2026 |
| Spectrum Analyzer        | Agilent      | E4408B    | MY50140780 | Nov. 04, 2023 | Nov. 03, 2024 |
| EMI Receiver             | R&S          | ESRP7     | 101393     | Nov. 04, 2023 | Nov. 03, 2024 |
| Amplifier                | Schwarzbeck  | BBV9743B  | 00153      | Nov. 04, 2023 | Nov. 03, 2024 |
| Amplifier                | EMEC         | EM01G8GA  | 00270      | Nov. 04, 2023 | Nov. 03, 2024 |
| Broadband Trilog Antenna | Schwarzbeck  | VULB9162  | 00306      | Nov. 04, 2023 | Nov. 03, 2024 |
| Horn Antenna             | Schwarzbeck  | BBHA9120D | 02139      | Nov. 04, 2023 | Nov. 03, 2024 |
| 966 Cable 1#             | ChengYu      | 966       | 004        | Nov. 04, 2023 | Nov. 03, 2024 |
| 966 Cable 2#             | ChengYu      | 966       | 003        | Nov. 04, 2023 | Nov. 03, 2024 |

##### Other

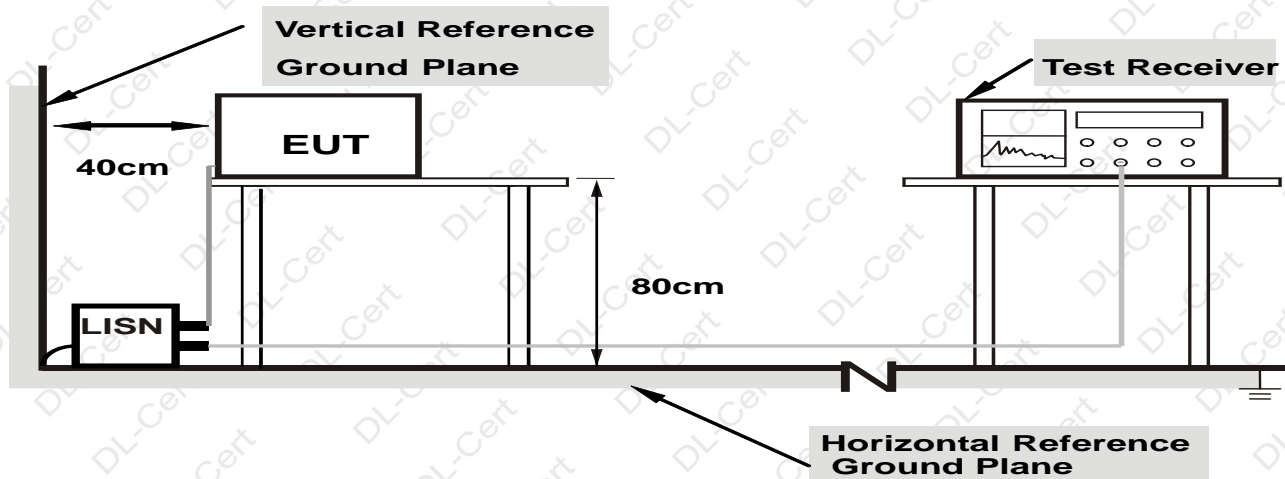
| Name                       | Manufacturer | Model  | Software version |
|----------------------------|--------------|--------|------------------|
| EMC Conduction Test System | FALA         | EZ EMC | EMC-CON 3A1.1    |
| EMC radiation test system  | FALA         | EZ EMC | FA-03A2          |



## 5. CONDUCTED EMISSION TEST

### 5.1 Block Diagram of Test Setup

#### For Mains Terminals Test



**Note: 1.Support units were connected to second LISN.**

**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes**

### 5.2 Test Standard and Limit

#### FCC PART 15 B

| Frequency<br>MHz | Limits dB( $\mu$ V) |               |
|------------------|---------------------|---------------|
|                  | Quasi-peak Level    | Average Level |
| 0.15~0.50        | 66 ~ 56*            | 56 ~ 46*      |
| 0.50~5.00        | 56                  | 46            |
| 5.00~30.00       | 60                  | 50            |

Notes: 1. \*Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

### 5.3 EUT Configuration on Test

The following equipment's are installed on conducted emission test to meet FCC PART 15 B requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 5.4 Operating Condition of EUT

5.4.1 Setup the EUT and simulators as shown in Section 5.1.

5.4.2 Turn on the power of all equipments.

5.4.3 Let the EUT work in test modes and test it.



### 5.5 Test Procedure

The EUT is put on the table and connected to the AC mains through a Artificial Mains Network (AMN) or ISN. This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission levels according to the **ANSI C63.4** regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESR) is set at 10KHz.

The frequency range from 150 KHz to 30 MHz is investigated.

### 5.6 Test Result

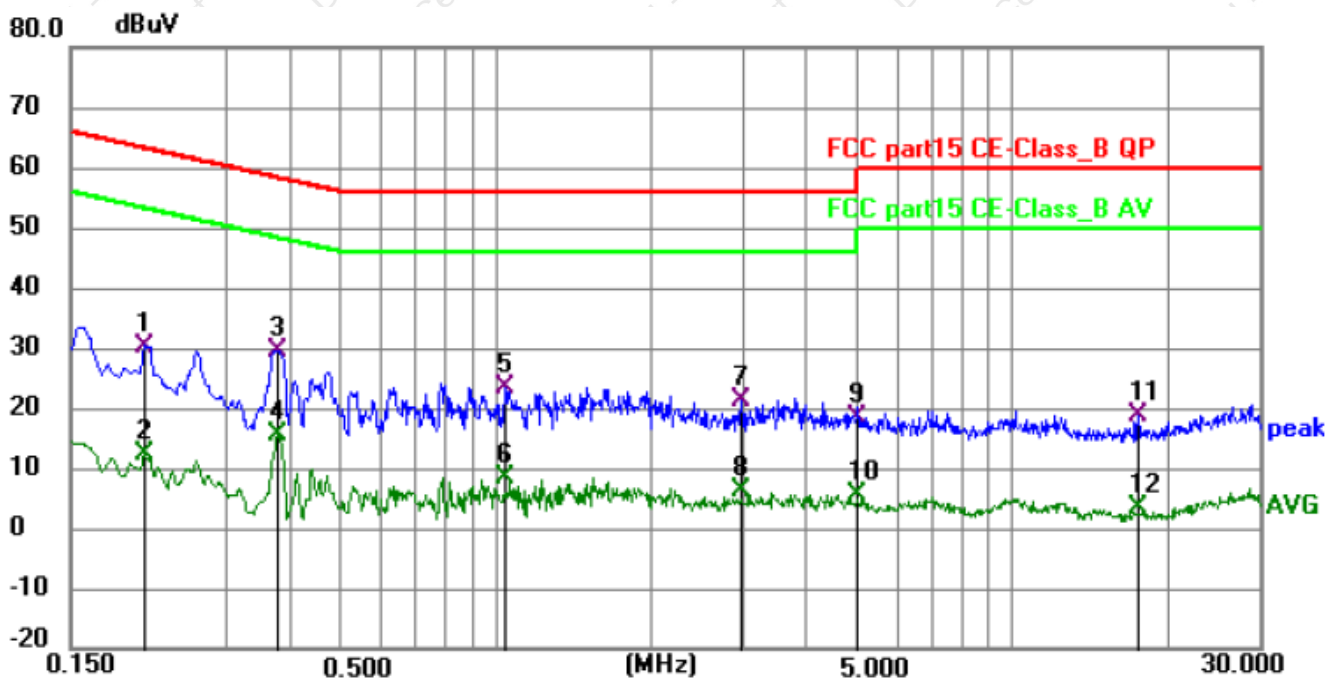
PASS

Please refer to the following page.



## Conducted Emission Test Data

|               |              |                    |        |
|---------------|--------------|--------------------|--------|
| Temperature:  | 24.5 °C      | Relative Humidity: | 54%    |
| Pressure:     | 1009hPa      | Phase:             | Line   |
| Test Voltage: | AC 120V/60Hz | Test Mode:         | Mode 1 |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|-------------|--------------|--------------|-------------|----------|-----|--------|
| 1   | 0.2084          | 20.29          | 9.93        | 30.22        | 63.27        | -33.05      | QP       | P   |        |
| 2   | 0.2084          | 2.25           | 9.93        | 12.18        | 53.27        | -41.09      | AVG      | P   |        |
| 3 * | 0.3795          | 19.70          | 9.91        | 29.61        | 58.29        | -28.68      | QP       | P   |        |
| 4   | 0.3795          | 5.62           | 9.91        | 15.53        | 48.29        | -32.76      | AVG      | P   |        |
| 5   | 1.0455          | 13.43          | 9.97        | 23.40        | 56.00        | -32.60      | QP       | P   |        |
| 6   | 1.0455          | -1.73          | 9.97        | 8.24         | 46.00        | -37.76      | AVG      | P   |        |
| 7   | 2.9805          | 11.34          | 9.95        | 21.29        | 56.00        | -34.71      | QP       | P   |        |
| 8   | 2.9805          | -3.85          | 9.95        | 6.10         | 46.00        | -39.90      | AVG      | P   |        |
| 9   | 4.9830          | 8.35           | 9.93        | 18.28        | 56.00        | -37.72      | QP       | P   |        |
| 10  | 4.9830          | -4.43          | 9.93        | 5.50         | 46.00        | -40.50      | AVG      | P   |        |
| 11  | 17.4884         | 8.70           | 10.01       | 18.71        | 60.00        | -41.29      | QP       | P   |        |
| 12  | 17.4884         | -6.63          | 10.01       | 3.38         | 50.00        | -46.62      | AVG      | P   |        |

Remark: Correct Factor = Cable lose + LISN insertion loss;

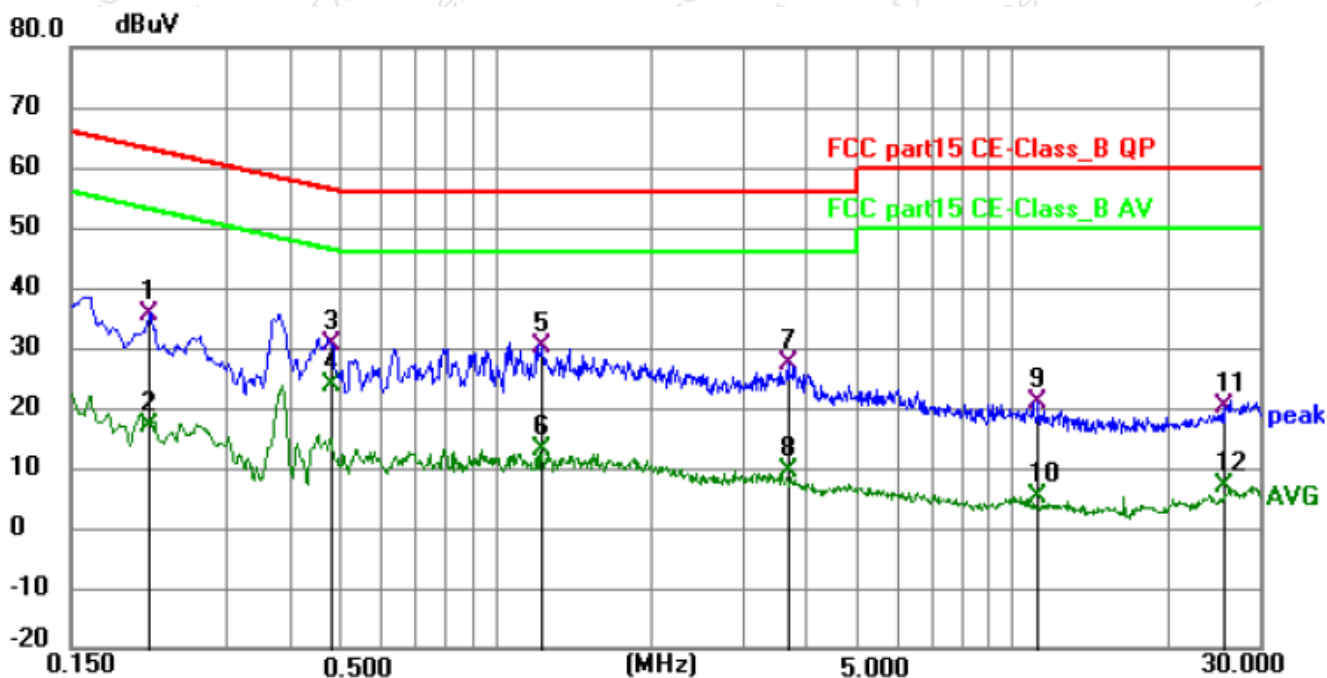
Level = Reading + Correct factor; Margin = Level – Limit;





## Conducted Emission Test Data

|               |              |                    |         |
|---------------|--------------|--------------------|---------|
| Temperature:  | 24.5 °C      | Relative Humidity: | 54%     |
| Pressure:     | 1009hPa      | Phase:             | Neutral |
| Test Voltage: | AC 120V/60Hz | Test Mode:         | Mode 1  |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|-------------|--------------|--------------|-------------|----------|-----|--------|
| 1   | 0.2130          | 25.69          | 9.93        | 35.62        | 63.09        | -27.47      | QP       | P   |        |
| 2   | 0.2130          | 7.01           | 9.93        | 16.94        | 53.09        | -36.15      | AVG      | P   |        |
| 3   | 0.4811          | 20.68          | 9.88        | 30.56        | 56.32        | -25.76      | QP       | P   |        |
| 4 * | 0.4811          | 13.74          | 9.88        | 23.62        | 46.32        | -22.70      | AVG      | P   |        |
| 5   | 1.2300          | 20.17          | 9.98        | 30.15        | 56.00        | -25.85      | QP       | P   |        |
| 6   | 1.2300          | 3.03           | 9.98        | 13.01        | 46.00        | -32.99      | AVG      | P   |        |
| 7   | 3.6780          | 17.58          | 9.91        | 27.49        | 56.00        | -28.51      | QP       | P   |        |
| 8   | 3.6780          | -0.33          | 9.91        | 9.58         | 46.00        | -36.42      | AVG      | P   |        |
| 9   | 11.2560         | 11.03          | 9.89        | 20.92        | 60.00        | -39.08      | QP       | P   |        |
| 10  | 11.2560         | -4.63          | 9.89        | 5.26         | 50.00        | -44.74      | AVG      | P   |        |
| 11  | 25.7549         | 9.96           | 10.24       | 20.20        | 60.00        | -39.80      | QP       | P   |        |
| 12  | 25.7549         | -3.45          | 10.24       | 6.79         | 50.00        | -43.21      | AVG      | P   |        |

Remark: Correct Factor = Cable lose + LISN insertion loss;

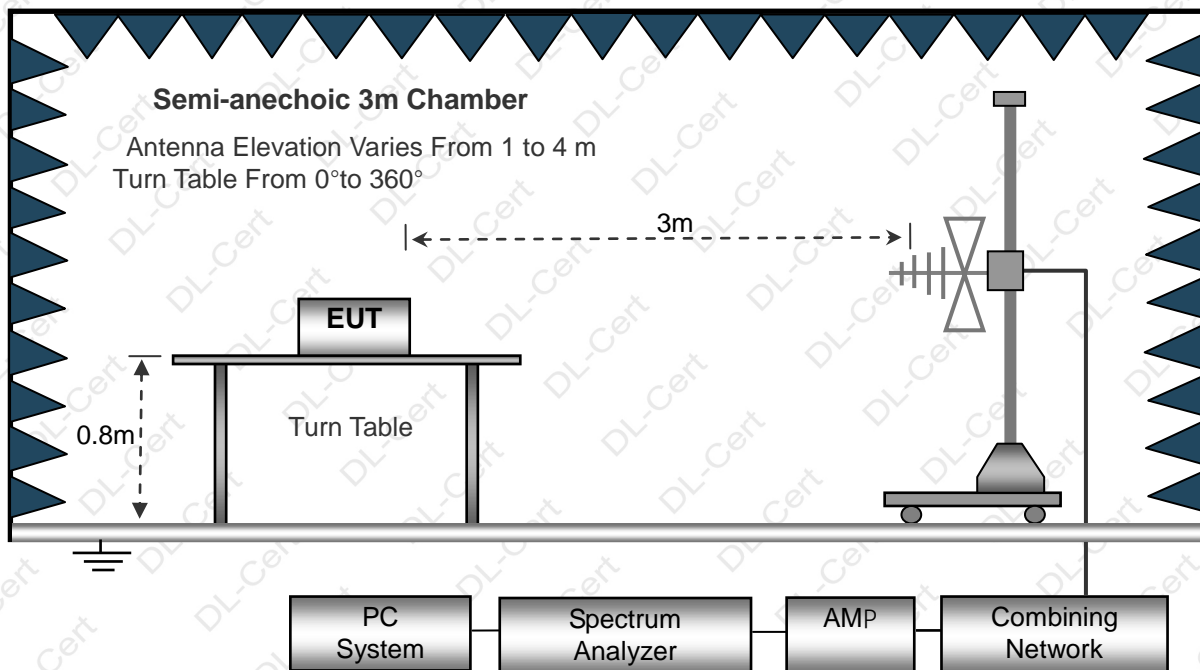
Level = Reading + Correct factor; Margin = Level - Limit;



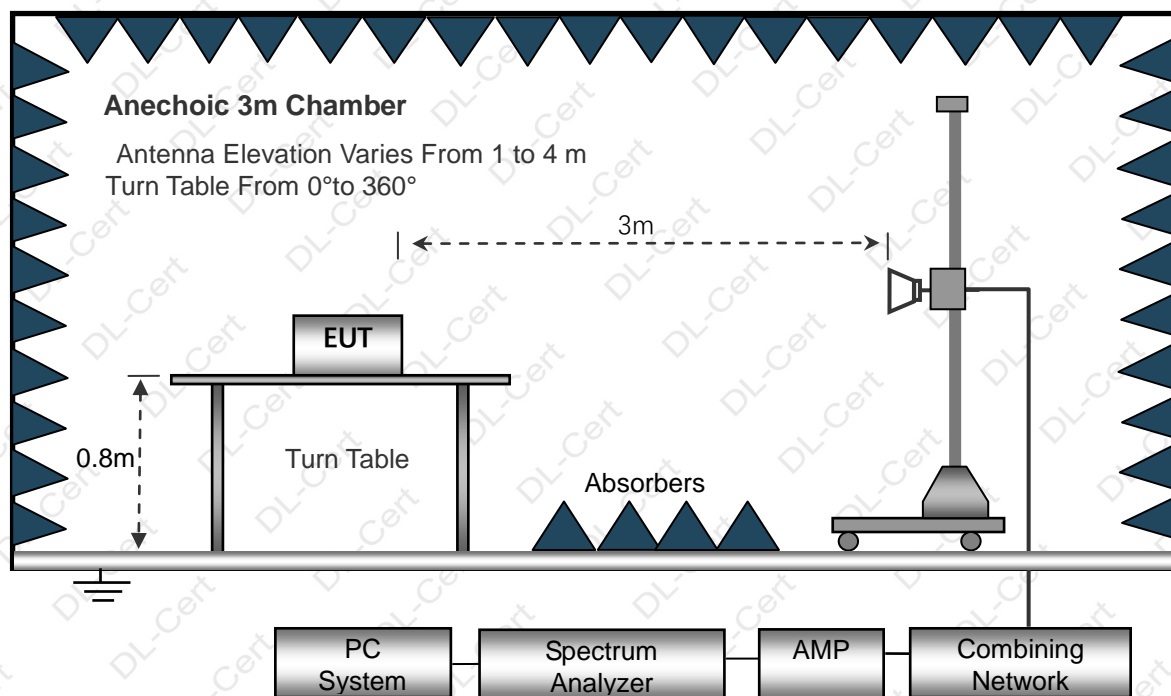
## 6. RADIATION EMISSION TEST

### 6.1 Block Diagram of Test Setup

Below 1GHz



Above 1GHz



### 6.2 Test Standard and Limit FCC PART 15 B



## Below 1GHz

| Frequency<br>(MHz) | Distance<br>(Meters) | Field Strengths Limits<br>(dB $\mu$ V/m) |
|--------------------|----------------------|--|
| 30 ~ 88            | 3                    | 40.0                                     |
| 88 ~ 216           | 3                    | 43.5                                     |
| 216 ~ 960          | 3                    | 46.0                                     |
| 960 ~ 1000         | 3                    | 54.0                                     |

## Above 1GHz

| Frequency<br>MHz | Distance<br>(Meters) | Field Strengths Limits<br>dB( $\mu$ V)/m | Detector |
|------------------|----------------------|--|----------|
| 1000~25000       | 3                    | 74.0                                     | PEAK     |
| 1000~25000       | 3                    | 54.0                                     | AVERAGE  |

## Remark:

- (1) The smaller limit shall apply at the cross point between two frequency bands.
- (2) Distance refers to the distance in meters between the measuring instrument, antenna and the closed point of any part of the device or system.

## 6.3 EUT Configuration on Test

The FCC PART 15 B regulations test method must be used to find the maximum emission during radiated emission test.

The configuration of EUT is the same as used in conducted emission test.

Please refer to Section 5.3.

## 6.4 Operating Condition of EUT

Same as conducted emission test, which is listed in Section 5.4 except the test set up replaced as Section 6.2.

## 6.5 Test Procedure

- 1) The radiated emissions test was conducted in a semi-anechoic chamber.
- 2) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
- 3) Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
- 4) The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.
- 5) The bandwidth setting on the field strength meter (R&S Test Receiver ESCI) is set at 120KHz.
- 6) The frequency range from 30MHz to 25000MHz is checked.
- 7) For above 6GHz, the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

## 6.6 Test Result

PASS

Please refer to the following page.



## Radiation Emission Test Data (Below 1GHz)

|               |              |                    |            |
|---------------|--------------|--------------------|------------|
| Temperature:  | 24.5°C       | Relative Humidity: | 54%        |
| Pressure:     | 1009hPa      | Polarization:      | Horizontal |
| Test Voltage: | AC 120V/60Hz | Test Mode:         | Mode 1     |



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dB | Margin<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|-------------|--------------|----------|
| 1   |     | 178.1327     | 45.51                    | -16.65                  | 28.86                    | 43.50       | -14.64       | QP       |
| 2   |     | 286.9823     | 46.39                    | -12.42                  | 33.97                    | 46.00       | -12.03       | QP       |
| 3   | *   | 311.0867     | 48.86                    | -11.78                  | 37.08                    | 46.00       | -8.92        | QP       |
| 4   |     | 396.2415     | 39.51                    | -9.72                   | 29.79                    | 46.00       | -16.21       | QP       |
| 5   |     | 744.8661     | 34.65                    | -3.25                   | 31.40                    | 46.00       | -14.60       | QP       |
| 6   |     | 948.7610     | 30.14                    | -0.27                   | 29.87                    | 46.00       | -16.13       | QP       |

## Remark:

Correct Factor=Cable loss+Antenna factor-Preamplifier

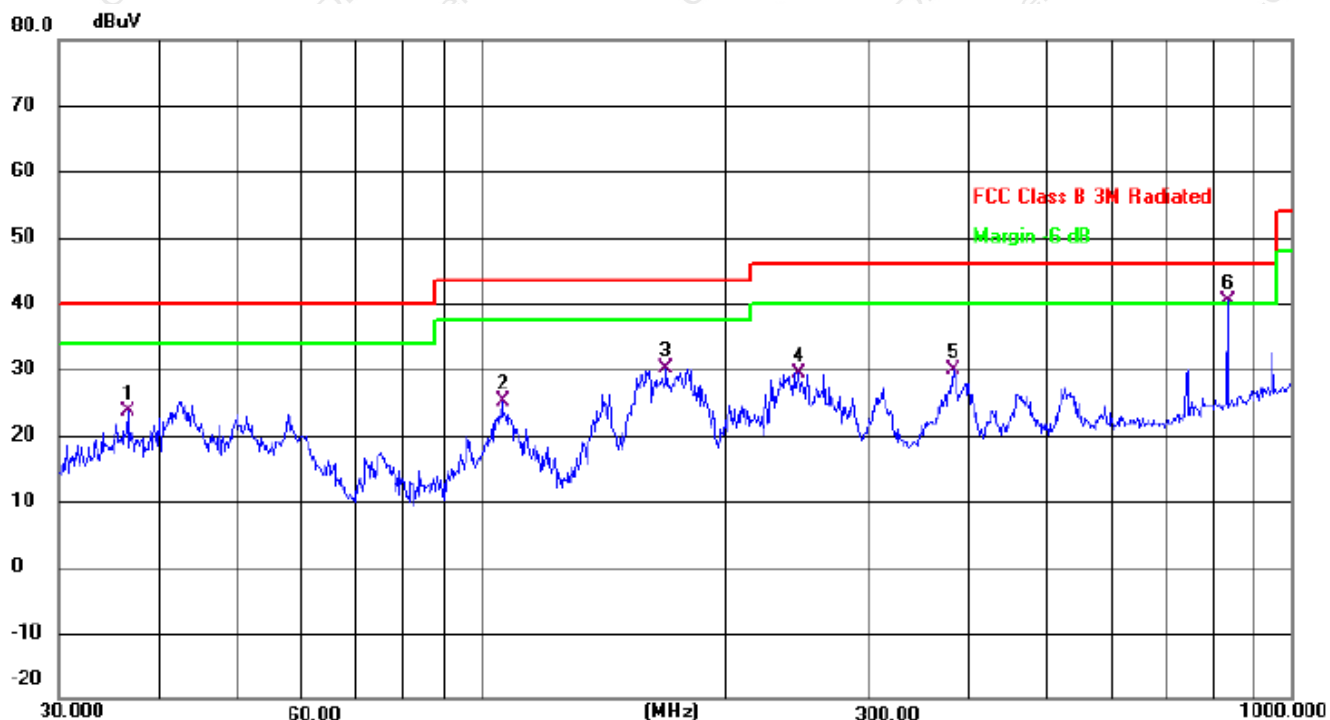
Measurement Level = Reading Level + Correct Factor; Margin = Measurement Level- Limit;





## Radiation Emission Test Data (Below 1GHz)

|               |              |                    |          |
|---------------|--------------|--------------------|----------|
| Temperature:  | 24.5°C       | Relative Humidity: | 54%      |
| Pressure:     | 1009hPa      | Polarization:      | Vertical |
| Test Voltage: | AC 120V/60Hz | Test Mode:         | Mode 1   |



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dB | Margin<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|-------------|--------------|----------|
| 1   |     | 36.5092      | 38.72                    | -15.19                  | 23.53                    | 40.00       | -16.47       | QP       |
| 2   |     | 106.0126     | 39.97                    | -14.88                  | 25.09                    | 43.50       | -18.41       | QP       |
| 3   |     | 169.0054     | 47.24                    | -17.04                  | 30.20                    | 43.50       | -13.30       | QP       |
| 4   |     | 246.8149     | 42.75                    | -13.26                  | 29.49                    | 46.00       | -16.51       | QP       |
| 5   |     | 382.5879     | 39.53                    | -9.71                   | 29.82                    | 46.00       | -16.18       | QP       |
| 6   | *   | 833.3171     | 42.30                    | -2.01                   | 40.29                    | 46.00       | -5.71        | QP       |

## Remark:

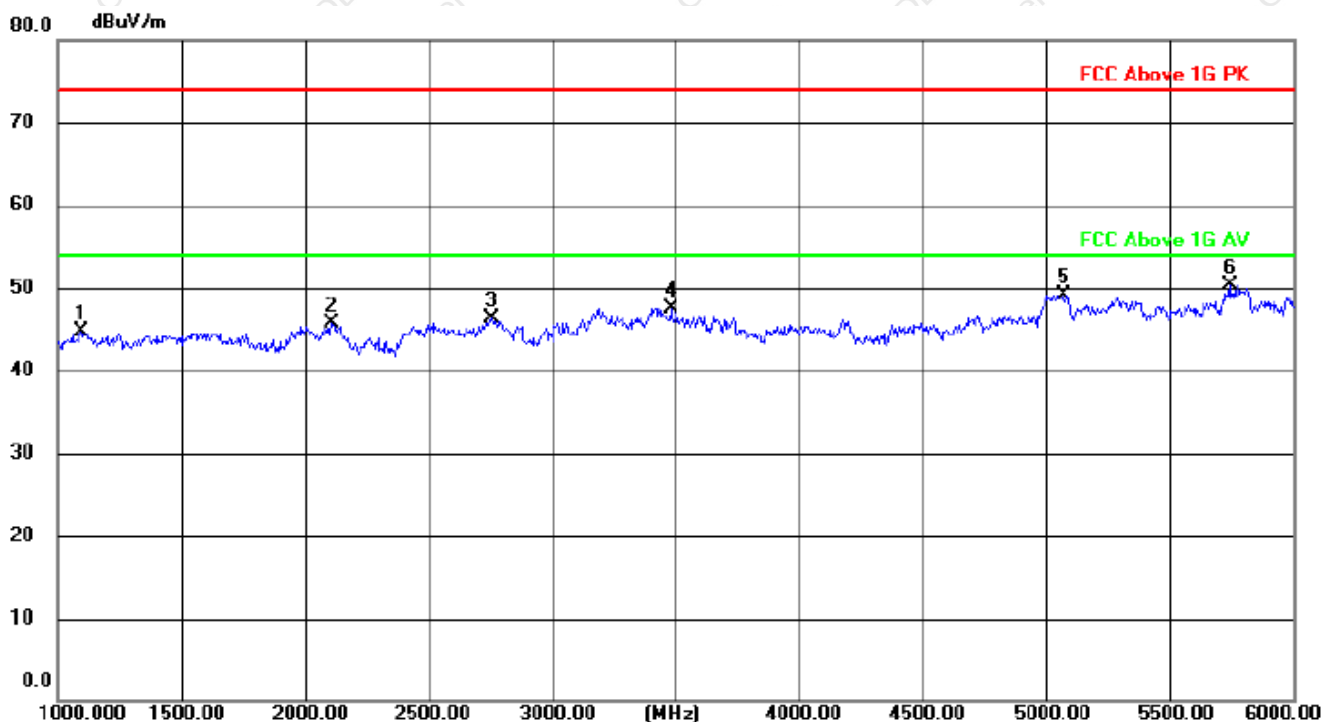
Correct Factor=Cable loss+Antenna factor-Preamplifier

Measurement Level = Reading Level + Correct Factor; Margin = Measurement Level- Limit;



## Radiation Emission Test Data (Above 1GHz)

|               |              |                    |            |
|---------------|--------------|--------------------|------------|
| Temperature:  | 24.5℃        | Relative Humidity: | 54%        |
| Pressure:     | 1009hPa      | Polarization:      | Horizontal |
| Test Voltage: | AC 120V/60Hz | Test Mode:         | Mode 1     |



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit | Margin | Detector |
|-----|-----|----------|---------------|----------------|-------------|-------|--------|----------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dB/m  | dB     |          |
| 1   |     | 1095.000 | 57.55         | -12.88         | 44.67       | 74.00 | -29.33 | peak     |
| 2   |     | 2110.000 | 53.94         | -8.28          | 45.66       | 74.00 | -28.34 | peak     |
| 3   |     | 2755.000 | 53.50         | -7.24          | 46.26       | 74.00 | -27.74 | peak     |
| 4   |     | 3480.000 | 53.96         | -6.42          | 47.54       | 74.00 | -26.46 | peak     |
| 5   |     | 5070.000 | 54.65         | -5.48          | 49.17       | 74.00 | -24.83 | peak     |
| 6   | *   | 5740.000 | 55.49         | -5.26          | 50.23       | 74.00 | -23.77 | peak     |

## Remark:

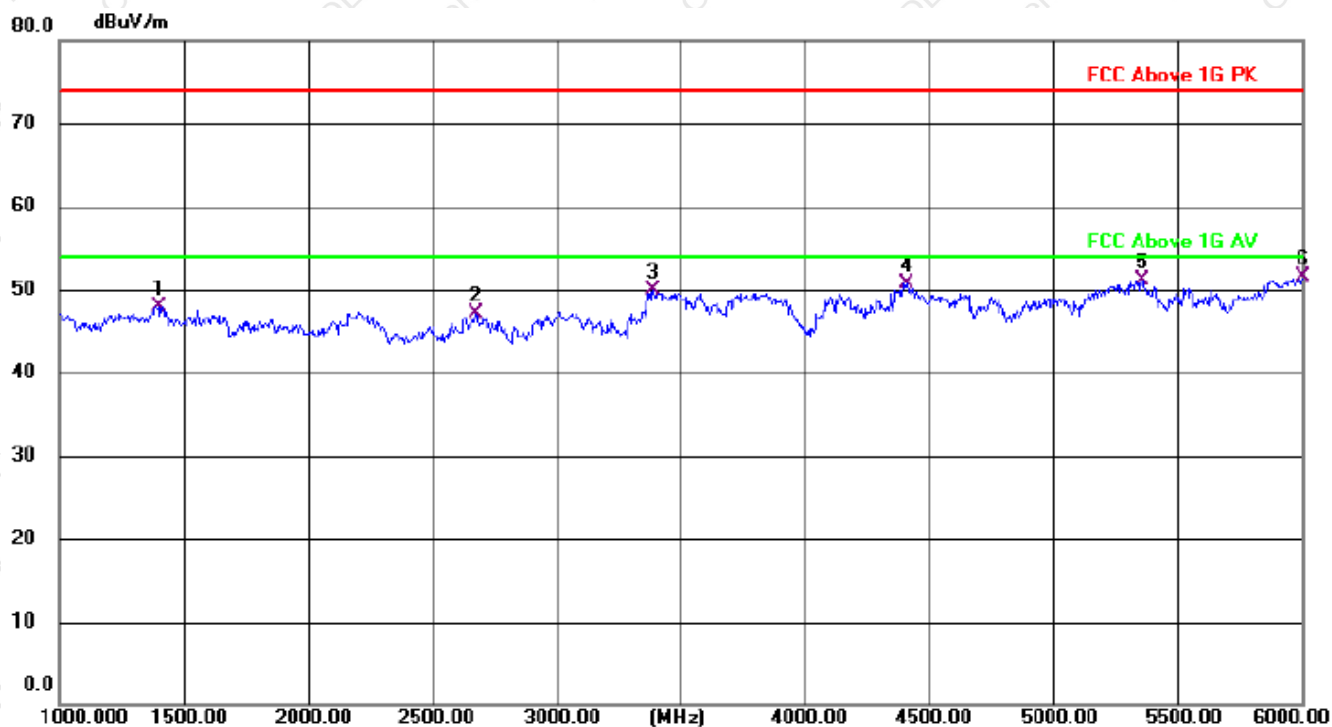
Correct Factor=Cable loss+Antenna factor-Preamplifier

Measurement Level = Reading Level + Correct Factor; Margin = Measurement Level- Limit;



## Radiation Emission Test Data (Above 1GHz)

|               |              |                    |          |
|---------------|--------------|--------------------|----------|
| Temperature:  | 24.5°C       | Relative Humidity: | 54%      |
| Pressure:     | 1009hPa      | Polarization:      | Vertical |
| Test Voltage: | AC 120V/60Hz | Test Mode:         | Mode 1   |



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dB/m | Margin<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|---------------|--------------|----------|
| 1   |     | 1400.000     | 59.26                    | -11.32                  | 47.94                      | 74.00         | -26.06       | peak     |
| 2   |     | 2675.000     | 54.45                    | -7.44                   | 47.01                      | 74.00         | -26.99       | peak     |
| 3   |     | 3390.000     | 56.35                    | -6.46                   | 49.89                      | 74.00         | -24.11       | peak     |
| 4   |     | 4410.000     | 57.29                    | -6.54                   | 50.75                      | 74.00         | -23.25       | peak     |
| 5   |     | 5355.000     | 56.37                    | -5.30                   | 51.07                      | 74.00         | -22.93       | peak     |
| 6   | *   | 6000.000     | 56.80                    | -5.34                   | 51.46                      | 74.00         | -22.54       | peak     |

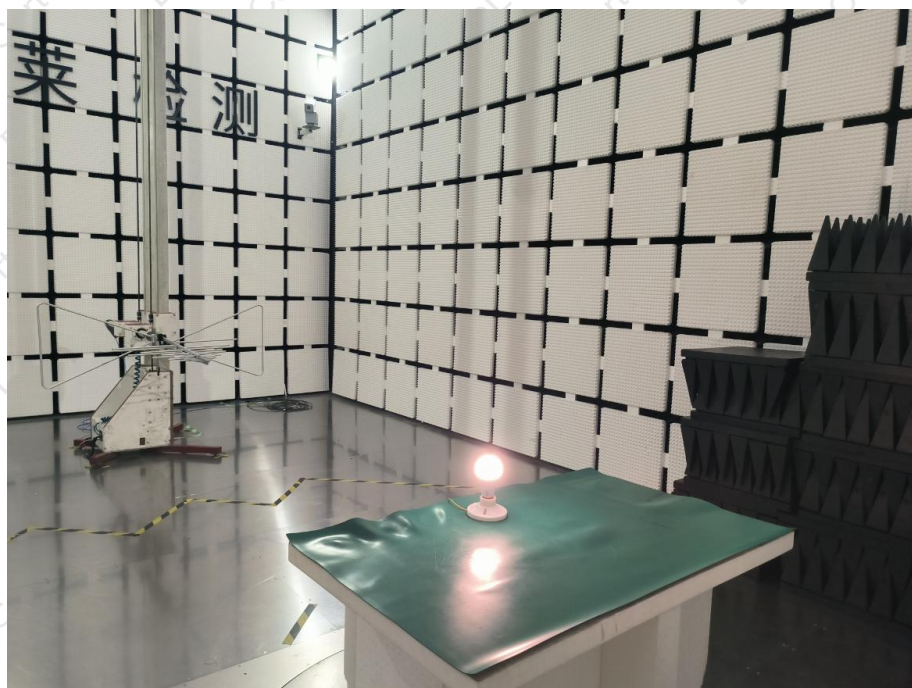
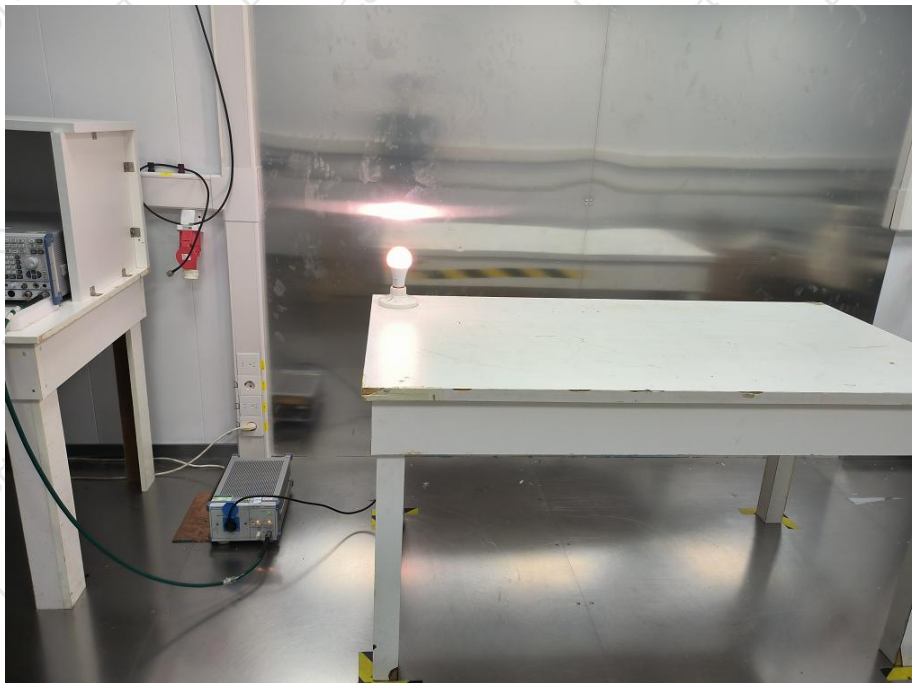
## Remark:

Correct Factor=Cable loss+Antenna factor-Preamplifier

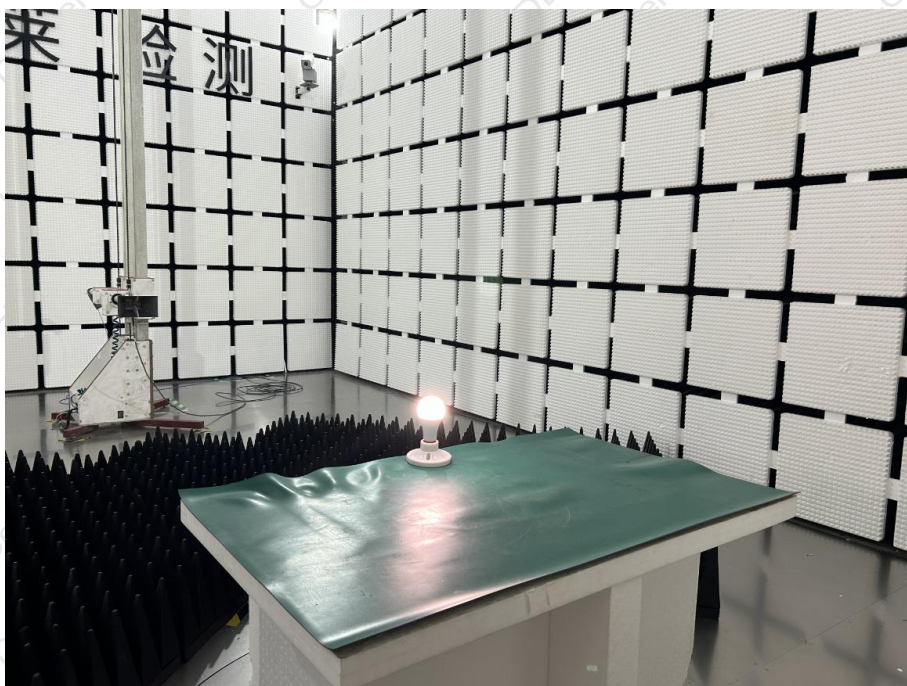
Measurement Level = Reading Level + Correct Factor; Margin = Measurement Level- Limit;



## 7. SETUP PHOTOGRAPHS







## 8. EUT PHOTOGRAPHS

Reference to the appendix II for details.

\*\*\*\*\* END OF REPORT \*\*\*\*\*